48th PROCEEDINGS

Of The

AMERICAN PEANUT RESEARCH AND EDUCATION SOCIETY, INC.

Annual Meeting

July 12-14, 2016
Hilton Clearwater Beach Hotel
Clearwater Beach, FL

Publication Date
December 2016

Editors: Ramon Leon and Kimberly Cutchins

AMERICAN PEANUT RESEARCH & EDUCATION SOCIETY, INC.

48th Annual Meeting

July 12-14, 2016 * Clearwater Beach, FL

Sponsors

Wednesday Night Reception & Dinner
Bayer
BASF

Meeting Breaks
Birdsong Peanuts
Fine Americas, Inc.
Olam Edible Nuts
Syngenta

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Arysta Life Sciences
DuPont
Golden Peanut & Tree Nuts
Monsanto
National Peanut Board
National Peanut Buying Points Association
North Carolina Peanut Growers Association
The J.M. Smucker Company
U.S. Gypsum
Valent
Virginia Peanut Growers Association

Registration Bags & Product Donations
Florida Peanut Producers Association
Romer Labs
Verdesian Life Sciences
American Peanut Shellers Association
Syngenta

Awards Reception
Dow AgroSciences

Spouses Hospitality Suite
Georgia Peanut Commission

Joe Sugg Graduate Student Competition
North Carolina Peanut Growers Association
Anonymous Donor

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JLA, Inc.

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Alabama Peanut Producers Association
Bell Plantation
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Georgia Peanut Commission
Hershey's Chocolate
Hormel Foods
Mars Chocolate
Mississippi Peanut Growers Association
National Peanut Board
North Carolina Peanut Growers Association
The J.M. Smucker Company
Snyder's/Lance
South Carolina Peanut Board
Texas Peanut Producers Board
Virginia Peanut Growers Association

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AMERICAN PEANUT RESEARCH & EDUCATION SOCIETY
BOARD OF DIRECTORS
2015-16

President……………………………………………………………………………. Tom Stalker (2017)

Past President…………………………………………………………………. Naveen Puppala (2016)

President-Elect………………………………………………………………… Corley Holbrook (2018)

Executive Officer…………………………………………………………… Kimberly Cutchins (2016)

University Representatives:

Virginia-Carolina……………………………………………………………. David Jordan (2016)
Southeast…………………………………………………………………….Barry Tillman (2016)
Southwest……………………………………………………………………. Peter Dotray (2017)

USDA Representative…………………………………………………….…. Marshall Lamb (2016)

Industry Representatives:

Production……………………………………………………………….. Wilson Faircloth (2018)
Shelling, Marketing, Storage………………………………… Darlene Cowart (2016)
Manufactured Products………………………………………………… Jim Elder (2017)

Director of Science and Technology of the
American Peanut Council………………………………… Howard Valentine (2016)

National Peanut Board ……………………………………………………… Dan Ward (2016)

AMERICAN PEANUT RESEARCH & EDUCATION SOCIETY
BOARD OF DIRECTORS
2016-17

President…………………………………………………………………………. Corley Holbrook (2018)

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University Representatives:
Virginia-Carolina………………………………………………………. Rick Brandenburg (2019)
Southeast……………………………………………………………..Peggy Ozias-Akins (2019)
Southwest………………………………………………………………. Michael Baring (2017)

USDA Representative……………………………………………………. Marshall Lamb (2019)

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Production……………………………………………………………. Wilson Faircloth (2018)
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Manufactured Products……………………………………………… Jim Elder (2017)

Director of Science and Technology of the
American Peanut Council………………………………… Howard Valentine (2017)

National Peanut Board …………………………………………………. Dan Ward (2017)

PAST PRESIDENTS

H. Thomas Stalker	2015-16			
Naveen Puppala	2014-15		Charles E. Simpson	1991-92
Timothy B. Brenneman	2013-14		Ronald E. Henning	1990-91
Ames Herbert	2012-13		Johnny C. Wynne	1989-90
Todd Baughman	2011-12		Hassan A. Melouk	1988-89
Maria Gallo	2010-11		Daniel W. Gorbet	1987-88
Barbara Shew	2009-10		D. Morris Porter	1986-87
Kelly Chenault Chamberlin	2008-09		Donald H. Smith	1985-86
Austin K. Hagan	2007-08		Gale A. Buchanan	1984-85
Albert K. Culbreath	2006-07		Fred R. Cox	1983-84
Patrick M. Phipps	2005-05		David D.H. His	1982-83
James Grichar	2004-05		James L. Butler	1981-82
E. Ben Whitty	2003-04		Allen H. Allison	1980-81
Thomas G. Islieb	2002-03		James S. Kirby	1979-80
John P. Damicone	2001-02		Allen J. Norden	1978-79
Austin K. Hagan	2000-01		Astor Perry	1977-78
Robert E. Lynch	1999-00		Leland Tripp	1976-77
Charles W. Swann	1998-99		J. Frank McGill	1975-76
Thomas A. Lee, Jr.	1997-98		Kenneth Garren	1974-75
Fred M. Shokes	1996-97		Edwin L. Sexton	1973-74
Harold Pattee	1995-96		Olin D. Smith	1972-73
William Odle	1994-95		William T. Mills	1971-72
Dallas Hartzog	1993-94		J.W. Dickens	1970-71
Walton Mozingo	1992-93		David L. Moake	1969-70
			Norman D. Davis	1968-69

ANNUAL MEETING SITES

1969 - Atlanta, GA
1970 - San Antonio, TX
1971 - Raleigh, NC
1972 - Albany, GA
1973 - Oklahoma City, OK
1974 - Williamsburg, VA
1975 - Dothan, AL
1976 - Dallas, TX
1977 - Asheville, NC
1978 - Gainesville, FL
1979 - Tulsa, OK
1980 - Richmond, VA
1981 - Savannah, GA
1982 - Albuquerque, NM
1983 - Charlotte, NC
1984 - Mobile, AL
1985 - San Antonio, TX
1986 - Virginia Beach, VA
1987 - Orlando, FL
1988 - Tulsa, OK
1989 - Winston-Salem, NC
1990 - Stone Mountain, GA
1991 - San Antonio, TX
1992 - Norfolk, VA
1993 - Huntsville, AL
1994 - Tulsa, OK
1995 - Charlotte, NC
1996 - Orlando, FL
1997 - San Antonio, TX
1998 - Norfolk, VA
1999 - Savannah, GA
2000 - Point Clear, AL
2001 - Oklahoma City, OK
2002 - Research Triangle Park, NC
2003 - Clearwater Beach, FL
2004 - San Antonio, TX
2005 - Portsmouth, VA
2006 - Savannah, GA
2007 - Birmingham, AL
2008 - Oklahoma City, OK
2009 - Raleigh, NC
2010 - Clearwater Beach, FL
2011 - San Antonio, TX
2012 - Raleigh, NC
2013 - Young Harris, GA
2014 – San Antonio, TX
2015 – Charleston, SC
2016 - Clearwater Beach, FL

1969-1978: American Peanut Research and Education Association (APREA)
1979-Present: American Peanut Research and Education Society, Inc. (APRES)

APRES Committees
2015-16

Bailey Award Committee
Scott Monfort, Chair (2016)
Charles Chen (2017)
Peter Dotray (2017)
Phat Dang (2018)
John Damicone (2018)
Jason Sarver (2016)

Coyt T. Wilson Distinguished Service Award Committee
Corley Holbrook, Chair (2016)
Jason Woodward (2018)
Austin Hagan (2016)
Emily Cantowine (2017)

Dow AgroSciences Awards Committee
Kelly Chamberlain, Chair (2017)
Michael Baring (2018)
Scott Tubbs (2016)
Lisa Dean (2016)
Bill Branch (2018)
Victor Nwosu (2017)
John Richburg (2017)

Fellows Committee
David Jordan, Chair (2017)
Mark Burow (2017)
Chris Butts (2016)
Jack Davis (2016)
Diane Rowland (2017)

Finance Committee
Todd Baughman, Chair (2017)
Howard Valentine (2018)
Tim Brenneman (2018)
Naveen Puppala (2017)
Scott Tubbs (2017)

Joe Sugg Graduate Student Award Committee
Robert Kemerait, Chair (2017)
Hillary Mehl (2018)
Juliet Chu (2018)
Wilson Faircloth (2016)
Maria Balota (2017)
Rebecca Bennett (2017)
Jianping Wang (2016)

Nominating Committee
Naveen Puppala, Chair (2016)
Peggy Ozias-Akins (2018)
Corley Holbrook (2018)
Noelle Barkley (2017)
Tom Stalker (2017)
Barry Tillman (2017)

Peanut Quality Committee
Mark Kline, Chair (2017)
Lisa Dean (2018)
Michael Franke (2017)
Darlene Cowart (2018)
Marshall Lamb (2018)
Barry Tillman (2016)
Chris Liebold (2017)

Program Committee
Corley Holbrook, Chair (2016)
Ramon Leon, Technical Program Chair
Greg MacDonald, Local Arrangements Chair

Publications and Editorial Committee
Chris Butts, Chair (2017)
Nick Dufault, (2016)
Baozhou. Guo (2018)
Emily Cantowine (2016)
Shyam Tallury (2017)
Jianping Wang (2017)
Chris Liebold (2018)
Michael J. Mulvaney (2018)

Public Relations Committee
Jason Woodward, Chair (2017)
Ron Sholar (2018)
Julie Marshall (2016)
Bob Sutter (2016)
Jamison Cruce

Site Selection Committee
Barry Tillman, Chair (2016)
Michael Baring, Chair (2017)
Barbara Shew (2018)
Tom Isleib (2018)
Nick Dufault (2016)
Rebecca Bennett (2017)

APRES Committees
2016-17

Bailey Award Committee
John Damicone, Chair (2018)
Charles Chen (2017)
Peter Dotray (2017)
Phat Dang (2018)
Maria Balota (2019)
Kim Moore (2019)

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Jason Woodward (2018)
Albert Culbreath (2019)
Mark Abney (2019)

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Victor Nwosu (2017)
John Richburg (2017)
Michael Baring (2018)
Bill Branch (2018)
Carroll Johnson (2019)
Dylan Wann (2019)

Fellows Committee
David Jordan, Chair (2017)
Mark Burow (2017)
Diane Rowland (2017)
Eric Prostko (2019)

Finance Committee
Todd Baughman, Chair (2017)
Naveen Puppala (2017)
Scott Tubbs (2017)
Howard Valentine (2018)
Tim Brenneman (2019)

Joe Sugg Graduate Student Award Committee
Robert Kemerait, Chair (2017)
Maria Balota (2017)
Rebecca Bennett (2017)
Juliet Chu (2018)
Hillary Mehl (2018)

Nominating Committee
Tom Stalker, Chair (2017)
Barry Tillman (2017)
Peggy Ozias-Akins (2018)
Corley Holbrook (2018)

Peanut Quality Committee
John Bennett, Chair (2019)
Michael Franke (2017)
Chris Liebold (2017)
Darlene Cowart (2018)
Lisa Dean (2018)
Marshall Lamb (2018)
Barry Tillman (2016)
Robert Moore (2019)

Program Committee
Peter Dotray, Chair (2017)
Todd Baughman, Technical Program Chair
Gary Schwarzlose, Local Arrangements Chair

Publications and Editorial Committee
Chris Butts, Chair (2017)
Shyam Tallury (2017) Co-Editor
Jianping Wang (2017)
Baozhou. Guo (2018)
Chris Liebold (2018) Co-Editor
Michael J. Mulvaney (2018)
Nick Dufault Co-Editor

Public Relations Committee
Jason Woodward, Chair (2017)
Ron Sholar (2018)
Keith Rucker (2019)
William Pearce (2019)

Site Selection Committee
Michael Baring, Chair (2017)
Rebecca Bennett (2017)
Naveen Puppala (2017)
Tom Isleib (2018)
Barbara Shew (2018)
Charles Chen (2019)
Hannah Jones (2019)

FELLOWS of the SOCIETY

Dr. Eric Prostko	2016
Dr. Robert Kemerait, Jr.	2015
Dr. Todd A. Baughman	2014
Dr. Austin K. Hagan	2014
Mr. Emory Murphy	2014
Dr. Jay W. Chapin	2013
Dr. Barbara B. Shew	2013
Mr. Howard Valentine	2013
Dr. Kelly Chenault	2012
Dr. Robin Y.Y. Chiou	2012
Dr. W. Carroll Johnson III	2012
Dr. Mark C. Black	2011
Dr. John P. Damicone	2011
Dr. David L. Jordan	2011
Dr. Christopher L. Butts	2010
Dr. Kenneth J. Boote	2009
Dr. Timothy Brenneman	2009
Dr. Albert K. Culbreath	2007
Mr. G.M. "Max" Grice	2007
Mr. W. James Grichar	2007
Dr. Thomas G. Isleib	2006
Mr. Dallas Hartzog	2006
Dr. C. Corley Holbrook	2006
Dr. Richard Rudolph	2005
Dr. Peggy Ozias-Akins	2005
Mr. James Ron Weeks	2004
Mr. Paul Blankenship	2004
Dr. Stanley Fletcher	2004
Mr. Bobby Walls, Jr.	2003
Dr. Rick Brandenburg	2003
Dr. James W. Todd	2002
Dr. John P. Beasley, Jr.	2002
Dr. Robert E. Lynch	2002
Dr. Patrick M. Phipps	2001
Dr. Ronald J. Henning	2001
Dr. Norris L. Powell	2001
Mr. E. Jay Williams	2000
Dr. Gale A. Buchanan	2000
Dr. Thomas A. Lee, Jr.	2000
Dr. Frederick M. Shokes	1999
Dr. Jack E. Bailey	1999
Dr. James R. Sholar	1998
Mr. William M. Birdsong, Jr.	1998
Dr. Gene Sullivan	1998
Dr. Timothy H. Sanders	1997
Dr. H. Thomas Stalker	1996
Dr. Charles W. Swann	1996
Dr. Thomas B. Whitaker	1996
Dr. David A. Knauft	1995
Dr. Charles E. Simpson	1995
Dr. William D. Branch	1994
Dr. Frederick R. Cox	1994
Dr. James H. Young	1994
Dr. Marvin K. Beute	1993
Dr. Terry A. Coffelt	1993
Dr. Hassan A. Melouk	1992
Dr. F. Scott Wright	1992
Dr. Johnny C. Wynne	1992
Dr. John C. French	1991
Dr. Daniel W. Gorbet	1991
Mr. Norfleet L. Sugg	1991
Dr. James S. Kirby	1990
Mr. R. Walton Mozingo	1990
Mrs. Ruth Ann Taber	1990
Dr. Darold L. Ketring	1989
Dr. D. Morris Porter	1989
Dr. Donald J. Banks	1988
Mr. J. Frank McGill	1988
Dr. Donald H. Smith	1988
Dr. James L. Steele	1988
Mr. Joe S. Sugg	1988
Dr. Daniel Hallock	1986
Dr. Olin D. Smith	1986
Dr. Clyde T. Young	1986
Mr. Allen H. Allison	1985
Dr. Thurman Boswell	1985
Mr. J. W. Dickens	1985
Dr. William V. Campbell	1984
Dr. Allen J. Norden	1984
Dr. Harold Pattee	1983

BAILEY AWARD RECIPIENTS

2016	J. Davis, J. Leek, JLA, Inc.; D. Sweigart, The Hershey Company; P. Dang, C. Butts, R. Sorenson, and M. Lamb, USDA-ARS-NPRL
2015	J. Clevenger, Yufang Guo, and P. Ozias-Akins
2014	R. Srinivasan, A. Culbreath, R. Kemerait, and S. Tubbs
2013	A.M. Stephens and T.H. Sanders
2012	D.L. Rowland, B. Colvin. W.H. Faircloth, and J.A. Ferrell
2011	T.G. Isleib, C.E. Rowe, V.J. Vontimitta and S.R. Milla-Lewis
2010	T.B. Brenneman and J. Augusto
2009	S.R. Milla-Lewis and T.G. Isleib
2008	Y. Chu, L. Ramos, P. Ozias-Akins, and C.C. Holbrook
2007	D.E. Partridge, P.M. Phipps, D.L. Coker, and E.A. Grabau
2006	J.W. Chapin and J.S. Thomas
2005	J.W. Wilcut, A.J. Price, S.B. Clewis, and J.R. Cranmer
2004	R.W. Mozingo, S.F. O'Keefe, T.H. Sanders and K.W. Hendrix
2003	T.H. Sanders, K.W. Hendrix, T.D. Rausch, T.A. Katz and J.M. Drozd
2002	M. Gallo-Meagher, K. Chengalrayan, J.M. Davis and G.G. MacDonald
2001	J.W. Dorner and R.J. Cole
2000	G.T. Church, C.E. Simpson and J.L. Starr
1999	J.L. Starr, C.E. Simpson and T.A. Lee, Jr.
1998	J.W. Dorner, R.J. Cole and P.D. Blankenship
1997	H.T. Stalker, B.B. Shew, G.M. Garcia, M.K. Beute, K.R. Barker, C.C. Holbrook, J.P. Noe and G.A. Kochert
1996	J.S. Richburg and J.W. Wilcut
1995	T.B. Brenneman and A.K. Culbreath
1994	A.K. Culbreath, J.W. Todd and J.W. Demski
1993	T.B. Whitaker, F.E. Dowell, W.M. Hagler, F.G. Giesbrecht and J. Wu
1992	P.M. Phipps, D.A. Herbert, J.W. Wilcut, C.W. Swann, G.G. Gallimore and T.B. Taylor
1991	J.M. Bennett, P.J. Sexton and K.J. Boote
1990	D.L. Ketring and T.G. Wheless
1989	A.K. Culbreath and M.K. Beute
1988	J.H. Young and L.J. Rainey
1987	T.B. Brenneman, P.M. Phipps and R.J. Stipes
1986	K.V. Pixley, K.J. Boote, F.M. Shokes and D.W. Gorbet
1985	C.S. Kvien, R.J. Henning, J.E. Pallas and W.D. Branch
1984	C.S. Kvien, J.E. Pallas, D.W. Maxey and J. Evans
1983	E.J. Williams and J.S. Drexler
1982	N.A. deRivero and S.L. Poe
1981	J.S. Drexler and E.J. Williams
1980	D.A. Nickle and D.W. Hagstrum
1979	J.M. Troeger and J.L. Butler
1978	J.C. Wynne
1977	J.W. Dickens and T.B. Whitaker
1976	R.E. Pettit, F.M. Shokes and R.A. Taber

JOE SUGG GRADUATE STUDENT COMPETITION AWARD RECIPIENTS

2016	J. Clevenger[1]
2016	K. Racette[2]
2015	C. Klevorn
2014	Y. Tseng
2013	A. Fulmer
2012	R. Merchant
2011	S. Thornton
2010	A. Olubunmi
2009	G. Place
2008	J. Ayers
2007	J.M. Weeks, Jr.
2006	W.J. Everman
2005	D.L. Smith
2004	D.L. Smith
2003	D.C. Yoder
2002	S.C. Troxler
2001	S.L. Rideout
2000	D.L. Glenn
1999	J.H. Lyerly
1998	M.D. Franke
1997	R.E. Butchko
1996	M.D. Franke
1995	P.D. Brune
1994	J.S. Richburg
1993	P.D. Brune
1992	M.J. Bell
1991	T.E. Clemente
1990	R.M. Cu
1989	R.M. Cu

COYT T. WILSON DISTINGUISHED SERVICE AWARD

2016	Dr. Timothy B. Brenneman
2015	Mr. Howard Valentine
2014	Dr. Tom Isleib
2013	Dr. John P. Bealey, Jr.
2012	Dr. Patrick M. Phipps
2011	Mr. W. James Grichar
2010	Dr. Albert K. Culbreath
2009	No Nominations
2008	Dr. Frederick M. Shokes
2007	Dr. Christopher L. Butts
2006	Dr. Charles E. Simpson
2005	Dr. Thomas B. Whitaker
2004	Dr. Richard Rudolph
2003	Dr. Hassan A. Melouk
2002	Dr. H. Thomas Stalker
2001	Dr. Daniel W. Gorbet
2000	Mr. R. Walton Mozingo
1999	Dr. Ray O. Hammons
1998	Dr. C. Corley Holbrook
1997	Mr. J. Frank McGill
1996	Dr. Olin D. Smith
1995	Dr. Clyde T. Young
1994	No Nominations
1993	Dr. James Ronald Sholar
1992	Dr. Harold E. Pattee
1991	Dr. Leland Tripp
1990	Dr. D.H. Tripp

DOW AGROSCIENCES AWARD FOR EXCELLENCE IN RESEARCH

2016	H. Thomas Stalker
2015	Charles Simpson
2014	Michael Baring
2013	No Nominations Received
2012	Timothy H. Sanders
2011	Timothy Grey
2010	Peter A. Dotray
2009	Joe W. Dorner
2008	Jay W. Chapin
2007	James W. Todd
2006	William D. Branch
2005	Stanley M. Fletcher
2004	John W. Wilcut
2003	W. Carroll Johnson, III
2002	Harold E. Pattee and Thomas G. Isleib
2001	Timothy B. Brenneman
2000	Daniel W. Gorbet
1999	Thomas B. Whitaker
1998	W. James Grichar
1997	R. Walton Mozingo
1996	Frederick M. Shokes
1995	Albert Culbreath
1994	James Todd and James Demski
1993	Hassan Melouk
1992	Rodrigo Rodriguez-Kabana

*1998 Changed to DowAgroSciences Award for Excellence in Research

DOW AGROSCIENCES AWARD FOR EXCELLENCE IN EDUCATION

2016	Timothy Grey
2015	Jay Chapin
2014	Jason Woodward
2013	Peter A. Dotray
2012	Todd A. Baughman
2011	Austin K. Hagan
2010	David L. Jordan
2009	Robert C. Kemerait, Jr.
2008	Barbara B. Shew
2007	John P. Damicone
2006	Stanley M. Fletcher
2005	Eric Prostko
2004	Steve L. Brown
2003	Harold E. Patee
2002	Kenneth E. Jackson
2001	Thomas A. Lee
2000	H. Thomas Stalker
1999	Patrick M. Phipps
1998	John P. Beasley, Jr.
1997	No Nominations Received
1996	John A. Baldwin
1995	Gene A. Sullivan
1994	Drs. Albert Culbreath, James Todd, James Demski
1993	A. Edwin Colburn
1992	J. Ronald Sholar

1992-1996 DowElanco Award for Excellence in Extension
1997 Changed to DowElanco Award for Excellence in Education
1998 Changed to Dow AgroSciences Award for Excellence in Education

PEANUT RESEARCH AND EDUCATION AWARD RECIPIENTS

2016 Bob Kemerait
2015 Tom Stalker and Noelle Barkley
2014 Baozhou Guo
2013 John Beasley
2012 Tom Isleib and Corley Holbrook
2011 No Nominee
2010 P. Ozias-Akins
2009 A. Stephens
2008 T.G. Isleib
2007 E. Harvey
2006 D.W. Gorbet
2005 J.A. Baldwin
2004 S.M. Fletcher
2003 W.D. Branch and J. Davidson
2002 T.E. Whitaker and J. Adams
2001 C.E. Simpson and J.L. Starr
2000 P.M. Phipps
1999 H. Thomas Stalker
1998 J.W. Todd, S.L. Brown, A.K. Culbreath and H.R. Pappu
1997 O.D. Smith
1996 P.D. Blankenship
1995 T.H. Sanders
1994 W. Lord
1993 D.H. Carley and S.M. Fletcher
1992 J.C. Wynne
1991 D.J. Banks and J.S. Kirby G. Sullivan
1990 R.W. Mozingo
1989 R.J. Henning
1987 L.M. Redlinger

2015 Emory Murphy
1986 A.H. Allison
1985 E.J. Williams and J.S. Drexler
1984 Leland Tripp
1983 R. Cole, T. Sanders, R. Hill and P. Blankenship
1982 J. Frank McGill
1981 G.A. Buchanan and E.W. Hauser
1980 T.B. Whitaker
1979 J.L. Butler
1978 R.S. Hutchinson
1977 H.E. Pattee
1976 D.A. Emery
1975 R.O. Hammons
1974 K.H. Garren
1973 A.J. Norden
1972 U.L. Diener and N.D. Davis
1971 W.E. Waltking
1970 A.L. Harrison
1969 H.C. Harris
1968 C.R. Jackson
1967 R.S. Matlock and M.E. Mason
1966 L.I. Miller
1965 B.C. Langleya
1964 A.M. Altschul
1963 W.A. Carver
1962 J.W. Kickens
1961 W.C. Gregory

2005 Now presented by: Peanut Foundation and renamed – Peanut Research and Education Award
1997 Changed to American Peanut Council Research and Education Award
1989 Changed to National Peanut Council Research and Education Award

2016 ABSTRACTS

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Symposium:
Translating Genome Sequence to Peanut Improvement

WEDNESDAY, JULY 23, 2016		
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	Marker-assisted Selection for Biotic Stress Tolerance **Ye Chu**, Research Professional IV, University of Georgia	23
	Accelerating Introgression of Favorable Alleles from Wild Species Using Genomic Tools **Daniel Fonceka**, Researcher, Molecular Genetics, CIRAD	24
	Breeding for Abiotic Stress Tolerance **Mark Burow**, Professor, Dept of Soil & Crop Science, Texas A&M AgriLife Research and Professor, Dept. of Plant & Soil Science, Texas Tech University	25
	Innovative Molecular Breeding Methods **Wayne Parrott**, Professor at the Department of Crop Sciences and Institute for Plant Breeding, Genetics and Genomics, University of Georgia	NOT AVAILABLE
	Industry Perspectives **Steve Brown**, Executive Director, The Peanut Foundation	NOT AVAILABLE

<u>Peanut Genomics for Crop Improvement</u>.

S.A. JACKSON*, D. BERTOLI, S. LEAL-BERTOLI, C. CHAVARRO, C. BALLEN, K-D. KIM, J-H. SHIN and D. GAO, Center for Applied Genetic Technologies, The University of Georgia, Athens, GA 30621; and J. CLEVENGER and P. OZIAS-AKINS, Department of Horticulture, The University of Georgia, Tifton, GA 31793-0748.

The diploid ancestors of tetraploid, cultivated peanut have been sequenced and efforts to improve the cultivated peanut genome continue. PacBio sequencing and improved assembly approaches are being undertaken at HudsonAlpha and the USDA in Starkville, MS. The diploid ancestors provide insights on genome structure in cultivated peanut and already molecular markers for tracking introgression segments containing traits of interest, e.g. disease resistance, have been developed. Resequencing of additional wild species that have potential to provide novel and useful traits for peanut improvement are underway as are the development of synthetic polyploids from the wild relatives that can be used to introgress these traits. I will present an update on the progress on sequencing the cultivated peanut and on resequencing of wild Arachis accessions and the development of new synthetic tetraploids as a tool to move new genes into the cultivated germplasm.

<u>A 60K *Arachis* SNP Array Uncovers Signatures of Selection in the History of US Peanut Breeding</u>

J. CLEVENGER*, Y. CHU, and P. OZIAS-AKINS, Department of Horticulture and Institute of Plant Breeding, Genetics & Genomics, The University of Georgia, Tifton, GA 31793, C. CHAVARRO, J. VAUGHN, D.J. BERTIOLI, S. BERTIOLI, and S. JACKSON, Institute of Plant Breeding, Genetics & Genomics, The University of Georgia, Athens, GA, G. AGARWAL, S. NAYAK, M. PANDEY, and R.K. VARSHNEY, ICRISAT, Hyderabad India 502324, T.G. ISLEIB, Department of Crop Science, Raleigh, NC 27695-7629

We used the 60K *Arachis* SNP array to survey 63 released cultivars and germplasm lines that represent the history of runner peanut breeding in the United States spanning the first crosses made in the 1930's to Georgia-14N released in 2014. A total of 5,537 SNP markers from the array were polymorphic among these 63 lines. We identified 34 parent-progeny combinations and tested which allele for each marker was preferentially selected. Using a simple probability calculated from deviation from random selection, we identified regions of the genome that have undergone preferential selection. Within these regions we found homologs of Soybean maturity genes, *E1*, *E2*, and *E4*, and the meristem identity gene, *LFY*. We traced two important plant introductions, PI259785 and PI203396, to discover genomic regions controlling TSWV and leaf spot resistance. Finally, we tracked new recombination events using 11 breeding paths ranging from 3 to 5 cycles. Analysis of recombination along these paths revealed a marked decrease in new allele combinations after only 3 cycles. Implications for the future of peanut breeding and development of mapping populations will be discussed.

Marker-assisted-selection of Peanut to Improve Tolerance to Biotic Stress.

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Next generation sequencing of whole genomes and transcriptomes of peanut allows for rapid development of genetic markers associated with disease resistance. In this research, genetic markers for host resistance to root-knot nematode (*Meloidogyne arenaria*) and late leaf spot (*Cercosporidium personatum*) were discovered using two recombinant inbred line (RIL) populations, i.e. C1501(Gregory x Tifguard) for nematode resistance and C1801(Florida-07 x SPT-06-06) for late leaf spot.

For nematode resistance, RNAseq was performed using the parents and two RILs demonstrating recombination within the introgressed region from *A. cardenasii*. Refined mapping of the alien introgression yielded 555 SNPs, defining the introgressed region as 92% of the A09 chromosome according to the *A. duranensis* genome. One RIL carrying strong nematode resistance only possesses 3.6% of the introgressed region.

For late leaf spot resistance, QTLseq was performed with the resistant and susceptible pools of genomic DNA from the C1801 population. Genetic markers linked to LLS resistance on chromosomes B03 and A05 were discovered. Further QTL mapping of the C1801 population with polymorphic markers from an Affymetrix SNP array identified a third QTL region that confers resistance to LLS. All of these newly discovered SNP markers were converted to a user-friendly KASP assay detection platform and integrated into current breeding programs.

Accelerating Introgression of Favorable Alleles from Wild Species using Genomic Tools.

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Molecular breeding efforts in cultivated peanut have long been impeded by the paucity of DNA polymorphism. Conversely, high level of polymorphism exists with peanut wild relatives that can be harnessed together with important agronomic traits to improve the cultivated varieties. In a collaborative project with CIRAD, ISRA and EMBRAPA we developed a resolutive interspecific QTL mapping populations (AB-QTL and CSSL) using the synthetic tetraploid (A. ipaensis x A.duranensis)4x as wild donor. The CSSL population is of particular interest. It has been developed so as to representing the entire wild species genomes in a set of lines each carrying one or a few wild donor segments in the genetic background of the cultivated peanut. The introgression of the wild segments was monitored using SSR markers. The population allows breeders to access novel genetic variations coming from the wild species in a way that can be easily usable because of the reduction of the negative effects resulting from the interactions between donor alleles. The CSSL population is being extensively phenotyped for many traits related to yield components and several QTLs are identified and validated. Moreover, pyramiding the wild segments containing QTL involved in seed size increase has been performed. The recent release of the peanut diploid genomes opens new avenues for a comprehensive characterization of this genetic resource.

Characterization of Improved Early-Maturing Peanut Breeding Lines.

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We have identified several high-yielding, early-maturing runner lines. Tests over multiple years have indicated yields and grades similar to check varieties. Selections have been made in sensory evaluations for materials lacking detectable fruity-fermented attributes. Seeds have a high oleic:linoleic fatty acid composition; seed size varies from similar to Florunner and Flavorunner 458 to similar to Tamrun OL02. Screening at a location with Sclerotinia blight demonstrated moderate resistance among some accessions.

Production Technology/Weed Science I

WEDNESDAY, JULY 23, 2016		
1:30 - 3:30	**Production Technology/Weed Science I** *Chair and Moderator: Steve Li, Auburn University*	**Page Number**
1:30 p.m	**Best Combination of Disease Resistance, Drought Tolerance, and Dollar Value among Runner and Virginia-Type Peanut Cultivars in Georgia.** **W. D. BRANCH*** and S. M. FLETCHER. Dept. of Crop and Soil Sciences, and Dept. of Agric. and Applied Economics, University of Georgia, Tifton and Griffin Campus, respectively.	**27**
1:45 p.m.	**The Need for Micronutrients in Peanut Production.** **G. HARRIS***, University of Georgia, Tifton, GA; J. HOWE and A. CALLAWAY, Auburn University, Auburn, AL.	**28**
2:00 p.m.	**Yield, Water Use Efficiency, and Water Footprint for Irrigated Peanut In Georgia** **M.C. LAMB***, R.B. SORENSON, and C.L. BUTTS, USDA-ARS, National Peanut Research Laboratory, Dawson, GA 39242.	**29**
2:15 p.m.	**The Influence of Plant Population on Peanut Varieties.** **J. C. OAKES*** and M. BALOTA, Virginia Tech Tidewater AREC, Suffolk, VA 23437	**30**
2:30 p.m.	**Irrigation Scheduling Methods for Peanuts a Continued Study.** **W. M. PORTER***, C. D. PERRY, W. S. MONFORT, J. L. SNIDER, G. VELLIDIS, Department of Crop and Soil Sciences, and A.R. SMITH, Department of Agricultural Economics, University of Georgia, Tifton, GA 31793-0748.	**31**
2:45 p.m.	**How Planting Date and Row Pattern Influence Peanut Pod Yield in Mississippi.** **J.M. SARVER*** and C.C. ABBOTT, Department of Plant and Soil Sciences, Mississippi State University, Mississippi State, MS 39762.	**32**
3:00 p.m.	**Planter Speed, Vacuum Pressure, and Seed Plate Effects on Peanut Plant Stand in Single Row Pattern.** **R.S. TUBBS***, G.A. HANCOCK, Crop and Soil Sciences Department, University of Georgia, Tifton, GA 31793; and J.M. SARVER, Department of Plant and Soil Sciences, Mississippi State University, Mississippi State, MS 39762.	**33**
3:15 p.m.	**Dynamic Variable Rate Irrigation Scheduling for Peanuts.** G. VELLIDIS, W. PORTER, **V. LIAKOS***, C. PERRY Department of Crop and Soil Sciences University of Georgia, Tifton, GA. And Xi LANG, Department of Plant, Soil, and Entomological Sciences, University of Idaho, Aberdeen Research and Extension Center, 1693 S 2700 W Aberdeen, ID 83210.	**34**

Best Combination of Disease Resistance, Drought Tolerance, and Dollar Value among Runner and Virginia-Type Peanut Cultivars in Georgia.

W. D. BRANCH* and S. M. FLETCHER. Dept. of Crop and Soil Sciences, and Dept. of Agric. and Applied Economics, University of Georgia, Tifton and Griffin Campus, respectively.

Utilization of peanut (*Arachis hypogaea* L.) cultivars with the best combination of disease resistance, drought tolerance, and greatest dollar value return would be beneficial to enhance economical return and sustainability of Georgia farming operations. Replicated field tests were conducted for five-years (2011–15) and four years (2012–15) with minimum inputs and without irrigation to evaluate the performances of several runner and virginia-type cultivars at two locations in Georgia. Each year, minimum inputs for disease control included only three fungicide sprays at recommended rates on a 28-d schedule beginning 37-d after planting. No insecticide, nematocides, miticides, or irrigation were applied during the growing seasons each year. 'Georgia-06G', 'Georgia-12Y', 'Georgia-13M', 'Georgia-14N', and Florida-EP '113' had the lowest TSWV and total disease incidence (best resistance) among the runner-type cultivars when averaged across both Georgia locations; whereas, 'Georgia-08V', 'Georgia-11J', and 'Bailey' had the least disease incidence among the virginia-type cultivars. Similarly, Georgia-13M, Georgia-06G, and Georgia-12Y had the greatest gross dollar value return per hectare (best drought tolerance) among the runner-types; whereas, Georgia-08V and Georgia-11J had the greatest dollar values per hectare among the virginia-type cultivars when averaged across both Georgia locations in this four and five-year study, respectively.

The Need for Micronutrients in Peanut Production.

G. HARRIS*, University of Georgia, Tifton, GA; J. HOWE and A. CALLAWAY, Auburn University, Auburn, AL.

Field trials were conducted to determine the need for micronutrients in peanut production especially compared to current University Extension recommendations. Boron is currently recommended at a 0.5 lb B/a rate preferably in “split” foliar applications with early fungicide sprays. Manganese applications are only recommended as based on tissue sampling and will likely only occur under high soil pH and low soil test manganese level combinations. Response of peanut to other micronutrients such as copper or nickel, in terms of yield, are thought to be rare.

Different rates, sources and timing of boron applications were applied in randomized and replicated field trials under both irrigation and dryland conditions. Leaf tissue samples were taken mid-season and yield and grade were measured at harvest. Since boron deficiency can also cause an internal damage called hollow heart, subsamples from each plot were shelled and visually evaluated for hollow heart. Different rates and sources of manganese were also evaluated for their effect on yield, grade and mid-season leaf tissue levels of manganese. The need for copper and nickel were also evaluated in the same trials as manganese.

Statistically significant yield responses to applied micronutrients were not measured in any of the studies. Grades were also not affected. This is likely due to residual soil levels of these micronutrients already being present in adequate amounts. Leaf tissue levels of micronutrients however were significantly different between treatments. Hollow heart was detected and is currently being analyzed to determine if affected by boron treatments.

Yield, Water Use Efficiency, and Water Footprint for Irrigated Peanut in Georgia

M.C. LAMB*, R.B. SORENSEN, and C.L. BUTTS. USDA-ARS National Peanut Research Laboratory, Dawson, GA 39842

During most years, irrigation is essential to sustain high peanut yield[1] quality[1] and net returns in the Southeast. Next to land, water for irrigation is arguably the most important natural resource in production agriculture such that producers have increased irrigated cotton, corn, and peanut acreage in Georgia. A recent study commissioned by the United Nations Educational, Scientific, and Cultural Organization found a favorable position for US peanut production in terms of water use compared to other protein sources and competing countries. These studies were conducted for 126 crops at a 5-arc minute (10x10km) scale to aggregate the water use values to differing spatial scales (i.e., states). The results showed the blue (irrigation) and grey (water use to disperse nutrients) water footprint was 357 and 264 liters of water per kg of shelled peanuts, respectively. While aggregate studies are important in establishing baseline water usage for comparative analysis, replicated field and plot scale studies can validate water usage. Irrigation and crop rotational studies conducted from 2001 through 2015 at the USDA/ARS Multi-crop Irrigation Research Farm in Shellman, GA (84° 36′ W, 30° 44′ N) on a Greenville fine sandy loam (fine, kaolinitic, thermic Rhodic Kandiudults) provided data to calculate water usage. In 2 yr out rotation sequences, sprinkler irrigation increased peanut yield 2,012 kg/ha compared to non-irrigated yield. Incrementally, for every inch of irrigation water applied peanut yield increase 203 kg/ha over non-irrigated peanut. The blue water footprint was 304 liters/kg. In 1 yr out rotation sequences, sprinkler irrigation increased peanut yield 1,349 kg/ha compared to non-irrigated yield. Incrementally, for every inch of irrigation water applied peanut yield increased 164 kg/ha over non-irrigated. The blue water footprint increased to 370 liters/kg. While altering peanut based rotations are often economic considerations for producers, the water footprint of peanuts could be impacted if peanut yields decrease.

The Influence of Plant Population on Peanut Varieties.

J. C. OAKES* and M. Balota, Virginia Tech Tidewater AREC, Suffolk, VA 23437

Throughout the Virginia-Carolina region, there exists some controversy among growers and researchers as to the ideal plant population for peanut (*Arachis hypogea* L.) in the region. Besides influencing yield and value, plant population has the potential to influence other factors such as disease and insect pressure, as well as plant size. The objective of this study was to evaluate how several different peanut genotypes (4 commercial varieties and 5 breeding lines) responded to four different seeding rates. These seeding rates were 1.2, 3.0, 5.6, and 8.6 seeds per foot. Thrips and disease pressure were measured throughout the growing season. Pod yield and grading characteristics were determined at physiological maturity. This study was conducted over two years in Suffolk, VA.

Significant differences in yield and value were observed among plant populations in both years of the study, though the population with the highest yield varied over the two years. Overall yield increased with plant population, but tended to level off at a certain population. In both years, Tomato Spotted Wilt Virus (TSWV) decreased as population increased, while Sclerotinia Blight (SB) increased as population increased. In general, the yield of the individual varieties performed similarly to each other. This study will provide much needed clarification to peanut producers as to the proper seeding rate for peanut in the Virginia-Carolina region.

Irrigation Scheduling Methods for Peanuts a Continued Study.

W. M. PORTER*, C. D. PERRY, W. S. MONFORT, J. L. SNIDER, G. VELLIDIS, Department of Crop and Soil Sciences, and A.R. SMITH, Department of Agricultural Economics, University of Georgia, Tifton, GA 31793-0748

Five irrigation scheduling treatments along with a rain fed treatment were tested in 2014 and seven irrigation scheduling treatments along with a rain fed treatment in 2015 at the Stripling Irrigation Research Park near Camilla, GA to determine the best option for producers in the Southeast. The seven methods tested were a UGA developed soil moisture system which consisted of three Watermark® sensors, called the UGA Smart Sensor Array (SSA), a SmartCrop© canopy temperature sensor utilizing a Crop Water Stress Index (CWSI), the UGA EasyPan, the UGA Peanut Checkbook Method, 50% of the UGA Peanut Checkbook Method, USDA-ARS IrrigatorPro and University of Florida's PeanutFarm.

The UGA SSA had three Watermark® sensors at depths of four, eight, and sixteen inches, with an irrigation trigger threshold, which consisted of a weighted average from the three sensors set at 45-50 KPa. Meaning that each time the weighted average approached 45 KPa an irrigation event was triggered. The SmartCrop© canopy temperature sensors utilized a CWSI developed from 2014 data. The UGA EasyPan is an easy to build galvanized evaporation pan that is set in the field with the crop to simulate crop evapotranspiration. The UGA Peanut Checkbook Method is a historically developed water use curve for peanuts, the trouble with this method is that it does not fully account for environmental conditions, only rainfall and irrigation applied. USDA-ARS IrrigatorPro is a model that uses Watermark® sensors to determine irrigation triggers. Lastly, University of Florida's PeanutFarm is an online scheduling tool that uses local weather station data, soil texture, and adjusted Growing Degree Days (aGDD) to estimate peanut maturity and water requirements.

Four cultivars commonly planted in the region were selected and planted in two row plots within each irrigation treatment zone. The four cultivars were GA-06G, GA-12Y, TUFRunner 511, and TUFRunner 727. Variety differences were observed with the GA-06G generally being the highest yielding variety in each case. During the 2014 production season 12.33 inches of rainfall were received while 22.65 inches of rain fall were received during the 2015 production season. The data show that the utilization of any type of irrigation scheduling method helps potentially increase yield and reduce the amount of irrigation applied to the crop in either year tested.

How Planting Date and Row Pattern Influence Peanut Pod Yield in Mississippi.

J.M. SARVER* and C.C. ABBOTT, Department of Plant and Soil Sciences, Mississippi State University, Mississippi State, MS 39762.

Peanut are produced across a wide geographic area in the state of Mississippi. While the historical production area in the state is similar in climate and soil characteristics to traditional Southeastern U.S. production areas, much of the recent expansion in acreage has occurred in the Mississippi Delta and the northern half of the state; areas which are different in both climate and soil types to traditional runner peanut producing regions and are also limited by the length of the growing season. As a result, planting date is an important consideration for growers in these areas. This study was designed to determine optimum planting date for Mississippi peanut growers, the yield penalty associated with planting after this date, and if there is an advantage to a twin row planting pattern versus the traditional single row pattern. Peanut cultivars Georgia-06G and Georgia-09B were planted in both twin rows and single rows at four planting dates per site-year in Poplarville, MS in 2014 and in Starkville, MS in 2014 and 2015. At each site-year, the earliest planting date occurred when 10-cm soil temperature reached 20 degrees Celsius, and subsequent planting dates occurred at approximately one week intervals following initial planting. Twin rows resulted in a 6.8 percent yield advantage over single rows. The optimum planting date was the earliest date, which average 8-May across site-years. A pod yield penalty of 67.7 kg ha^{-1} was observed in twin rows, while a penalty of 53.0 kg ha^{-1} was observed in single rows, for each day planting was delayed after optimum. To maximize yield potential as it relates to planting date, Mississippi growers should plant peanuts as soon as possible after soil temperature reaches 20 degree Celsius.

Planter Speed, Vacuum Pressure, and Seed Plate Effects on Peanut Plant Stand in Single Row Pattern.

R.S. TUBBS*, G.A. HANCOCK, Crop and Soil Sciences Department, University of Georgia, Tifton, GA 31793; and J.M. SARVER, Department of Plant and Soil Sciences, Mississippi State University, Mississippi State, MS 39762.

Vacuum planters are common in peanut (*Arachis hypogaea* L.) planting, and even though gearing for seeding rate is independent of tractor speed, the accuracy of placing one seed for each hole on the planter plate can be influenced by a number of factors. A faster tractor speed causes the plate to spin more rapidly, decreasing the amount of time for a seed to settle on the plate. Also, vacuum pressure may affect both tractor speed (if PTO driven) and suction force, which may influence the ability for a seed to adhere to the plate depending on seed size and weight. Additionally, the hole spacing on the circumference of the plate could cause interference with seed settling in an adjacent hole, or cause multiple seed to be carried on a single hole if extra seed become wedged against an adjacent seed on the neighboring hole. An experiment was conducted in five site-year replicates, to determine which of these factors, or the potential interaction of variables, might influence plant stand and ultimately yield of peanut planted in single rows. A Monosem vacuum planter with a PTO driven fan was used on a McCormick C70 tractor, with treatment variables including tractor gear (Low 2, Low 3, and Low 4), vacuum pressure (20 and 24 PSI), and seed plate (4060 and 4860 models). Averaged over all 5 trials, tractor gear impacted multiple variables as the fastest speed resulted in the lowest plant stands (at 4 weeks after planting and at harvest), shortest canopy height, and lowest yield. The slowest speed had a 15-17% improvement in plant stand, 4% taller canopy, and 5% increase in yield over the fastest gear. Vacuum pressure also altered plant stand with a 4-6% increase in plant stand when the higher pressure was used, but did not affect canopy height or yield. The 4860 plate (shorter distance between adjacent holes) also caused reductions in plant stand (4-9%) and canopy height (3%) compared to the 4060 plate, but likewise did not affect yield. These results demonstrate the importance of using proper equipment operation for planters to function at optimum efficiency. It is unrealistic to assume 100% efficiency in field settings, however operational decisions can influence the reliability of the expected results.

Dynamic Variable Rate Irrigation Scheduling for Peanuts.

G. VELLIDIS, W. PORTER, **V. LIAKOS***, C. PERRY Department of Crop and Soil Sciences University of Georgia, Tifton, GA. And Xi LANG, Department of Plant, Soil, and Entomological Sciences, University of Idaho, Aberdeen Research and Extension Center, 1693 S 2700 W Aberdeen, ID 83210

Variable rate irrigation (VRI) for center pivots now offered by most pivot manufacturers. Irrigation water application rates are controlled by an application or prescription map. Prescription maps are developed by dividing fields into irrigation management zones (IMZs) and assigning application rates to each of the IMZs. At the moment, the prescription maps are static. In other words, they are developed once and used thereafter, thus, do not respond to environmental variables such as weather patterns and other factors which affect soil moisture condition and crop growth rates. So although VRI is a great leap forward in improving water use efficiency, the system could be greatly enhanced by having real-time information on crop water needs to drive the application rates. One approach for creating dynamic prescription maps is to use soil moisture sensors to estimate the amount of irrigation water needed to return each IMZ to an ideal soil moisture condition. The UGA Smart Sensor Array (UGA SSA) is an inexpensive wireless soil moisture sensing system, which allows for a high density of sensor nodes to be placed throughout a field – a feature needed to account for soil variability and enable dynamic prescription maps. The UGA SSA consists of smart sensor nodes and a base station. The term sensor node refers to the combination of electronics and sensor probes installed within a field. In the current design, the UGA SSA supports Watermark® soil moisture sensors. Each soil moisture probe integrates up to three Watermark sensors. A base station sends the node data to an FTP server hourly using a cellular modem. The soil matric potential data are visualized in a variety of formats on a web-based user interface. In addition, a modified Van Genuchten model was used to estimate the volume of irrigation water needed to bring the soil profile back to 75% of field capacity. These estimates are converted into daily prescription maps, which can be downloaded remotely to a VRI controller thus creating a dynamic VRI control system. During 2015, we conducted an experiment to assess this system. We worked with a producer with a VRI-enabled pivot in a 230ac field in which peanuts were being produced, in southwestern Georgia. The field was divided into alternating conventional irrigation and dynamic VRI strips with each strip 120 rows wide. The conventional strips were irrigated uniformly based on the producer's standard recommendations. We used soil electrical conductivity, topography, and the EZZone software to develop IMZs in the VRI strips. After planting and stand establishment we installed UGA SSA sensors in each of the IMZs. The data from the sensors were used to develop daily irrigation scheduling recommendations for each IMZ. The recommendations were converted into a daily prescription map and downloaded remotely to the pivot VRI controller. Thus, when an irrigation event was initiated, the VRI-enabled pivot responded dynamically to soil moisture conditions. If an irrigation event was in progress, the pivot responded to the new map. Yield data were collected at the end of the season to aid in the quantification of each of the irrigation treatments. Initial data show potential water savings and yield increases for utilization of properly managed dynamic VRI scheduling on peanuts.

Harvesting, Curing Shelling, Storing & Handling
Processing and Utilization
Economics

WEDNESDAY, JULY 23, 2016		
1:30 - 3:30 p.m. Waters Edge B	**Harvesting, Curing Shelling, Storing & Handling** **Processing and Utilization** **Economics** *Chair: Wes Porter, Univesity of Georgia* *Moderator: Nathan Smith, Clemson University*	**Page Number**
1:30 p.m	**Influence of Planting Date, Irrigation, and Late Season Flower Termination on Harvested Single Kernel Oleic Acid (%) Distributions and Other Quality Factors of High Oleic Runner and Spanish Seed.** **J.P. DAVIS***, C.M. BAKER, J.M. LEEK, JLA International, Albany, GA 31721; M. KLINE, Technical Center, The Hershey Company, Hershey, PA 17033; C.L. BUTTS, R.B. SORENSEN, and M.C. LAMB, USDA, ARS, National Peanut Research Laboratory, Dawson, GA 39842.	**37**
1:45 p.m.	**Growing Degree Days, Harvest Dates and Peanut Quality Attributes** **F.D. MILLS, JR.*** and S.S. NAIR, Department of Agricultural Sciences and Engineering Technology, Sam Houston State University, Huntsville, TX 77341; C.L. BUTTS, R.B. SORENSEN and M.C. LAMB, USDA-ARS National Peanut Research Lab, Dawson, GA 39842; W.J. PEARCE, Golden Peanut Company, Camilla, GA 31730.	**38**
2:00 p.m.	**Intensities of Sensory Attributes in High- and Normal-Oleic Cultivars in the N.C. State University Performance Trials.** **H.E. PATTEE***, T.G. ISLEIB, S.C. COPELAND, W.G. HANCOCK, and F.R. CANTOR BARREIRO, Dept. of Crop, Soil, and Environmental Sciences, N.C. State Univ., Raleigh, NC 27695-7629, and M.A. DRAKE and M.D. YATES, Dept. of Food, Bioprocessing, and Nutrition Sciences, N.C. State Univ., Raleigh, NC 27695-7624.	**40**
2:15 p.m.	**Changes in Sensory and Physical Attributes of Multiple Peanut Varieties Grown in Several Locations and Roasted For a Range of Times.** **K.W. HENDRIX***, L.L. DEAN, Market Quality and Handling Research Unit, USDA-ARS, Raleigh, NC, 27695 and M. C. LAMB, National Peanut Research Lab, USDA-ARS, Dawson, GA 39842.	**41**
2:30 p.m.	**Impacts of Gender, Livelihood and Environment on Peanut Productivity and Post-harvest Practice: Baseline findings in Haiti.** **RHOADS, J.***, KOSTANDINI, G, University of Georgia, Athens, GA; CARROLL, E., JOHNSON, R., Acceso Peanut Enterprise Corp. Petionville, Haiti; SCHWARTZBORD, J., Cornell University, Ithaca, NY.	**43**
2:45 p.m.	**Alternative Storage Environments for Shelled Peanuts.** **C. L. BUTTS***, USDA, ARS, National Peanut Research Laboratory, Dawson, GA; K. HORM, Mars Chocolate NA, Elizabethtown, PA; S. POWELL, B. ANTHONY and J. BENNETT, Mars Chocolate NA, Elizabethtown, PA; D. COWART, Birdsong Peanuts, Blakely, GA; and M.C. LAMB, USDA, ARS, National Peanut Research Laboratory, Dawson, GA.	**44**

3:00 p.m.	**Peanut Warehousing Alternatives: Building vs. Shipping.** **C.J. RUIZ***, S.M. FLETCHER, Z. SHI, N. SMITH. National Center for Peanut Competitiveness, University of Georgia, Griffin, GA 30223-1797.	**45**
3:15 p.m.	**Peanut Warehousing: Future Implications.** **C.J. RUIZ***, S.M. FLETCHER, Z. SHI. National Center for Peanut Competitiveness, University of Georgia, Griffin, GA 30223-1797.	**46**
4:00 p.m.	**Evaluation of 2015 Peanut Crop Insurance Program.** **SHI***, S.M. FLETCHER, C.J. RUIZ, N. SMITH. National Center for Peanut Competitiveness, University of Georgia, Griffin, GA 30223-1797.	**47**
4:15 p.m.	**Peanuts 2016: Payment Limit vs Acreage Planted.** **S.M. FLETCHER***, Z.SHI. National Center for Peanut Competitiveness, University of Georgia, Griffin, GA 30223-1797.	**48**

Influence of Planting Date, Irrigation, and Late Season Flower Termination on Harvested Single Kernel Oleic Acid (%) Distributions and Other Quality Factors of High Oleic Runner and Spanish Seed.

J.P. DAVIS*, C.M. BAKER, J.M. LEEK, JLA International, Albany, GA 31721; M. KLINE, Technical Center, The Hershey Company, Hershey, PA 17033; C.L. BUTTS, R.B. SORENSEN, and M.C. LAMB, USDA, ARS, National Peanut Research Laboratory, Dawson, GA 39842.

High oleic peanuts have an excellent shelf life compared to conventional varieties. The oleic acid/linoleic acid (O/L) ratio of individual seeds within commercial high oleic lots often varies substantially, such that some proportion of peanuts will not meet established thresholds in O/L chemistry needed to confer optimal shelf life. This seed to seed variation is attributed to natural variation in the fatty acid chemistry due to crop maturity, or the potential contamination of high oleic lots with conventional peanut seed. The overarching goal of the current study was to better quantify populations of high oleic peanuts using near infrared (NIR) technology via measurement of high numbers of individual seed, both before planting and post-harvest, while simultaneously investigating strategies to improve O/L chemistry. A randomized complete block design was used with three planting dates (13 April, 13 May, and 12 June 2015), two irrigation rates (full irrigation and dryland), and three spray levels of Diflufenzopyr (1, control, i.e. no Diflufezopyr; 2, 2x rate at 100 and 110 days after planting (DAP); 3) 3x rate at 100 DAP) in Terrell County, GA. Runners and spanish peanuts were dug 140 and 120 DAP, respectively, allowed to dry about three days, then threshed using a small plot picker, and dried using forced air according to standard industry practices. Dried samples were then shelled according to American Peanut Sheller Association grade standards. Samples of 100 kernels from each harvested grade were scanned via NIR to measure oleic acid (%) on an individual kernel basis, for a total of 35,700 individual kernel measurements. Of 21,300 measurements of harvested runner kernels, only 0.1% were contaminates, i.e. obvious non high oleic peanuts based on oleic acid (%), which agreed well with an initial purity check of the planted runners which showed 0% contaminates in a 250 seed sample. Excluding contaminates, about 4% of the 21,300 runners where borderline high O/L and of these borderline kernels, 80% were No1's when comparing proportion of Jumbo's, Mediums and No1's, with No1's also having lower ($p<0.05$) mean oleic acid (%) compared to Jumbo's or Mediums across all runner measurements. Furthermore, when comparing peanuts from the three planting dates, only 10% of harvested runners that were borderline high oleic were from the first planting date, which also had a higher ($p<0.05$) mean oleic acid (%) compared to middle or late planted runners. A slight, positive irrigation effect was observed in oleic acid (%) which was more pronounced in late planted runners which received less rain over the last 50 days prior to harvest. For harvested spanish kernels, about 1.0% of 14,400 measured kernels were contaminates, with another approximate 0.6% that were borderline high oleic. Contamination measurements in harvested spanish agreed well with seed purity measurements prior to planting (1.6% contaminates; n= 250). Mean oleic acid (%) of spanish kernels were greater than runners and excluding true contaminates, variation was compressed for spanish compared to runners, reflecting the more determinate spanish physiology. Diflufenzopyr treatments applied to terminate late season flowers had no effect on oleic acid (%) distributions of runners; however, defoliation issues likely impacted chemical efficacy. Overall, early and mid-season planted peanuts, be they runner or spanish, which matured under the hottest conditions, had increased oleic acid (%) among harvested seed, which coupled with grade data suggest these peanuts were more mature; however, aflatoxin frequency was also greater in oilstock from these early and mid-planted peanuts.

Growing Degree Days, Harvest Dates and Peanut Quality Attributes

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Fat and sugar content are maturity indicators in a peanut kernel. As a peanut matures, fat content increases, while sugar content declines. Additionally, roasted peanut, a sensory attribute, is also expected to increase with maturity. Maturity is greatly impacted by length of the growing season and environmental conditions during the growth period. However, the indeterminate growth habit of peanuts, particularly the runner market-type, creates a situation where initial pods formed close to the taproot are generally more mature, while pods forming on the limbs are less mature. Therefore, the peanut farmer is seeking the harvest point where yield and quality (e.g., maturity) are optimum. Consequently, the objective of this study was to identify the ideal harvest date (HD) that optimizes peanut maturity based on growing degree days (GDD). Effect of HD on fat content, sugar content, and the sensory attribute, roasted peanut, were analyzed using analysis of variance (ANOVA) for a Randomized Complete Block Design using experimental data from the USDA-National Peanut Research Lab Farm in Dawson, Georgia. The ANOVA was followed by mean separation using Fisher's Least Significant Difference (LSD). The results revealed that HD significantly influenced fat and sugar content of peanuts ($p<0.005$) and the sensory attribute, roasted peanut ($p<0.05$). Therefore, based on these criteria, HD 2 (GDD = 2200) was identified as the HD optimizing maturity in this study. Additionally, the sample from HD 2 possessed the most robust roasted peanut flavor, another indicator of maturity.

Intensities of Sensory Attributes in High- and Normal-Oleic Cultivars in the N.C. State University Performance Trials.

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Flavor has long been identified by processors of virginia-type peanuts (*Arachis hypogaea* L.) as the pre-eminent trait of importance in marketing finished product. As new peanut cultivars are developed, it is important that the flavor profiles of new releases meet or exceed those of the cultivars they are intended to replace. Flavor of high- and normal-oleic peanuts entered in the Uniform Peanut Performance Test (UPPT) was compared recently and found to be not different. There is another array of flavor data measured using a trained descriptive sensory panel, but the samples used came only from the N.C. State Univ. yield trials of primarily virginia market-type lines conducted entirely on the coastal plain of North Carolina. This database was used to determine whether or not there was a consistent flavor difference between the newer high-oleic virginia-type lines and the older normal-oleic ones. Lines included in the analysis were restricted to ones that had been assayed for flavor for three or more years. Data sampled included 103 samples of high-oleic cultivars from 64 tests over 13 years during 2000-2014, 560 samples of normal-oleic cultivars from 129 tests over 28 years during 1985-2014, 570 samples of high-oleic experimental lines from 61 tests over 11 years during 2003-2014, 89 samples of normal-oleic experimental lines from 33 tests over 13 years during 1989-2011, 8 samples of high-oleic sensory checks from 6 tests over 2 years (2013-2014), and 112 samples of normal-oleic sensory checks from 56 tests over 24 years during 1985-2014. Sensory checks were Florunner, Georgia Green, Georgia-06G, and Georgia-09B, runner-type cultivars commonly used in the manufacture of peanut butter. Effects of type of line (virginia-type cultivar, experimental line, or sensory check) were commonly observed, but interaction between type of line and oleic acid level was found only for roast color and stale / cardboard. Unlike the results from the UPPT where there was little difference in flavor between normal- and high-oleic lines, there were a number of statistically significant differences between high- and normal-oleic virginia-type lines in the Virginia-Carolina area, almost all in a positive direction for the high oleics. The two types were not different for intensity of the off-flavors over-roast (1.99 vs. 1.81 flavor intensity units or “fiu”, P=0.053), painty / rancid (1.13 vs. 1.10 fiu, P=0.246), moldy (1.09 vs. 1.14 fiu, P=0.052), petroleum (1.02 vs. 1.00 fiu, P=0.281), tongue / throat burn (2.50 vs. 2.58 fiu, P=0.111), and astringent (3.09 vs. 3.12 fiu, P=0.350). High oleics did roast slightly darker than normal-oleics (57.18 vs. 57.67 CIELAB L* score, P=0.012), and had less intense flavor for a number of sensory attributes generally thought to be negative ones including under-roast (1.78 vs. 2.14 fiu, P<0.0001), fruity (1.82 vs. 1.97 fiu, P=0.038), bitter aftertaste (2.74 vs. 2.87 fiu, P=0.008), stale / cardboard (1.66 vs. 1.98 fiu, P<0.0001), wood / hulls / skins (3.20 vs. 3.32 fiu, P=0.028), and bitter (2.49 vs. 2.66 fiu, P=0.001). The high-oleics had more intense scores for a number of positive attributes including nutty aftertaste (3.75 vs. 3.44 fiu, P<0.0001), roasted peanut (4.71 vs. 4.34 fiu, P<0.0001), and sweet (3.86 vs. 3.52 fiu, P<0.0001). Where they occurred, these changes were small in magnitude, but they were all in the right direction, indicating that there is not a “flavor penalty” to be paid in the development of high-oleic cultivars. It is not possible to determine whether or not the slight improvement in flavor is due to the high-oleic trait *per se* or if it is the consequence of gradual improvement of flavor, the high-oleics being on the whole newer lines than the normal-oleics.

Changes in Sensory and Physical Attributes of Multiple Peanut Varieties Grown in Several Locations and Roasted For a Range of Times.

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Peanut sensory comparisons are accomplished after roasting to a defined seed color (or paste color) followed by human evaluation with either a professionally trained panel or a set of trusted evaluators with long practical experience with peanut product flavor. The question of does the maximum roast peanutty (RP) score occur at a particular color led us to evaluate peanut varieties grown in 5 locations from the 2014 UPPT trials roasted at a single temperature (177°C), for 6 to 20 minutes. By comparing their physical properties to their roasting and sensory scores, we hoped to determine the roast color-best flavor relationship and to gain new information concerning the effect of physical parameters on the peanut roasting process. Raw MC%, raw oil content, raw kernel color (un-blanched), roast MC%, roast kernel color (blanched) and roast paste color were measured. The maximum RP occurred with seed colors ranging from 44.2 to 55.4 (LAB L values) and paste colors ranging from 44.0 to 57.9. If flavor selection is important then flavor must be evaluated at different roasting times. The various peanut descriptor scores changed over time in a pattern that was repeated in all samples. RP, sweet aromatic (SA) and dark roast (DR) all rose above threshold together from 6 to 8 min and RP and SA peaked 1 to 4 minutes later. At approximately the same time, DR entered a distinctly different phase (DR break) in which its rate of upward change was cut in half. After this point, RP and SA slowly dropped back toward threshold detection levels. Ashy, an acrid flavor found usually in darker samples, began to rise above threshold at exactly the same point that DR changed phase. The data suggest that flavor (RP, SA) creation occurs early during roasting and only lasts for one to several minutes. At a certain point, destructive processes begin and RP and SA decline. The timing of events during roasting was controlled by two main factors. Seed size influenced all descriptors, i.e. the patterns of large seed occurred in smaller seed, just earlier. MC appears to have a major influence or at least a correlation with smaller changes in the patterns of certain descriptors relative to each other. RP and SA were first detectible (threshold) just before the MC reached ~2.0 in every sample irrespective of seed size. Dark roast (DR) rose above threshold just after MC dropped below 2.0. RP peaked when MC was between 1.0 and 2.0 %. Around 1.0% MC, DR reached its 'break' point where it continued to rise but more slowly, and RP and SA began to drop sharply. If MC dropped more slowly from 2.0 to 1.0 %, then RP would often stay near its maximum for longer time. The rise in RP to its peak took ca. 2 to 3 minutes and occurred between 1.0 and 2.0 % MC with very few exceptions.

Impacts of Gender, Livelihood and Environment on Peanut Productivity and Post-harvest Practice: Baseline findings in Haiti.

RHOADS, J.*, Kostandini, G, University of Georgia, Athens, GA: Carroll, E. Johnson, R. Acceso Peanut Enterprise Corp. Petionville, Haiti; Schwartzbord, J. Cornell University, Ithaca, NY.

A baseline dataset of peanut producing households (n=507) in Haiti's two major peanut production regions (Northeast n=152, runner producing region; and Central Plateau n=355, Valencia producing region) revealed significant findings for factors influencing productivity and post-harvest practices. Limited data is available for peanut production in Haiti, but this data further detailed the extreme yield gap (300-600kg/ha) in both regions and important baseline data on production and post-harvest practice. Very limited use of, or access to inputs or technology was indicated. Factors that were highly correlated with increased yield included education levels, access to remittances from abroad and other indicators of household wealth, such as ownership of cattle. Sloping land, a major concern for erosion, was the most significant indicator of reduced yield. Improved post-harvest practices, such as aflatoxin knowledge and use of a tarp, were positively tied with participation in farmer organizations and shared decision-making at the household level. Further data was collected in 2015 and is currently being analyzed.

Alternative Storage Environments for Shelled Peanuts.

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Small chamber studies were conducted to evaluate the effect of storing shelled peanuts at three different temperatures, 38, 55, and 70°F for one year. Shelled medium runner peanuts from the 2014 crop were placed in the three different environments in Feb 2015, sampled at 60-d intervals until Feb 2016 (364 days). Difficulty maintaining the desired relative humidity of 65% in the 38°F unit, led to unacceptable mold growth and severely degraded seed germination. Peanuts stored at 70°F developed an infestation of Indian meal moth after 238 d in storage rendering the samples unsuitable for sensory analysis from that point forward. The infestation most likely occurred due to hatches of eggs that were present in the original samples. Sensory analysis showed very little fade of the intensity of the Roasted Peanutty flavor characteristic in either storage environments. No unacceptable increases in free fatty acids or peroxide values were noted at the end of the 1-yr storage period for peanuts stored at 55°F remaining well below 1%.

Commercial studies were conducted to compare the potential of high moisture problems, wetness when storing shelled medium runner peanuts for 60 d at 38 and 55°F. During the period from Feb 2015 through Mar 2016, six 60-d runs were conducted where three totes were placed in each of the storage environments. There were no differences in the initial moisture content of peanuts when placed in the two storage environments. However, after 30 and 60-d storage, the peanuts stored at 55°F tended to be an average of 0.3% dryer than those stored at 38°F. The peanuts also increased in moisture the most during the storage period between June and August 2015, with the moisture content after 30 and 60 d storage at 38°F averaged 8.1 and 7.7%, respectively. The peanuts stored in the 55°F environment averaged 7.6 and 7.3% moisture content after 30 and 60 d in storage, respectively.

<u>Peanut Warehousing Alternatives: Building vs. Shipping</u>.

C.J. RUIZ*, S.M. FLETCHER, Z. SHI, N. SMITH. National Center for Peanut Competitiveness, University of Georgia, Griffin, GA 30223-1797.

Expected increases in peanut stocks for the 2015/16 year crop have created a concern that there may not be enough federal licensed peanut warehouses in the Southeast for the upcoming 2016 peanut crop. This study provides the preliminary analysis on two alternatives for peanut producers to mitigate the risk of lack of storage: building a new warehouse facility or shipping to warehouses in the Southwest with surplus capacity.

Given the historical decline in peanut acreage in the Southwest, the potential for unused peanut warehouses exists plus the excess capacity in peanut shelling operations. Brownfield, TX and Madill, Ok are two locations considered with storage capacity. Four locations in Georgia (Ashburn, Blakely, Quitman and Sylvania), one location in South Carolina (Cameron) and two locations in Alabama (Enterprise and Atmore) were used as origin points from the Southeast. Average cost per mile is estimated at $0.13 for a 23 ton load per trip. The average total cost per load ranged from $2811-$3592 depending on starting point and ending point.

The second alternative examined was the option of building a new peanut warehouse facility. Three storage levels (i.e., 8,000 ton; 15,000 ton; 20,000 ton) and two warehouse structure type were evaluated. The site preparation cost is rather significant representing up to 62% of the total cost; therefore, it might be a deterrent when making the decision to build. Hence, a financial sensitivity analysis was performed for alternative site preparation cost, warehouse type, capacity and level of financing. This analysis projected a flat warehouse facility with a capacity of 20,000 tons to be the most financially feasible with a 50% leveraged investment.

These different options discussed might all be viable depending the specific situation of a producer. Likewise, shipping peanut out of state may be optimal when shellers own facilities and contemplate better market-shelling conditions in those destinations that allow them to make up for the additional cost incurred. Preliminary results suggest negative returns over variable costs when incurring an unexpected out-of-state shipping cost regardless the destination. On the other hand, deciding to invest in a new warehouse facility must go along with the growth plans of the business. However, considering what will be the peanut supply state in the future is critical in order to move in this direction.

Peanut Warehousing: Future Implications.

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The USDA estimates that peanut stocks will be historically high for the 2015/16 year crop. On February 29, 2016, USDA reported 2.55 million tons of equivalent farmer stock which represents 600,000 tons more than a year ago. The NCPC estimates that an additional approximately 400,000 tons compared to previous year are expected by July 2016. Given this increase and the potential of continual large carryover plus increased production, the peanut industry has been adjusting their federal peanut warehouse capacity. One key fact from the data is the diversity of firms owning peanut warehouses. There is less concentration of warehouses by a few firms as compared to during the time period of supply management (i.e., prior to 2002). Second, warehouse capacity is shifting more to the Southeast. Finally, despite the fact that Georgia increased its storage capacity by 375,070 tons in 2015, preliminary estimates by NCPC suggest that the state will require at least an additional 207,000 tons of warehouse space to cover additional peanut stock expected by the beginning of harvest time for the 2016 crop. NCPC advises to take measures aimed to mitigate the risk of lack of warehouse to store loan peanuts. If a farmer does not have access to peanut warehouse approved by USDA, their peanuts cannot participate in the marketing loan program. Thus, farmers may need to reduce their intended planted acreage. While these numbers are preliminary estimates of the forthcoming 2016 crop year situation, this study provides a warning bell for the industry.

Evaluation of 2015 Peanut Crop Insurance Program.

Z. SHI*, S.M. FLETCHER, C.J. RUIZ, N. SMITH. National Center for Peanut Competitiveness, University of Georgia, Griffin, GA 30223-1797.

On September 2014, a new peanut revenue policy was approved by the Federal Crop Insurance Corporation for the 2015 peanut crop year. This policy replaced the Actual Production History (APH) program and will offer growers with a choice of Yield Protection (YP), Revenue Protection (RP) and Revenue Protection with the Harvest Price Exclusion (RPHPE). The new Peanut Crop Insurance beginning 2015 changed the landscape. As was expected, growers decided to move into the new revenue policy attempting to mitigate risks on prices they were not able to control previously. In the first year, 67.9% of U.S. acres were insured under the revenue option. YP and CAT policies had their share reduced to 22.2% and 9.9%, respectively. For Georgia, 68.5% of acres for RP, 19.9% for YP and 11.7% for CAT were observed. 2016 landscape might change or remain equal based on 2015 experience and risk expectations.

Peanuts 2016: Payment Limit vs Acreage Planted.

S.M. FLETCHER*, Z.SHI. National Center for Peanut Competitiveness, University of Georgia, Griffin, GA 30223-1797.

Farmers and bankers view peanuts as having a viable safety net relative to the other commodity options, especially since cotton does not have a commodity program and relies on crop insurance for its safety net. This lead to significant peanut acreage in 2015. Most peanut industry experts are predicting 2016 peanut acreage to be comparable to the 2015 peanut acreage if not slightly less. The National Center for Peanut Competitiveness conducted this study as farmers need to fully understand the details of the 2014 Farm Bill prior to finalizing their 2016 planting decisions.

For the 2015 peanut crop, USDA has provided an estimate for the national seasonal average price for peanuts of $366/ton which translates into a projected PLC rate of $169/base ton. The current national seasonal average price for the August 1, 2015-February 6, 2016 time period is $383/ton which translates into a projected PLC rate of $152/base ton. These two projected PLC rates provide a farmer with a realistic estimate of their projected 2015 safety net payments subject to the $125,000 per entity payment limit. Allowing the peanut payment yield to range from 1.75 tons/acre to 3.0 ton/acre in .25 tons/acre increments, this study took the payment limit and the formula to calculate PLC payments to determine the maximum peanut base acres (traditional peanut base plus the attributed generic base to peanuts) for one entity in a farming operation given the projected PLC payment rates.

The implication is that the maximum peanut base acres for one entity for the two projected PLC rates is between approximately 38% to 44% less than the maximum peanut base acres for the 2014 peanut crop. If the projected price drops to loan rate, the maximum peanut base acres for one entity is approximately 47% less than the maximum peanut base acres for the 2014 peanut crop. For example for the 2014 peanut crop, assuming a payment yield of 1.75 tons/acre (3,500 lbs/acre), one entity could have had 884.56 acres of total peanut base comprised of traditional peanut base and the attributed generic base to peanuts to reach the payment limit. For the 2015 crop, the total peanut base cannot exceed either 497.24 acres or 552.85 acres depending on the two alternative PLC rates forecasted. If the PLC rate is based on the loan rate, the total peanut base cannot exceed 466.85 acres.

Breeding, Biotechnology and Genetics I

WEDNESDAY, JULY 23, 2016		
1:30 - 3:15 p.m.	**Breeding, Biotechnology and Genetics I** *Moderator: Charles Chen, Auburn University*	**Page Number**
1:30 p.m	**Unlocking the Peanut Genomes to Provide Tools and Resources for Peanut Breeding, Genetics and Genomics.** **D.Y. GAO***, D.J. BERTIOLI, A. IWATA, X. HAN, S. JACKSON, Center for Applied Genetic Technologies (CAGT), University of Georgia, Athens, GA, USA; Y. CHU, J.P.CLEVENGER, P. OZIAS-AKINS. Department of Horticulture, The University of Georgia, Tifton, GA; L. FROENICKE, Genome Center-GBSF, University of California, Davis, California USA; X. LIU, BGI-Shenzhen, Shenzhen 518083, China and S. CANNON, Corn Insects and Crop Genetics Research Unit, US Department of Agriculture–Agricultural Research Service, Ames, Iowa, USA.	51
1:45 p.m.	**Dissecting the genetic bases of peanut nodulation.** H. ZHOU, Z. PENG, J. MAKU, L. TAN, F. LIU, , Y. LOPEZ, **J. WANG***, Agronomy Department, University of Florida, Gainesville, FL 32611, and M.GALLOW, College of Tropical Agriculture and Human Resources, University of Hawaii at Mānoa, Honolulu, HI 96822.	52
2:00 p.m.	**Analysis of Disease Resistance Gene Analogs (RGAs) Gene Expression to Associate Leaf Spot Resistance in Cultivated Peanut.** **P.M. DANG*** and M.C. LAMB, USDA-ARS National Peanut Research Laboratory, Dawson, GA 39842; K.L. BOWEN, Entomology and Plant Pathology Department, Auburn University, Auburn, AL 36849; C.Y. CHEN, Department of Crop, Soil and Environmental Sciences, Auburn University, Auburn, AL 36849.	53
2:15 p.m.	**Identification of genomic region controlling resistance to aflatoxin contamination in a peanut recombinant inbred line population (Tifrunner × GT-C20).** **G. AGARWAL***, M. VISHWAKARMA, S. KALE, S.N. NAYAK, M. PANDEY, R.K. VARSHNEY, International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), Patancheru, India, 502324; X. JI, X. GUO, J.C. FOUNTAIN, H. WANG, University of Georgia, Department of Plant Pathology, Tifton, GA, 31793; C.C. HOLBROOK, USDA-ARS, Crop Genetics and Breeding Research Unit, Tifton, GA; and B. GUO, USDA-ARS, Crop Protection and Management Research Unit, Tifton, GA.	54
2:30 p.m.	**Association Mapping of SSR Markers to TSWV Resistance in Cultivated Peanut.** J. LI, Y.Y. TANG, **C.Y. CHEN***, Department of Crop, Soil and Environmental Sciences, Auburn University, Auburn, AL 36849; P.M. DANG, USDA-ARS National Peanut Research Laboratory, Dawson, GA 39842; A. JACOBSON, A. HAGAN, Entomology and Plant Pathology Department, Auburn University, Auburn, AL 36849; M.L. WANG, USDA-ARS, PGRCU, Griffin, GA 30223; G.H. HE, Department of Agricultural and Environmental Sciences, Tuskegee University, Tuskegee, AL 36088.	55

2:45 p.m.	**"Kairi" – A New Foliar Disease Resistant Variety for the Australian Peanut Industry.** **G.C. WRIGHT***, Peanut Company of Australia, Kingaroy, Queensland, Australia, 4610; and N.V. HALPIN, D.B. FLEISCHFRESSER, L. OWENS, AgriSciences Queensland, Department of Agriculture and Fisheries, Kingaroy, Queensland, Australia, 4610.	**56**
3:00 p.m.	**Using the CROPGRO-Peanut Model to Simulate Genetic Yield Improvement of Peanut in West Africa.** **K. J. BOOTE***, University of Florida, Gainesville, FL; S. NARH, University of Ghana; J. NAAB, CSRI-SARI, Wa, Ghana; J. W. JONES and B. L. TILLMAN, University of Florida; M. ABUDULAI, CSRI-SARI, Tamale, Ghana; P. SANKARA and Z. M'BI BERTIN, University of Quagadougou, Burkina Faso; and D.L. JORDAN and R.L. BRANDENBURG, North Carolina State University, Raleigh, NC.	**57**

Unlocking the Peanut Genomes to Provide Tools and Resources for Peanut Breeding, Genetics and Genomics.

D.Y. GAO*, D.J. BERTIOLI, A. IWATA, X. HAN, S. JACKSON, Center for Applied Genetic Technologies (CAGT), University of Georgia, Athens, GA, USA; Y. CHU, J.P.CLEVENGER, P. OZIAS-AKINS. Department of Horticulture, The University of Georgia, Tifton, GA; L. FROENICKE, Genome Center-GBSF, University of California, Davis, California USA; X. LIU, BGI-Shenzhen, Shenzhen 518083, China and S. CANNON, Corn Insects and Crop Genetics Research Unit, US Department of Agriculture–Agricultural Research Service, Ames, Iowa, USA

With the rapid advancement of new sequencing technologies, costs have dramatically fallen and plants with large and complex genomes have now been sequenced. However, it still is still a challenge to annotate sequenced genomes, particularly for repetitive sequences. Transposons are ubiquitous in all plant genomes, especially those with large genomes such as peanut. We developed a bioinformatics pipeline by combining de novo annotation and homology-based sequence searches to identify transposons and generated a peanut transposon library. We found that transposons account for more than 60% of the A. duranensis (AA) and A. ipaensis (BB) genome and the genomes are comprised of higher fraction of non LTR retroelements than any other sequenced plants. We identified a new active retrotransposon that is being used to develop molecular markers. Furthermore, we conducted comprehensive analysis and revealed possible genetic exchange between peanut and other eukaryotes. Overall, our efforts provide an important resources and tools for peanut breeding and other researches and may shed lights on the dynamic and unique genomes.

<u>Dissecting the genetic bases of peanut nodulation</u>.

H. ZHOU, Z. PENG, J. MAKU, L. TAN, F. LIU, , Y. LOPEZ, **J. WANG*,** Agronomy Department, University of Florida, Gainesville, FL 32611, and M. GALLO, College of Tropical Agriculture and Human Resources, University of Hawaiʻi at Mānoa, Honolulu, HI 96822

Peanut rhizobia enter the peanut root through a crack at the sites of lateral root emergence which does not resemble the root hair infection processes in many other legume species. Understanding the genetic and molecular mechanisms of peanut nodulation will not only reveal novel insights into nodule organogenesis, but also provide the bases for improving peanut nitrogen fixation efficiency. To establish peanut nodulation system, single colonies from peanut nodules were sampled for 16S rDNA sequencing. Seven different rhizobia strains belonging to two different genera, Bradyrhizobium and Paenibacillus were identified. All of the strains are Gram-staining positive, and can infect peanut and form functional nodules but with varied nodule number and nitrogen fixation rate. The stain with highest nitrogen fixation rate was used for inoculation of peanut for nodulation phenotyping. Two pairs of peanut non-nodulating and nodulating recombinant inbred lines were infected by a single rhizobial strain. Nodulating lines produced nodules at 8-9 days after inoculation while the non-nodulating lines didn't produce nodules at all. To map the genes controlling peanut nodulation, the two non-nodulating lines were cross-pollinated with their nodulating sister lines to generate two F_2 segregating populations. The segregating ratios of nodulating: non-nodulating of the two populations fit 9:7 and 57:7, respectively. Two quantitative trait loci (QTLs) have been identified respectively. Two candidate genes near the QTLs were identified, which were corresponding to one of the genes controlling the peanut nodulation in each population. Dissecting the biological and genetic bases of peanut nodulation and symbiosis through crack entry infection is critical for sustainable agriculture, specifically for developing crop cultivars with highly efficient symbiosis.

Analysis of Disease Resistance Gene Analogs (RGAs) Gene Expression to Associate Leaf Spot Resistance in Cultivated Peanut.

P.M. DANG* and M.C. LAMB, USDA-ARS National Peanut Research Laboratory, Dawson, GA 39842; K.L. BOWEN, Entomology and Plant Pathology Department, Auburn University, Auburn, AL 36849; C.Y. CHEN, Department of Crop, Soil and Environmental Sciences, Auburn University, Auburn, AL 36849.

Early and Late Leaf Spot are serious fungal diseases in peanuts. Acceptable levels of leaf spot resistance in cultivated peanut has been elusive due to the combination of environmental interactions and the proper combination of resistance genes in any particular peanut genotype. Resistance Gene Analogs (RGAs) have been shown to be involved in disease resistance in many important crop plants. The goals of this research are to identify functional RGAs through reverse-transcribed (RT) PCR using RNA extracted from leaf spot infected peanut leaves, to sequence these PCR products to confirm identity, and to apply a sub-set of these RGAs in a gene-expression study utilizing peanut genotypes with a range of disease levels to correlate leaf spot resistance. Putative peanut RGAs (350) were available from a public database (NCBI). Primers were designed and PCR products were generated. A total of 155 RGAs produced PCR bands on agarose gels of respectable intensity. These PCR products were purified and sequenced. All matched to the putative sequence targets and are suitable for further gene-expression studies. Representative RGAs from this set are being utilized in a gene-expression study to associate levels of leaf spot resistance in peanuts. Identification and association of specific gene-expression will facilitate selection of peanut lines with high levels of leaf spot resistance.

Identification of Genomic Region Controlling Resistance to Aflatoxin Contamination in a Peanut Recombinant Inbred Line Population (Tifrunner × GT-C20).

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Aflatoxin contamination of peanut is a significant threat to global food safety. In this study we performed quantitative trait loci (QTL) analysis to identify peanut genomic regions contributing to aflatoxin contamination resistance in a recombinant inbred line (RIL) population derived from the Tifrunner (susceptible) and GT-C20 (resistant). Using an in-vitro kernel screening assay, visible fungal colonization and aflatoxin contents were measured in three repeated tests, each with three technical replicates. Aflatoxin levels and fungal colonization ratings varied among the RILs with a distribution skewed toward lower aflatoxin levels. Using previously determined genotypes for the population, QTL analysis for all replicates was performed and identified a total of 14 QTLs, four QTLs for aflatoxin contamination and ten for fungal colonization. Four major QTLs were identified, each with more than 10% phenotypic variation explained (PVE). One major QTL for aflatoxin contamination had 15.14% PVE and three for fungal colonization had PVEs of 13.23%, 11.21% and 14.17%, respectively. Comparing the major aflatoxin QTL with the peanut diploid reference genome sequences showed that the QTL flanking markers defined a ~99 Mb region containing 1,308 genes on chromosome A04. Genes of interest in this region include LLRs, pathogenesis related genes, NBRs, disease resistance response proteins, MYB transcription factors (TF), and pathogenesis-related thaumatin superfamily proteins. The other three major QTLs identified for fungal colonization were found on chromosomes A03 and A05, spanning ~50.5, 4.4, and 14.8 Mb regions, respectively, each containing genes coding for LRR, NAC, Myb TF, and Zn finger proteins. In order better identify potential candidate genes; more genotyping is currently being performed to increase marker density.

Association Mapping of SSR Markers to TSWV Resistance in Cultivated Peanut.

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Tomato Spotted Wilt Virus (TSWV), one of the most serious diseases in peanut, is transmitted by thrips in the genus Franklinieila. Breeding and selection of resistant genotypes is the optimal method to manage TSWV in peanut. In order to more efficiently breed resistant cultivars a better understanding of the mechanism of TSWV resistance and relevant genes in peanut is needed so that marker-assisted selection can be implemented in breeding programs. The objectives of this study are to screen the U.S. peanut mini-core collection to identify genotypes that are resistant to TSWV; to examine genetic diversity and population structure in the U.S. peanut mini core collection by SSR markers; and to conduct an association mapping analysis of SSR markers to TSWV resistance in cultivated peanut. One hundred eighteen genotypes of the U.S. peanut mini-core germplasm collection were screened for TSWV resistance using mechanical inoculation and ELISA assay to determine their susceptibility to TSWV infection in the greenhouse, and by quantifying final incidence of TSWV in small plot trials conducted in two years. One hundred and thirty-three SSR markers were then used to genotype a panel of 104 accessions. Four genotypes, PI356004, PI493880, PI355271, and PI496401, were identified as resistant to TSWV based on the absence of TSWV infection in greenhouse, ELISA, and in field. Association mapping analysis indicated that the five markers, pPGPseq5D5, GM1135, GM1991, TC23C08, and TC24C06, were consistently associated with visual symptoms by four models, Q model, PCA model, Q+K model, and PCA+K model. These identified markers accounted for 36.4% of the phenotypic variance for TSWV resistance. Moreover, pPGPseq5D5 and GM1991 were both associated with visual symptoms and ELISA resulting in a high R2. The identification of TSWV resistant genotypes and putative SSR markers from this study provide important knowledge that will be used to improve current breeding efforts aimed at development of TSWV resistant peanut varieties.

"Kairi" – A New Foliar Disease Resistant Variety for the Australian Peanut Industry.

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Improvement in foliar disease resistance has been a long-term objective of the Australian peanut breeding program since the early 1980's. Peanuts in Queensland are affected by 4 foliar fungal diseases – late leafspot, early leafspot, leaf rust and net (web) blotch. These diseases are of varying importance in different peanut growing regions throughout the world, while in Queensland they are significant pathogens in our two main growing regions of the Atherton Tablelands (N. Qld) and Bundaberg (coastal S. Qld). In both these regions the cost of foliar fungicides can be up to 30% of the total growing costs in current varieties. These varieties are mainly high yielding Introductions from the USA which are highly susceptible to leaf spot and rust, and require a full spray program of up to 12 + sprays to control these diseases. Hence combined genetic resistance to all these diseases is highly attractive but until recently any resistant types developed have suffered a significant pod yield depression compared to disease susceptible varieties that are kept fully sprayed. Growers have therefore not widely adopted these new varieties as the yield penalty is too large such that it has still been more cost effective to spray susceptible types. A new peanut variety, "Kairi", bred and about to be released by the Australian Peanut Breeding Program, has very good foliar disease resistance to the 4 leaf fungal diseases, as well as having significantly higher pod yield compared to currently grown susceptible checks. In 38 variety evaluation trials conducted with a full fungicide protection program over the past 3 years (2013-15), "Kairi" has demonstrated a 9.9% pod yield improvement above the high yielding but disease susceptible variety "Holt", an introduction from the University of Florida. Under an unsprayed foliar disease nursery in a high foliar disease pressure site in N. Qld over the past 3 years, "Kairi" has produced an average pod yield of 2890 kg/ha compared to 985 kg/ha for "Holt", representing a yield benefit of more than 290%. Current research is aimed at developing optimal fungicide spray programs that can best manage the new disease resistant "Kairi", by minimizing the number of sprays to optimize pod yield and quality. In a timing of fungicide application trial under intense leaf rust pressure in Bundaberg, it was shown that Kairi could produce the same pod yield with 7 v's 11 sprays. This research showed that the optimal spray program involved an early initial spray (at 6 weeks after planting) followed by subsequent sprays at 21-day intervals, compared to the normal 14 day program. It is believed further reductions in fungicide application will be possible, and lead to significant input cost savings of $100-$200/ha, along with environmental benefits of reduced pesticide usage.

Using the CROPGRO-Peanut Model to Simulate Genetic Yield Improvement of Peanut in West Africa.

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Crop models can be used to simulate combinations of traits in virtual cultivars to evaluate genetic yield improvement for target environments. Field experiments were conducted on 19 peanut genotypes during 2009 and 2010 in Wa and Tamale, Ghana and in Farakoba and Gampela, Burkina Faso. Pod yield and ICRISAT disease scores were measured at all sites. Phenology was observed and growth analysis was conducted at 60, 80, 100 days, and maturity at Ghana sites for computing partitioning and crop growth traits. Model genetic coefficients and disease scores were computed from these data for each genotype. Then, the CROPGRO-Peanut model was used to evaluate combinations of genetic traits (life cycle, productivity, and partitioning) and disease resistance traits, in order to evaluate the genetic potential yield over multiple seasons (30 years) for these four sites. The range of traits simulated was constrained by the observed data into three life cycles (90, 103 and 116 day), three disease resistances (susceptible, moderately susceptible, and resistant), over five growth traits (photosynthesis, partitioning, duration of pod addition, seed filling duration, and shelling percentage). Genetic potential yield was increased 19 to 33% going from short to longer life cycle but there was an interaction with the seed-filling period, as larger yield increase with longer cycle required concurrent increase in single seed filling period. Yield potential was consistently increased (22 to 37%) going from susceptible to resistant cultivars (using observed disease progress based on existing cultivars). Among the five growth traits, yield was increased equivalently by higher photosynthesis and higher partitioning intensity to pods. Single seed-filling duration usually increased yield. Compared to farmer-check Chinese cultivar (short cycle, susceptible), putting the better growth traits into long cycle, disease resistant line increased yield by 141% from 1200 to 2900 kg/ha averaged over all sites, and 18% higher than the best observed cultivar, Nkatesari. Field observations and model simulations indicated yield can be twofold higher than existing farmer cultivars.

Plant Pathology/Nematology I

WEDNESDAY, JULY 23, 2016		
1:30 - 3:30 p.m. Waters Edge C	**Plant Pathology/Nematology I** *Chair & Moderator: Nicholas Dufault, University of Florida*	**Page Number**
1:30 p.m	**Survey of Pod Rot Pathogens in Oklahoma.** **R.S. BENNETT***, USDA-ARS, Stillwater, OK 74075-2714; and J.P. DAMICONE, Department of Entomology and Plant Pathology, Oklahoma State University, Stillwater, OK 74078-3033.	**59**
1:45 p.m.	**Concentration of Azoxystrobin in the Soil that Affects Pod Rot.** **T. A. WHEELER***, Texas A&M AgriLife Research, Lubbock, TX 79403; R. D. FRENCH-MONAR, and Texas A&M AgriLife Extension Service, Amarillo, TX, 79106; and J. E. WOODWARD, Texas A&M AgriLife Extension Service, Lubbock, TX 79403.	**60**
2:00 p.m.	**Seeding Rate impact on Diseases and Yield of Selected Runner Peanut Varieties in a Rainfed Production System in Southeast Alabama.** **A.K. HAGAN***, H. L. CAMPBELL, K.L. BOWEN. Auburn University, AL 36849; L. WELLS. Wiregrass Research and Extension Center, Headland, AL 36849.	**61**
2:15 p.m.	**Evaluating Disease Management Programs on Newly Released Virginia-type Cultivars in North Carolina.** **B. B. SHEW***, Department of Entomology and Plant Pathology, T.G. ISLEIB and D.L. JORDAN, Department of Crop Science, NC State University, Raleigh, NC.	**62**
2:30 p.m.	**The Impact of Oscillating Soil Temperatures on the Seasonal Development of "White Mold" in Florida Peanut Fields.** **N. S. DUFAULT***, Department of Plant Pathology, The University of Florida, Gainesville, FL 32611-0680 and R. BAROCCO, W. ELWAKIL, Doctor of Plant Medicine Program, The University of Florida, Gainesville, FL 32611.	**63**
2:45 p.m.	**An Evaluation of Monocyclic Components of Late Leaf Spot on Six Peanut Genotypes** **L. GONG***, K. L. BOWEN, Entomology and Plant Pathology Department, Auburn University, Auburn, AL 36849, P.M. DANG, USDA-ARS National Peanut Research Laboratory, Dawson, GA 39842, C.Y. CHEN, Department of Crop, Soil and Environmental Sciences, Auburn University, Auburn, AL 36849.	**64**
3:00 p.m.	**Phosphite Fungicides for Peanut Disease Management: Efficacy and Regulatory Issues.** **T. B. BRENNEMAN*** and A. K. CULBREATH. Department of Plant Pathology, University of Georgia, Tifton, GA 31794.	**65**

Survey of Pod Rot Pathogens in Oklahoma.

R.S. BENNETT*, USDA-ARS, Stillwater, OK 74075-2714; and J.P. DAMICONE, Department of Entomology and Plant Pathology, Oklahoma State University, Stillwater, OK 74078-3033.

Pod rot is a sporadic and occasionally devastating disease of peanuts in Oklahoma, particularly of Virginia market types. Previous studies identified Pythium myriotylum and Rhizoctonia solani as the predominant pod-rotting pathogens in Oklahoma, but recent studies in other states have isolated additional species of Pythium from symptomatic pods. A survey to identify the pathogens causing pod rot in Oklahoma was conducted in 2015. A total of 898 pods with symptoms of pod rot, collected from over twelve fields in six Oklahoma counties were plated on both water agar and P5ARP. No Rhizoctonia solani was isolated from the pods. The species of Pythium are currently being identified using ITS sequences and the results will be presented at the meeting. This information will be useful in developing greenhouse-based assays for evaluating pod rot resistance.

Concentration of Azoxystrobin in the Soil that Affects Pod Rot.

T. A. WHEELER*, Texas A&M AgriLife Research, Lubbock, TX 79403; R. D. FRENCH-MONAR, and Texas A&M AgriLife Extension Service, Amarillo, TX, 79106; and J. E. WOODWARD, Texas A&M AgriLife Extension Service, Lubbock, TX 79403.

Pod rot can be caused by *Pythium* spp. and *Rhizoctonia solani*. There are only a few fungicides labeled for Pythium pod rot management, and those containing azoxystrobin, such as Abound FL, are the only ones that have the ability to suppress both genera of pathogens. The objective of this study was to determine the concentration of azoxystrobin in the soil that was necessary to manage pod rot caused by both of these organisms. Abound FL was applied to the soil surface in pots in 100 ml of water, when peanuts were pegging. The concentrations of azoxystrobin measured one day later for the eight rates at the 5 to 10 cm depth were: 0, 3.2, 5.0, 6.9, 10.6, 14.4, 21.8, and 29.3 ppm. The soil concentrations of azoxystrobin were analyzed by the European Standard EN 15662 (Omic USA Inc., Portland, OR). The soil was obtained from a peanut field that had substantial pod rot. In the absence of azoxystrobin, an average of 20% of the pods/pegs had symptoms of rot. In the presence of all azoxystrobin rates > 0, percent (%) pod rot was reduced significantly. A quadratic model: % pod rot = 18.2 – 3.1(Azoxystrobin ppm) + 0.14(Azoxystrobin ppm)^2, $P = 0.035$, $R^2 = 0.88$ described the relationship between azoxystrobin concentration at 1 day after application (DAA) to subsequent pod rot. The maximum azoxystrobin rate used to fit this model was 14.4 ppm, since higher rates all yielded no pod rot. *Rhizoctonia solani* and *Pythium* spp. were isolated from symptomatic pods (59 and 41% isolation frequency, respectively). The test was repeated with a second soil, with azoxystrobin concentrations of 0, 0.33, 0.42, 0.58, 0.75, 1.11, 1.44, and 2.22 ppm at 1 DAA. No relationship between azoxystrobin concentrations and % pod rot was obtained. With this soil, *Pythium* spp. and/or *R. solani* were only isolated from about half of the symptomatic pods (32 and 16% isolation frequency, respectively. Pods where *Pythium* spp. and *R. solani* were not isolated had severe black hull symptoms (*Thielaviopsis basicola* was present) and *Fusarium* spp. was also isolated from those damaged pods. Based on the model from the first soil, a 50 and 90% reduction in pod rot would have required 3.5 and 8.4 ppm of azoxystrobin, respectively. In previous field trials unrelated to this project, the highest concentration of azoxystrobin measured in the pod formation zone was 0.84 ppm. This measurement was taken two irrigation events after application. However, it is unlikely that soil concentrations were much higher than 1 ppm at their peak. It may not be possible, with current label rates, to adequately manage these organisms with azoxystrobin alone.

Seeding Rate impact on Diseases and Yield of Selected Runner Peanut Varieties in a Rainfed Production System in Southeast Alabama.

A.K. HAGAN*, H. L. CAMPBELL, K.L. BOWEN. Auburn University, AL 36849; L. WELLS. Wiregrass Research and Extension Center, Headland, AL 36849.

Impact of seeding rate on yield of selected runner peanut varieties as well as the occurrence of tomato spotted wilt (TSW), leaf spot diseases, and stem rot were evaluated in 2014 and 2015 under rainfed conditions on a site maintained in a one-year out rotation with cotton at the Wiregrass Research and Extension Center. A factorial arranged as split split split-split plot design was used with year as the whole plot, date of planting (DOP) as the split plot, Georgia-06G, Georgia-09B, and Georgia-12Y peanut variety as the split split-plot, and seeding rate of 3, 4, 6 and 8 seed/row ft as the split split split-split plot. Planting dates in both study years were in the 3rd week in April and May. Each plot, which consisted of four 30-ft rows in 3 ft centers, were randomized in four complete blocks. The study was not irrigated. Leaf spot control was obtained with seven applications of Echo 720 @ 1.5 pt/A made at 2-wk intervals starting 40 DAP. Stand counts were made from one of two harvest rows at 14 DAP. TSW incidence and leaf spot severity was assessed just prior to plot inversion, while stem rot incidence was recorded immediately after plot inversion. With the exception of the poor stands recorded for the May 2015 planting of Georgia-06G, stand counts did not greatly differ by year, planting date, or variety. Stand counts rose with each incremental increase in seeding rate. Leaf spot incidence was higher on all varieties in the 2nd than 1st DOP in 2014 with Georgia-09B having the greatest and Georgia-12Y the lowest ratings. For 2015, Georgia-09B had a greater leaf spot rating in the 1st than 2nd DOP, while similarly low ratings were noted at both DOP for Georgia-06G and Georgia-12Y. Also, leaf spot intensity rose with increasing seeding rates. While TSW incidence was low, ratings differed by DOP and variety with Georgia-09B but not the other two varieties suffering greater in the 2nd than 1st DOP. While stem rot incidence was similarly low in 2014 for all varieties in the 1st and 2nd DOP, Georgia-09B and Georgia-06G had greater stem rot indices at the 1st than 2nd DOP. Stem rot incidence was consistently lower on Georgia-12Y than Georgia-06G or Georgia-09B. Stem rot intensified with increasing seeding rate on the latter two but not the former variety. Greater yields were recorded in 2015 than 2014. Similar yields were recorded for all varieties. Yields, which differed by planting date and seeding rate, were greater at 3 than 6 and 8 seed/row ft for the 1st DOP but were not influenced by seeding rate at the 2nd DOP. Yields were lower at the 2nd DOP, regardless of seeding rate, compared with all seeding rates at the 1st DOP.

Evaluating Disease Management Programs on Newly Released Virginia-type Cultivars in North Carolina.

B. B. SHEW*, Department of Entomology and Plant Pathology, T.G. ISLEIB and D.L. JORDAN, Department of Crop Science, NC State University, Raleigh, NC.

The cultivars Bailey and Sugg have resistance to several diseases that are important in North Carolina and Virginia. These cultivars can be grown with fewer inputs for disease control, and many growers have adopted reduced management strategies. The objective of this research was to evaluate reduced inputs for disease management on the new virginia-type cultivars Sullivan, Wynne, and Spain. These cultivars were tested along with Bailey and Sugg at five levels of disease management: 1) Full = five foliar sprays, three for leaf spot control and two for combined leaf spot and stem rot control, plus two sprays for Sclerotinia control and an in-furrow fungicide application; 2) Reduced = four foliar sprays, three for leaf spot, one for combined leaf spot and stem rot control, plus one Sclerotinia spray; 3) No Stem Rot Control = four sprays for leaf spot control only, plus one Sclerotinia spray; 4) No Sclerotinia Control = four foliar sprays as in 2, but with no Sclerotinia spray; and 5) No Leaf Spot Control, with two sprays for stem rot control only, plus one Sclerotinia spray.

In 2014, management programs performed consistently across cultivars for leaf spot, defoliation, stem rot, Sclerotinia blight, and yield. Leaf spot incidence and defoliation were low overall, but higher in No Leaf Spot Control than in the other treatments. Sullivan had less defoliation than the other cultivars. Stem rot incidence generally highest in the cultivar Spain, but low overall. Incidence of Sclerotinia blight was extremely high, particularly in No Sclerotinia Control, which also had the lowest yield. Spain, Sullivan and Wynne had high incidence of Sclerotinia blight, with lowest yields in Spain. Yield was negatively correlated with incidence of Sclerotinia blight ($r = -0.3668$, $P = 0.0002$) and stem rot ($r = -0.26557$, $P = 0.0082$). In 2015, cultivar performance for leaf spot, defoliation, and Sclerotinia blight varied with management programs. For leaf spot and defoliation, this dependence primarily reflected high levels of leaf spot and corresponding differences among cultivars in No Leaf Spot Control. In that treatment, leaf spot incidence was highest in Sullivan. Leaf spot was lowest in Spain and Wynne and management treatments did not affect defoliation in these cultivars. Sclerotinia blight generally was low, with highest incidence in Spain with No Sclerotinia Control. The differences in management programs and cultivars were consistent for incidence of stem rot, which was highest in Spain and lowest in Sugg. Leaf spot was the only disease variable negatively correlated with yield ($r = -0.2067$, $P = 0.0390$). Contrary to the results in 2014, yield was highest in Spain, followed by Sugg. In both years and across all cultivars, the Full and Reduced programs did not differ for leaf spot, stem rot, Sclerotinia blight, or yield. These results suggest that the reduced input program currently recommended on Bailey and Sullivan also will be effective on the new cultivars. However, some results were inconclusive due to wide differences in the 2014 and 2015 growing seasons. Of particular concern was the difference between years in leaf spot incidence and defoliation in Bailey and Sullivan. Programs will undergo additional testing to strengthen management recommendations for new cultivars.

The Impact of Oscillating Soil Temperatures on the Seasonal Development of "White Mold" in Florida Peanut Fields.

N. S. DUFAULT*, Department of Plant Pathology, The University of Florida, Gainesville, FL 32611-0680 and R. BAROCCO, W. ELWAKIL, Doctor of Plant Medicine Program, The University of Florida, Gainesville, FL 32611.

"White mold" is a devastating disease of peanuts which can be efficiently managed by properly timed and applied fungicides. Recently, it was observe that the pathogen, Sclerotium rolfsii, varied in its mycelial growth response to various temperatures, and that the magnitude of temperature oscillations around various mean temperatures was critical to fungal growth. Based on this information, it was hypothesized that "white mold" disease development in a field setting would respond similarly to soil temperature oscillations. For this study, field research plots at the Plant Science Research and Education Unit in Citra, FL were inoculated with 3 isolates of S. rolfsii. These plots were planted at 2 different dates either in late (25th to 30th) April or early (1st to 6th) June with the cultivar Georgia-06G. Disease incidence, evaluated as the number 1 foot peanut row sections with fungal signs present out of 50 linear row feet, was recorded on a bi-weekly schedule starting approximately 40 days after planting (DAP). Yield and leaf spots disease data were also recorded. It was observed that temperature oscillations did have an effect on overall disease development and yield losses attributed to "white mold". However, this effect was less pronounced in later plantings as mean soil temperatures were generally lower 60 DAP compared to early plantings. The information from this study can be used to improve early season risk models for "white mold" disease development as well as early fungicide application timings.

An Evaluation of Monocyclic Components of Late Leaf Spot on Six Peanut Genotypes

L. GONG*, K. L. BOWEN, Entomology and Plant Pathology Department, Auburn University, Auburn, AL 36849, P.M. DANG, USDA-ARS National Peanut Research Laboratory, Dawson, GA 39842, C.Y. CHEN, Department of Crop, Soil and Environmental Sciences, Auburn University, Auburn, AL 36849.

Cultivated peanut (*Arachis hypogaea* L.) is an economically important crop that is produced not only in the United States, but worldwide. *Cercosporidium personatum* (Cp) is a major fungal pathogen of cultivated peanuts that causes late leaf spot (LLS) and threatens the yield with up to 50% losses. This study evaluated LLS monocyclic components of six peanut genotypes (C1-6), including at least one genetically modified line that over-expresses chitinase. Both vegetative and reproductive growth stages (VGS and RGS, respectively) plants were inoculated with 5000 conidia /ml Cp suspension. The monocyclic components evaluated were incubation period, number and size of lesions, and proportion of defoliation. The experiment was conducted using whole plants in a greenhouse under intermittent mist to simulate dew in a randomized complete block design, with five replications of each treatment (genotypes and growth stages). Five leaves of each plant were examined daily after inoculation. Data analysis was carried out by PROC Glimmix of SAS (SAS 9.4, 2010).

Peanut plants at RGS had a significantly longer incubation period (27.8 days) compared to plants at VGS (12.1 days). At 42 days after inoculation (DAI), RGS plants had significantly higher lesion counts, larger lesion sizes, and lower defoliation compared to VGS plants. C6 had a significantly shorter incubation period and higher lesion count compared to other genotypes, while C3 and C5 had the longest incubation periods. In addition, C3 had the fewest lesions and C4 tended to have the smallest lesions. No significant differences were observed in two-way interactions. Given the values of monocyclic components, the genotypes might rank in order from most to least susceptible as C6, C1 and C4, C2 and C5, then C3. The intermediate reactions of C1 and C4 suggested similar susceptibility, as did those of C2 and C5.

Phosphite Fungicides for Peanut Disease Management: Efficacy and Regulatory Issues.

T. B. BRENNEMAN* and A. K. CULBREATH. Department of Plant Pathology, University of Georgia, Tifton, GA 31794.

Phosphorous acid-based fungicides (phosphites) are labeled for use on peanuts and many other crops. Originally developed for control of oomycetes, they were later found to have activity on a wide range of diseases on numerous crops. Their primary benefit in peanuts has been for management of Pythium pod rot, which utilizes their strength on oomycetes as well as their acropetal and basipetal systemic movement within the plant. Foliar sprays usually result in reduced levels of leaf spot, but the degree of control is less than with currently used fungicides such as chlorothalonil. The basipetal movement of these products should improve their utility for soilborne diseases of peanut. Such diseases can be hard to control with foliar sprays due to difficulty in penetrating the dense canopy. Unfortunately, the phosphites have shown little activity on peanut stem rot (*Sclerotium rolfsii*), but data on other diseases is very limited. There are also potential issues with residues in peanuts exported to the European Union where the MRL for these products has been set at a very low level.

Plant Pathology/Nematology II

WEDNESDAY, JULY 23, 2016		
4:00 - 5:30 p.m. Waters Edge C	**Plant Pathology/Nematology II** *Moderator: Barbara Shew, North Carolina State University*	**Page Number**
4:00 p.m.	**Changes in the Efficacy of Pyraclostrobin for Control of Peanut Leaf Spot Diseases.** **A.K. CULBREATH***, T.B. BRENNEMAN, R.C. KEMERAIT and K.S. STEVENSON, Department of Plant Pathology, Univ. of Georgia, Tifton, GA 31793-5766.	67
4:15 p.m.	**Vibrance®: A New Fungicide Active ingredient for Early Season Disease Control in Peanut.** **V. MASCARENHAS***, H. McLEAN, P. EURE, M. VANDIVER, R. JACKSON AND S. MARTIN, Syngenta Crop Protection, Greensboro, NC.	68
4:30 p.m.	**ADEPIDYN™: A New Fungicide Active Ingredient for Disease Control in Peanut.** **H. MCLEAN***, K. BUXTON, V. MASCARE NAS, T. HARP, and A. TALLY, Syngenta Crop Protection, LLC, 410 Swing Road, Greensboro, NC 27409.	69
4:45 p.m.	**Rancona® V PD: A New Broad-Spectrum Fungicide Seed Treatment for Peanuts** **J. YANES, JR.*** and K. J. DONOVAN, Arysta LifeScience North America, Collierville, TN 38017 and Cheshire, CT 06410.	70
5:00 p.m.	**Responses of High O/L Peanut Cultivars to Fungicide for Control of Sclerotinia Blight.** **J. DAMICONE***, Department of Entomology and Plant Pathology, Oklahoma State University, Stillwater, OK 74078-3033; and K. CHAMBERLIN and R. BENNETT, USDA/ARS, Stillwater, OK 74075-2714.	71
5:15 p.m.	**Assessment of ELATUS for Management of Southern Stem Rot and Leaf Spot Diseases.** **R. C. KEMERAIT***, T.B. BRENNEMAN and A.K. CULBREATH, Department of Plant Pathology, University of Georgia, Tifton, GA 31793, and H. MCLEAN and W. FAIRCLOTH, Syngenta Crop Protection, Greensboro, NC 27419.	72

Changes in the Efficacy of Pyraclostrobin for Control of Peanut Leaf Spot Diseases.

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In the southeastern United States, control of early leaf spot (*Cercospora arachidicola*) and late leaf spot (*Cercosporidium personatum*) of peanut (*Arachis hypogaea*) is heavily dependent on the use of fungicides. Pyraclostrobin is a strobilurin (group 11) fungicide that was labeled for use on peanut in the U.S. in 2002. Results from trials conducted in 1999 and 2000 indicated that treatments of 112 g a.i./ha or higher of pyraclostrobin applied 5 times at 21-day intervals were superior to 1.26 kg a.i./ha of chlorothalonil applied 7 times at 14-day intervals. In recent years, however, levels of leaf spot control achieved with treatments that included pyraclostrobin have not been consistent. In many cases, treatments included other fungicides, so which fungicide was responsible for control or lack thereof was not always discernable. The objective of this study was to compare full season applications of pyraclostrobin to chlorothalonil and other fungicides for leaf spot control. Field experiments were conducted in 2014 and 2015 in Tifton, GA. In both years, treatments included pyraclostrobin (Headline 250 SC) at 164 g a.i./ha; prothioconazole (Proline) at 200 g a.i./ha; a mixture of pyraclostrobin at 97 g a.i./ha plus fluxapyroxad (Priaxor) at 49 g a.i./ha; chlorothalonil (Bravo WeatherStik) at 1.26 kg a.i./ha; and a nontreated control. In 2015, treatments also included three other strobilurin fungicides, picoxystrobin (Approach) at 220 g a.i./ha; azoxystrobin (Abound) at 331 g a.i./ha; and trifloxystrobin (Flint 50 W) at 140 g a.i./ha. In both years, initial applications were made ca. 55 days after planting, with subsequent applications made at ca. 21-day intervals for a total of four applications. Final leaf spot ratings (Florida 1-10 scale) for the nontreated, prothioconazole, pyraclostrobin plus fluxapyroxad, pyraclostrobin, and chlorothalonil treatments were 9.0, 3.6, 4.9, 6.9, and 6.4, respectively (LSD = 1.4) in 2014, and 10.0, 4.0, 6.0, 8.3, and 8.0, respectively (LSD = 1.2) in 2015. Final leaf spot severity ranged from 8.0 to 8.9 among the other treatments in 2015, all of which were similar to the pyraclostrobin and chlorothalonil treatments. In contrast to previous reports of pyraclostrobin being superior to chlorothalonil for leaf spot control, results from 2014 and 2015 indicate that those two fungicides now provide similar levels of control. Investigations are in progress to determine whether changes in sensitivity to pyraclostrobin in the leaf spot pathogen populations are responsible for the changes in control.

Vibrance®: A New Fungicide Active ingredient for Early Season Disease Control in Peanut.

V. MASCARENHAS*, H. McLEAN, P. EURE, M. VANDIVER, R. JACKSON AND S. MARTIN, Syngenta Crop Protection, Greensboro, NC.

Vibrance is a new seed treatment fungicide for early season disease protection in peanut. It is the first fungicide developed by Syngenta Crop Protection exclusively for use as a seed treatment. Vibrance has long lasting activity combined with ideal mobility, which makes it a highly effective seed treatment fungicide. Vibrance delivers stronger, healthier roots which can more efficiently uptake nutrients and water. This results in protecting the genetic yield potential and more consistent crop performance.

Sedaxane the active ingredient in Vibrance is in the SDHI class of fungicides. It delivers best in class control of *Rhizoctonia* sp. Vibrance will be combined with Dynasty PD or CruiserMaxx Peanut to provide four powerful fungicides resulting in broad-spectrum seedling disease control.

<u>ADEPIDYN™: A New Fungicide Active Ingredient for Disease Control in Peanut.</u>

H. MCLEAN*, K. BUXTON, V. MASCARENHAS, T. HARP, and A. TALLY, Syngenta Crop Protection, LLC, 410 Swing Road, Greensboro, NC 27409.

ADEPIDYN™ fungicide is a new active ingredient in the carboxamide chemical class (FRAC group 7) under development by Syngenta Crop Protection, LLC. Initial characterization and efficacy experiments have indicated Adepidyn provides excellent residual control of a broad spectrum of plant pathogens including powdery mildews and leaf spots on vegetables as well as row crops. The first wave crops to be registered include fruiting and leafy vegetables, cereals, peanut, grape, potato, soybean, and corn. Some of the key strengths of ADEPIDYN™ include early and late leaf spot on peanut, *Alternaria* spp., and powdery mildews. Field trials have shown the unparalleled residual control of ADEPIDYN™ fungicide, at low rates in comparison to commercial standards, providing more than three to four weeks control of *A. solani* on potato, *Cercospora* spp. on peanut, and powdery mildew cucurbits. The high intrinsic activity and long-lasting duration of control of ADEPIDYN™ fungicide on these diseases will provide growers another effective tool for effectively managing leaf spot and other diseases in peanut. Complete integrated disease management programs are under development that have the potential to provide broad spectrum disease control with built in resistance management strategies and possibly with a significant reduction in the number of applications required per season in peanut.

Rancona® V PD: A New Broad-Spectrum Fungicide Seed Treatment for Peanuts

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On February 19, 2016 EPA approved the federal registration for Rancona® V PD peanut seed treatment fungicide. This new peanut seed treatment features three active ingredients --- ipconazole, carboxin and metalaxyl. It provides broad-spectrum contact and systemic control of key peanut diseases such as seed rot, damping-off and seedling blight caused by *Rhizoctonia, Fusarium,* and *Pythium* and seed rot caused by seed-borne *Penicillium, Aspergillus flavus, Rhizopus* and *Sclerotinia*. Rancona V PD is also labeled for partial control of early-season stages of crown rot caused by seed-borne *Aspergillus niger*, white mold / stem rot caused by *Sclerotium rolfsii*, and black rot caused by *Cylindrocladium parasiticum*.

21 trials were conducted across the U.S. Peanut Belt over a period of three years evaluating the efficacy of Rancona V PD compared with Dynasty PD and an untreated check. Data was collected for stand counts, plant vigor, disease control and yield. Compared to the untreated check, Rancona V PD increased stand counts and provided disease control comparable to Dynasty PD. Rancona V PD treatments resulted in increased peanut yields 6.3% (132.8 lbs./A) over Dynasty PD.

<u>Responses of High O/L Peanut Cultivars to Fungicide for Control of Sclerotinia Blight</u>.

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Sclerotinia blight, caused by *Sclerotinia minor*, remains an important disease of peanuts in Oklahoma where it causes severe damage when prolonged periods of wet weather occur during mid to late season. Progress has been made in increasing the resistance of peanut cultivars to Sclerotinia blight. Spanish cultivars such as Tamnut OL06 and Olin are resistant and application of the fungicides fluazinam or boscalid rarely results in a yield response. However, fungicide application has generally increased yields of runner cultivars such as Tamrun OL01 and Tamrun OL02 classified as moderately resistant. The objective was to use fungicide application as a tool to measure resistance to Sclerotinia blight in new cultivars and breeding lines. From 2008 to 2012, the response of the susceptible cultivar Flavor Runner 458 to fluazinam at 0.75 lb a.i./A was compared to the cultivars Red River Runner and Tamrun OL07. In untreated plots, Flavor Runner 458 averaged 50% disease incidence and 2781 lb/A yield. Red River Runner averaged 34% disease incidence and 3909 lb/A yield, and Tamrun OL07 averaged 28% disease incidence and 3662 lb/A without fungicide treatment. However, 2 applications of fluazinam increased yields (P=0.05) of all cultivars (986 lb/A for Tamrun OL07, 1032 lb/A for Red River Runner, and 1363 lb/A for Flavor Runner 458) suggesting that Red River Runner and Tamrun OL07 have moderate resistance to Sclerotinia blight with additive yield response to fungicide. In 2012, the responses of the new cultivars Lariat (runner), Venus (virginia), and Olé (spanish) to fluazinam were compared to Flavor Runner 458 (susceptible) and Tamnut OL06. In untreated plots, Flavor Runner 458 had 66% disease and yielded 2359 lb/A while Tamnut OL06 had only 4% disease and yielded 3104 lb/A. Lariat had 1% disease and 5037 lb/A yield, Venus had 4% disease and 3467 lb/A yield, and Olé had 1% disease and 4565 lb/A yield without fungicide treatment. Fluazinam increased (P=0.05) yields of Flavor Runner 458 (1271 lb/A) and Venus (753/A), but not Tamnut OL06 (417 lb/A), Lariat (270 Lb/A), and Olé (-37 lb/A). The resistance in Lariat and Olé appears to be sufficient to offset the need for fungicide treatment to control Sclerotinia blight, but the results need to be verified.

Assessment of ELATUS for Management of Southern Stem Rot and Leaf Spot Diseases.

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Management of soilborne and foliar diseases is of critical importance to peanut producers in the southeastern United States. Three of the most important diseases are southern stem rot (*Sclerotium rolfsii*), late leaf spot (*Cercosporidium personatum*) and early leaf spot (*Cercospora arachidicola*). Tactics to manage these diseases include crop rotation, planting partially-resistant cultivars and fungicides. Growers typically apply fungicides 4-7 times per year to manage diseases and protect yields. Effective fungicide programs must not only effectively manage disease but also protect against fungicide resistance. Syngenta Crop Protection received a Section 3 label for use of ELATUS (azoxystrobin + benzovindiflupyr/solatenol) on peanut in 2015. This study, conducted in 2014 and 2015 reports on the efficacy of ELATUS for disease management in peanut. Field trials were conducted at the Attapulgus Research and Education Center in fields frequently rotated to peanut. Plots were planted to 'Georgia-06G' and managed according to recommendations from UGA Extension. Plots were 2-rows wide and 25 ft in length. Treated plots (to include the control) were separated from each other by two unsprayed rows to maximize disease potential. Fungicide treatments were applied with a Lee Spider mounted boom sprayer, flat fan spray tips in 15 gal/A. In 2014, ELATUS (9 oz/A, 2 applications) was compared against other full-season programs to include Provost (10.7 fl oz/A, 4 applications), Muscle (7.2 fl oz/A, 4 applications) Fontelis (16 fl oz/A, 3 applications) and Convoy (13 fl oz/A, 3 applications). The lowest stem rot rating and highest yield was recorded in plots treated with ELATUS. In 2015, ELATUS was assessed at rates of 7.14 oz/A applied three times during the season (early emergence, 60 and 90 days after planting) and at 9.5 oz/A applied two times during the season (twice mid-season and once soon after emergence + once mid-season) and compared to a 4-block Provost (7.4 fl oz/A), a 3-block Fontelis program (16 fl oz/A) and an Abound (18 fl oz/A) + alto (5.5 fl oz/A) program. Though typically not significantly different, plots treated twice with the Abound + alto mixture had the lowest levels of leaf spot and southern stem rot at the end of the season. However, numerically highest yields (above plots treated with Fontelis, Provost or Abound + Alto) were observed where ELATUS was applied. From these two years of field trials, ELATUS has been found to be an effective fungicide for protecting against disease, protecting yield and also reducing risk to fungicide resistance by including two fungicides of differing modes of action.

Joe Sugg Graduate Student Competition I
Breeding/Genetics/Plant Pathology

THURSDAY, JULY 14, 2016		
8:00 - 11:45 a.m. Salon D	**Joe Sugg Graduate Student Competition I** Breeding/Genetics/Plant Pathology *Sponsored by North Carolina Peanut Growers Association* *Moderator: Maria Balota, Virginia Tech*	**PAGE NUMBER**
8:00 a.m.	**Sensitivity of Sclerotinia minor to Common Peanut Fungicides.** **M. D. CANNON*** and B. B. SHEW, Department of Entomology and Plant Pathology, North Carolina State University, Raleigh, NC 27695.	**75**
8:15 a.m.	**SNP Genotyping as a Tool for Peanut Breeding.** **C. CHAVARRO*,** University of Georgia, Institute of Plant Breeding Genetics and Genomics, Athens, GA; Y. CHU, University of Georgia, Institute of Plant Breeding Genetics and Genomics, Tifton, GA; J. CLEVENGER, University of Georgia, Institute of Plant Breeding Genetics and Genomics, Tifton, GA; C.C. HOLBROOK, USDA-ARS, Tifton, GA; T. G. ISLEIB, North Carolina State University, Department of Crop Science and Environmental Science, Raleigh, NC 27695- 7629; D BERTIOLI, University of Georgia, Institute of Plant Breeding Genetics and Genomics, Athens, GA; S. BERTIOLI, University of Georgia, Institute of Plant Breeding Genetics and Genomics, Athens, GA; R. VARSHNEY, M. PANDEY, G. AGARWAL, and S. NAYAK, International Crops Research Institute for the Semi-Arid (ICRISAT), Hyderabad 502324, India; and, S. JACKSON, University of Georgia, Institute of Plant Breeding Genetics and Genomics, Athens, GA; P. OZIAS-AKINS2, University of Georgia, Institute of Plant Breeding Genetics and Genomics, Tifton, GA.	**76**
8:30 a.m.	**RNA Sequencing of Contaminated Seeds Reveals the Permissive State for Pre-harvest Aflatoxin Contamination and Points to a Potential Susceptibility Factor** **J. CLEVENGER***, K. MARASIGAN, and P. OZIAS-AKINS, Department of Horticulture and Institute of Plant Breeding, Genetics & Genomics, The University of Georgia, Tifton, GA 31793, B. LIAKOS, G. VELLIDIS, Department of Crop and Soil Sciences, The University of Georgia, Tifton, GA 31793, V. SOBOLEV, USDA-ARS National Peanut Research Laboratory, Dawson, GA, 39842, and C.C. HOLBROOK, USDA-ARS, Tifton, GA 31793.	**77**
8:45 a.m.	**Phenotyping of Peanut Stem Rot in a RIL Population.** **R. CUI***, T.B. BRENNEMAN, Plant Pathology Department, The University of Georgia, Tifton, GA 31794; J.P. CLEVENGER, Y. CHU, P. OZIAS-AKINS, Department of Horticulture, The University of Georgia, Tifton, GA 31793; T.G. ISLEIB, Department of Crop Science, North Carolina State University, Raleigh, NC 27695-7620; and C. HOLBROOK, USDA-ARS, Tifton, GA 31794.	**78**
9:00 a.m.	**Sensitivity of Early and Late Leaf Spot Peanut Pathogens to QoI Fungicides and Genetic Variability Based on ITS Sequences.** **W. ELWAKIL***, Doctor of Plant Medicine Program, The University of Florida, Gainesville, FL 32611; and N. S. DUFAULT, Department of Plant Pathology, The University of Florida, Gainesville, FL 32611.	**79**

9:15 a.m.	**Breeding for Sclerotinia Blight Resistance in the NCSU Peanut Breeding Program.** **W.G. HANCOCK***, J.W. HOLLOWELL, S.C. COPELAND, F.R. CANTOR BARREIRO and T.G. ISLEIB, Dept. of Crop Science, N.C. State Univ., Raleigh, NC 27695-7629.	**80**
9:30 a.m.	**Effect of New Peanut Genotypes and Two Cultivars on Leaf Spot Severity and Yield When Grown without Fungicides for Possible Use in Organic or Limited Input Systems** **B.S. JORDAN***, Dept. of Plant Pathology, University of Georgia, Tifton, GA 31793-5766; W. D. BRANCH, Dept. of Crop and Soil Science, University of Georgia, Tifton, GA 31793-5766; and A.K.CULBREATH, Dept. of Plant Pathology, University of Georgia, Tifton, GA 31793-5766.	**81**
9:45 a.m.	**Variability Among Genotypes for *Aspergillus flavus* Seed Infection Monitored with a GFP-Engineered Strain.** **W. A. KORANI***, Y. CHU, and P. OZIAS-AKINS, Institute of Plant Breeding, Genetics and Genomics (IPBGG), University of Georgia (UGA), Tifton, GA 31793.	**82**
10:30 a.m.	**Use of a Genotype-by-Targeted Resequencing Approach in Peanut.** **R. KULKARNI***, Department of Plant and Soil Science, Texas Tech University, Lubbock, TX 79409; R. CHOPRA, USDA-ARS, Lubbock, TX 79415; J.CHAGOYA, and M.D. BUROW Texas A & M, AgriLife Research, Lubbock, TX 79403, and Department of Plant and Soil Science, Texas Tech University, Lubbock, TX 79409.	**83**
10:45 a.m.	**Comparison of Four RIL Mapping Populations of Peanut for Field Response to Tomato Spotted Wilt and Late Leaf Spot.** **S. E. PELHAM***, Department of Plant Pathology, The University of Georgia, Tifton, GA 31793, C. C. HOLBROOK, B. GUO, The United States Department of Agriculture, Agriculture Research Services, Tifton, GA, 31793, Y. CHU, P. OZIAS-AKINS, Department of Horticulture, The University of Georgia, Tifton, GA 31793, and A. K. CULBREATH, Department of Plant Pathology, The University of Georgia, Tifton, GA 31793.	**84**
11:00 a.m.	**Genes and Gene Network Involved in Peanut Nodulation.** **Z. PENG*,** F. LIU, L. WANG, and J. WANG, Agronomy Department, The University of Florida, Gainesville, FL 32611.	**85**
11:15 a.m.	**Genetic variation and virulence diversity among three *Sclerotium rolfsii* isolates on two peanut cultivars.** **P.S. SORIA***, M.E. SMITH, and N.S. DUFAULT, Plant Pathology Department, University of Florida, Gainesville, FL 32611 – 0180.	**86**
11:30 a.m.	**Using Sub-Genome Specific Transcriptome-derived SNP Markers to Develop a Genetic Linkage Map for a BC1 Mapping population in Peanut (*Arachis hypogaea L.*)** **T.K. TENGEY***, Department of Plant and Soil Science, Texas Tech University, Lubbock, TX 79409; R. Chopra, USDA-ARS-CSRL, Lubbock, TX 79415; C.E SIMPSON, Texas A & M AgriLife Research, Stephenville, TX 76401; V. MENDU, Department of Plant and Soil Science, Texas Tech University, Lubbock, TX 79409; M.D. BUROW, Texas A & M AgriLife Research, Lubbock, TX 79403, and Department of Plant and Soil Science, Texas Tech University, Lubbock, TX 79409.	**87**

<u>Sensitivity of *Sclerotinia minor* to Common Peanut Fungicides.</u>

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Growers often must rely on fungicides to control Sclerotinia blight caused by *Sclerotinia minor*. Other methods are not sufficient to prevent losses in problem fields; for example, rotation has limited effectiveness because sclerotia can remain viable in soil for many years. Likewise, no cultivar has high levels of Sclerotinia blight resistance. Fluazinam (Omega 500F) is the fungicide most commonly used to control Sclerotinia blight and is highly effective when applications are properly timed. Other fungicides are labeled for control or suppression of Sclerotinia blight, but do not perform as consistently as fluazinam in field trials or grower's fields. These fungicides include penthiopyrad (Fontelis), fluopyram + prothioconazole (Propulse) and iprodione. Although highly effective in NC trials, boscalid (Endura) has not been widely accepted by NC growers, who sometimes report inconsistent performance. Elatus, a mixture of azoxystrobin + benzovindiflupyr, is also of interest for Sclerotinia blight control but has not been extensively tested. It is possible that inconsistent performance of some fungicides is due to differences in sensitivity among isolates of *S. minor*. The objective of this research was to determine the sensitivity of S. minor populations to six fungicides (Omega, Endura, Fontelis, Propulse, Elatus and iprodione). Sensitivity of five isolates of S. minor was tested on potato dextrose agar (PDA) amended with the formulated fungicides at concentrations of 0.1, 1.0, 10 and 100 ppm of active ingredient. All isolates tested (P2, P13, P30, W10 and W26) were collected prior to 2003. A five mm plug of each isolate was placed in the middle of agar dispensed in three replicate 9-mm petri plates and cultures were incubated on the bench at room temperature. Colony diameter was measured at 24 and 48 hours. The treatment combinations were arranged in a randomized complete block design and the trial was conducted twice. The trial was conducted a third time in a dark 20°C incubator. All tested fungicides inhibited colony growth, but inhibitory concentrations varied among fungicides. Across all isolates, Endura caused 85% inhibition at the highest concentration (100 ppm), whereas Elatus and iprodione caused 100% inhibition at only 10 ppm. Propulse and Omega caused 100% inhibition at 100 ppm. However, Propulse caused only 74% inhibition and Omega caused 98% inhibition at 1.0 ppm. Fontelis caused 90% inhibition at 100 ppm and 80% inhibition at 1.0 ppm. The four SDHI-containing fungicides (succinate dehydrogenase inhibitors; Endura, Fontelis, Propulse, and Elatus) also were tested with and without salicylhydroxamic acid (SHAM) to eliminate the possibility that they could overcome toxicity via an alternative oxidative pathway. Response to SHAM varied by isolate, fungicide and concentration, but responses were inconsistent.

SNP Genotyping as a Tool for Peanut Breeding.

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Genotyping of structured populations is an extremely useful tool for breeding. This research is crucial as an instrument for breeding in peanut since it can be contrasted with the phenotyping of biparental populations to identify QTLs and genes underlying agronomic traits. Therefore, a group of 23 genotypes from all the market classes including 10 parents such as Tifrunner, NC 3033, Florida 07, C76-16, SPT06-06 and New Mexico Valencia, etc., from a nested association mapping (NAM) population developed in Tifton, GA, and Raleigh, NC, were genotyped using an Affymetrix chip with 60k SNPs designed based on comparative analysis of tetraploid sequence with the two diploid ancestor reference genomes. The NAM population consists of 16 RIL populations with two common parents (Tifrunner and Florida 07) based on crosses of genotypes with different trait combinations such as disease resistance, drought tolerance, and pod morphologies. Thus, 11633 SNP markers were found to be polymorphic between the 23 genotypes and 8999 SNPs were found to be polymorphic between all the 10 CAP parents; 8965 for the crosses with Tifrunner and 8857 for the crosses with Florida 07. Additionally, one part of the RIL population from the cross of Tifrunner by NC 3033 was genotyped and the genetic map was generated based on 2288 polymorphic markers for the cross. The genetic position of the markers was compared with the chromosome sequences from the two diploid ancestor genomes to confirm the genetic positions and analyze potential rearrangements that could be present in the tetraploid genome as compared to the two ancestors. Seed and pod phenotypic traits have also been correlated with the genotyping data to identify QTLs. Studies will continue to confirm the applicability of this tool.

RNA Sequencing of Contaminated Seeds Reveals the Permissive State for Pre-harvest Aflatoxin Contamination and Points to a Potential Susceptibility Factor

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Pre-harvest aflatoxin contamination (PAC) is a major problem facing peanut production worldwide. Produced by the ubiquitous soil fungus, *Aspergillus flavus*, aflatoxin is the most carcinogenic naturally occurring compound. The interaction between fungus and host resulting in PAC is complex, and progress from breeding for PAC resistance has been slow. It has been shown that aflatoxin production can be induced by applying drought stress as peanut seeds mature. We have implemented an automated rainout shelter that controls temperature and moisture in the root and peg zones to induce aflatoxin production. Using PCR and HPLC we selected seeds that were infected with *Aspergillus flavus* and were contaminated with aflatoxin and those that were not contaminated. RNA sequencing analysis revealed groups of genes that describe the genetic state of the seed that is contaminated and not contaminated. These data show that fatty acid biosynthesis and ABA signaling are altered in contaminated seeds and point to a potential susceptibility factor, *ABR1*, as a repressor of ABA signaling that may play a role in permitting PAC.

Phenotyping of Peanut Stem Rot in a RIL Population.

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Georgia peanut producers suffers severe yield loss from stem rot (white mold) caused by Sclerotium rolfsii. Progress has been made in developing cultivars with better disease resistance, but these cultivars are not widely grown. Mapping stem rot resistance and identification of molecular markers will greatly advance the breeding process.

The resistance to stem rot was evaluated from 2013 to 2015 in 132 RIL's from a population derived from Tifrunner X NC3033. Peanuts were planted in a randomized complete blocks with two replicates on beds (15ft x 6ft, 36 inch row spacing). The field was tarped and fumigated with 100% chloropicrin (300 lb/A) before planting to kill any fungal inoculum in the soil. Then, up to 10 plants per plot were inoculated with 1-cm plug of Sclerotium rolfsii on PDA at midseason when peanut foliage covered the ground. Irrigation was applied before the inoculation and for 3 consecutive days after to encourage disease establishment. At harvest the plants were dug and rated on a 0-10 scale, with 0=no disease and 10=a dead plant. Analysis of the mean stem rot ratings showed that Tifrunner was more susceptible than NC3033 (4.76 and 2.69, respectively). There was transgressive segregation of resistance levels among the RIL's. The result of a single marker analysis showed that 2 of the 105 SSR markers analyzed explained 15%-20% of the variation observed, which indicated a promising resistance region at the end of chromosome B05. Additional QTL analysis and mapping data are being conducted to determine the robustness of this result.

Sensitivity of Early and Late Leaf Spot Peanut Pathogens to QoI Fungicides and Genetic Variability Based on ITS Sequences.

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For this study, research plots were established at three different University of Florida research and educations centers in Citra, Quincy, and Jay, Florida. The trial was conducted in 2014 and replicated in 2015. Peanut seeds of the cultivar Georgia-06G were planted during the first week of June with fungicide treatments being applied using a randomized block design with four replicates. Fungicide applications were made on a biweekly schedule starting 20 days after planting. Fungicide treatments consisted of an untreated check and solo product programs consisting of chlorothalonil (Echo® 720 @ 24 fl oz/A), tebuconazole (TebuStar® @ 7.2 fl oz/A), azoxystrobin (Abound® 2.08 SC @ 18 fl oz/A) and pyraclostrobin (Headline® @ 9 fl oz/A). Twelve leaflets were sampled at various times throughout the season at each site, and general foliar disease ratings were collected using 1-10 Florida scale. Isolates were collected from the leaflet samples and cultured using peanut hull agar. Genomic DNA was extracted from the collected *Cercospora arachidicola* and *Cercosporidium personatum* isolates. Extracted DNA was amplified with ITS 4 and ITS 5 primers, sequenced, and analyzed for diversity. Sensitivity of both pathogen isolates to QoI fungicides was tested using an in-vitro assay, where spore germination was assessed on azoxystrobin and pyraclostrobin amended media at 10ppm. Information gained from this study will provide insights about the peanut leaf spot pathogens' sensitivity to QoI fungicides as well as providing the groundwork for genetic population studies across Florida and eventually the Southeast.

Breeding for Sclerotinia Blight Resistance in the NCSU Peanut Breeding Program.

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Sclerotinia blight (SB) of peanut (*Arachis hypogaea* L.) caused by the soil-borne fungus *S. minor* Jagger, is one of the most important diseases affecting peanut production in North Carolina, Oklahoma and Texas. Chemical control of SB is one approach to managing this disease but is very costly. Host plant resistance is the ideal form of disease prevention and is preferred by growers. To make suitable progress in the development of resistant cultivars, field based evaluations of SB can be supplemented with greenhouse- or lab-based screening methods. In addition, the availability of favorable genetic variation for SB resistance in a breeding program can increase the genetic gain from each cycle of selection. Past research has suggested that there may be a different genetic source of SB resistance in the virginia market-type. The objective of this research is to determine if the genetic source of SB resistance in the virginia marker-types differs from that found in runner, spanish and valencia germplasm in the Southwestern USA. In this experiment, a runner type plant introduction line with high levels of SB resistance was crossed with an advanced NCSU peanut breeding line also with good SB resistance. The resulting F_2 progeny were evaluated for SB severity using a whole plant greenhouse based resistance assay. An augmented incomplete block design was used with two susceptible checks and the two parents replicated in each block. Lesion lengths were measured 4, 5, 6, 7, and 8 days after inoculation, and areas under the disease progress curves (AUDPC) were calculated. The mean AUDPC for Sclerotinia blight for F_2 individuals ranged from 1.2 mm day^{-1} to 293.61 mm day^{-1} with a mean of 78.34 mm day^{-1} and a midparent value of 76.51 mm day^{-1}. The susceptible checks had mean AUDPC of 102.67 mm day^{-1} and 195.56 mm day^{-1}, respectively. The presence of SB resistant transgressive segregants in the F_2 population will aid in the long term goal of developing virginia market-type cultivars with high SB resistance although additional crosses will need to be made to achieve acceptable yield and quality.

Effect of New Peanut Genotypes and Two Cultivars on Leaf Spot Severity and Yield When Grown without Fungicides for Possible Use in Organic or Limited Input Systems

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Control of early and late leaf spot diseases caused by *Cercospora arachidicola* and *Cercospordium personatum* respectively, are critical for peanut *Arachis hypogaea* production in both conventional and organic situations. Cultivars with resistance and/or tolerance to one or both pathogens could reduce direct losses to these diseases when effective fungicides are not available and indirect losses in cost of control when fungicides are available. Field trials were conducted in Tifton, GA in 2014 and 2015 at the University of Georgia Gibbs and Lang Farms in which all breeding lines and two cultivars, Georgia-06G, and Georgia-12Y were grown without foliar fungicides. Experimental design was a randomized complete block with four replications. Late leaf spot was the predominant foliar disease, and epidemics were severe by the end of the season. Final leaf spot ratings (Florida 1-10 scale) ranged from 8.8 in Georgia-06G to 3.0 in GA072523-11 (Lang 2015). All of the breeding lines had final leaf spot ratings lower than those of Georgia-06G. Yields ranged from 5066 kg/ha in Georgia-06G to 7365 kg/ha in GA072523-1 (Lang 2015). Yields were 7365, 7365, 7345, and 7735 kg/ha for genotypes, GA072523-1, GA072523-9, and GA072523-10, and the cultivar Georgia-12Y (Lang 2015), respectively, all of which were higher than the 5066 kg/ha for Georgia-06G. Several of the breeding lines show potential for use in production regimes with reduced or no fungicide applications for leaf spot control.

<u>Variability Among Genotypes for *Aspergillus flavus* Seed Infection Monitored with a GFP-Engineered Strain.</u>

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Post-harvest *Aspergillus flavus* growth and the subsequent contamination of seeds with aflatoxin is one of the biggest issues for peanut production. Studies to profile gene expression among genotypes with varying levels of resistance to *Aspergillus*-infection have used different methods for inoculation and assessment of infection. We present modified methods for seed colonization assay that take advantage of green fluorescent protein (GFP)-expressing *A. flavus* to assess the resistance levels among ten selected peanut genotypes, i.e., C76-16, A72, ICG88145, A69, ICG1471 Tifrunner, GT-C20, Tifguard, NC3033 and Florida-07. The seeds were inoculated with a GFP-expressing *A. flavus* strain after surface sterilization with UV. GFP expression was monitored every 8 h up to 72 h for the infection coverage and intensity on a scale of 1-5 and 1-3, respectively. The experiment was designed in a Randomized Complete Block (RCB) using three to four blocks and five replicates and was repeated three times. No completely resistant genotypes were observed; however, NC3033 showed the best resistance and GT-C20 was the worst. These observations were confirmed statistically by applying repeating measures for the nine time points in the analysis model and by analyzing of the Area Under the Disease Progress Curve (AUDPC). In addition, we designed Matlab script to estimate the infection coverage and fluorescence intensity from images recorded at the final time point. Statistical analysis of data for all traits showed similar results. Moreover, NC3033 showed a unique pattern of infection progress compared with other genotypes, specifically, the successful infection events were locally restricted and did not distribute or distributed slowly in a small region. These results provide a benchmark for us to select genotypes for future RNAseq analysis to identify genetic factors contributing to the infection process.

Use of a Genotype-by-Targeted Resequencing Approach in Peanut.

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The allopolyploid nature and large genome size of cultivated peanut makes genotyping and mapping studies complicated. One of the major challenges in using SNP technology for genetic studies in such a crop is the presence of homoeologs. In this study, we used the genome guided assembly approach to separate homoeologous SNPs among 13 cultivars. Raw reads were mapped to the synthetic tetraploid genome reference generated by combining A- and B- genome scaffolds. Approximately 10,500 polymorphic SNPs were obtained, of which 800 SNPs have been selected for validation and marker development. Selected SNPs consisted of adjacent variants within a 200bp region, which differentiated both A and B genome copies including a SNP differentiating cultivars. Primers were designed to cover the variants in the 200bp region of interest to perform targeted re-sequencing. This approach provides an advantage of screening variations in both the genomes simultaneously of a tetraploid as compared to allele specific technologies, which targets only one allele at a time. We believe this approach will benefit tetraploid breeding programs by reducing the cost of genotyping and selection of favorable allele in both sub-genomes at the same time.

Comparison of Four RIL Mapping Populations of Peanut for Field Response to Tomato Spotted Wilt and Late Leaf Spot.

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Recombinant inbred line (RIL) populations of peanut (Arachis hypogaea L.) are being used to develop markers for resistance to several diseases, including tomato spotted wilt (tomato spotted wilt virus) and late leaf spot (Cercosporidium personatum). Susceptibility to both of these diseases within populations has been characterized, but populations have not been compared within the same trial. In 2015, a field trial was conducted to determine the effect of 18 RILs from each of four mapping populations (S, T, 1799, and 1801). Based on ranked results from previous trials, the 6 RILs with the highest, 6 RILS with the lowest scores disease severity, and 6 RILs nearest the population mean were included from each population. Parental lines from all populations were included. Area under the disease progress curve (AUDPC) values for tomato spotted wilt scale evaluations were highest for the T population and the S population for late leaf spot Florida 1-10 scale evaluations. AUDPC of SPT 06-06, a parental line for population 1801, was lower than for any other parent when looking at tomato spotted wilt and late leaf spot. Results indicate the populations differ for both tomato spotted wilt and leaf spot severity, but highest levels of leaf spot resistance in individual RILs may not come from the most resistant parent. Results also indicate that levels of resistance can be obtained in individual lines that are better than that of either parent.

Genes and Gene Network Involved in Peanut Nodulation.

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Biological nitrogen fixation is important for growth and yield of legumes and the sustainable agriculture. Cultivated peanut has a relatively lower efficiency in nitrogen fixation compared to some other grain legumes, such as faba beans. It is necessary to optimize nitrogen fixation efficiency in peanut to achieve high yield and production. The rhizobial infection in cultivated peanut follows a crack entry, which has not been well studied. In this study, we investigated the transcriptional profiles in peanut roots during bradyrhizobia infection and nodule initiation by using RNA-seq technology. Two pairs of recombination inbred sister lines with each pair containing one nodulating line and one non-nodulating line, as well as their parents were subjected to inoculation with a single bradyrhizobia strain. Roots of 5 days after infection (DAI) of treatments and controls were harvested for RNA isolation and deep sequencing. A total of 307 genes were up-regulated and 245 genes were down-regulated in nodulating lines compared to non-nodulating lines after infection. Gene ontology (GO) enrichment analysis showed that the most significantly enriched GO term was oxidation-reduction process (16.99%), followed by metabolic process (12.82%), and catalytic activity (11.22%). Through co-expression network analysis, we identified 27 co-expression modules. One of them contained a hub gene (orthologous to CLE13 gene), which is connected with several orthologous symbiosis genes, including NIN, HAR1, Nod70, and ENod16/20, and with plant hormone genes, including cytokinin and ethylene. This gene may play a central role in regulating peanut nodulation. To our knowledge, this is the first report revealing nodulation-related genes in a genome-wide manner in cultivated peanut. This study will facilitate elucidating the genetic mechanisms of peanut symbiosis, providing the foundation for peanut nitrogen fixation efficiency improvement.

<u>Genetic variation and virulence diversity among three *Sclerotium rolfsii* isolates on two peanut cultivars</u>.

P.S. SORIA*, M.E. SMITH, and N.S. DUFAULT, Plant Pathology Department, University of Florida, Gainesville, FL 32611 – 0180.

Sclerotium rolfsii is a soilborne fungal pathogen that is the causal agent of Southern stem rot on peanut (*Arachis hypogaea*). Significant phenotypic diversity has been observed between fungal isolates in terms of mycelial growth rate, sclerotial size, and temperature tolerance. Population structure and genetic diversity is largely unknown, although the presence of several mycelial compatibility groups (MCGs) in Florida suggests high genetic diversity among isolates. Three Florida isolates of *S. rolfsii*, belonging to three different MCGs were inoculated on two peanut cultivars to assess the relationship between diversity in virulence and possible genetic variation. Two peanut cultivars, 'Georgia-06G' and 'Georgia-13M' were inoculated with *S. rolfsii* using infested agar plugs at the crown of the plant. The experiment as done in a growth chamber set to 28°C (±2°C) and repeated 3 times. Disease severity was measured daily and was scored based on stem lesion size and observed yellowing, wilting, and death of plants.

In addition to MCGs, the phylogenetic relationship between these isolates and other Florida isolates was determined using ITS (internal transcribed spacer) region sequences. Results of comparing genetic variation, as measured by MCGs and ITS phylogeny, with variations in virulence between *S. rolfsii* isolates will further characterize the implications of pathogen population dynamics on stem rot disease severity.

Using Sub-Genome Specific Transcriptome-derived SNP Markers to Develop a Genetic Linkage Map for a BC_1 Mapping population in Peanut (*Arachis hypogaea* L.)

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Distinguishing homologous from homoeologous single-nucleotide polymorphisms (SNPs) poses a challenge in genotyping polyploids such as peanut. This study sought to identify and validate homologous SNPs and construct a genetic linkage map for a BC_1 interspecific introgression population. A-genome and B-genome SNPs were selected from a transcriptome sequence database made of A-genome parents, A. *diogoi*, A. *cardenasii* and A. *duranensis*, and B/K-genome parents, A. *ipaensis* and A. *batizocoi*, and parents of the backcross population (Florunner and TxAG-6). Polymorphic SNPs were first filtered between TxAG-6 and Florunner at each contig followed by screening for sub-genome specific SNPs. Primers synthesized were validated based on KASP chemistry using the Roche LightCycler system. Validation results showed that 63% representing 49 out of 78 selected A-genome SNPs and 71% representing 91 out of the 128 selected B-genome SNPs perfectly matched the selection criteria used in targeting the SNPs. These validated SNPs were used in genotyping the BC_1 mapping population and subsequent construction of a genetic linkage map.

Joe Sugg Graduate Student Competition II
Production Technology/Mycotoxins/Weed Science/Other

THURSDAY, JULY 14, 2016		
8:15 - 11:45 a.m. Waters Edge ABC	**Joe Sugg Graduate Student Competition II** Production Technology/Mycotoxins/Weed Science/Other *Sponsored by an Anonymous Donor* *Chair and Moderator: Peter Dotray, Texas Tech and Texas A&M University*	**PAGE NUMBER**
8:15 a.m.	**Evaluating the Impact of Canopy Defoliation at Multiple Timings in Peanut.** **C.C. ABBOTT***, and J.M. SARVER, Mississippi State University, Mississippi State, MS; J. GORE, and D. COOK, Mississippi State University, Stoneville, MS.	**90**
8:30 a.m.	**Drought Stress Reduces Symbiotic Nitrogen Fixation in Peanut Genotypes** **X. WANG***, Y. FENG and C. CHEN, Dept. of Crop, Soil and Environmental Sciences, Auburn Univ., Auburn, AL 36849, P. DANG and M. LAMB, USDA-ARS National Peanut Research Laboratory, Dawson, GA 39842; C. HOLBROOK, USDA-ARS, Crop Genetics and Breeding Research, Tifton, GA 31793; P. OZIAS-AKINS and Y. CHU, Dept. of Horticulture, Univ. of Georgia, Tifton, GA 31793; and T.G. ISLEIB, Dept. of Crop, Soil, and Env. Sci., N.C. State Univ., Raleigh, NC 27695.	**91**
9:00 a.m.	**Generational Priming Memory Induced by Primed Acclimation in Early Root Traits of Peanut (*Arachis hypogaea L.*).** **K.A. RACETTE***, D.L. ROWLAND, Agronomy Department, The University of Florida, Gainesville, FL 32611; and B.L. TILLMAN, North Florida Research and Education Center, Marianna, FL 32446.	**92**
9:15 a.m.	**Land Preparation and Irrigation Method Impacts on Peanut Pod Yield.** **S.D. LEININGER***, L.J. KRUTZ, and J. GORE, Mississippi State University, Stoneville, MS; J.M. SARVER, and C.C. ABBOTT, Mississippi State University, MS.	**93**
9:30 a.m.	**Effect of Inoculum Level, Planting Date and Variety on the Onset and Predominance of Early and Late Leaf Spot of Peanut.** **A. FULMER*** and R. KEMERAIT, JR., Department of Plant Pathology, The University of Georgia, Tifton, GA 31793.	**94**
9:45 a.m.	**Tissue Analyses as a Late Season Peanut Seed Quality Prediction Tool** **A. K. PIERRE***, M. J. MULVANEY, Agronomy Department, The University of Florida, Jay FL 32565; D. L. ROWLAND, Agronomy Department, The University of Florida, Gainesville, FL 32611; T. GREY, Crop and Soil Science, University of Georgia, Tifton, GA 31794; B. TILLMAN, Agronomy Department, The University of Florida, Marianna, FL 32446; C. W. WOOD, West Florida Research and Education Center, The University of Florida, Jay FL 32565.	**95**

10:30 a.m.	**Evaluation of Diclosulam Efficacy on Yellow Nutsedge Development.** **A.A. DIERA***, T.L. GREY, R.S. TUBBS, W.K. VENCILL, D.B. SIMMONS Department of Crop and Soil Sciences, University of Georgia, Tifton, GA 31793 and Department of Crop and Soil Sciences, University of Georgia, Athens, GA, 30605.	**96**
10:45 a.m.	**Time of Day Effects on Peanut Weed Control Programs.** **O.W. CARTER*** and E.P. PROSTKO, Department of Crop and Soil Sciences, The University of Georgia, Tifton, GA 31793-0748.	**97**
11:00 a.m.	**Comparative Study of Sorting Raw and Blanched Peanuts as Pre-Storage Treatment in Reducing Aflatoxin Along the Peanut Value Chain.** **C. DARKO***, P. KUMAR MALLIKARJUNAN, Biological Systems Engineering Department, Virginia Tech, Blacksburg, VA 24060; K. DIZISI, Agricultural Engineering Department, Kwame Nkrumah University of Science & Technology, Kumasi, Ghana; M. ABUDULAI, CSIR-Savanna Agricultural Research Institute, Tamale, Ghana; M.B. MOCHIAH, CSIR-CRI, Kumasi, Ghana, and D.L. JORDAN, North Carolina State University, Raleigh, NC 27695.	**98**
11:15 a.m.	**Effect of Diclosulam on Purple Nutsedge Control in Peanut.** **D. SIMMONS***, T.L. GREY, R.S. TUBBS, W.K. VENCILL, A.D. DIERA, Department of Crop and Soil Sciences, University of Georgia, Tifton, GA, 31793 and Department of Crop and Soil Sciences, University of Georgia, Athens, GA, 30605.	**99**
11:30 a.m.	**Influence of Herbicides and Fungicides on Peanut Production and Quality in Ghana.** **S. ARTHUR***, G. BOLFREY-ARKU, and M. B. MOCHIAH, CSIR-Crops Research Institute, Kumasi, Ghana; J. SARKODIE-ADDO and W.O. APPAW, Kwame Nkrumah University of Science and Technology, Kumasi, Ghana; and D.L. JORDAN and R.L. BRANDENBURG, North Carolina State University, Box 7620, Raleigh, NC.	**100**

Evaluating the Impact of Canopy Defoliation at Multiple Timings in Peanut.

C.C. ABBOTT*, and J.M. SARVER, Mississippi State University, Mississippi State, MS; J. GORE, and D. COOK, Mississippi State University, Stoneville, MS

Crop yield can be adversely impacted by canopy defoliation. Canopy defoliation in peanuts may be caused by a multitude of factors including foliage-feeding caterpillars, foliar disease and mammalian pests. Insect infestations are random, variable in size, and not well understood; therefore knowing how peanuts respond to canopy defoliation percentage may be more informative than trying to understand and manage crops based off feeding patterns or insect infestation levels. Newer peanut cultivars lack information in regards to integrated pest management, especially in Mississippi where peanut production is relatively new when compared to other crops such as corn, cotton, rice, and soybean. Knowing how current peanut cultivars respond to defoliation will help extension personnel make informed insect management decisions and will allow growers to become more efficient users of pesticides. The objective of this research was to determine the response of peanut to defoliation at different times during the season and identify those times that most adversely affect pod yield. Peanuts were planted in Stoneville, MS in 2014 and in both Stoneville and Starkville, MS in 2015. Treatments included 100% canopy defoliation at 35, 50, 65, 80, 95, and 110 days after emergence, along with a non-defoliated control. In two of three site-years, defoliation at all timings caused a significant yield loss, while the third site-year saw yield reductions for all timings between 35 and 80 days. Losses ranged from 11.5% to 40%. Results from these experiments will be used to design additional research to determine yield-limiting defoliation levels at critical stages of plant development. Ultimately, this research will be used to develop defoliation thresholds for insects in peanut.

Drought Stress Reduces Symbiotic Nitrogen Fixation in Peanut Genotypes

X. WANG*, Y. FENG and C. CHEN, Dept. of Crop, Soil and Environmental Sciences, Auburn Univ., Auburn, AL 36849, P. DANG and M. LAMB, USDA-ARS National Peanut Research Laboratory, Dawson, GA 39842; C. HOLBROOK, USDA-ARS, Crop Genetics and Breeding Research, Tifton, GA 31793; P. OZIAS-AKINS and Y. CHU, Dept. of Horticulture, Univ. of Georgia, Tifton, GA 31793; and T.G. ISLEIB, Dept. of Crop, Soil, and Env. Sci., N.C. State Univ., Raleigh, NC 27695.

Drought stress is one of the major environmental factors affecting peanut productivity and its effect can be economically devastating when occurring at critical growth stages. The objective of this study was to evaluate the effects of drought stress on symbiotic nitrogen fixation in various peanut genotypes. Three drought treatments (irrigated control, mid-season and late-season drought) were applied to three separate rainout shelters. Two parental lines (Tifrunner and C76-16) and 14 recombinant lines (seven drought susceptible and seven drought tolerant genotypes) were planted in rainout shelters using a randomized complete block design within each drought treatment. The ^{15}N natural abundance technique was used to evaluate differences in symbiotic nitrogen fixation among different genotypes under drought stress. Both drought treatments negatively affected symbiotic nitrogen fixation; the mid-season drought treatment showed a greater reduction in the amount of nitrogen fixed compared with the late-season drought treatment. Percentages of shoot N derived from the atmosphere (%Ndfa) varied among different genotypes. Under mid-season drought, %Ndfa for the drought tolerant lines was higher than those for the susceptible lines. The most drought tolerant line identified in our previous yield study had the highest N-fixing capacity under both drought treatments. There was no correlation between %Ndfa and total shoot N in the drought treatments although they were correlated in the irrigated treatment. Our results suggest that drought stress had a negative effect on symbiotic nitrogen fixation in peanut and the effect was more severe for mid-season drought.

<u>Generational Priming Memory Induced by Primed Acclimation in Early Root Traits of Peanut (*Arachis hypogaea* L.).</u>

K.A. RACETTE*, D.L. ROWLAND, Agronomy Department, The University of Florida, Gainesville, FL 32611; and B.L. TILLMAN, North Florida Research and Education Center, Marianna, FL 32446.

Due to recent increases in the duration and severity of drought events in the U.S., the availability and allocation of water resources within agricultural systems are being challenged more than ever before. Primed acclimation (PA), or the exposure of a crop to a period of mild to moderate water deficit early in the crop's development, is a management strategy that can enhance the ability of the crop to respond to subsequent or more extreme water deficits while also conserving water resources. However, the impact of PA on seed quality and general characteristics has been poorly characterized to date. Impacts on these seed quality parameters have the potential to modify the vigor, growth and even stress tolerance in this subsequent germination, an effect termed generational priming memory (GPM). The main objective of this study was to determine the phenotypic effects of GPM in peanut, which has been observed to respond positively to PA. Field-grown peanut plants of the cultivars COC041 (*Arachis hypogaea* subsp. *fastigiata* L.) and TufRunner '511' (*Arachis hypogaea* subsp. *hypogaea*) were subjected to two irrigation treatments: fully irrigated (FI) (receiving 1.9 cm per irrigation event for the entire growth cycle) and PA (receiving 60% of FI until the time of midbloom and 100% of FI, thereafter). Fully mature seeds collected from these parent source plants were grown in rhizotron tubes in a growth chamber for 12 days representing two treatments: 1) progeny from primed plants (PM) and 2) progeny from non-primed (FI) plants (NM). Preliminary studies of early root development in COC041 suggest that a lag in tap root development and an increase in total root dry weight 12 days after radicle emergence in the PM as compared to the NM could have implications for water uptake and discovery as the crop develops. This preliminary study indicates that GPM is possible and may have an impact on early root establishment. Additional screening studies are ongoing, including testing of additional genotypes and results will be discussed.

Land Preparation and Irrigation Method Impacts on Peanut Pod Yield.

S.D. LEININGER*, L.J. KRUTZ, and J. GORE, Mississippi State University, Stoneville, MS; J.M. SARVER, and C.C. ABBOTT, Mississippi State University, MS.

Bedding systems and irrigation scheduling techniques that optimize yield and water use efficiency for furrow-irrigated peanut [*Arachis hypogea (L.)]* have not been determined. The objective of these studies was to evaluate alternative bedding strategies and irrigation scheduling methods that optimize peanut yield, quality, and water use efficiency in furrow irrigated environments. Two separate field studies were conducted in 2015 at Stoneville, MS on a Bosket sandy loam. For the land preparation study, peanuts were planted on 40-in rows either flat, in narrow beds (40 inch), or wide beds (80 inch), and irrigation was delivered to either every furrow or every-other furrow. For the irrigation scheduling study, peanuts were planted on 40 inch raised beds and irrigated using FAO-56 (atmospheric modeling) at a 2-inch deficit or with watermark soil moisture sensors at a threshold of -50, -75 and -100 centibar (cbar). Peanut yield was not different among bedding systems or irrigation method, i.e., every furrow or every-other furrow. Relative to FAO-56, sensor-based irrigation scheduling improved peanut yield and water use efficiency by 13% and 89%, respectively. Our results indicate peanut yield, quality, and water use efficiency is optimized at an irrigation threshold of -100 cbar, regardless of bedding system or irrigation method.

Effect of Inoculum Level, Planting Date and Variety on the Onset and Predominance of Early and Late Leaf Spot of Peanut.

A. FULMER* and R. KEMERAIT, JR., Department of Plant Pathology, The University of Georgia, Tifton, GA 31793.

Onset of early (ELS) and late leaf spot (LLS), caused by *Cercospora arachidicola* and *Cercosporidium personatum,* generally occurs at 30-50 and 50-70 days after planting (DAP), respectively, however, onset for each disease can range from 30-140 DAP. Additionally, the predominance of each disease can differ locally and regionally for multiple years at a time. During 2014 and 2015, field trials with 2-way combinations of inoculum level, planting date and variety were conducted to determine their effect on the varying behavior of ELS and LLS. Inoculum in the form of infested peanut residue was applied in the late fall as ELS, LLS, ELS/LLS or None. Planting dates included late April, May and June. Varieties included past and current cultivars. Inoculum level and variety had a significant effect on onset and predominance of each disease; the effect of planting date was less consistent. In trials planted with Georgia-06G at multiple dates, ELS was generally detected prior to LLS across inoculum treatments; however, LLS onset was statistically earlier and closer to ELS onset in plots inoculated with LLS residue and in later planted peanuts. There was no difference between the onset of ELS and LLS in early planted variety trials that were inoculated with LLS residue and sown to the susceptible cultivars 'Georgia Valencia' and 'Carver'; in late planted trials (July & August), onset of ELS and LLS was equal for all varieties – including Georgia-06G. Across trials, plots inoculated with either ELS and LLS residue were predominantly ELS and LLS, respectively. Within each inoculum regime, the proportion of each leaf spot was also significantly influenced by variety, and there was generally more LLS in later planted peanuts.

Tissue Analyses as a Late Season Peanut Seed Quality Prediction Tool

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Peanut seed maturity level impacts germination and seedling vigor. Calcium (Ca) and boron (B) are important elements for development of high quality peanut seed. The objectives of this research were to 1) quantify tissue Ca and B concentrations at various harvest dates, 2) determine germination and vigor of peanut seed from various harvest dates, and 3) correlate tissue Ca and B concentrations to peanut seedling vigor. Four varieties were harvested at three digging dates in Jay, FL in 2015. Leaf tissue samples were assessed for nutrient concentrations at digging. Pods were classed as mature and immature using the peanut profile board and the Digital Imaging Model. Each maturity class was assessed for nutrient concentration at each digging date. Germination and vigor was assessed with a thermal gradient table. According to the preliminary data collected in the first year there seems to be a correlation between growing degree day (GDD) and the Ca concentration in the kernel. A correlation between Ca and GDD is also observed in the leaf sample, as well as a connection between B and the GDD.

Evaluation of Diclosulam Efficacy on Yellow Nutsedge Development.

A.A. DIERA*, T.L. GREY, R.S. TUBBS, W.K. VENCILL, D.B. SIMMONS Department of Crop and Soil Sciences, University of Georgia, Tifton, GA 31793 and Department of Crop and Soil Sciences, University of Georgia, Athens, GA, 30605.

Yellow nutsedge (*Cyperus esculentus*) is among one the most common and problematic weeds in peanut production across the southern United States. Yellow nutsedge produce clumps of tubers that are easily broken up and spread by tillage practices. The size and texture of yellow nutsedge tubers are similar to that of shelled peanuts, and thus pose a contamination risk. Nutsedge is also problematic once established in peanut fields, as they can be difficult to identify prior to harvest and difficult to control. The herbicide diclosulam is registered for broad-spectrum weed control, including yellow nutsedge, in peanut production. There is little information about the physiological effects of diclosulam on yellow nutsedge growth and development. The objective of this research is to determine yellow nutsedge response to pre-plant incorporated (PPI), pre-emergence (PRE), and post-emergence (POST) applications of diclosulam via selective placement either to the soil or foliage. Greenhouse research was conducted in Tifton, GA in 2016 as a randomized complete block design with five 16-oz cup replications for six treatments and one untreated control. Prior to trial initiation, yellow nutsedge tubers were germinated prior to transplanting to containers in the greenhouse. To simulate PPI soil treatments, diclosulam was incorporated at the field use rate of 26 g a.i.ha^{-1} and then applied either 5 cm above, or 5 cm below the germinated tuber. PRE treatments were simulated by applying the same rate to the soil surface as shoots emerged, followed by irrigation to activate diclosulam. POST application were applied to the foliage when in the 2 to 4 leaf stage of growth. Yellow nutsedge stand counts, dry weight, regrowth dry weigh of shoots, root and tuber dry biomass were collected 30 and 60 DAT (days after treatment) and analyzed to quantify response to each treatment.

Time of Day Effects on Peanut Weed Control Programs.

O.W. CARTER* and E.P. PROSTKO, Department of Crop and Soil Sciences, The University of Georgia, Tifton, GA 31793-0748

Reductions in weed control performance at the farm level have caused extension weed science programs to focus on potential causes of the differences observed between small-plot research and commercial applications. One possible explanation for these differences in control may be related to the application time of day. Herbicide recommendations made by weed scientists are typically based on research conducted during the working hours of 6 am to 9 am (that's when we spray all our test most days). However, growers very typically spray as early as 6 am and as late as 10 pm. Recent research on the herbicide glufosinate and several PPO-inhibiting herbicides has shown reduced performance in low light intensity. Consequently, research was conducted in 2015 to determine if time of day influences the performance of peanut weed control systems. A small plot replicated field trial was conducted in a non-crop (bare-ground) scenario. Various commonly used peanut weed control treatments were applied at the following times: 7 am, 12 pm, 5 pm, 10 pm. Treatments included the following: paraquat (0.188 lb ai/A) + bentazon (0.334 lb ai/A) + acifluorfen (0.17 lb ai/A) + *s*-metolachlor (1.1 lb ai/A); imazapic (0.063 lb ai/A) + *s*-metolachlor (1.1 lb ai/A) + 2,4-DB (0.22 lb ai/A); lactofen (0.195 lb ai/A) + *s*-metolachlor (1.1 lb ai/A) + 2,4-DB (0.22 lb ai/A). All treatments were applied with a CO_2- backpack sprayer calibrated to deliver 15 GPA at 3.0 MPH using 11002DG nozzle tips. At the time of application, Palmer amaranth was 2-6" tall, Florida beggarweeed 1-2", and several species of annual grasses were 1-3". At 15 days after treatment, a significant interaction between time of day and treatment was observed for Palmer amaranth, Florida beggarweed, and annual grass control. Palmer amaranth control with imazapic was most effective at the 5 pm timing and control was not influenced by time of day with the paraquat or lactofen treatments. Florida beggarweed control was most effective with lactofen at the 7 am timing and the paraquat and imazapic treatments showed no significant difference in control across the four timings. Annual grass control with paraquat was reduced at 7 am when compared to the other timings. Control of annual grass with lactofen was most effective at the 7 am timing when compared to the other timings and control with imazapic was not affected by time of day. An additional in-crop study was conducted comparing the performance of recommended peanut herbicide programs sprayed at the same four timings of 7 am, 12 pm, 5 pm, and 10 pm. The treatments consisted of the following: paraquat (0.188 lb ai/A) + acifluorfen (0.17 lbs ai/A) + bentazon (0.334 lb ai/A) + *s*-metolachlor (1.1 lb ai/A) EPOST followed by either imazapic (0.063 lb ai/A) + *s*-metolachlor (1.1 lb ai/A) + 2,4-DB (0.22 lb ai/A) or lactofen (0.195 lb ai/A) + *s*-metolachlor (1.1 lb ai/A) + 2,4-DB (0.22 lb ai/A). Treatments were applied when Palmer amaranth was f 2-3" tall. There was no interaction between time of day or herbicide treatment. After the entire herbicide program was applied, neither time of day nor treatment had an influence on Palmer amaranth control. Peanut yields were not influenced by time of day or treatment. Generally, these results suggest that common peanut herbicide programs are not influenced by time of application.

Comparative Study of Sorting Raw and Blanched Peanuts as Pre-Storage Treatment in Reducing Aflatoxin Along the Peanut Value Chain.

C. DARKO*, P. KUMAR MALLIKARJUNAN, Biological Systems Engineering Department, Virginia Tech, Blacksburg, VA 24060; K. DIZISI, Agricultural Engineering Department, Kwame Nkrumah University of Science & Technology, Kumasi, Ghana; M. ABUDULAI, CSIR-Savanna Agricultural Research Institute, Tamale, Ghana; M.B. MOCHIAH, CSIR-CRI, Kumasi, Ghana, and D.L. JORDAN, North Carolina State University, Raleigh, NC 27695.

Aflatoxin contamination of peanuts still occurs despite numerous interventions aimed at preventing and reducing aflatoxin contamination in peanut products. One of the surest ways to combat high levels of aflatoxin in peanuts is sorting. A comparative study of sorting raw and blanched peanuts, as a pre-storage treatment in reducing aflatoxin along the value chain, was conducted. Initially, thirty-three (33) sacks of raw, shelled peanuts weighing about 80-kg were sorted by hand. Seventeen (17) bags of the raw sorted samples were then partially roasted, half not blanched and the other blanched. Discolored peanuts from the blanched samples were then sorted out and the rest was put in storage. Both raw and blanched peanuts were packaged in polyethylene sacks and stored in market and seed-company storage facilities in Kumasi and Tamale, both in Ghana, for a period of twenty-six weeks. Results for 10 weeks indicate that the mean percent of discolored raw peanuts sorted out for Kumasi and Tamale were 1.90% and 0.49%, respectively. The mean percentage of discolored blanched peanuts sorted out for Kumasi and Tamale were 1.53% and 0.57%, respectively, and 0% for partially roasted but not blanched peanut samples. The mean aflatoxin week 0 values for Kumasi and Tamale samples were found to be 1.99 ppb and 0.241 ppb for raw sorted samples, 1.31 ppb and 0.84 ppb for partially roasted not blanched, 0.06 ppb and 0 ppb for partially-roasted blanched peanuts, respectively. While week 10 recorded 0.21 ppb and 1.42 ppb for raw sorted samples, 1.05 ppb and 0.28 ppb for partially roasted not blanched, 0.11 ppb and 0.08 ppb for partially roasted blanched peanuts for Kumasi and Tamale, respectively. It can be inferred from these results that blanching peanuts increases the effectiveness of peanut sorting, and in turn aids in reducing or eliminating aflatoxin levels along the peanut value chain.

Effect of Diclosulam on Purple Nutsedge Control in Peanut.

D.B. SIMMONS*, T.L. GREY, R.S. TUBBS, W.K. VENCILL, A.D. DIERA, Department of Crop and Soil Sciences, University of Georgia, Tifton, GA, 31793 and Department of Crop and Soil Sciences, University of Georgia, Athens, GA, 30605.

Due to its global distribution and ability to reduce crop yield and quality, purple nutsedge (Cyperus rotundus) is considered to be one of the world's worst weed. Across the peanut belt in the Southern United states, purple nutsedge is among the most common and troublesome weeds within the region. Within GA, purple nutsedge is ranked as the 6th most common and the 7th most troublesome weed in peanut production. Diclosulam is used in peanut production for broad spectrum weed control, but there is limited information available about the effects of this herbicide on purple nutsedge. The objectives of this research were to determine how purple nutsedge tuber production responds to diclosulam as a PRE (pre-emergence), PPI (pre-plant incorporated), and POST (post-emergence) application. Greenhouse studies were conducted in Tifton, GA in 2016 to determine the response of purple nutsedge to selective soil and foliar placements of diclosulam. Five cm of soil was treated with diclosulam at a rate of 26 g a.i. ha-1 above and/or below the nutsedge tubers of soil. Diclosulam was also applied at a rate of 26 g a.i. ha-1 as a soil-only, foliar-only, and foliar + soil application. Purple nutsedge tubers were pre-germinated under laboratory growth lights and transplanted into greenhouse pots, two tubers with emerged rhizomes per experimental unit. To obtain separation between the soil layers (treated and untreated), a very thin layer of charcoal was placed on the soil surface. At 30 and 60 DAT (days after treatment) shoot dry mass, shoot regrowth mass, shoot number, and tuber dry mass were quantified by harvesting nutsedge plants to analyze the response of purple nutsedge to the different diclosulam treatments.

Influence of Herbicides and Fungicides on Peanut Production and Quality in Ghana.

S. ARTHUR*, G. BOLFREY-ARKU, and M. B. MOCHIAH, CSIR-Crops Research Institute, Kumasi, Ghana; J. SARKODIE-ADDO and W.O. APPAW, Kwame Nkrumah University of Science and Technology, Kumasi, Ghana; and D.L. JORDAN and R.L. BRANDENBURG, North Carolina State University, Box 7620, Raleigh, NC.

Peanut farmers in sub-Saharan Africa cultivate smaller farm sizes mainly because most rely on manual weed control. Research was conducted to determine the contribution of the interactive effect of chemical or manual weed control and fungicides application on weed control and peanut growth, yield and quality at the Council for Scientific and Industrial Research – Crops Research Institute (CSIR-CRI) on Kwadaso station in 2015. Weed control treatments included: Metolachlor applied preemergence (PRE), imazethapyr applied postemergence (POST) 3 weeks after planting (WAP), application of both PRE and POST herbicides, PRE herbicide and hand weeding (HW) at approximately 5 WAP, POST herbicide and HW at 5WAP, PRE and POST herbicides and HW, (vii) 2 HW at 3 and 6 WAP, and a non-weeded control. Fungicide treatments included: no fungicide application versus tebuconazole followed by azoxystrobin. Metolachlor reduced grass population by 80-98% and general weed populations by 34-55% and 27% by 3 and 6 WAP compared with the non-weeded control. At 6 WAP, imazethapyr reduced weed populations by 34%, HW 3 WAP by 30%, PRE + HW by 88%, and PRE + POST by 89% relative to the non-weeded control. Two HW cost GH₵ 1,668.2/ha (US$ 417) and 66.6 man-days/ha were required for weeding. Herbicides in combination with HW reduced weed control cost by 53 – 60% and time by 36 – 41 man-days/ha while PRE + POST emergence reduced weed control cost by 94% and only 1.3 man-days/ha were required to control weed. Fungicide treatment did not interact with weed control practices with respect to peanut growth and yield, most likely because environmental conditions during 2015 were unfavorable for disease development. Weed control methods improved plant growth except PRE only or non-weeded treatments which caused etiolation of peanut plants. Two HW produced a pod yield of 1.2 tons/ha, herbicides in combination with HW produced pod yield of 0.9 - 1.2 tons/ha, PRE + POST produced 0.9 tons/ha, and POST, 0.7 tons/ha. PRE only herbicides or the non-weeded control caused yield loss of up to 72% of effective weeding treatments. Seed weight was similar among treatments. Aflatoxin levels of fresh and dried seeds were very low (0.1 to 1.0 PPB).

Production Technology/Weed Science II

THURSDAY, JULY 14, 2016		
1:30 - 3:15 p.m. Waters Edge A	**Production Technology/Weed Science II** *Chair and Moderator: Steve Li, Auburn University*	**PAGE NUMBER**
1:30 p.m	**Peanut Cultivar Response to Common Peanut Herbicides.** **B.J. BRECKE***, R.G. LEON, University of Florida, West Florida Research and Education Center, Jay, FL 32565 and B. TILLMAN, University of Florida, North Florida Research and Education Center, Marianna, FL 32446.	**102**
1:45 p.m.	**Exploring the Importance of Growth Habit and Canopy Architecture of Peanut Competitive Ability Against Weeds.** **R.G. LEON*** and M.J. MULVANEY, University of Florida, Jay, FL; and B.L. TILLMAN, University of Florida, Marianna, FL.	**103**
2:00 p.m.	**Efficacy of Fluridone Based Herbicide Programs in Peanut.** **M.W. MARSHALL***, C.H. SANDERS, and J. HAIR, Edisto Research and Education Center, Clemson University, Blackville, SC 29817.	**104**
2:15 p.m.	**Peanut Growth and Yield Response to Grazon P+D.** **E. PROSTKO***, O.W. CARTER, and M. DOWDY, Department of Crop & Soil Sciences, The University of Georgia, Tifton, GA 31793.	**105**
2:30 p.m.	**Exploratory Use of RGB-Derived Vegetation Indices for High-Throughput Phenotyping of Peanut Varieties.** **M. BALOTA***, J. OAKES, Tidewater Agric. Res. & Ext. Center, Virginia Tech, Suffolk, VA 23437-7099; T.G. ISLEIB, Dept. of Crop Sci., N.C. State Univ., Raleigh, NC 27695-7629; and C.C. HOLBROOK, USDA-Agric. Res. Ser., Tifton, GA 31793.	**106**
2:45 p.m.	**Adapting the Hull-Scrape Technique to Recently Released Peanut Varieties.** **C. K. KVIEN***, NESPAL, University of Georgia, C.C. HOLBROOK, USDA, Crop Genetics & Breeding, Tifton, GA, and P. OZIAS-AKINS, Department of Horticulture, University of Georgia, Tifton, GA 31793.	**107**
3:00 p.m.	**Variation in Transpiration Efficiency and its Related Traits in Valencia Mapping Population** **N. PUPPALA***, New Mexico State University, Agricultural Science Center at Clovis, 2346 State Road 288, Clovis, NM 88101; JYOSTNA DEVI MURA, New Mexico State University, Agricultural Science Center at Clovis, 2346 State Road 288, Clovis, NM 88101; VINCENT VADEZ, International Crop Research Institute for Semi Arid Tropics, Patancheru, Telangana, India 502324; HARI UPADHYAYA, International Crop Research Institute for Semi Arid Tropics, Patancheru, Telangana, India 502324; SUBE SINGH, MANISH PANDEY, International Crop Research Institute for Semi Arid Tropics, Patancheru, Telangana, India 502324; and RAJEEV VARSHNEY, International Crop Research Institute for Semi Arid Tropics, Patancheru, Andhra Pradesh, India 502324.	**108**

<u>Peanut Cultivar Response to Common Peanut Herbicides.</u>

B.J. BRECKE*, R.G. LEON, University of Florida, West Florida Research and Education Center, Jay, FL 32565 and B. TILLMAN, University of Florida, North Florida Research and Education Center, Marianna, FL 32446.

Field studies were conducted at the University of Florida West Florida Research and Education Center, Jay, FL from 2010 through 2015 to determine peanut (*Arachis hypogaea* L.) cultivar response to herbicides commonly used for weed management in peanut. The peanut cultivars evaluated included Florida-07, Georgia-07W, Georgia-06G and TifGuard (all six years), Georgia Greener (2010 through 2013) and TUFRunner 727, FloRun 107 and Georgia-09B (2013 through 2015). The herbicides Valor (flumioxazin), Gramoxone (paraquat), Cobra (lactofen) or Classic (chlorimuron) were applied at twice the labelled rate to insure detecting any differences in tolerance among the peanut cultivars tested. A nontreated check was included for comparison. All plots were hand-weeded to prevent confounding of results from any differences in weed interference. Data collected included visual injury ratings with 0 = no injury and 100 = peanut death, peanut canopy width measurements (12 per plot) and peanut pod yield at crop maturity. While there were differences among year-cultivar combinations, chlorimuron had the most consistent effect on peanut yield. Averaged over years, TUFRunner (22%), Georgia 06G (19%) and Georgia 07W (16%) exhibited the greatest yield loss from a 2X rate of chlorimuron while yields of Floirda-07, Georgia Greener and Georgia 09B were reduced less than 10%. A 2X rate of paraquat, while reducing canopy width 20 to 25% had minimal impact on yield (10% or less for all cultivars tested). Similar results were observed for most cultivars in response to 2X applications of lactofen or flumioxazin. Only Georgia 07W yield was reduced more than 10% by lactofen and FloRun 107 was the only cultivar where flumioxazin reduced yield by more than 10%. In general, effect on peanut canopy width was a poor predictor of impact on peanut yield. In several instance peanut canopy was reduced by 20 to 25% with no effect on yield while in other instances peanut canopy was reduced by less than 10% with greater than 20% yield loss.

Exploring the Importance of Growth Habit and Canopy Architecture of Peanut Competitive Ability Against Weeds.

R.G. Leon*, Michael J. Mulvaney, and B.L. Tillman. [1]University of Florida, Jay, FL, [2]University of Florida, Marianna, FL.

Tolerance to weed competition and weed growth suppression are traits that can increase the importance of the crop in integrated weed management strategies. Growth habit and canopy structure determine ground coverage and light interception thus potentially influencing crop competition and weed suppression. Field experiments were conducted in 2013, 2014, and 2015 in Jay, FL to determine whether differences in growth habit and canopy structure between 'Bailey' (erect growth and tall canopy), 'Georgia-06G' (semi-bunch), 'TUFRunner-727' (prostrate growth), and 'UFT312' (very prostrate growth) influence their ability to compete against weeds and suppress their growth. These cultivars were grown under three weed competition scenarios: weed free, early season competition, and full season competition. Also, a no crop treatment was included for each weed competition scenario to determine maximum weed growth. There was a negative relation between weed competition duration and peanut yield for all cultivars confirming that the weed pressure present in the field effectively interfered with peanut growth. No consistent interactions between cultivar and competition scenario were detected for peanut yield and plant dry weight, so the four peanut cultivars exhibited similar competition ability against weeds. Peanut reduced yield and maintained plant dry weight in response to weed competition. Competitiveness of peanut to weeds could be improved by identification of cultivars that better balance reproductive and vegetative growth.

Efficacy of Fluridone Based Herbicide Programs in Peanut.

M.W. MARSHALL*, C.H. SANDERS, and J. HAIR, Edisto Research and Education Center, Clemson University, Blackville, SC 29817.

Recent confirmation of PPO-resistant Palmer amaranth populations in the Southern United States is troublesome news for peanut growers. Flumioxazin, a PPO-inhibitor (group 14), currently provides the backbone for early season management of ALS-resistant Palmer amaranth in peanut. Additional modes-of-action are needed in peanut herbicide programs. Previous research has shown fluridone, a phytoene desaturase inhibitor (group 12), is highly effective on small-seed broadleaves and grass weeds, especially Palmer amaranth. Therefore, research studies were initiated in 2014 and continued in 2015 to determine effect of preemergence fluridone combinations of weed control and crop response in peanuts. Field studies were conducted at Edisto Research and Education Center near Blackville, SC. Experimental design was a randomized complete block with 4 replications with individual plot sizes of 3.9 by 12 m. Virginia type peanut 'Bailey' was seeded at 15.2 seeds/cm on May 29, 2014 and 2015. Preemergence treatments were applied in water on after planting followed by early POST at 14 days after planting (DAP) and mid-POST at 30 DAP. Soil residual treatments included fluridone at 0.11, 0.17, and 0.22 kg/ha alone, fluridone at 0.11, 0.17, and 0.22 kg/ha + flumioxazin at 0.05 and 0.11 kg/ha, s-metolachlor at 1.07 kg/ha + fluimioxazin at 0.11 kg/ha. Early POST treatments were paraquat at 0.18 kg/ha + bentazon at 0.56 kg/ha + acifluorfen at 0.28 kg/ha + s-metolachlor at 1.07 kg/ha followed by a mid-POST treatment was imazapic at 0.07 kg/ha + acetochlor at 1.26 kg/ha across all plots except the untreated. Percent weed control and peanut injury ratings were collected at early POST and mid-POST timings. Peanuts were harvested on October 25, 2014 and October 30, 2015. Weed control data, crop injury, and crop yield were analyzed using ANOVA and means separated at the P = 0.05 level. Fluridone plus flumioxazin and fluridone alone, regardless of rate, provided 100% control of Palmer amaranth, pitted morningglory, and Texas panicum at 28 and 35 DAP. Overall, no significant crop response to fluridone was observed in peanut during the growing season. No differences were observed in peanut yields across treatments in 2014 and 2015. Fluridone, as part of an intensive management program, provided good to excellent control of Palmer amaranth, pitted morningglory, and annual grass control in peanuts. The utilization of fluridone in peanut herbicide program would provide an additional mode-of-action to reduce the selection pressure on the PPO inhibitors in peanuts.

Peanut Growth and Yield Response to Grazon P+D.

E.P. PROSTKO*, O.W. CARTER, and M. DOWDY, Department of Crop & Soil Sciences, The University of Georgia, Tifton, GA 31793.

Grazon P+D 2.54SL (2,4-D @ 2.0 lb/gal + picloram @ 0.54 lb/gal) is commonly used in Georgia pastures for the control of broadleaf weeds. Because of its long rotation restrictions, potential occurrence in runoff or irrigation water, and residues in forage/urine/feces, it is not uncommon to observe picloram damage in peanut fields every year. Minimal research has been conducted to determine the effects of picloram on peanut. Therefore, research was conducted in 2015 to assess the potential impacts of Grazon P+D on peanut growth and yield. Four rates of Grazon P+D (1/10th, 1/100th, and 1/300th X) were applied to peanut at 4 different timings [preemergence (PRE), 31 days after planting (DAP), 63 DAP, and 93 DAP]. The 1X labeled rate of Grazon P+D is 24 oz/A. PRE applications of Grazon P+D had no effect on peanut plant density at 14 DAP. At ~ 120 DAP, the 1/10th rate of Grazon P+D applied 63 DAP caused significant peanut stunting. Additionally, peanut leaf roll symptomology was observed for the 1/10th rate applied at 63 and 93 DAP and for the 1/100th rate at 93 DAP. At harvest, 100 peanut pod weights were reduced 14 to 15% by the 1/10th rate applied at 63 and 93 DAP. However, no rate or timing of Grazon P+D had an effect on peanut yield ($P > 0.45$). Previous evaluations of peanut fields exhibiting injury from Grazon P+D may have over-estimated the potential impacts on yield.

Exploratory Use of RGB-Derived Vegetation Indices for High-Throughput Phenotyping of Peanut Varieties.

M. BALOTA*, J. OAKES, Tidewater Agric. Res. & Ext. Center, Virginia Tech, Suffolk, VA 23437-7099; T.G. ISLEIB, Dept. of Crop Sci., N.C. State Univ., Raleigh, NC 27695-7629; and C.C. HOLBROOK, USDA-Agric. Res. Ser., Tifton, GA 31793.

We have examined the suitability of hue-saturation-lightness (HSL) color space characteristics and RGB-derived vegetation indices for "high-throughput phenotyping" (HTP) of peanut cultivars and breeding lines to water deficit stress and late leaf spot (LLS) disease. Twenty six peanut genotypes were grown under four rainout shelters; two shelters (two replications) were water stressed and two were maintained well-watered from July 15 (beginning peg stage) until October 5 (ten days before digging). All plots received 321 mm rain from planting until July 15. Additionally, 366 mm irrigation was applied to the well-watered regime (approximately 41 mm weekly) and 53 mm to the water stress shelters on August 24. The plants under water stress showed typical symptoms including reduced biomass accumulation and discoloration, and reduced pod yield. Yield varied significantly among genotypes from 1174 kg ha^{-1} for PI 576638 to 3602 kg ha^{-1} for the drought tolerant GP-NC WS 17. The well-watered plants developed severe LLS later in the season. They were visually rated for percent leaf loss, which ranged from 10 to 80%; 0 to 5% leaf drop was noted under drought. After the plots were uncovered, 24.3 MP digital images were taken with a Sony Alpha 6000 camera with 20 mm Sony lens from an unmanned aerial system (UAS) (Ascending Technologies GmbH) flying 20 m above the plots. The camera is fully integrated with the UAS system when flying in automatic mode. Each plot was saved in a separate image of 6000 by 4000 pixels in *jpeg* file format which was further processed with Image J software. The computed color space characteristics were hue angle, intensity, saturation, a*, b*, u*, and v*. Vegetation indices Green Area (GA) and Greener Area (GGA) were calculated from the Hue angle ranging between 60 and 120°. These indices and the Normalized Difference Vegetation Index (NDVI) measured with a handheld GreenSeeker (Trimble) crop sensing system were correlated with yield for the drought plots and leaf loss visual rate for the well-watered plots.

Saturation (R^2 = 0.39) and GGA (R^2 = 0.26) predicted yield slightly better than did NDVI (R^2 = 0.01). Hue angle (R^2 = 0.73) and GGA (R^2 = 0.62) predicted leaf loss better than did NDVI (R^2 = 0.30). This preliminary research demonstrates that the RGB-based HTP shows promise for the development of drought tolerance and disease resistant peanut; and the RGB-derived vegetation indices may outperform multispectral indices such as NDVI.

Adapting the Hull-Scrape Technique to Recently Released Peanut Varieties.

C. K. KVIEN*, NESPAL, University of Georgia, C.C. HOLBROOK, USDA, Crop Genetics & Breeding, Tifton, GA, and P. OZIAS-AKINS, Department of Horticulture, University of Georgia, Tifton, GA 31793.

The hull-scrape maturity profile chart needs updating to better predict harvest dates for current peanut varieties. In 2015 we noted that the current Hull- Scrape chart (with no modification) predicted Georgia-14N and TUFRunner 511 accurately (at 148 days and 128 days after planting, respectively). Georgia Greener's and Georgia-09B best harvest date was predicted about 5 days earlier than optimum (both at 123 days instead of the optimum date of128 days). The current hull-scrape chart predicted both Tifguard and Georgia-06G 12 days too early (123 days instead of the optimum date of 135 days. Georgia-12Y was predicted 22 days early (126 days instead of the optimum date of 148 days). Possibly the most confusing was the predictions of Georgia-13M. The mesocarp of this variety does not seem to further darken after reaching pod maturity, instead it remains an early black classification indefinitely. Thus at 121 days, two weeks from the optimum harvest date of 135 days, the chart predicted 144 days - or 9 days later than it should be. The best predictions for this line came at the 100 and 106 day samplings - predicting 131 and 137 days respectively.

Variation in Transpiration Efficiency and its Related Traits in Valencia Mapping Population

N. PUPPALA*, New Mexico State University, Agricultural Science Center at Clovis, 2346 State Road 288, Clovis, NM 88101; JYOSTNA DEVI MURA, New Mexico State University, Agricultural Science Center at Clovis, 2346 State Road 288, Clovis, NM 88101; VINCENT VADEZ, International Crop Research Institute for Semi Arid Tropics, Patancheru, Telangana, India 502324; HARI UPADHYAYA, International Crop Research Institute for Semi Arid Tropics, Patancheru, Telangana, India 502324; SUBE SINGH, MANISH PANDEY, International Crop Research Institute for Semi Arid Tropics, Patancheru, Telangana, India 502324; and RAJEEV VARSHNEY, International Crop Research Institute for Semi Arid Tropics, Patancheru, Andhra Pradesh, India 502324.

Transpiration efficiency (TE) has been considered as an important component for water use efficiency (WUE) and to screen yield variation under drought stress in peanut. A Recombinant Inbred Lines (RIL's) for Valencia breeding were developed for high WUE from two contrasting parents differed in their drought tolerance. A set of 288 RILs derived from drought tolerant JUG3 and drought susceptible Valencia-C were used along with parents to evaluate TE and pod yield. A lysimetric system was used to grow the plants and to screen the RILs for their water use, dry weight, TE, pod yield and haulm weight. One experiment was conducted during the rainy season 2015 using randomized complete block design with 4 replications. Plants were subjected to drought stress treatment, imposed from 40 days after sowing in the form of an intermittent stress, i.e. the plant were subjected to cycles of drying and re-watering similar to treatments applied under field conditions. A 2-fold variation for TE was observed among the RILs, which was typical of a rainy season environment. Other parameters pod yield, water use and haulm weight showed significant variation among the RILs. A significant association was observed between TE and pod yield in this study, although the coefficient of variation was relatively weak (R2 = 0.22), which was also quite typical of mild vapor pressure deficit environment. The results will be further discussed in detail after the repetition of the experiment. The distribution of TE among the 288 RILs indicates polygenic character of TE controlled by dominant and additive genes. This study further requires quantitative trait loci (QTL) analysis for marker assisted selection to select and breed efficient genotypes for improved TE.

Bayer Excellence in Extension Techniques and Technology

<table>
<tr><th colspan="3">THURSDAY, JULY 14, 2016</th></tr>
<tr><td>1:30 - 4:00 p.m.
Waters Edge B</td><td>Bayer Excellence in Extension Techniques and Technology
Moderator: Michael Mulvaney, University of Florida</td><td>PAGE NUMBER</td></tr>
<tr><td>1:30 p.m</td><td>Overview of 2015: A Challenging Year for Peanut Production in North Carolina.
M. HUFFMAN*, R. GURGANUS. J. HURRY, R. RHODES, B. SPEARMAN, M. LEARY, M. SHAW, M. CARROL, K. BAILEY, A. BRADLEY, M. CARROL, P. SMITH, R. THAGARD, A. WHITEHEAD, B. PARRISH, M. SMITH, T. BRITTON, J. MORGAN, A. COCHRAN, C. ELLISON, M. SEITZ, L. GRIMES, M. MALLOY, D. KING, R. WOOD, A.B. STEWART, T. WALEY, N. HARRELL, C. SUMNER, D.L. JORDAN, R. BRANDENBURG, and B. SHEW. North Carolina Cooperative Extension Service, Raleigh, NC 27695.</td><td>111</td></tr>
<tr><td>1:45 p.m.</td><td>Clemson Extension Agriculture Programming: Serving the Peanut Producers in Orangeburg County, South Carolina.
J. CROFT*, Clemson University, 1550 Henley St., Suite 200, Orangeburg, SC 29115.</td><td>112</td></tr>
<tr><td>2:00 p.m.</td><td>Stakeholder Engagement: Exploring Changes in Rainfall Intensity and Seasonal Variability
Daniel DOURTE, Agricultural and Biological Engineering, University of Florida; C. FRAISSE, Agricultural and Biological Engineering, University of Florida; W. BARTELS, Florida Climate Institute, University of Florida; MACE BAUER*, IFAS Extension, University of Florida.</td><td>113</td></tr>
<tr><td>2:15 p.m.</td><td>Burrower Bugs… A “New” Pest for Emanuel County Peanuts.
P. M. CROSBY*, Cooperative Extension, University of Georgia, Swainsboro, GA. 30401; and
M. R. ABNEY, Department of Entomology, University of Georgia, Tifton, GA. 31793.</td><td>114</td></tr>
<tr><td>2:30 p.m.</td><td>Interactive Cooperative Extension Agent Training Session for Early Season Pest Management in Peanut.
J. HURRY*, M. CARROL, A. BRADLEY, P. SMITH, R. THAGARD, A. WHITEHEAD, T. BRITTON, J. MORGAN, R. RHODES, A. COCHRAN, C. ELLISON, M. HUFFMAN, L. GRIMES, M. MALLOY, D. KING, A.B. STEWART, C.L. SUMNER, A. HARE, M.D. INMAN, D.L. JORDAN, R. BRANDENBURG, and B. SHEW. North Carolina Cooperative Extension Service, Raleigh, NC 27695.</td><td>115</td></tr>
<tr><td>2:45 p.m.</td><td>Baker County 2015 Peanut at Plant In-Furrow Fungicide, Nematicide & Inoculant Test Plot
E.L. JORDAN*, UGA Baker County Extension; A. SHIRLEY, UGA Mitchell County Extension, R B. KEMERAIT, UGA Plant Pathology, Coastal Plains Research Center, Tifton, GA.</td><td>116</td></tr>
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3:00 p.m.	**2015 Bulloch County Peanut Fungicide and Nematode Research Results.** **W. G. TYSON***, University of Georgia Cooperative Extension, Bulloch County, Statesboro, GA 30458 and R. C. KEMERAIT, University of Georgia, Department of Plant Pathology, Tifton, GA 31794.	**117**
3:15 p.m.	**Assessment of Fungicide Program Efficacy Using On-Farm, Large Plot and Small Plot Trials in North Florida.** **K. WYNN***, University of Florida/Institute of Food and Agricultural Sciences, Jasper, FL 32052; D. FENNEMAN University of Florida/Institute of Food and Agricultural Sciences, Madison, FL. 32340; C. VANN University of Florida/Institute of Food and Agricultural Sciences, Mayo, FL. 32066; and N.S. DUFAULT, Department of Plant Pathology, University of Florida, Gainesville, FL. 32611-0680.	**118**
3:30 p.m.	**Updated Version of the Peanut Risk Management Tool for North Carolina.** **D.L. JORDAN***, G.G. WILKERSON, R.L. BRANDENBURG, B.B. SHEW, and G. BUOL, North Carolina State University, Raleigh, NC 27695.	**119**
3:45 p.m.	**Development of Multiuse Research/Demonstration Planter for Peanut.** **W.S. MONFORT***, W.M. PORTER, R. S. TUBBS, Crop and Soil Sciences Department, University of Georgia, Tifton, GA 31793.	**120**

Overview of 2015: A Challenging Year for Peanut Production in North Carolina.

M. HUFFMAN*, R. GURGANUS. J. HURRY, R. RHODES, B. SPEARMAN, M. LEARY, M. SHAW, M. CARROL, K. BAILEY, A. BRADLEY, M. CARROL, P. SMITH, R. THAGARD, A. WHITEHEAD, B. PARRISH, M. SMITH, T. BRITTON, J. MORGAN, A. COCHRAN, C. ELLISON, M. SEITZ, L. GRIMES, M. MALLOY, D. KING, R. WOOD, A.B. STEWART, T. WALEY, N. HARRELL, C. SUMNER, D.L. JORDAN, R. BRANDENBURG, and B. SHEW. North Carolina Cooperative Extension Service, Raleigh, NC 27695.

Peanut yield in North Carolina was lower in 2015 compared with the previous 3 growing seasons. Statewide, peanut yield was 3,400 pounds/acre in 2015 compared with yields of 4,030, 3,900, and 4,320 pounds/acre during 2012, 2013, and 2,014, respectively. Using survey data from approximately 85 farmers in February 2016, average yield in 2014 for this group of farmers attending Cooperative Extension peanut production meetings was 4,860 pounds/acre compared with 4,080 pounds/acre in 2015 (17% reduction in yield). During 2014 yield ranged from 3,600 to 6,400 pounds/acre while the range of yield during 2015 was 0 to 5,700 pounds/acre. Yield and quality was affected by limited rainfall during the summer for some farmers, especially during August. However, excessive rainfall during the fall that delayed digging or combining after digging was the major cause of reduced yield. Seventy-three percent of farmers indicated that weather was the major cause of lower yields in 2015 compared with 2014. However, some farmers experienced high yields on all of their production. For example, growers in the 5,000 Pound Club (average yield for all acres of production for that season) yielded 5,420, 5,660, and 5,700 pounds/acre in 2013, 2014, and 2015, respectively.

Clemson Extension Agriculture Programming: Serving the Peanut Producers in Orangeburg County, South Carolina.

J. CROFT*, Clemson University, 1550 Henley St., Suite 200, Orangeburg, SC 29115.

Extension programs are conducted year round focusing on crop production issues facing Orangeburg County and area peanut producers. Farmers seek out help from Extension on numerous peanut production subjects: variety selection, fungicide programs, maturity determination, production issues and crop budgeting. Educational meetings, on-farm trials, newsletters and other methods are used as means of getting the newest peanut production information to area growers. The information that is transferred to the producers is based on research conducted locally at Clemson University Research and Education Centers. Each year in Orangeburg County we hold local peanut production programs with an average attendance of 25 at two locations within the county. Orangeburg County has also been the site of the annual South Carolina Peanut Grower's State Meeting for many years now and the average attendance at the meeting is 300. Peanut maturity clinics are another major component of the educational programming conducted in Orangeburg County. These clinics in combination with one-on-one farm visits for peanut maturity checks have become very important over the last couple of years. An annual average of 30 Orangeburg County growers with 10,000 total acres have improved their harvest timing as a result of these efforts. The peanut acreage in SC has increased to over 100,000 acres over the last couple of years. Even though Orangeburg has been a traditional peanut county in SC, we have seen an increase in the number of peanut producers in the county, some of them for the first time or others that have not grown peanuts for many years. Through Extension education programming, these growers were able to get up to speed and grew as good a crop of peanuts as those who haven't missed a season. The programming offered by Extension in Orangeburg County and SC is driven by the needs of the producers and we continue to strive to meet those needs in this ever-changing world of agriculture.

Stakeholder Engagement: Exploring Changes in Rainfall Intensity and Seasonal Variability

D. DOURTE, Agricultural and Biological Engineering, University of Florida;
C. FRAISSE, Agricultural and Biological Engineering, University of Florida; W-L BARTELS, Florida Climate Institute, University of Florida; **M. BAUER***, IFAS Extension, University of Florida.

The distribution of rainfall has major impacts in agriculture, affecting the soil, hydrology, and plant health in agricultural systems. The goal of this study was to test for recent changes in rainfall intensity and seasonal rainfall variability in the Southeastern U.S. by exploring the data collaboratively with agricultural stakeholders. During the last 30 years (1985-2014), there has been a significant change (53% increase) in the number of extreme rainfall days (>152.4 mm/day) and there have been significant decreases in the number of moderate intensity (12.7-25.4 mm/day) and heavy (25.4-76.2 mm/day) rainfall days in the Southeastern U.S., when compared to the previous 30 year period (1955-1984). The variability in spring and summer rainfall increased during the last 30 years, but winter and fall showed less variability in seasonal totals in the last 30 years. In agricultural systems, rainfall is one of the leading factors affecting yield variability; so it can be expected that more variable rainfall and more intense rain events could bring new challenges to agricultural production. However, these changes can also present opportunities for producers who are taking measures to adjust management strategies to make their systems more resilient to increased rain intensity and variability. Extension programs held throughout the tri-state region (FL, GA, AL) have delivered adaptive management strategies to farmers and their advisors.

Burrower Bugs… A "New" Pest for Emanuel County Peanuts.

P. M. CROSBY*, Cooperative Extension, University of Georgia, Swainsboro, GA. 30401; and M. R. ABNEY, Department of Entomology, University of Georgia, Tifton, GA 31793.

Farmers in the Southeastern Georgia county of Emanuel faced a new pest in 2010. The insect called the peanut burrower bug, Pangaeus bilineatus, damaged 13 tons of peanuts in 2010. In 2012, damage resulted in grade reduction to 360 tons of peanuts. In 2014, over 2100 tons of peanuts were graded as Segregation 2 peanuts as the result of burrower bug feeding damage. The value of damaged peanut was reduced by 65% which cost Emanuel County farmers over $500,000 in lost revenue.

During the 2015 growing season, the county Extension agent conducted a research program that monitored burrower bug movement, evaluated burrower bug presence in different soil types and evaluated the efficacy of several insecticides against burrower bugs. Movement studies using light traps identified three significant time periods for adult flight activity in and around fields. Web Soil Series maps were used to identify specific soil series types in twenty fields with Segregation 2 damage caused by burrower bugs.

The project also included trials to evaluate the effectiveness of Lorsban 15G for reducing burrower bug populations and to compare Lorsban 15G to night time applications of imidicloprid and bifenthrin. The insecticide efficacy trials were arranged in a randomized complete block design with treatments replicated four times. Efficacy data were analyzed using ANOVA, and treatment means were separated using LSD. Burrower bug damage was significantly reduced in the Lorsban 15G and bifenthrin treatments compared to the untreated check. Damage in the imidacloprid treatment did not differ from the untreated check or the other insecticide treatments.

<u>Interactive Cooperative Extension Agent Training Session for Early Season Pest Management in Peanut.</u>

J. HURRY*, M. CARROL, A. BRADLEY, P. SMITH, R. THAGARD, A. WHITEHEAD, T. BRITTON, J. MORGAN, R. RHODES, A. COCHRAN, C. ELLISON, M. HUFFMAN, L. GRIMES, M. MALLOY, D. KING, A.B. STEWART, C.L. SUMNER, A. HARE, M.D. INMAN, D.L. JORDAN, R. BRANDENBURG, and B. SHEW. North Carolina Cooperative Extension Service, Raleigh, NC 27695.

Cooperative Extension agents often make recommendations for weed and thrips control in peanut. To enhance agent ability to make recommendations, plots were established in peanut during 2015 and agents were allowed to examine plots and make recommendations on herbicides and insecticides 3 weeks after peanut emergence. Herbicide and insecticide treatments were applied within 3 days after the recommendation. Cooperative Extension agents made a second recommendation 2 weeks later after viewing the effectiveness of the previous treatments. During the season images were made by the weed specialist of each plot (26 total treatments) and provided to Cooperative Extension agents as a reference. Yield was recorded and results relative to economic return of each treatment was calculated and discussed at in-service training in January 2016. Similar activities at a different location are scheduled for 2016 with a different spectrum of weeds.

Baker County 2015 Peanut at Plant In-Furrow Fungicide, Nematicide & Inoculant Test Plot

E.L. JORDAN*, UGA Baker County Extension; A. SHIRLEY, UGA Mitchell County Extension, R B. KEMERAIT, UGA Plant Pathology, Coastal Plains Research center, Tifton, GA.

Peanuts have been number one cash crop in S.W. Georgia for many years. Peanut Root Knot nematode has historically cause yield reduction in many peanut fields. The loss of the in furrow treatment of Temik nematicide has lower peanut yields where peanut root knot nematodes were present.
The loss of temik created the need to evaluate the in furrow treatment of Velum for the control of peanut Root Knot Nematode in peanuts.

Velum can be mixed with Proline Fungicide and Peanut Inoculant. This test evaluated the three way mix of Velum, Proline, and Peanut Inoculant.

This test was set up with five randomized on farm test plots that included the in furrow application of Check, Velum, Proline, Velum & Proline and Velum, Proline & Inoculant mixture.

The test plots were evaluated for Plant Stand, Thrip Control, TSWV and Leafspot Control, White Mold Control, and Yield.

2015 Bulloch County Peanut Fungicide and Nematode Research Results.

W. G. TYSON*, University of Georgia Cooperative Extension, Bulloch County, Statesboro, GA 30458 and R. C. KEMERAIT, University of Georgia, Department of Plant Pathology, Tifton, GA 31794.

Impact of soilborne diseases on peanut production is a problem that has been addressed with on-farm research in Bulloch County. Peanut producers there have experienced severe outbreaks of southern stem rot (white mold) and other diseases. Current management recommendations are based on a combination of resistant varieties and application of fungicides.

In the first study, effectiveness of 7 different fungicide treatments was evaluated for the control of white mold. The experimental design was a randomized complete block with 3 replications. Peanut, 'Georgia Greener', was planted on May 4 and inverted on September 18. Fungicides included Proline, Provost, Muscle ADV, Echo 720, Fontelis, Convoy, Artisan, Abound, Alto and Tilt-Bravo. There was a strong negative relationship between incidence of white mold and yield. Top-yielding programs included Artisan/Convoy, Abound/Alto and Proline/Provost. Dry conditions during much of the season coupled with lack of irrigation in the field likely contributed to levels of white mold control observed with different fungicide programs.

Effectiveness of Velum Total, Abound and Proline for management of nematodes and soilborne disease was evaluated in two additional trials. Treatments in these trials were replicated three times using a randomized block design. All treatments were applied in-furrow at planting. The Proline (5.7 fl oz/A) treatment yielded 488 lbs/A and the Proline + Velum Total (18 fl oz/A) yielded 695 lb/A better than the control (no in-furrow treatment). Such information is helpful to growers in southeastern Georgia as they work to improve management of soilborne diseases and nematodes.

Assessment of Fungicide Program Efficacy Using On-Farm, Large Plot and Small Plot Trials in North Florida.

K. WYNN*, University of Florida/Institute of Food and Agricultural Sciences, Jasper, FL 32052; D. FENNEMAN University of Florida/Institute of Food and Agricultural Sciences, Madison, FL. 32340; C. VANN University of Florida/Institute of Food and Agricultural Sciences, Mayo, FL. 32066; and N.S. DUFAULT, Department of Plant Pathology, University of Florida, Gainesville, FL. 32611-0680.

Peanut production has become an important commodity crop for Hamilton County and the surrounding counties over the past ten years. In North Florida, throughout the Suwannee River Valley, peanut producers generated approximately $56,482,000 from the 70,603 acres of peanuts produced in 2015. Each year these peanut producers are faced with the difficult task of determining the best fungicide spray program for disease management to use in peanuts. To assist peanut producers a partnership was formed between a University of Florida Extension Agent, a University of Florida Peanut Specialist and a cooperating peanut farmer. This partnership has created a peanut program centered on a peanut on-farm trial.

Over the past four years four agro-chemical companies' fungicide spray programs were compared. Plots consisted of 24 rows and were replicated 3 to 4 times. This resulted in a peanut on-farm trial consisting of forty acres. The cooperating producer's equipment was utilized for planting, management, and harvest in which both yield and quality were recorded and compared. With a plot this large it is unrealistic to request a producer provide an untreated check. This encouraged the decision to duplicate the trial at the Suwannee Valley Agriculture Extension Center. At the center acreage was sufficient to allow implementation of a 3 acre large plot trial consisting of two treatments, one considered a high input treatment and the other more economical. A small plot fungicide trial was also incorporated that consisted of 10 treatments and replicated four times. This trial was comparable to fungicide trials in other Extension Centers. Through this platform, University of Florida peanut specialists and Extension Agents were able to help producers increase quality and yields.

In Hamilton County, 100 percent of peanut producers (n = 45) now use fungicide spray programs consisting of biweekly sprays adopted from the Hamilton County peanut on-farm trial. Adopting one of the recommended fungicide programs increased input costs $38.00 per acre (5600 acres) for a total expense of $212,800 in the county. However, the use of fungicides increased yields over 1,000 pounds per acre resulting in an additional returns of $963,200 in Hamilton County for a $750,400 estimated net return.

Updated Version of the Peanut Risk Management Tool for North Carolina.

D.L. JORDAN*, G.G. WILKERSON, R.L. BRANDENBURG, B.B. SHEW, and G. BUOL, North Carolina State University, Raleigh, NC 27695.

Effectively managing and avoiding risks are critical for successful peanut production. Management of pests is often focused on practices associated with a single pest or perhaps 2 or 3 pests, and determining the aggregate risk of practices can be challenging. A risk management tool was developed for the Carolinas and Virginia and has been available through a website housed at North Carolina State University since 2008. The risk management tool was updated in 2016 to reflect new cultivars, cultural practices, and pesticide availability and use. The tool defines risk for *Cylindrocladium* black rot, leaf spot, southern corn rootworm, spider mites, *Sclerotinia* blight, and tomato spotted wilt. In addition to risk for individual pests, the risk management tool allows practitioners to see the combined risk of all pests using the anticipated practices. Farmers and their advisors are then able to adjust practices prior to planting. Cost of pest management and production are tied to each practice for each pest and enables one to observe the added cost or savings when practices are changed. The tool is designed for planning prior to planting.

<u>Development of Multiuse Research/Demonstration Planter for Peanut</u>.

W.S. MONFORT*, W.M. PORTER, R. S. TUBBS, Crop and Soil Sciences Department, University of Georgia, Tifton, GA 31793.

Evaluation of row configuration (row spacing, twin vs single), seeding rates, and other planter settings have been an integral part of agronomic research to further enhance yield potential. Unfortunately, conducting these types of research trials sometimes required the use of multiple planters or time limiting alterations to an existing planter lending to increased error in results. To enhance current agronomic research, an economical multi-use research/demonstration planter was designed and developed using available equipment and parts from John Deere and ALMACO. This new planter will allow researchers and extension faculty the chance to evaluate row configuration, seeding rates, downforce settings, and other planter settings from one planter without the hassle of multiple planters. With the addition of GPS technology and onboard sensors to provide planter efficiency and soil condition feedback, issues related to poor seed germination, plant stand, and plant vigor can be further evaluated to determine if the problem is due to seed quality or more with planter performance and/or soil conditions.

Entomology/Mycotoxins

THURSDAY, JULY 14, 2016		
1:30 - 3:15 p.m. Waters Edge C	**Entomology/Mycotoxins** *Moderator: Mark Abney, University of Georgia*	**PAGE NUMBER**
1:30 p.m	**Gene Expression Profiles of *Aspergillus flavus* Isolates Responding to Oxidative Stress in Different Culture Media.** B68 **J.C. FOUNTAIN***, L. YANG, R.C. KEMERAIT, University of Georgia, Department of Plant Pathology, Tifton, GA, 31793; P. BAJAJ, M. PANDEY, S.N. NAYAK, V. KUMAR, A.S. JAYALE, A. CHITIKINENI, R.K. VARSHNEY, International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), Patancheru, India, 502324; S. CHEN, University of Florida, Department of Biology, Gainesville, FL, 32601; R.D. LEE, University of Georgia, Department of Crop and Soil Sciences, Tifton, GA, 31793; B.T. SCULLY, U.S. Horticultural Research Laboratory, Fort Pierce, FL., 34945; and B. GUO, USDA-ARS, Crop Protection and Management Research Unit, Tifton, GA.	**123**
1:45 p.m.	**A Case for Regular Aflatoxin Monitoring in Peanut Butter in sub-Saharan Africa: Lessons from a 3-Year Survey in Zambia.** **S.M.C. NJOROGE***, International Crops Research Institute for the Semi-Arid Tropics (ICRISAT-Malawi); L. MATUMBA, Lilongwe University of Agriculture and Natural Resources, NRC Campus; K. KANENGA, Zambia Agriculture Research Institute, Chipata; M. SIAMBI, ICRISAT-Kenya; F. WALIYAR, ICRISAT-India; J. MARUWO, ICRISAT-Malawi; and E.S. MONYO, ICRISAT-Kenya.	**124**
2:00 p.m.	***Aspergillus* and Aflatoxin Contamination of Groundnut (*Arachis hypogaea L.*) and Food Products in Eastern Ethiopia.** **A. MOHAMMED***, M. DEJENE, College of Agriculture and Environmental Sciences, Haramaya University, Dire Dawa, Ethiopia; A. CHALA, College of Agriculture, Hawassa University, Hawassa, Ethiopia; D.HOISINGTON, College of Agriculture and Environmental Sciences, Peanut and Mycotoxin Innovation Lab, University of Georgia, Athens Georgia, 30602-4356; and V. S. SOBOLEV,R. S. ARIAS,USDA-Agricultural Research Services-National Peanut Research Laboratory, Dawson, GA 39842-0509.	**Paper Withdrawn**
2:15 p.m.	**Residual Toxicity of Neonicotinoids and Resistance Issues in Peanut Thrips Management** **R. SRINIVASAN***, P. LAI, M. ABNEY. Entomology Department, University of Georgia, Tifton, GA 31793; and A. CULBREATH, Department of Plant Pathology, University of Georgia, Tifton, GA 31793.	**126**
2:30 p.m.	**Effects of Combined Tobacco Thrips, *Frankliniella fusca*, and Herbicide Injury on Peanut Yield and Time to Maturity.** **W. GAY***, County Extension Agent, The University of Georgia, Ashburn, GA 31714; and M.R. ABNEY, The University of Georgia, Tifton, GA 31793-0748.	**127**

2:45 p.m.	**Effect of Tillage Type on Peanut Burrower Bug, *Pangaeus bilineatus*, Damage in Non- irrigated, Runner-Type Peanut.** **S.M. HOLLIFIELD***, B. SHIRLEY, M.L. HARRIS, The University of Georgia Cooperative Extension, Quitman, GA 31643 and M.R. ABNEY, Department of Entomology, The University of Georgia, Tifton, GA 31793.	**128**
3:00 p.m.	**DuPont™ Exirel® Insect Control: Novel Insecticide for Crop Protection and Yield Optimization in Peanuts.** **H.E. PORTILLO***, DuPont Crop Protection, 1090 Elkton Rd, Newark, DE 19702; R.W. WILLIAMS, DuPont Crop Protection, 2310 Lake Drive, Raleigh, NC 27609; S. S. ROYAL, DuPont Crop Protection, Rocky Ford Rd., Valdosta GA 31601; D.A. HERBERT, Virginia Tech University, Tidewater AREC 6321 Holland Rd, Suffolk, VA 23437; and A. K. CULBREATH, Department of Plant Pathology, The University of Georgia, Tifton, GA 31793.	**129**

Gene Expression Profiles of *Aspergillus flavus* Isolates Responding to Oxidative Stress in Different Culture Media.

J.C. FOUNTAIN*, L. YANG, R.C. KEMERAIT, University of Georgia, Department of Plant Pathology, Tifton, GA, 31793; P. BAJAJ, M. PANDEY, S.N. NAYAK, V. KUMAR, A.S. JAYALE, A. CHITIKINENI, R.K. VARSHNEY, International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), Patancheru, India, 502324; S. CHEN, University of Florida, Department of Biology, Gainesville, FL, 32601; R.D. LEE, University of Georgia, Department of Crop and Soil Sciences, Tifton, GA, 31793; B.T. SCULLY, U.S. Horticultural Research Laboratory, Fort Pierce, FL., 34945; and B. GUO, USDA-ARS, Crop Protection and Management Research Unit, Tifton, GA.

Aflatoxin contamination of peanut by *Aspergillus flavus* is exacerbated by drought stress. Drought also stimulates the production of reactive oxygen species (ROS) in plant tissues implying a correlation between ROS and aflatoxin production. Here, we performed gene expression analysis by RNAseq of toxigenic and atoxigenic isolates of *A. flavus* in aflatoxin conducive and non-conducive culture medium amended with various levels of H_2O_2. In total we generated 282.6 Gb of sequencing data with an average of 40.3 million filtered reads per sample of which 92.3% mapped to the *A. flavus* NRRL3357 genome. In general, isolates with greater oxidative stress tolerance and higher aflatoxin production exhibited fewer differentially expressed genes (DEGs) than less tolerant, atoxigenic isolates ($r < -0.6$). Genes involved in cell wall maintenance, antioxidant enzyme activity, cell membrane integrity, and carbon metabolism were regulated by increasing stress to different extents depending on medium carbon source. Fungal development pathways were also regulated in response to increasing stress more prevalently in less tolerant isolates indicating that delayed development may contribute to the overall differential expression patterns. Secondary metabolite production was also shown to be affected by oxidative stress and carbon source including aflatoxin and kojic acid. The expression of genes involved in aflatrem production were also regulated in a similar fashion to aflatoxin genes. Overall, these data suggest that the production of aflatoxin, aflatrem, and kojic acid are involved in *A. flavus* oxidative stress responses.

A Case for Regular Aflatoxin Monitoring in Peanut Butter in sub-Saharan Africa: Lessons from a 3-Year Survey in Zambia.

S.M.C. NJOROGE*, International Crops Research Institute for the Semi-Arid Tropics (ICRISAT-Malawi); L. MATUMBA, Lilongwe University of Agriculture and Natural Resources, NRC Campus; K. KANENGA, Zambia Agriculture Research Institute, Chipata; M. SIAMBI, ICRISAT-Kenya; F. WALIYAR, ICRISAT-India; J. MARUWO, ICRISAT-Malawi; and E.S. MONYO, ICRISAT-Kenya.

We analyzed 954 containers of 24 local and imported peanut butter brands, collected between the years 2012 to 2014. For analysis, a sample included six containers of a single brand, from the same processing batch number, and same shop. Each container was quantitatively analyzed for aflatoxin B_1 (AFB_1) in six replicates using competitive enzyme linked immunosorbent assay. Results showed that 73% of the brands tested in 2012, were contaminated with > 20 µg/kg, and ranged upto 130 µg/kg. In 2013, 80% of the brands were contaminated with > 20 µg/kg, and ranged upto 10,740 µg/kg. Compared to 2012 and 2013, fewer brands in 2014, i.e., 53% had aflatoxin B_1 levels > 20 µg/kg, and ranged upto 1,000 µg/kg. Of the 8 brands tested repeatedly across the 3-year period, none consistently averaged ≤ 20 µg/kg.

Our survey clearly demonstrates the regular occurrence of high levels of aflatoxin B_1 in peanut butter in Zambia. Considering that some of the brands tested originated from neighboring countries such as Malawi, Zimbabwe, and South Africa, the current findings provide a sub-Saharan regional perspective regarding the safety of peanut butter.

Paper Withdrawn

Residual Toxicity of Neonicotinoids and Resistance Issues in Peanut Thrips Management

R. SRINIVASAN*, P. LAI, M. ABNEY. Entomology Department, University of Georgia, Tifton, GA 31793; and A. CULBREATH, Department of Plant Pathology, University of Georgia, Tifton, GA 31793.

Spotted wilt disease caused by *Tomato spotted wilt virus* (TSWV) is a limiting factor in peanut production. Tobacco thrips, *Frankliniella fusca* (Hinds), is the main vector that transmits TSWV in the Southeast. Insecticide application is crucial to suppress thrips populations, and subsequently reduce spotted wilt disease incidence. Neonicotinoids such as imidacloprid (Admire Pro®) and thiamethoxam (CruiserMaxx®) are currently being used for thrips management as alternatives to previously used broad-spectrum carbamate and organophosphate insecticides such as aldicarb (Temik®) and phorate (Thimet®), respectively. However, recent studies have found that some neonicotinoids are no longer effectively suppressing thrips, the main concern being resistance development against neonicotinoids. We examined resistance to neonicotinoids in thrips via membrane-based feeding assays using field-collected thrips populations and a laboratory population. The median lethal concentrations i.e., dosage required to kill 50% of the test population (LC_{50}) of two neonicotinoids and phorate (control) were evaluated. LC_{50} values for thrips from the laboratory colony were established as a baseline, and compared with LC_{50} values of field-collected populations. Field-collected thrips populations evaluated in this study had similar levels of susceptibility as that of the lab population, thereby suggesting lack of neonicotinoid resistance. To further investigate the ineffectiveness of neonicotinoids against thrips, we examined the temporal residual toxicity of neonicotinoids in peanut leaf tissues, and assessed corresponding thrips mortality. Results indicated that insecticide residues detected in leaf tissues declined significantly (down by 20-fold) from 10 days after application at planting. Subsequently, the effectiveness of neonicotinoids to cause larvae and adults thrips mortality largely declined 10 days post treatment. These results suggested that short residual toxicity could be affecting the efficacy of neonicotinoids against thrips, but did not provide evidence for neonicotinoid resistance in thrips.

Effects of Combined Tobacco Thrips, Frankliniella fusca, and Herbicide Injury on Peanut Yield and Time to Maturity.

W. GAY*, County Extension Agent, The University of Georgia, Ashburn, GA 31714; and M.R. ABNEY, The University of Georgia, Tifton, GA 31793-0748.

Thrips damage and herbicide injury are two issues in peanut production that growers face every year. A field research trial was conducted in 2015 at the University of Georgia, Bowen Farm to investigate the effects of these two factors on peanut yield and incidence of Tomato Spotted Wilt Virus. The experiment was arranged in a randomized complete block, split-plot design with thrips treatment as the main plot factor and post emergence herbicide treatment as the subplot factor. The cultivar Georgia-06G was planted in a single row pattern on 36 inch row spacing in an irrigated test plot. In-furrow treatments or seed treatments were made at planting with the following insecticides for thrips management: phorate (Thimet @5lbs/a), imidacloprid (Admire Pro @10fl oz/a), and thiamethoxam (Cruisermaxx Peanut @ 0.318mg ai/seed). Each insecticide was applied to plots that were eight rows wide by thirty feet long. At 35 days after planting, the herbicide treatment, tank mix of paraquat dichloride (Gramoxone 2 @ 12 fl oz/a), s-metolachlor (Dual EC @16 fl oz/a), and sodium salt of bentazon/aciflourfen (Storm @ 16 fl oz /a), was applied to four row subplots in each main plot. Main plot treatments were replicated 4 times. The following data were collected: stand counts, thrips damage ratings, thrips population density, pod yield at harvest, and Tomato Spotted Wilt Virus incidence at 90 days and just prior to harvest. Results of this one year study showed a significant impact of insecticide treatment on thrips injury. Data suggest that treatments may impact the incidence of Tomato Spotted Wilt Virus. Additional studies are planned for 2016.

Effect of Tillage Type on Peanut Burrower Bug, Pangaeus bilineatus, Damage in Non-irrigated, Runner-Type Peanut.

S.M. HOLLIFIELD*, B. SHIRLEY, M.L. HARRIS, The University of Georgia Cooperative Extension, Quitman, GA 31643 and M.R. ABNEY, Department of Entomology, The University of Georgia, Tifton, GA 31793.

Pangaeus bilineatus (Hemiptera: - Cydnidae) is commonly referred to as the peanut burrower bug, and it is a significant pest of various crops. In Brooks County, GA non-irrigated peanuts have suffered adverse effects due to the burrower bug feeding on developing pods. The feeding damage caused by burrower bug does not appear to impact peanut yield in most fields, but the insect's piercing/sucking mouthparts produce scars and poorly flavored peanuts, drastically reducing the quality and profitability of the crop. With current grading standards, farmers' stock peanuts are downgraded from "segregation 1" to "segreagation 2" at 2.5 percent damage.

Generating meaningful data related to burrower bug management can be difficult. This is due to the random presence and sporadic feeding activity of the burrower bug. Previous research conducted at Clemson University, demonstrated that deep turning of the soil reduced burrower bug abundance and feeding damage. Currently, University of Georgia burrower bug management recommendations include, deep turning the soil as one potential control method. Peanut producers in Brooks County primarily utilize minimum tillage management practices which may put them at increased risk of damage when burrower bug populations are present. With this knowledge, affected minimum tillage producers began to ask the question, "To what extent must the soil be tilled to reduce the risk of burrower bug damage?"

An experiment was initiated in a non-irrigated commercial peanut field with a history of burrower bug damage in Brooks County, Georgia in 2015 to evaluate the effect of three tillage types on burrower bug damage. The trial included three tillage level treatments: 1. Strip Till: peanut planted directly into the previous year's cotton residue; 2. Vertical Tillage: plots were subjected to two passes with a Case 335 VT vertical tillage implement; 3. Deep Turn: plots were turned with a Harrell 2805 5 bottom switch plow. Each treatment was replicated twice in a randomized block design with individual plots measuring 27 m by 305 m. A light trap was placed at the edge of the peanut field and checked twice weekly to monitor burrower bug presence and flight activity. At crop maturity, gross treatment yield was determined by mechanically harvesting and weighing the peanuts from the middle six rows of each plot. A subsample of harvested pods was randomly collected from each plot for analysis of damage and grade. Burrower bug populations at the test location were high as evidenced by season-long light trap capture of more than 3000 individual bugs and damage levels greater than 35% in four out of six plots. Burrower bug damage was dramatically reduced in the deep turn treatment compared to the strip till and vertical tillage treatments. These preliminary findings support those from studies conducted in South Carolina that indicated that deep tillage can reduce the risk of burrower bug damage. The tillage study described here will be repeated in 2016 with additional in-field replication.

DuPont™ Exirel® Insect Control: Novel Insecticide for Crop Protection and Yield Optimization in Peanuts.

H.E. PORTILLO*, DuPont Crop Protection, 1090 Elkton Rd, Newark, DE 19702; R.W. WILLIAMS, DuPont Crop Protection, 2310 Lake Drive, Raleigh, NC 27609; S. S. ROYAL, DuPont Crop Protection, Rocky Ford Rd., Valdosta GA 31601; D.A. HERBERT, Virginia Tech University, Tidewater AREC 6321 Holland Rd, Suffolk, VA 23437; and A. K. CULBREATH, Department of Plant Pathology, The University of Georgia, Tifton, GA 31793.

Exirel® insect control is a novel insecticide based on the active ingredient Cyazypyr® (DPX-HGW86, cyantraniliprole) that belong to the second anthranilic diamide insecticides discovered by DuPont™. Exirel® is the first product in its class of chemistry that protects crops against a cross-spectrum of insect pests including Lepidoptera, Dipteran leafminers, fruit flies, beetles, whiteflies, thrips, aphids, leafhoppers, psyllids and weevils, while conserving key predators and parasitoids. Exirel® selectively activates the ryanodine receptor in insect muscles resulting in paralysis and rapid inhibition of feeding. Exirel® has been optimized for foliar use, demonstrating excellent translaminar movement. Data on the use of Exirel® for thrips management and impact on transmission of thrips vectored tomato spotted wilt virus, crop establishment and crop yield benefits will be discussed. Exirel® has been granted reduced risk status on registered crops by the US Environmental Protection Agency (EPA), EPA approval for use on peanuts is anticipated for the 2016 growing season.

Breeding and Genetics II

THURSDAY, JULY 14, 2016		
1:30 - 3:15 p.m. Salon D	**Breeding and Genetics II** *Moderator: Phat Dang, USDA-ARS*	**PAGE NUMBER**
1:30 p.m	**Enhancing Groundnut Productivity and Quality in Spanish Types Using Cultivated and Wild Arachis Germplasm.** **HARI DEO UPADHYAYA***, International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), Patancheru PO, Telangana, India.	**131**
1:45 p.m.	**Breeding for Resistance to Spotted Wilt.** **B.L. TILLMAN***, University of Florida, Agronomy Department, North, Florida REC, Marianna, FL, 32446; YU-CHIEN TSENG, University of Florida, Agronomy Department, North, Florida REC, Marianna, FL, 32446; JIANPING WANG, University of Florida, Agronomy, Gainesville, FL 32611.	**132**
2:00 p.m.	**Yield and Grade of High- and Normal-Oleic Cultivars in the Uniform Peanut Performance Test.** **T.G. ISLEIB***, Dept. of Crop, Soil, and Environmental Science, Box 7629, N.C. State Univ., Raleigh, NC 27695-7629, and R. SCOTT TUBBS, Dept. of Crop and Soil Sciences, 2360 Rainwater Rd., Univ. of Georgia Coastal Plain Exp. Sta., Tifton, GA 31793.	**133**
2:15 p.m.	**Comparison of Large-Seeded NCSU Breeding Line N11020olJ with Gregory.** S.C. COPELAND, **T.G. ISLEIB***, W.G. HANCOCK and F.R. CANTOR BARREIRO, Dept. of Crop, Soil, and Environmental Science, Box 7629, N.C. State Univ., Raleigh, NC 27695-7629, and M. BALOTA, Virginia Polytechnic Univ. and State Univ. Tidewater Agric. Res. & Ext. Center, Suffolk, VA 23437-7099R.	**134**
2:30 p.m.	**Characterization of Improved Early-Maturing Peanut Breeding Lines.** **M. D. BUROW***, Texas A&M AgriLife Research, Lubbock, TX 79403, and Texas Tech University, Department of Plant and Soil Science, Lubbock, TX, 79409; J. CHAGOYA and D. BUSH, Texas A&M AgriLife Research, Lubbock, TX 79403; M. R. BARING, Texas A&M AgriLife Research, College Station, TX 77843; C. E. SIMPSON and J. CASON, Texas A&M AgriLife Research, Stephenville, TX 76401.	**135**
2:45 p.m.	**Initial Non-Targeted Analysis of the Peanut Seed Metabolome.** **L.L. DEAN***, Market Quality and Handling Research Unit, USDA, ARS, SEA, Raleigh, NC 27695-7624; C. M. KLEVORN, Department of Food, Bioprocessing and Nutrition Sciences, North Carolina State University, Raleigh, NC 27695-7624; and M.C.LAMB, National Peanut Laboratory, USDA, ARS, SEA, Dawson, GA 39842.	**136**
3:00 p.m.	**Where is my GRIN-Global peanut order?** **S. TALLURY***, M. SPINKS, L. CHALKLEY, T. FIELDS, S. JONES, A. LEWIS, D. PINNOW and G. PEDERSON, Plant Germplasm Resources Conservation Unit, USDA-ARS, Griffin, GA 30223-1797.	**137**

Enhancing Groundnut Productivity and Quality in Spanish Types using Cultivated and Wild *Arachis* Germplasm.

HARI DEO UPADHYAYA*, International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), Patancheru PO, Telangana, India.

Wild *Arachis* species are the source of stress tolerance, and agronomic and seed nutritional traits. An amphidiploid TxAG 6 crossed with TMV 2 resulted varieties with exceptionally large-seeds into Spanish background with specific adaptation. ICGV 15434 is adapted to rainy (June to October), ICGV 15436, 15454, and 15457 to irrigated postrainy (November to March), and ICGV 15443, 15449, and 15452 to both rainy and postrainy seasons. These varieties produced 10 to 34% greater pod yield over TMV 2 (1.585-2.78 t ha^{-1}). The 100-seed weight was two to three times more of TMV 2 (33-45 g). Greater SPAD chlorophyll meter reading and lower specific leaf area confer drought tolerance. These varieties possess such characteristics. Pre-breeding work has been initiated at ICRISAT to produce and recycle synthetics to broaden the cultigen's genepool in groundnut.

Crosses involving germplasm lines identified from the peanut mini core collection with oil content similar as of many released cultivars (~48%) produced breeding lines with >53% oil and those involving normal × high or high × high oil contents resulted breeding lines with exceptionally high oil (up to 63%) into improved genetic backgrounds. ICGV 13098, a Spanish bunch variety with normal duration (~120 days), had 61% oil but recorded 39% greater pod yield over control, ICGV 91114 (yield, 2.30 t ha^{-1}; oil, 48%). ICGV 91114 is a short duration widely adapted (both rainy and postrainy seasons) variety in India. Selecting for early maturity combined with high oil or large-seed size is a breeding challenge. ICGV# 15314, 15318, and 15323 produced up to 26% greater pod yield and up to 18% greater oil over ICGV 91114 (yield 2.7 t ha^{-1}; oil, 48%), while ICGV# 15308 and 15311 produced 41-59% greater pod yield and 50-60% greater seed weight over ICGV 91114 (yield, 2.2 t ha^{-1}; seed weight, 30 g). All these varieties matured at 1470 ^{0}Cd (degree days), which is equivalent to 90 days after sowing during the rainy season at Patancheru, India.

Breeding for Resistance to Spotted Wilt.

B.L. TILLMAN*, University of Florida, Agronomy Department, North, Florida REC, Marianna, FL, 32446; YU-CHIEN TSENG, University of Florida, Agronomy Department, North, Florida REC, Marianna, FL, 32446; JIANPING WANG, University of Florida, Agronomy, Gainesville, FL 32611.

Spotted wilt disease has had long-term impacts on peanut production in the Southeastern USA. In addition to the immediate impacts of crop loss caused by the disease, management practices to minimize risk of loss to spotted wilt have had major consequences for the entire industry. Three major implications are 1) delayed planting, 2) increased seeding density, and 3) cultivar change. Prior to spotted wilt, planting commenced during the month of April. Since spotted wilt became endemic, except for the upper peninsula of Florida, only a small portion of peanut acreage is planted in April representing a two to four week delay in planting. Seeding density prior to spotted wilt was typically four seeds per foot of row and current recommendations call for six seeds per foot of row. Both of these changes are cost factors for peanut producers and potentially for the entire supply peanut supply chain. For example, later planting necessitates a narrow planting duration since planting after the end of May creates a higher risk for frost to occur prior to optimum harvest maturity in the fall. Immaturity negatively impacts seed quality and flavor. Cultivar change required incorporation of genetics which were new to the Southeastern USA and have had some unintended consequences such as increased seed size, longer maturity duration, and reduced seed germination/vigor. However, the benefits of resistance to spotted wilt and other diseases have far outweighed the negative impacts. The search for resistance to spotted wilt has identified *Arachis hypogaea var. hirsuta* germplasm with resistance that is far superior to that found in current cultivars, but that has yet to be deployed in commercial cultivars. In this germplasm, there is the potential to negate or significantly diminish the impacts of seeding density and planting date in peanut. The University of Florida peanut breeding program has been working to characterize the inheritance of this resistance and to understand something of its mechanism. This presentation will summarize research over the past ten years regarding spotted wilt resistance derived from *Arachis hypogaea var. hirsuta* germplasm.

Yield and Grade of High- and Normal-Oleic Cultivars in the Uniform Peanut Performance Test.

T.G. ISLEIB*, Dept. of Crop, Soil, and Environmental Science, Box 7629, N.C. State Univ., Raleigh, NC 27695-7629, and R. SCOTT TUBBS, Dept. of Crop and Soil Sciences, 2360 Rainwater Rd., Univ. of Georgia Coastal Plain Exp. Sta., Tifton, GA 31793.

In order to ascertain whether or not yield and grade differed between high- and normal-oleic peanuts (*Arachis hypogaea* L.), data from the agronomic assessment phase of the Uniform Peanut Performance Test (UPPT) were used to compare the mean of 25 high-oleic cultivars with 34 normal-oleic cultivars and registered germplasm lines. On average, high-oleic cultivars yielded more than did normal-oleic lines (5031 vs. 4642 kg ha^{-1}, P<0.0001), a difference that resulted in a difference in crop value (1,991 vs. US $1,843 ha^{-1}, P<0.0001). The improvement of yield and value was most likely due to the fact that high-oleic lines were tested on average four years later than normal-oleics with a difference of 29 years between the first test of a normal-oleic and the last test of a high-oleic line. If breeders are making progress in improvement of yield, then cultivars developed and tested later should and do yield more on average. High-oleic cultivars averaged lower farmer stock fancy pod content (38.9 vs. 41.7%, P=0.0088), but greater in content of total sound mature kernels (72.1 vs. 71.7%, P=0.0459). A difference between high- and normal-oleic cultivars also was detected for digging date (147.8 vs. 146.4 days after planting, P=0.0010), virginia extra large or jumbo runner kernel content on an in-shell (33.2 vs. 31.4%, P=0.0006) or shelled (46.0 vs. 43.9%, P=0.0021) basis, medium kernel content on an in-shell (27.9 vs. 29.9%, P=0.0002) or shelled (38.9 vs. 41.6, P<0.0001) basis, and No. 1 kernel content on an unshelled (5.2 vs. 5.7%, P=0.0129) or shelled (7.3 vs. 8.0%, P=0.0263) basis. No difference was detected for weight of 100 seeds, content of other kernels, meat content, damaged kernels, or support price. Like the change in yield and value, the slight increase in content of larger seeds and decrease in the smaller medium and No. 1 seed contents probably reflects trends in peanut breeding, particularly runner peanut breeding, more than it does any intrinsic effect of the high-oleic trait on seed size distribution.

Comparison of Large-Seeded NCSU Breeding Line N11020olJ with Gregory.

S.C. COPELAND, **T.G. ISLEIB*,** W.G. HANCOCK and F.R. CANTOR BARREIRO, Dept. of Crop, Soil, and Environmental Science, Box 7629, N.C. State Univ., Raleigh, NC 27695-7629, and M. BALOTA, Virginia Polytechnic Univ. and State Univ. Tidewater Agric. Res. & Ext. Center, Suffolk, VA 23437-7099R.

The large-seeded virginia-type peanut (*Arachis hypogaea* L.) cultivar Gregory has long been favored by processors of virginia "super extra-large kernels (SELK)," *i.e.*, kernels that ride a 24/64 x 1 in (9.5 x 25.4 mm) slotted screen. In 75 trials conducted by N.C. State Univ., Gregory had a mean SELK content of 22%, but it was released in 1997 and is normal-oleic. Because the dominating virginia-type cultivar, normal-oleic Bailey, does not produce nearly as many SELK (9% across 96 trials), Gregory is being maintained by a handful of producers. A new very large-seeded high-oleic line, N11020olJ, has been developed by the N.C. State Univ. breeding program, but its pod yield and crop value were not as great as some other smaller-seeded lines, so it is not likely to be a candidate for release as a cultivar for general use. However, it could still have a role in niche production of high-oleic SELK. N11020olJ was compared directly with Gregory using data from five different databases. In each case, data for the two lines were extracted from the database, the data were merged to pair the two where they appeared in the same test, the difference was computed, and the mean difference was compared with zero by t-test. (1) Using yield and grade measured in the Peanut Variety and Quality Evaluation (PVQE) program, the "official variety test" for the Virginia-Carolina area, it was not possible to compare SELK contents because SELK was not measured while Gregory was entered in the trials. In fact, the two lines appeared in the same trials in only one year. However, N11020olJ did have greater pod yield than Gregory (5397 vs. 4768 kg ha^{-1} across 6 trials, P=0.046) and greater crop value ($2269 vs. $2008 ha^{-1} across 6 trials, P=0.036). (2) Using blanching and fatty acid data from the PVQE program, N11020olJ did not blanch differently from Gregory, but it did express the array of changes in fatty acid traits that one would expect when comparing a high- with a normal-oleic line, *i.e.*, N11020olJ had lesser content of total saturated fatty acids than did Gregory (5.8 vs. 9.1% across 6 trials, P=0.000), primarily as a reduction in palmitic (16:0) fatty acid, greater content of oleic (18:1) fatty acid (79.8 vs. 53.9% across 6 trials, P=0.000), and lesser content of linoleic (18:2) fatty acid (4.8 vs. 27.3% across 6 trials, P=0.000) resulting in greater oleic-to-linoleic (O/L) ratio (17.11 vs. 1.98 across 6 trials, P=0.000). There were a number of other changes that were statistically but perhaps not biologically significant. (3) Using yield and grade data from the N.C. State Univ. in-state trials where SELK was measured from 2003 on, N11020olJ had greater content of SELK than did Gregory (24.2 vs. 21.1% across 9 trials, P=0.026), greater pod yield (4283 vs. 3218 kg ha^{-1} across 10 trials, P=0.004), and greater crop value ($1723 vs. $1274 ha^{-1} across 9 trials, P=0.005). (4) There was insufficient overlap of disease testing of N11020olJ and Gregory to allow direct comparison. (5) Measured using a trained descriptive sensory panel and samples from the N.C. State Univ. testing program, flavor of N11020olJ was not detectably different from that of Gregory, considered to be a good-tasting line, although N11020olJ did have lesser intensity of under-roast (1.78 vs. 2.13 flavor intensity units or "fiu" across 13 trials, P=0.002) and greater intensity of sweet (4.28 vs. 3.94 fiu across 13 trials, P=0.037). Based on these comparisons, N11020olJ appears to be a reasonable replacement for Gregory in the SELK market.

Use of Genomics for Breeding Drought-Tolerant Peanut.

J. CHAGOYA, M. G. SELVARAJ, J. L. AYERS, Texas A&M AgriLife Research, Lubbock, TX 79403, and Texas Tech University, Dept. of Plant and Soil Science, Lubbock, TX 79409; R. KULKARNI, V. BELAMKAR, R. CHOPRA, Texas Tech University, Dept. of Plant and Soil Science, Lubbock, TX 79409; M. R. BARING, Texas A&M AgriLife Research, College Station, TX 77843; J. MAHON, P. PAYTON , USDA-ARS-CSRL, Lubbock, TX 79415; C. C. HOLBROOK, USDA-ARS Coastal Plains Experiment Station, Tifton, GA 31793; and **M. D. BUROW***, Texas A&M AgriLife Research, Lubbock, TX 79403, and Texas Tech University, Dept. of Plant and Soil Science, Lubbock, TX 79409.

We have pursued two avenues for developing peanut for growth under reduced irrigation. The first involves use of a CAP-RIL population developed by the peanut community. Significant variation for field measures of plant response were obtained, as well as large differences in yield. It is expected that QTLs will become available as marker data are obtained as part of the community effort. In a second approach, significant marker-trait associations were found in the U.S. peanut minicore collection by association mapping of field measurements of response to differing irrigation treatments as well as yield. We have made crosses to test introducing alleles from minicore accessions into advanced breeding lines with improved quality characteristics. We have been able to validate several MTAs in segregating F2 populations, and have been able to make selections for drought tolerance, nematode resistance, and high oleic oil using markers. It is hoped that early selection may be able to fix some favorable alleles early in the breeding process and eliminate unfavorable materials, allowing evaluation of improved breeding lines in replicated trials in later generations.

Initial Non-Targeted Analysis of the Peanut Seed Metabolome.

L.L. DEAN*, Market Quality and Handling Research Unit, USDA, ARS, SEA, Raleigh, NC 27695-7624; C. M. KLEVORN, Department of Food, Bioprocessing and Nutrition Sciences, North Carolina State University, Raleigh, NC 27695-7624; and M.C.LAMB, National Peanut Laboratory, USDA, ARS, SEA, Dawson, GA 39842.

There are likely a large number of compounds that constitute the peanut seed metabolome that have yet to be elucidated. Although the proximate composition and nutrients such as vitamins and minerals are well known, the composition of many other small molecule metabolites present have not been systematically studied. This report describes the findings of a non-targeted approach using several analytical platforms to generate metabolomic profiles of raw and roasted runner-type peanuts (n=15). Only blanched samples were analyzed to limit the focus to the metabolites present only in the seeds themselves. A total of 383 metabolites were identified in the samples, of which 69 were found at higher levels in the raw samples and 28 were found to be unique to the roasted samples. The metabolites found belong for the most part to the amino acid, lipid, and carbohydrate super pathways and include oxylipins, aromatic amino acids, flavonoids, gamma-glutamyl amino acids, benzenoid and purine metabolism products. As part of a much larger and ongoing study, this information contributes to a better understanding of the chemical composition of peanut seeds that could impact growth and health of the peanut plant and influence the effects of peanut consumption on human and animal health and well-being.

Where is my GRIN-Global peanut order?

S. TALLURY*, M. SPINKS, L. CHALKLEY, T. FIELDS, S. JONES, A. LEWIS, D. PINNOW and G. PEDERSON, Plant Germplasm Resources Conservation Unit, USDA-ARS, Griffin, GA 30223-1797.

The USDA National Plant Germplasm System peanut collection consists of 9,313 accessions of the cultivated peanut (*Arachis hypogaea* L.) and 630 accessions of wild *Arachis* species. The collection is maintained by the Plant Genetic Resources Conservation Unit (PGRCU) located on the University of Georgia-Griffin Campus. Small quantities of the peanuts are available for research and educational purposes. The PGRCU receives seed requests throughout the year for all of its mandated crop species and the requests are filled in the order they were received. Occasionally, due to the large number of orders to process, the time taken from placing the order to receiving the materials may be delayed. The goal of this outline is to demonstrate the steps involved in processing a seed request on GRIN-Global by the PGRCU staff. Once an order is placed, it is received by the PGRCU Seed Storage staff and verified and screened for accuracy. APHIS is consulted regarding international regulations concerning requirements for phytosanitary certificates and import permits. The order is routed to the peanut curator for review and approval. The curator returns the request to the seed storage staff for order processing which includes printing a packing list and envelopes for packaging, pulling the samples from the cold rooms, seed counting and shipment. On the other hand, when a cooperator requests germplasm from other countries, the imported seeds go through quarantine screening as required by APHIS to prevent the accidental introduction of exotic pathogens/pests. In this process, the seeds are germinated in quarantine inspected greenhouses and seedlings are evaluated for diseases. The disease-free plants are kept to maturity to harvest pods. The recovered seeds are then shipped to the cooperator. This process could take between 12-24 months before the cooperator would have access to the seeds. As a result, it is recommended that cooperators order materials sufficiently early to avoid delays in obtaining materials in a timely manner to successfully carry out their research.

Poster Viewing and Discussions

THURSDAY, JULY 14, 2016		
3:30 - 4:30 p.m. Salons ABC	**Poster Viewing and Discussions** ***(Authors Present)*** *Chair: Greg MacDonald, University of Florida*	**PAGE NUMBER**
	Economic Injury Levels and Improved Monitoring for Tobacco Thrips, Frankliniella fusca, in Seedling Peanut. **M.R. ABNEY***, Department of Entomology, University of Georgia, Tifton, Georgia 31794; R.L. BRANDENBURG, Department of Entomology and Plant Pathology, North Carolina State University, Raleigh, NC 27695; and, R. SRINIVASAN, Department of Entomology, University of Georgia, Tifton, Georgia 31794.	**144**
	Evaluation of Peanut Butter in Northern Ghana **Y. ABUBAKARI*,** R. AKROMAH, W. ELLIS AND W. APPAW, Kwame Nkrumah University of Science and Technology, Kumasi, Ghana; M. ABUDULAI, CSIR-Savanna Agricultural Research Institute, Tamale, Ghana; A. BUDU, University of Ghana, Legon, Accra, Ghana; M. CHINNAN andK. ADHIKARI, University of Georgia, Griffin, GA; K. MALLIKARJUNAN, Virginia Tech, Blacksburg, VA, and D.L. JORDAN, North Carolina State University, Raleigh, NC.	**145** Abstract Unavailable
	Peanut (*Arachis hypogaea*) Response to Weed and Leaf Spot Management in Northern Ghana. **M. ABUDULAI*** and S. SEINI, CSIR-SARI, Tamale, Ghana; I.K. DZOMEKU, University for Developmental Studies/CSIR-SARI, Tamale, Ghana J. NAAB, CSIR-SARI, Wa, Ghana; K. BOOTE, University of Florida, Gainesville, FL; and D.L. JORDAN and R.L. BRANDENBURG, North Carolina State University, Raleigh, NC.	**146**
	Comparison of Drying Methhods for Peanut in Ghana **I.K. ADDO,** K.A. DZISI, R. AKROMAH, W. ELLIS, and W.O. APPAW, Kwame Nkrumah University of Science and Tehnology, Kumasi, Ghana.	**147**
	White Mold Control Efficacy Associated with Fungicide Management Intensity and Variety. D.J. ANCO*, J.W. CHAPIN, and J.S. THOMAS, Agricultural and Environmental Sciences, Edisto Research and Education Center, Clemson University, Blackville, SC 29817.	**148**
	Aflatoxin Control: Evaluation of Pre- and Post-Harvest Practices on Toxic Levels in Peanuts **W.O. APPAW,** W.O. ELLIS, I. ODURO, R. AGGELEDBE, and R. AKROMAH, Kwame Nkrumah University of Science and Technology, Kumasi, Ghana; M.B. MOCHIAH, CSIR-CRI, Kumasi, Ghana; and D.L. JORDAN, North Carolina State University, Raleigh, NC.	**149**
	Traditional Processing of Peanut Oil in Ghana: Implications for Food Safety **S. BAAH-TUAHENE*,** A. SIMPSON BUDU and K. FIRIBU SAALIA, Univrsity of Ghana, Legon, Ghana, K. MALLIKARJUNAN, Virginia Tech, Blacksburg, VA; and K. ADHIKARI, University of Georgia, Griffin, GA.	**150**

	QTL mapping for disease resistance in a cultivated peanut x wild species F¬2 population. **C. BALLEN-TABORDA*,** University of Georgia, Athens, GA; S. LEAL-BERTIOLI, University of Georgia, Athens, GA and EMBRAPA, Brasília, Brazil; J. MORRISSEY, Mars, Miami, Florida; E. ANTEPENCO, University of Georgia, Athens, GA; D. LIVINGSTON, Y. Chu, University of Georgia, Tifton, GA; C.C. HOLBROOK, USDA-ARS, Tifton, GA; P. OZIAS-AKINS, University of Georgia, Tifton, GA; S. JACKSON, University of Georgia, Athens, GA; and, D. BERTIOLI, University of Georgia, Athens and University of Brasília, Brazil.	151
	Effect of Storage Treatments on Aspergillus Growth and Aflatoxin Production in Peanuts. C. DARKO, P. K. MALLIKARJUNAN, Biological Systems Engineering, Virginia Tech, Blacksburg, Virginia USA 24061; **M. BALOTA***, Virginia Tech Tidewater AREC, Suffolk, Virginia USA 23437, K. DIZISI, Agricultural Engineering Department, Kwame Nkrumah University of Science & Technology, Kumasi, Ghana AND D. JORDAN, Crop Science, North Carolina State University, Raleigh, NC 27695.	152
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Economic Injury Levels and Improved Monitoring for Tobacco Thrips, *Frankliniella fusca*, in Seedling Peanut.

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Tobacco thrips, Frankliniella fusca, are found in nearly every peanut field in the Southern US, but the economic impact of thrips feeding on modern runner and Virginia market-type cultivars has not been quantified, and no economic thresholds exist. Standard thrips management in peanut consists of an insecticide applied preventatively at planting. This treatment is often followed by a foliar insecticide application if feeding damage is observed in a field. The release of cultivars with high levels of field resistance to Tomato Spotted Wilt Virus may have the unintended effect of moving growers away from cultural management practices for thrips and subsequently increasing insect pressure. The work presented here represents the first year of a multi-year study to examine the relationship(s) between thrips abundance, feeding injury, yield loss, and time to maturity. Field trials were conducted in Georgia and North Carolina (runner and Virginia market-type cultivars respectively) in 2015. The experiments utilized thrips-proof field cages and were arranged in a randomized complete block design with plant age and thrips density per plant as the experimental variables; treatments were replicated six times. Thrips injury was rated weekly, plant height and width was recorded, and pod weight was recorded at harvest. Field cages were not 100% efficient at excluding extant thrips, and original treatment levels were diluted over time. Economic injury levels and thresholds are only useful if effective sampling methods are available for the pest. Thrips are difficult to see and are often found within folded immature peanut leaflets where assessing population density is difficult. Beat cup sampling was compared to absolute sampling (Burlese funnel) to determine the efficiency with which infestation levels could be assessed with the relatively quick and inexpensive beat cup method. Preliminary results suggest that beat cup sampling could be a useful tool for tobacco thrips monitoring in peanut.

Evaluation of Peanut Butter in Northern Ghana

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ABSTRACT UNAVAILABLE

<u>Peanut (*Arachis hypogaea*) Response to Weed and Leaf Spot Management in Northern Ghana.</u>

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Weeds and leaf spot disease can reduce peanut yields and increase cost of production. While herbicides and fungicides have limited availability in many areas of Ghana and currently are too expensive for resource-poor farmers, these pesticides can have a major positive impact on peanut yield. Field experiments were conducted during the rainy seasons of 2009 and 2010 in northern Ghana near Bagurugu, Nyankpala, and Wa to determine the effects of herbicide and fungicide on weed and disease management. Peanut pod yield was often more highly correlated with disease severity and peanut canopy defoliation resulting from early leaf spot (caused by Cercospora arachidicola Hori) and late leaf spot (caused by Cercosporidium personatum (Berk. & M.A. Curtis) Deighton) diseases than with weed biomass. In some instances less disease and canopy defoliation were observed when weeds were controlled less well compared with increased weed management through hand weeding or herbicide. Two hand weedings or applying pendimethalin preemergence with one hand weeding in combination with 4 applications of triadimefon and chlorothalonil resulted in the lowest weed density and canopy defoliation and often the highest yields.

Comparison of Drying Methods for Peanut in Ghana.

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The main objective of this study was to determine the effect of different drying techniques on the quality (aflatoxin concentration) of the peanut. A mixed–mode solar dryer was designed and fabricated to address this objective. The dryer was designed for small-scale commercial farmers. The capacity of the dryer was found to be 35–40 kg of unshelled freshly harvested groundnuts. The dryer had a collector with area 2 m^2. The performance of the solar dryer was tested and compared with sun drying on tarpaulin. The results showed that the moisture content was reduced from 55.4% to 5.0% wet basis within 27hour with an average ambient temperature of 31 °C, average ambient relative humidity of 67%, and average solar insolation of 581Wm-2 in the solar drying. For the sun drying, the moisture was reduced from 55.4% to 11.5% wet basis within the same period under the same conditions. However, 11.5% is above the limit for safe storage of peanut. The maximum temperature during the sun drying was 40.7 °C with corresponding relative humidity of 50.7%. In the solar drying the maximum temperature was 70.1 °C with corresponding relative humidity of 17.9%. The dryer efficiency was calculated to be 22.7%.

<u>White Mold Control Efficacy Associated with Fungicide Management Intensity and Variety</u>.

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This test evaluated three levels of soil disease control across five runner (Georgia 12Y, Georgia 13M, Georgia 06G, TUFRunner 511, and Florunner 727) and five Virginia varieties (Bailey, Sugg, Sullivan, Wynne, and Champs) for white mold (stem rot [*Sclerotium rolfsii*]) management efficacy. The management programs were as follows: low (5 Bravo sprays), moderate (5 Bravo with 4 Orius sprays), and high (early season banded Propulse, followed by 3 Bravo + Orius, two of which also contained Convoy, and 2 Provost sprays). White mold disease levels were related to management intensity (less disease with increased management intensity) and variety resistance to white mold. Yield loss in Georgia 12Y under the moderate intensity program compared to the high intensity program was comparable to the amount seen with Bailey (8 vs. 13%, respectively). Varieties with greater white mold susceptibility (Champs, Georgia 06G, TUFRunner 727, and FloRun 107) exhibited greater yield losses ($\geq$ 25%) when management intensity decreased, indicating their yield contingency on aggressive fungicide management in the presence of moderate to high amounts of white mold disease pressure. These results suggest Georgia 12Y could be effectively managed for white mold using tebuconazole (in this case, four applications), similar to reduced programs commonly used for Bailey.

Aflatoxin Control: Evaluation of Pre and Postharvest Practices on Toxic Levels in Peanut.

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Aflatoxin contamination have been reported to occur and increase at all steps of the peanut supply chain due to inadequate Good Agriculture Practices (GAP) by farmers and inappropriate postharvest handling. Comparative studies of improved and traditional pre and postharvest practices in aflatoxin mitigation along the peanut value chain (field, drying and storage) in Southern Ghana were investigated. Konkoma variety (local) was planted in two peanut growing villages (Ejura and Drobonso) in Ashanti Region, Ghana using farmer-managed traditional and best management practices for the 2014/2015 major and minor planting seasons. Peanut pods harvested from traditional and best management practice fields were solar dried using traditional (bare floor) and improved (tarpaulin) methods respectively for 6 weeks to an average moisture content of 6.25%. Samples dried on tarpaulin were stored in hermetic bags on wooden pallet (improved practice), while pods dried on bare floor were stored in woven polythene sacks on the floor (traditional practice) for 9 months. Samples were analyzed from each stage (field, drying and storage) for aflatoxin. At harvesting, there was no significant difference ($p>0.05$) in aflatoxin levels of peanut grown under different practices for both villages. There was an overall decrease in moldy and discolored peanut using best management practices as compared to traditional practices along the value chain. Interventions significantly ($p<0.05$) influenced aflatoxin levels at drying whereas storage levels were significantly ($p<0.05$) influenced by both interventions and season. For major season, improved practices significantly ($p<0.05$) reduced aflatoxin levels by 50 to 97% at drying and 86 to 99% at storage for Drobonso, and 29 to 93% at drying and 52 to 94% at storage at Ejura compared to the traditional method. Minor season also recorded a significant ($p< 0.05$) reduction of 26 to 96% and 92 to 99% for drying and storage stages respectively in Drobonso; whereas in Ejura had 15 to 100% at drying and 81 to 100% at storage. The improved practices/best management practices are better for mitigating aflatoxin along the peanut value chain compared to traditional practices.

Traditional Processing of Peanut Oil in Ghana: Implications for Food Safety.

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Peanut production provides income for most small scale farmers and processors in Ghana. The quality and safety of peanut products has however become a great concern due to incidence of aflatoxin contamination. In this study, the food safety practices of peanut oil processors were evaluated by conducting a cross-sectional study using a semi-structured questionnaire. The study also sampled peanut products along the peanut oil processing chain from selected communities in the Northern, Ashanti and Greater Accra regions of Ghana. Samples were analyzed for aflatoxins (B1, B2, G1, and G2) using the High Performance Liquid Chromatography. All the traditional peanut processors were females between 36-50 years and originated from the Northern parts of Ghana. They identified insect attack and inadequate rains as the highest causes of defects in peanuts. Forty percent of them thought there were no food safety issues associated with the consumption of defective peanuts whiles 33.3% associated the consumption of defective peanuts to stomach pains among other health issues. They also acknowledged that the shelf life of peanut by-products depended on storage and handling conditions. Total aflatoxin levels detected for raw peanuts, peanut paste, peanut cake, kulikuli and peanut oil were 563.33 μg/kg, 76.8 μg/kg, 117 μg/kg, 160.69μg/kg, and 78.57μg/kg, respectively. These far exceeded the set maximum limit of 4μg/kg by European Union or 20 μg/kg maximum limit by the United States of America. Aflatoxin levels increased with processing. The high aflatoxin levels could be due to improper or non-sorting of raw peanuts and lack of application of Good Manufacturing Practices.

QTL Mapping for Disease Resistance in a Cultivated Peanut x Wild Species F2 Population.

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Late leaf spot (LLS) and root-knot nematodes are important disease of peanut (Arachis hypogaea L.) that negatively affect yield and quality, and increase production costs. Sources of resistance against many diseases are available in the wild Arachis species and thus are of interest to peanut breeding programs. Previously, a mapping population based on a cross between highly polymorphic wild diploid species was used to identify candidate regions in the genome that confer disease resistance. QTLs conferred by A. stenosperma V10309 for late leaf spot resistance have been found on linkage groups A02 and A04 and for root-knot nematode on linkage groups A02 and A09. With this knowledge and confirmation of these QTL in allotetraploid peanut, a population of 218 F2 plants was developed from a cross of A. hypogaea and (A. batizocoi K9484 x A. stenosperma V10309)4x. These were genotyped with 576 DNA markers using the Fluidigm technology. The genotyping, in combination with disease resistance phenotyping, have allowed us to study previously described QTL in a tetraploid background and study new chromosome segments that may confer resistance. For nematode resistance we found 2 main QTL in the A linkage groups A05 and A09 (confirming previous data) and 2 main QTL in the B linkage groups B02 and B07. The QTL results for nematode need some additional validation and QTL analysis for late leaf spot is currently underway. This information will allow us to use A. stenosperma resistance regions for introgression and selection in peanut breeding programs.

Effect of Storage Treatments on Aspergillus Growth and Aflatoxin Production in Peanuts.

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Peanut (*Arachis hypogaea*), a leguminous crop is susceptible for aflatoxin contamination, which is secondary metabolite of some *Aspergillus* fungi, mostly *A. flavus* and *A. parasiticus*. Foods contaminated with aflatoxins can cause hepatocellular carcinoma (a.k.a. liver cancer), stunted growth in children, immune system disorders and subsequently result in trade barriers. Studies have shown that a high percentage of harvested peanuts are already contaminated with *Aspergillus* fungi, and under favorable environmental conditions (27- 33°C and 62-99% RH) for aflatoxins production during storage. This study was conducted to investigate the effects of different packaging systems and treatment conditions on aflatoxin production and quality assessment of peanuts. To asses, aflatoxin production and peanut quality, four peanut (Baileys variety) treatments were employed: raw clean (RC), raw inoculated with *A. Flavus* (RI), inoculated and partially roasted (IPR), and inoculated partially roasted and blanched (IPRB). Treated peanuts were stored under controlled laboratory conditions: temperature of 30 ±1 ^{0}C and water activity of 0.85± 0.01 for 14 weeks. Samples were stored in four packaging systems (ie. polyproperlyene sacks – PS, four-layered high density polyethylene bags – HP, four-layered high density polyethylene bags with oxygen absorber – HPO, and four-layered high density polyethylene bags vacuumed – HPV).

Preliminary results show that storage in the polyproperlyene sacks had a significantly ($p \leq 0.05$) higher aflatoxin production compared to other three packaging systems, with mean values: 11.44, 6.02, 5.54, and 5.82 ppb for PS, HP, HPO and HPV, respectively. Aflatoxin production was significantly higher in the inoculated raw peanuts as compared to the other peanut treatments, with mean values of 12.06, 6.99, 5.12, and 4.52 ppb for RI, RC, IPR and IPRB, respectively. In terms quality, the peroxide value for RC was significantly lower than that of the other treatments, with mean values of 16.62, 9.22, 10.6, and 9.37 for RI, RC, IPR and IPRB, respectively. In addition, peroxide value for polypropylene sacks was significantly higher than other packaging systems with mean values of 14.91, 10.57, 9.99, and 10.4 for PS, HP, HPO and HPV, respectively.

These results indicate the potential of removing oxygen from hermetic packaging, instead of the conventional polyproperlyene bags will help in suppressing aflatoxin production and quality deterioration. Also partially roasted blanched peanuts showed a potential for reducing aflatoxin content and for maintaining quality.

Spanish-type Breeding Lines Developed in an Attempt to Transfer Resistance to Root-knot Nematodes.

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Initial resistance to root-knot nematodes [*Meloidogyne arenaria* (Neal) Chitwood and *M. javanica* (Treub) was transferred into the cultivated peanut from the wild species derived hybrid TxAG-6 by C.E. Simpson and J.L. Starr beginning in 1977 with the first cross between TxAG-6 and Florunner. Since that time much effort has been devoted to developing runner-type cultivars with resistance to root-knot nematodes and pyramiding of other improved traits such as high O/L, resistance to *Tomato spotted wilt virus*, and resistance to Sclerotinia blight (caused by *Sclerotinia minor)*. The TAMU AgriLife peanut breeding program has released COAN, NemaTAM, and Webb over the past seventeen years and continue to use lines with nematode resistance in all of their crossing programs.

We initiated a crossing program in an attempt to transfer the nematode resistance we had developed in the runner-type peanuts to the Spanish-type peanut over a decade ago. OLin and Tamnut OL06 were used as Spanish-type parents and two high oleic, runner-type breeding lines developed from crosses between NemaTAM and Tamrun OL02, were used as the donor parents of the nematode resistance. Several cycles of selections, back-crossing, and three-way crossing have led to a number of breeding lines that carry the nematode resistance and have Spanish-type characteristics. In addition to the nematode resistance, we noted a complete absence of leaf scorch symptoms in our West Texas nursery in 2015 when compared to many of the non-nematode resistant breeding lines and commercial cultivars. The leaf scorch, for lack of a better term, has been occurring late in the growing season and resembles leaf burn associated with salt, but no definitive conclusions have been documented as to the causal agent of this foliar phenomenon.

Peanut Tolerance to Fluridone.

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Fluridone herbicide has been registered since 1986 as an aquatic herbicide. Fluridone is a carotenoid biosynthesis inhibitor (Group 12) herbicide. It is currently labeled for preemergence weed control in cotton in a premix combination with either fluometuron or fomesafen. Fluridone can potentially aid as a resistant weed management tool for problematic weeds like Palmer amaranth (*Amaranthus palmeri*). Research trials were developed in the Southwest peanut-growing region to determine the tolerance of peanut to fluridone herbicide programs. Field studies were conducted during the 2015 growing season in Oklahoma and Texas. Peanut were planted at the Oklahoma Agricultural Experiment Station near Fort Cobb, OK on a Binger fine sandy loam and at a commercial farm near Seagraves, TX on a Patricia fine sand. Virginia peanut (Florida Fancy) were planted in 36-in rows at Fort Cobb and runner peanut (TamRun OL12) in 40-in rows at Seagraves. Fluridone was applied at 0.15 lb ai/A (1X rate) and 0.30 lb ai/A (2X rate) alone or in combination with s-metolachlor (Dual Magnum) at 1.27 lb ai/A or flumioxazin (Valor) at 0.095 lb ai/A. Visual evaluation of crop response was evaluated throughout the growing season. Peanut were harvested with a commercial thresher and samples were used to determine yield. Peanut injury was evaluated at 3 weeks after planting. Peanut injury was 6 to 15% across locations with the 1X rate of fluridone and 14 to 23% with the 2X rate. Peanut injury was again evaluated at 16 weeks after planting and was 14 to 21% across locations at the 1X rate and greater than 40% with the 2X rate. Peanut yields were reduced 19% at Fort Cobb and 17% at Seagraves with the 1X rate of fluridone. Yield reductions were in excess of 50% at Fort Cobb and 30% at Seagraves. The addition of s-metolachlor or flumioxazin did not increase yield loss compared to fluridone applied alone at either location. These studies would indicate that peanut injury from fluridone may be too excessive in southwest peanut production. However, rainfall was above normal and air temperatures cooler than normal in 2015 at both locations.

<u>Evaluation of Alternatives to Chlorothalonil for Peanut Disease Control in Alabama.</u>

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Chlorothalonil shortages have resulted in growers looking for alternatives for controlling leaf spot and soil-borne diseases in peanut. Efficacy of alternatives fungicides and chlorthalonil were compared in 2015 for control of leaf spot dideases and stem rot as well as yield response in an irrigated peanut production system in southeast Alabama and rain-fed production system in southwest Alabama. Trials were conducted at the Wiregrass Research and Extension Center (WREC) in Headland, Alabama and at the Gulf Coast Research and Extension Center (GCREC) in Fairhope, Alabama. Peanut cultivar 'Georgia 09B' was planted on May 26 at WREC and May 27 at GCREC. Plots, which consisted of four 30-ft rows spaced 3-ft apart, were arranged in a randomized complete block with six replicates. Leaf spot diseases were visually rated on October 13 (WREC) and October 14 (GCREC) using the Florida leaf spot scoring system. Counts of stem rot (SR) loci (1 locus was defined as $\leq$ 1 ft of consecutive symptoms and signs of the disease) were made on October 20 (WREC) and October 15 (GCREC) immediately after plot inversion. Plots were harvested on October 23 and yields were reported at <10% moisture. Significance of treatment effects were tested by analysis of variance and Fisher's protected least significant difference (LSD) test ($P = 0.05$). At WREC, stem rot incidence was higher than in previous years due to higher soil temperatures. Leaf spot intensity rating was lower for all fungicide programs than the untreated control. Of the programs tested, only the season-long Mancozeb program had higher leaf spot intensity ratings than did the season-long Echo 720 standard. Better leaf spot control was obtained with Mancozeb + Topsin than any other programs except for CuproFix Ultra + Topsin and CurproFix + Topsin/Mancozeb + Muscle. Among the remaining programs, Mancozeb + Topsin/Mancozeb + Muscle and Absolute/Echo 720, gave significantly better leaf control than the season-long Echo 720 standard. Lowest incidence of stem rot was observed with the CuproFix Ultra + Topsin/Mancozeb + Muscle, and Absolute/Muscle ADV/Echo programs. When compared to the season-long Echo 720 standard, none of the remaining programs significantly reduced stem rot incidence. With the exception of the full-season Mancozeb, Mancozeb + Topsin, and Echo 720 standard, all other fungicide programs had higher yields than the non-fungicide treated control. Elast full-season, Elast/Elast + Custodia, Elast/Muscle ADV, CuproFix Ultra + Topsin yielded higher than the full-season Echo 720 standard. All other fungicide programs had similar yields. At GCREC, stem rot incidence which was similar to that observed in previous years, was low. All fungicide programs had significantly lower leaf spot ratings than the non-fungicide treated control. All fungicide programs, except for the season-long Mancozeb + Topsin program, gave similar leaf spot control as the season-long Echo 720 standard. Rust severity ratings for the untreated control and Echo 720 standard were similar to those recored for the other fungicide programs. With the exception of Mancozeb + Topsin/Mancozeb + Muscle ADV, CuproFix Ultra + Topsin/Mancozeb + Muscle, and Absolute/Echo 720, all remaining fungicide programs had significantly lower stem rot indices than the untreated control. Higher yields were recorded for the full-season Elast and full-season Mancozeb than the non-fungicide treated control. Yield for the full-season Echo 720 standard and all other fungicide programs were similar.

PeanutBase: New Resources for Peanut Researchers.

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PeanutBase (http://peanutbase.org) is under continual development to incorporate new information from and for the peanut research community. The website includes genome browsers, genetic map viewers, sequence search tools, a database of traits and QTL locations, and marker-assisted selection pages with detailed information about markers and accessions for some high-value peanut traits.

New features in 2015-16 include: a gene expression atlas for cultivated peanut, new ways to browse the diploid genome sequences and features, new tools for exploring genes and gene families, a search tool for finding peanut literature, a metabolic pathway viewer, additional QTLs (for root-knot nematodes, bruchid resistance, kernel quality, and other traits), and more than a thousand images of germplasm accessions (pods, seeds, and plants), with links to the USDA GRIN germplasm database. Also new in 2016 is a tool for displaying germplasm information for accessions with geographical locations (e.g. GRIN PI lines) on an interactive, high-resolution geographical map – and, in collaboration with the Legume Information System and Legume Federation projects, an interface for building queries about lists of genes, genomic features, gene expression, and other genomic data in PeanutBase.

PeanutBase is developed at Iowa State University and the National Center for Genome Resources in New Mexico, with funding from The Peanut Foundation and in-kind contributions from USDA-ARS.

Identification of QTL for pollen stainability of F_2 Lines Developed From a Interspecific Cross of Arachis duranensis x Arachis cardenasii.

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We have previously reported the development of an A-genome mapping population, Single Nucleotide Polymorphisms (SNPs), and subsequent QTL analysis based on plant architecture and seed traits of F_2 lines of an interspecific cross of *Arachis duranensis* Krapov. & W.C. Greg. (KSSc38901) x *Arachis cardenasii* Krapov. & W.C. Greg. (GKP 10017). Additional data were collected on the F_2 generation which was never analyzed. Pollen counts based on stainability were conducted on all individuals in the population during the summer of 2013. Flowers were collected, generally after the first flowering date, mounted and stained with a 1:1 mixture of acetocarmine/glycerin on the day of collection. Pollen counts were made by taking the mean of five 100-grain counts made from random fields (maximum ten grains per field). Counts were taken using a Bausch and Lomb dissecting microscope with a 10X eyepiece and 10X lens. As reported earlier, SNPs were genotyped on F_2 lines using KASP chemistry on Light Cycler 480, or using SNPType chemistry on the Fluidigm Biomark HD. This allowed use of markers for either, a more flexible design for use in marker assisted selection or high throughput analysis in the development a genetic map and QTL analysis. The final map consisted of 10 linkage groups, with 144 loci spanning a total map distance of 10,040.3 cM. The A-genome map was compared to the draft A-genome *A. duranensis* sequence using mapped markers, revealed a high degree of synteny between genetic and physical maps. For this analysis Windows QTL Cartographer was used. Analysis was conducted on the transformed pollen stainability data. A LOD score of greater than 2.5 was used as the cutoff for determination of significance at the p<.001 level. Analysis indicates a QTL on linkage group 2 and 7. QTLs detected in our research provide possible markers that can be used as an indication of fertility in interspecific hybrids. Markers may also provide insight into genetic mechanisms associated with fertility of interspecific hybrids.

Release of Lariat Peanut.

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Lariat is a high-oleic runner-type peanut (*Arachis hypogaea* L. subsp. *hypogaea* var. *hypogaea*) that has enhanced Sclerotinia blight and pod rot tolerance when compared to the cultivar Red River Runner. Lariat (experimental designation ARSOK-R35) is the result of a cross between cultivar Red River Runner X PI 274193 of the USDA germplasm collection. Advanced line disease trials indicated that Lariat averaged only 10% incidence of Sclerotinia blight where Red River Runner averaged 22% and the susceptible runner-type check averaged 51%. Furthermore, Lariat does not exhibit a yield boost or significant reduction in disease incidence upon fungicide application, as does Red River Runner. Thus, Lariat is greatly enhanced in resistance to Sclerotinia blight when compared to Red River Runner and will not require fungicide application to increase yields. These tests also indicate Lariat is enhanced in pod rot resistance. Results from Oklahoma state variety tests demonstrate that Lariat is indistinguishable from Red River Runner with regards to yield and grade, thus maintaining those highly desirable traits. Production of Lariat in fields where Sclerotinia blight is present will increase profits for the grower by $150-$200/A. The purpose for releasing Lariat is to provide peanut producers with a high-oleic runner cultivar that not only has excellent grade and yield, but also offers an outstanding fungal resistance package that will reduce fungicide application and therefore increase producers' profits.

Composting: A Biological Process for Aflatoxin Decontamination in Agricultural Environment.

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In developing countries, there is a high occurrence of aflatoxin contamination in peanuts due to climate conditions and handling practices. Contaminated peanut wastes and shells are often used as soil amendments and mulching materials, which re-introduces aflatoxins and aflatoxin-producing molds into subsequent farming seasons. This research evaluated whether composting can be used to control aflatoxin contamination in the agricultural environment by using peanut meal with a high level of aflatoxin contamination as a model matrix.

The peanut meal was uniformly mixed with deionized water. The samples were inoculated with either one of the 3 commercial starters alone or in combination with a commercial accelerator. The control was peanut meal without the starters or accelerator. Samples were incubated at 40°C in a water bath for 6 weeks. Compost temperature, pH and ammonia concentration were documented twice a day during the process. Aflatoxin B1, B2, G1 and G2 were quantified at the end of each week using high performance liquid chromatography. Two replicate experiments were performed and data obtained were analyzed statistically.

Results showed that composting resulted in a significant reduction in the amount of aflatoxin B1, B2, G1 and G2 in peanut meal during the 6 week experiment. The average amounts B1, B2, G1 and G2 decreased from 195.4 to 80.9 ppb, 22.2 to 10.0 ppb, 2.9 to 0.1 ppb, and 1.2 to 0.12 ppb, respectively. The reduction range of B1, B2, G1 and G2 were found to be 72.2-154.9 ppb, 7.4-17.6 ppb, 1.2- 6.9 ppb, and 0.0-2.1 ppb, respectively. Mean compost temperature, pH and ammonia contents ranged from 21.5°C to 48.3°C, 5.6 to 8.2 units, and 0 to ≥ 500 ppm, respectively, at different stages of the composting process.

The research demonstrates that composting does reduce aflatoxin in contaminated peanut meal. The process has the potential to reduce the level of aflatoxin contamination in agricultural environment. Scale up trials with aflatoxin contaminated agricultural wastes will soon be conducted at CSIR-CRI in Kumasi, Ghana.

Solar Drying of Peanuts,

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Solar drying is the most common and economic forms of food preservation. This study evaluated the feasibility of using this traditional approach for dehydrating peanuts. An indirect, passive, wooden dryer, with a galvanized steel panel (4.32 m^2) and five wire mesh shelves (2.12 m^2 each), was constructed. The dryer was evaluated for its capacity in drying a single layer (25 Kg), double layers (2 x 25 Kg), or five layers (5 x 7 Kg) of freshly-harvested peanuts on the University of Georgia Griffin campus.

The moisture contents of the peanuts decreased from 32.3% to 5.8% in the single-layer drying in 5 days, and from 26.6% to 4.7-5.3% in the double-layer drying in 4 days. When five layers of peanuts were dried, the moisture contents decreased from 15.3% to 6.2-7.4% in 2 days. The drying rate/time was weather-dependent. Faster drying rates were observed when peanuts had relatively higher moisture contents with R^2 values ranging from 0.89 to 0.92. Average solar radiation during the drying process ranged from 456 to 597 W/m^2. Total energies generated by the solar panel were from 218 to 423 MJ. The drying efficiency and thermal efficiency are 9.2-36.0% and 7.6-31.8%, respectively.

During solar drying, the ambient temperature and relative humidity immediately above the drying peanuts ranged from 7.9-43.6^oC (avg. 27.4^oC) and 14.6-99.3% (avg. 46.7%), respectively. In the open sun drying that took place simultaneously with the solar drying, the ambient temperature and relative humidity immediately above the drying peanuts were 8.4-46.8^oC (avg. 31.2^oC) and 13.3-100% (avg. 40.1%), respectively. When the same amount of peanuts (25 Kg) was dried by the two approaches, solar-dried peanuts reached 10% moisture content one day earlier than did open sun dried peanuts. Furthermore, solar dried peanuts had relatively lower free fatty acid and peroxide values which are indications of lower levels of lipid oxidation.

The study suggests that solar drying can be used effectively for preserving peanuts in developing countries. Additional drying trials are being conducted at CSIR-CRI in Kumasi, Ghana. Studies on peanut seed germination rate as affected by drying practice are underway.

Evaluating Peanut Cultivars Using a Reduced Cost and a Premium Fungicide Program

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Sclerotium rolfsii and Rhizoctonia solani are soilborne pathogens that cause white mold and limb rot, major diseases in peanut production. The most effective control of these diseases has been with good crop rotation and fungicides. Fungicides cost Georgia's peanut farmers an estimated $80 to $100 per acre each year. Release of new varieties and promising fungicides could offer growers improved management options for white mold and limb rot. The objective of this research was to compare the economic return when either a reduced cost fungicide program or a premium fungicide program was applied to two different varieties (Georgia-06G and Georgia-12Y). The trial was established at the Vidalia Onion and Vegetable Research Center in Lyons, GA. The experimental design was a split-plot and each combination of treatments (fungicide program X variety) was replicated three times. Both programs included seven fungicide applications. The reduced cost treatment was developed around a 4-block tebuconazole (7.2 fl oz/A)/chlorothalonil (1.5 pt/A) program. The premium treatment was developed around a 3-block Fontelis (16 fl oz/A) program with a single application of tebuconazole/chlorothalonil as above. Peanuts were planted on May 20, and harvested on October 29. Plots were rated for leaf spot, TSWV, Rhizoctonia limb rot, and white mold. The most important diseases in the trial were Rhizoctonia limb rot and tomato spotted wilt virus.

Potential Use of Pyroxasulfone in Peanut in the Southwest.

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Pyroxasulfone is the single active ingredient in Zidua® herbicide and is formulated in a premix with carfentrazone (Aim® EC) under the trade name Anthem® Flex or with flumioxazin (Valor® SX) as Fierce®. Pyroxasulfone is classified as a group 15 herbicide, similar to acetochlor (Warrant®), dimethenamid (Outlook®), and metolachlor (Dual Magnum®). These herbicide act by reducing the biosynthesis of very-long-chain fatty acids, which causes a buildup of fatty acid precursors. At present, no pyroxasulfone product is registered for use in peanut. The purpose of this research is to better understand crop response and weed control following pyroxasulfone applications to peanut in the southwest. Studies were conducted in 2014 and 2015 at several locations in the Texas High Plains, south Texas, and at Fort Cobb, Oklahoma. In 2014 near Seagraves, Texas on a Patricia fine sand, systems containing Zidua preemergence (PRE) at 0.054 and 0.08 lb ai/A (1 and 1.5 oz) caused up to 15 and 25% stunt to runner peanut 24 days after planting (DAP) and up to 35 and 47% 40 DAP. These rates applied at-crack (AC) caused 32% injury 40 DAP, but no injury was observed following an early-postemergence (EPOST) application. Palmer amaranth (*Amaranthus palmeri*) control 40 DAP was at least 70% following all Zidua systems. In 2015 at Seagraves 40 DAP, Zidua at 0.054 and 0.08 lb ai/A caused up to 35 and 53% injury when applied PRE and the 0.08 lb ai/A rate caused up to 12 and 10% injury when applied AC or EPOST. Palmer amaranth control was at least 79% 40 DAP for all Zidua systems. In 2015 at Lamesa, TX on an Amarillo fine sandy loam, Anthem Flex PRE at 0.094 lb ai/A injured peanut 37 to 42% 4 weeks after treatment, but controlled Palmer amaranth (*Amaranthus palmeri*) 100%. At Yoakum, TX, on a loamy fine sand, no peanut injury was noted with any Zidua PRE or EPOST treatment. When rated 29 DAP, all Zidua systems provided almost perfect control of Texas millet (*Urochloa texana*) while smellmelon (*Cucumis melo*) control was the best with the Zidua at 0.08 lb ai/A plus Outlook. At a second Yoakum location, no peanut injury was noted with any Zidua treatment. When rated 30 DAP, all Zidua systems provided almost perfect control of Texas panicum and Palmer amaranth while smellmelon control was best with the Zidua plus Valor. At Fort Cobb on a Binger fine sandy loam, Zidua applied PRE at 0.08 lb ai/A did not injure Spanish peanut (TamNutOL06) and controlled Texas millet and ivyleaf morningglory (*Ipomoea hederacea*) 65 and 88% mid-season, respectively. In a second study, Zidua PRE at 0.08 lb ai/A injured Spanish peanut 9%. If registered for use in peanut, Zidua would give growers another option for weed control and provides weed control comparable to Dual Magnum; however, there is concern about peanut response following PRE and AC applications.

Comparing Typical 8 Inch Twin-Row Planting Pattern to a Modified 12 Inch Twin-Row Planting Pattern in Peanut.

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Irwin County peanut farmers plant peanuts in either single or twin-row patterns. This replicated trial compared the typical twin–row pattern with 8 inches separating the two twins in comparison to a modified twin-row with 12 inches separating the two twin rows. Typically in single row planting patterns there is 36 inches between each of the rows. Similarly in this trial the twin-rows on both the 8-inch and 12-inch twin-row patterns are centered on 36 inches. The field was deep turned with a moldboard plow and rows laid off with a tillivator then planted. The four replications of each planting were planted on May 14, 2015 and inverted on October 12, 2015. The trial was 151 days when dug and slightly past optimum maturity due to excessive rain events. The variety was GeorgiaO6G and planted with John Deere 71 planters. The field has three-year rotation with cotton. This trial was intensively managed and under irrigation with a strong leafspot and soil-borne fungicide program as well as an in-furrow and foliar insecticide program. Each replication was weighed. The four replications of the two row patterns were put on separate trailers and graded.

Workflow to Study Genetic Biodiversity of Aflatoxigenic *Aspergillus* spp. in Georgia, USA.

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Aspergillus spp. produce carcinogen-mycotoxins in peanut seeds, causing considerable impact on both human health and the economy. Despite all efforts, currently there is not an effective control to manage aflatoxin contamination of susceptible crops. The purpose of this study was to develop a practical approach to obtain information about the biodiversity of aflatoxigenic *Aspergillus* present in a particular geographic location. Peanut seeds were sampled from the entire state of Georgia in 2014. More than 500 isolates of *Aspergillus* spp. were isolated using modified-dichloran rose Bengal (MDRB) medium and 238 were fingerprinted with 25 InDel markers within the aflatoxin-biosynthesis gene cluster (ABC). Cluster and structure analyses were performed and the genomic DNA of 10 isolates representing various clades were sequenced using illumina® Hiseq2500 at UW-htSEQ, Seattle, WA. All analyses performed (Neighbor-Joining, 3D-Principal Coordinate Analysis, Structure) revealed that the *Aspergillus* isolates sampled in this study were grouped by their capacity to produce aflatoxin. Three main groups were obtained: Group I comprised of ten non-aflatoxin and non-cyclopiazonic acid producers, including one commonly used as biocontrol; Group II included all the aflatoxin B and G producers, *A. parasiticus*; and Group III, the largest, mostly included aflatoxigenic *A. flavus* except for three *A. caelatus* that conformed a sister cluster themselves. The workflow proposed allows screening isolates for aflatoxin production and genotypic variations in the ABC by fingerprinting with InDel markers using capillary electrophoresis. Cluster analysis permitted the selection of representatives within clades for whole-genome sequencing, which supplied DNA information without sequencing all the individuals. Determining genetic diversity in section *Flavi* will provide valuable molecular information to select appropriate target genes to control aflatoxin accumulation in crops.

Informational Resources and Training on Peanuts and Mycotoxins Available from the Feed the Future Peanut & Mycotoxin Innovation Lab.

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The U.S. Feed the Future Peanut & Mycotoxin Innovation Lab (PMIL) is applying cutting-edge science to increase the productivity and profitability of peanut production for smallholder farmers and to reduce the negative impacts of mycotoxin contamination along the value chains of peanut and other crops in five Feed the Future countries – Haiti, Ghana, Malawi, Mozambique and Zambia. Development and dissemination of informational materials on the importance of peanuts and impacts of mycotoxins is an important focus of the communications strategy for PMIL. Simple infographics, translated into several languages, have been produced and made available in print and electronic media to present the benefits of consuming peanuts, and to convey the importance of reducing aflatoxin contamination. Webinars and short videos on mycotoxin sampling and detection, and methods to produce better peanuts and reduce aflatoxin contamination have been produced. All of these are freely available on the PMIL website (pmil.caes.uga.edu). Training in aflatoxin sampling and detection using a simple Neogen lateral flow strip and Mobile Assay eTablet reader has been provided to several researchers in the US, Haiti and Africa. Recently, such training resulted in the Haramaya University in Ethiopia being able to conduct aflatoxin analyses in-house, which was previously a limiting factor for many graduate students there.

Performance Review: Thimet® for Thrips Management and Yield Protection in Peanuts in the Southeastern US.

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Tobacco thrips, *Frankliniella fusca,* are a significant insect pest of peanuts across the southeastern United States. Based on bioassay findings, recent research has documented that some tobacco thrips populations (57 to 65%) have reduced sensitivity to neonicotinoid insecticides (imidacloprid and thiamethoxam). Previous research has demonstrated that peanuts treated with Thimet® 20G (phorate) insecticide have lower damage ratings from tobacco thrips and less incidence of *Tomato spotted wilt virus* (TSWV) compared with untreated peanuts. In 2015, a regional study consisting of replicated, small plot tests was initiated to examine the effects of Thimet on tobacco thrips, TSWV, and peanut yield. Thirteen field trials were conducted by University or Extension scientists located in AL, GA, NC, and VA. All peanut seed was treated with a base fungicide treatment of Dynasty® PD (azoxystrobin, fludioxonil, and mefenoxam). Four insecticide treatments included: Dynasty without insecticide, CruiserMaxx® (thiamethoxam) applied to peanut seed by manufacturer, Thimet, and Velum® Total (imidacloprid and fluopyram) with the latter two products applied in-furrow at planting. Thrips damage ratings and incidence of TSWV were lower on peanuts in Thimet treatments compared with CruiserMaxx, Velum Total, and peanuts not treated with insecticide. All insecticide treatments averaged greater yields compared with the untreated control; however, a return-on-investment analysis revealed that Thimet provided an ROI (5.0) roughly twice that observed with CruiserMaxx (2.6) and Velum Total (2.8). Findings from 2015 replicated trials reinforce prior findings that Thimet is a very useful tool for managing infestations of tobacco thrips in peanuts. In addition, Thimet offers a different insecticide mode of action compared with the neonicotinoid insecticides found in CruiserMaxx, Admire® Pro (imidacloprid), and Velum Total, and an added benefit of Thimet use in peanuts is suppression of TSWV.

The Various Methods to Break Dormancy after Harvest for TUFRunner™ '511' Cultivar

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To maintain good seed viability, peanuts go through a period of dormancy. This study was conducted to determine if dormancy could be broken using 5 different treatments. In 2013 and 2014, building upon initial research in 2012 on three cultivars, we conducted and refined the methods used to break dormancy only using TUFRunner™ '511'. A fresh seed supply of the cultivar was dried to 10% moisture. Treatments were control, dry heat (38C) for 10 days, Ethephon at 1 oz. applied in furrow, and Ethephon(1oz.) + Abound applied in furrow planted in a field emergence test. Field emergence tests were planted at 5, 32, & 62 days after harvest using the 4 treatments as stated above. The emergence count after 14 days from planting found that all treatments had better emergence than the control. Dried and Ethephon (1 oz/gallon) plus Abound(18.4 oz/A) appear to be the best treatments to break dormancy after 5 days, however, Ethephon and Abound applied in furrow were found to be a more practical way to break dormancy than the dried heat method when dealing with a large volume of seed. Also during 2013 and 2014, we conducted 3 towel germination tests using TUFRunner™ '511' to build our case that Ethephon is the best way to break dormancy in peanuts. The first treatment was dried, then Ethephon-applied in lab at the 1 oz. rate, 1.5 oz. rate, and finally the control. Within the towel tests, seed germination of all treatments were better than the control, however there was no difference between the Ethephon 1 oz. rate, 1.5 oz. rate, and the dried heat method. Dormancy appears to be naturally broken after 30 days as we observed near normal germination in the control after 32 days. In conclusion, our research shows that applying Ethephon, plus the Abound treatment applied in the furrow seems to be the quickest and most logical way to break dormancy when treating a large volume of peanut seed in as little as five days.

Evaluation of Root Traits among Peanut Cultivars.

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Seed germination and vigor are important traits for peanut farmers, but are largely overlooked in the breeding process. One major hurdle in breeding for seed germination and vigor is the lack of an assay to discriminate among genotypes. The objective of this research is to identify a method to evaluate and select peanut genotypes, which exhibit superior seed germination and/or seedling vigor. Preliminary work led to the evaluation of various root traits focusing on the root length and diameter. Eleven varieties developed by different breeding programs were used in the experiments. Three seed of each variety were sown in transparent rectangular plastic tubes (30.4 × 5.3 × 2.7 cm, H × L × D) with Turface Athletics® QuickDry® or GameSaver® as media. Two of the seed were removed 4 days after planting to leave only one seedling per tube. Tubes were placed in two different environments: the first group was placed inside a bucket, to eliminate direct light, in laboratory conditions were the mean temperature was 24 degrees Celsius. The second group was placed in a growth chamber were the mean temperature was set to 19.5 degrees Celsius. Tubes were placed at a 74° angle to force roots to follow the tube wall for easy evaluation. Tubes from the two groups were scanned at 7 DAP with an Epson Scanner. After scanning the tubes, roots were harvested, cleaned and scanned again. A second group of tubes in the same conditions was scanned at 14 DAP and roots were scanned after harvesting them. All scans were analyzed with the WinRhizo® software. Pearson Correlation between the tubes scans and the harvested roots was assessed. Data was analyzed as a linear mixed model using SAS® 9.4, a p-value = 0.05 was used to identify statistical differences in the experiments.

Total root length, projected root area, surface area, tips, forks, fine root length and principal root length after 7 and 14 days as assessed by intact tube scans were correlated with its equal by scanning after removal from the tubes. The correlation diminished at 14 DAP as compared to 7 DAP apparently because the roots expanded throughout the tube and were not visible against the tube wall, therefore the harvested roots tended to be greater in size and number compared to the tube scan. There was no cultivar effect and or interaction between cultivar and environment at 14DAP. Cultivar effect was significant ($p<0.05$) for the Total Root Length, Projected Area, Surface Area, number of Forks, Fine roots length and principal root length traits. These traits also showed a significant interaction ($p<0.05$) between the cultivar and environment effect at 7DAP.

The conducted tests confirm that peanut root growth is affected by low temperatures and varieties are affected in a similar way. It is possible to use the tubes scans to assess peanut roots traits having better results 7 days after planting. Since the best results occurred 7 DAP this test might be ideal to assess the seedling vigor of peanut genotypes in a breeding program. Further studies are needed to determine if the tubes can be used to identify varieties with better root architecture in a breeding program.

<u>Imazapic Effects on Purple Nutsedge (*Cyperus rotundus*) Tuber Production</u>

T.L. GREY*[1] and R.S. TUBBS[1],
[1]University of Georgia, Crop and Soil Science Dept, Tifton, GA 31793

Experiments were conducted from 2014 to 2015 to evaluate the effects of imazapic rate on purple nutsedge establishment and growth in peanut. Irrigated peanut experiments were established in fields that were purple nutsedge free. Pre-sprouted purple nutsedge tubers were then placed into sections of the smooth bed after planting with 20 total per plot. Tubers were planted in a random fashion but marked with a flag for future identification. As purple nutsedge emerged, they were covered with a cup and then paraquat plus NIS was applied to remove other weeds. Hand hoeing was also used to remove all weeds expect purple nutsedge. At 3 wk after peanut emergence, imazapic was applied at 17, 35, or 70 g ai/ha. A nontreated control was included for comparison. Prior to peanut harvest, purple nutsedge from half of the plot was excavated by hand to establish total biomass and tubers in the plot. Peanut was then mechanically harvested from the other half of the plot for yield. These samples were then evaluated for all materials that were segregated into nutsedge parts (tubers, stems, and rhizomes), quantified, and peanut graded.

Preliminary Evaluation of Peanut Response to Quick Sol® in North Carolina.

A. HARE*, M.D. INMAN, and D.L. JORDAN, North Carolina State University, Raleigh, NC.

Research was conducted in North Carolina at 2 locations in a total of 5 fields to determine peanut yield response to the product Quick Sol® at 10 oz product/acre applied as sequential treatments 2, 4, and 6 weeks after planting. A minimum if 60 feet separated treated plots and non-treated controls. No other chemicals were applied within 72 hours of application and new equipment was used to make the applications. Treatments were applied using a CO_2-pressurized backpack sprayer calibrated to deliver 15 gallon water per acre. No visible differences in the peanut canopy and growth were observed and pod yield did not differ when comparing yield among treated and non-treated peanut ($p = 0.5690$).

Evaluation of Insecticide Efficacy Against Lesser Cornstalk Borer in Peanut

B.W. HAYES[1]* and M.R. ABNEY[2]. [1]University of Georgia Cooperative Extension, Grady County, Cairo, Georgia 39828; [2]Department of Entomology, University of Georgia, Tifton, Georgia 31794

Lesser cornstalk borer (LCB), *Elasmopalpus lignosellus* (Zeller), is one of the most economically important pests of peanut in southwest Georgia, but there are few effective control options available to producers. Granular chlorpyrifos, a broad spectrum organophosphate, is currently the only insecticide recommended for use against LCB by the University of Georgia. Nevertheless, growers commonly target LCB with foliar insecticide applications. The effectiveness of these applications has not been proven in university research trials. This study was designed to evaluate the efficacy of seven commercially available insecticides against LCB in peanut. The two year study was conducted in irrigated and non-irrigated, commercial peanut fields with active LCB infestations in Grady and Decatur County, GA. Treatments in all experiments were arranged in a randomized complete block design with up to 15 treatments and four replications. Plot size varied by location along with treatment timing and application method. Methods and timing ranged from in-furrow and at planting sprays to banded and broadcast applications when LCB was present. Peanut yields and grades were determined for the middle two rows of each plot. All data were subjected to analysis of variance to identify significant treatment effects. Treatment means were separated using LSD where appropriate. Results from year one of this study showed that Prevathon and Diamond treated plots had increased yield and reduced LCB pod damage. LCB pressure at all research sites was low in 2015 and no significant differences in yield or damage were observed between treatments.

The Feed the Future Peanut & Mycotoxin Innovation Lab – Facilitating US Scientists to Solve Global Problems.

D. HOISINGTON* and J. RHOADS, University of Georgia, Athens

The U.S. Feed the Future Peanut & Mycotoxin Innovation Lab (PMIL), managed by The University of Georgia, is one of the 24 Feed the Future Innovation Labs supported with funding from USAID, and involved partners in 15 US states and 13 foreign countries. By applying cutting-edge science, PMIL aims to increase the productivity and profitability of peanut production for smallholder farmers and to reduce the negative impacts of mycotoxin contamination along the value chains of peanut and other crops in five Feed the Future countries – Haiti, Ghana, Malawi, Mozambique and Zambia. The research program is broadly organized into three areas: germplasm development, mycotoxin detection, and value chain interventions to increase quantity, quality and nutritional impact. PMIL researchers are employing modern molecular tools and approaches to develop improved varieties, evaluating the best on research stations and farmers' fields in the target countries, comparing several methods for crop management, drying and storage, and determining levels of aflatoxin and microbial contamination during processing and providing training on how to improve quality. Over 30 MSc and PhD students are being supported at US and international universities. Numerous informational and training materials have been produced and disseminated widely, and several training workshops conducted each year. More information on the program and the research programs and accomplishments is available on the PMIL website (pmil.caes.uga.edu) and by subscribing to the PMIL eNewsletter and following on social media.

A Fact Sheet on Managing and Harvesting Peanut in Ghana.

D.L. JORDAN* and R.L. BRANDENBURG, North Carolina State University, Raleigh, NC; M. ABUDULAI, CSRI-SARI, Tamale, Ghana; I.K. DZOMEKU, University for Developmental Studies/CSIR-SARI, Tamale, Ghana, G. MAHAMA, CSIR-SARI, Wa, Ghana; M.B. MOCHIAH and M. OWUSU-AKAYAW, CSIR-CRI, Kumasi, Ghana; G. MACDONALD and K. BOOTE, University of Florida, Gainesville, FL; K. MALLIKARJUNAN and M. BALOTA, Virginia Tech, Blacksburg, VA; B. BRAVO-URETA, University of Connecticut, Stores, CT; and J. RHOADS, D. HOSINGTON, and A. FLOYD, University of Georgia, Athens, GA.

Incorporating key steps into a production system is important in optimizing peanut yield. Although resources are limited for production of peanut in Ghana, timely implementation of key practices can increase the likelihood of success. Farmers often dig peanut based on disease incidence and severity irrespective of pod maturity. However, as new varieties with resistance to leaf spot and other diseases become available, and as farmers begin incorporating fungicides into their production systems, digging peanut based on pod and kernel maturation will be more feasible and could positively impact yield and quality of peanut. A chart was developed to assist farmers in maximizing yield based on the interaction of canopy defoliation and pod maturation for traditional varieties that are susceptible to disease and for varieties that are tolerant of or resistant to disease. The fact sheet with the chart will be translated into key languages for use by farmers and others in Ghana in an effort to increase yield and quality of peanut.

Overview of the PMIL Ghana Value Chain.

D.L. JORDAN* and R.L. BRANDENBURG, North Carolina State University, Raleigh, NC; M. ABUDULAI, CSRI-SARI, Tamale, Ghana; I.K. DZOMEKU, University for Developmental Studies/CSIR-SARI, Tamale, Ghana J. NAAB, S. BUAH, and G. MAHAMA, CSIR-SARI, Wa, Ghana; M.B. MOCHIAH, G. BOLFREY-ARKU, A. DANKYI, J. ASIBUO, M. OWUSU-AKAYAW, A. IBRAHIM, B. AMOABENG, J. LAMPTEY, and M. LAMPTEY, CSIR-CRI, Kumasi, Ghana; R. AKROMAH, W. ELLIS, and W.O. APPAW, Kwame Nkrumah University of Science and Technology, Kumasi, Ghana; A. BUDU, University of Ghana, Legon, Accra, Ghana; G. MACDONALD, K. BOOTE, and J. ERICKSON, University of Florida, Gainesville, FL; J. CHEN, D. PHILLIPS, M. CHINNAN, K. ADHIKARI, T. BRENNEMAN, University of Georgia, Griffin, GA; K. MALLIKARJUNAN and M. BALOTA, Virginia Tech, Blacksburg, VA; and B. BRAVO-URETA, University of Connecticut, Stores, CT.

A wide range of abiotic and biotic stresses negatively impact peanut production in the field and generally contributes to the reduced quality of marketed peanut in Ghana and West Africa. Aflatoxin contamination can occur and increase at all steps of the peanut supply chain including production in the field, storage in fields and villages, and in processed products. Interventions at each step of the supply chain can minimize aflatoxin contamination. Improved production in the field including pest resistant cultivars, adequate soil fertility and plant nutrition, and synchronization of peanut pod growth phase with adequate soil moisture can increase peanut yield and quality and minimize aflatoxin contamination. Adequate and timely drying of farmer stock peanut minimizes additional production of aflatoxin during storage in villages prior to marketing. Effective processing of farmer stock and shelled stock peanut can also reduce aflatoxin prior to purchase and consumption. Determining current practices by farmers, conducting research to mitigate aflatoxin and improve peanut quality, and transferring appropriate technology to farmers are needed to improve productivity, profits, and quality of peanut and to increase safety of peanut products consumed by humans and livestock. The primary platform being used to research aflatoxin contamination of peanut in the supply chain in Ghana is taking place in nine villages in northern and central Ghana. Interventions at each step of the supply chain are being implemented and aflatoxin contamination determined. Research is conducted at two institutions associated with the Savanna Agricultural Research Institute (SARI) and at the Crops Research Institute (CRI) to develop appropriate production and pest management strategies and to evaluate new germplasm suitable for the region. Results from efforts at villages and research stations are presented to farmers using the Farmer Field School approach and appropriate posters, bulletins and manuals. Graduate student training is closely linked to activities in villages and research stations. Results from the project are providing farmers in Ghana with information on documented interventions that reduce aflatoxin contamination of peanut throughout the supply chain. Improved productivity and quality of peanut coupled with acceptable levels of aflatoxin in peanut products improve access to local, regional, national and international markets leading to enhanced economic viability of farmers and their communities.

<u>Comparative Study of Aflatoxin Evaluation Across Various Laboratories in the Peanut Mycotoxin Innovation Lab Program</u>,

H. KAYA-CELIKER, P. KUMAR **MALLIKARJUNAN*,** Biological Systems Engineering Department, Virginia Tech, Blacksburg, VA 24060, J. RHOADS, and D. HOISINGTON, Peanut Mycotoxin Innovation Lab, University of Georgia, Athens, GA, 30602.

A major limitation in aflatoxin determination in peanuts is the lack of generally accepted and standardized methods. Even within the Peanut Mycotoxin Innovation Lab (PMIL) program collaborators, different evaluation methods have been reported in individual studies, which make the comparison of results difficult. The current project evaluated systematically compared existing/emerging analytical methods for aflatoxin determination in peanuts and peanut products. A blind test, in which the variety of peanut products was naturally and artificially contaminated with aflatoxin, was prepared to test the current, available analytical methods within the collaborating institutions/analysis laboratories. Analysis methods tested were HPLC, AflaTest Fluorometer by VICAM, FluoroQuant Afla by RomerLabs, RevealQ+LFD by Neogen, Homemade ELISA, ELISA by RomerLabs and e-Reader by Mobile Assay and tested peanut products include: ready-to-use therapeutic food spiked with aflatoxin B1; spiked peanut paste with aflatoxin B1; partially de-fatted peanut paste infected with *Aspergillus parasiticus* NRRL 5862; spiked peanut oil with aflatoxin mix; and, peanut oil extracted from *A. parasiticus* infected peanut paste. The results from the comparative study did not provide conclusive recommendation on any one method. All the methods, including HPLC, did not agree with known level of toxin in the products and without appropriate dilution methods, many methods resulted in erroneous output for toxin levels higher than 50 ppb. The emerging technology (eReader from Mobile Assay) has promising potential for broader utilization for mycotoxin evaluation.

Potential Nitrogen Credits from Peanut Residue

M. J. MULVANEY*, West Florida Research and Education Center, The University of Florida, Jay FL 32565; K. S. BALKCOM, USDA-ARS, Natl. Soil Dynamics Lab., Auburn, AL 36832; C. W. WOOD, West Florida Research and Education Center, The University of Florida, Jay FL 32565; D. JORDAN, North Carolina State University, Raleigh, North Carolina 27695-7620

Availability of residue nitrogen (N) to succeeding crops is dependent on N mineralization rates during decomposition. Following peanut (Arachis hypogaea L.) production, Extension currently recommends 22-67 kg N/ha credit to subsequent crops but these recommendations are not supported in the literature, nor do they specify if the credit is applied to a subsequent winter or spring crop. The objective of this study was to assess N release rates in the field from the residues of three peanut varieties (NC V-11, GA 02-C and ANorden) at two placements (surface and 10 cm deep) and two locations representing northern and southern extremes of commercial peanut production in the US (North Carolina and Alabama). Litterbags containing the equivalent of 3.5 Mg/ha were placed in a completely randomized design at both locations with four replications and retrieved periodically up to 335 days after application. Results were fit to single or double exponential decay models to determine N mineralization during subsequent crops. N mineralized from peanut residue during a subsequent wheat (Triticum aestivum L.) crop was estimated at 14-19 kg N/ha when peanut residues were buried after harvest, and 19-24 kg N/ha when left on the soil surface. N mineralized during a subsequent cotton (Gossypium hirsutum L.) crop was estimated at 2-9 kg N/ha (buried) and 6-10 kg N/ha (surface). Current extension publications recommend N credits following peanut at higher rates than the results of this study suggest and warrant re-examination.

***Cercospora arachidicola* and *Cercosporidium personatum*, Genome Release and Comparison**

V.A. ORNER*, R.S. ARIAS, X.M. WANG, USDA-ARS National Peanut Research Laboratory, Dawson, GA, 39842; E.G. CANTONWINE, Department of Biology, Valdosta State University, Valdosta, GA, 31698; and A.K. CULBREATH, Department of Plant Pathology, University of Georgia, Tifton, GA, 31793.

Cercospora arachidicola and *Cercosporidium personatum*, causal agents of early and late leaf spot, respectively, are important fungal pathogens of peanut. Leaf spot disease is a major contributor to the economic losses experienced by peanut farmers and the industry annually. Though peanut germplasms with some level of resistance to leaf spot have been identified, much remains unknown about the pathogens and their genetic diversity. The first step toward gaining knowledge is identifying the genome sequence of these organisms. We have sequenced the genomes of *C. arachidicola* and *C. personatum* and identified polymorphism among isolates by simple sequence repeat (SSR) fingerprinting. A genome-wide comparison of both genomes and transcriptomes will be presented. Information about these pathogens at the DNA and RNA level will help identify genotypes, which will be made available to breeding programs to challenge potentially resistant peanut germplasm.

Multi-Year Performance of Peanut Varieties in an Irrigated Environment

W. PARKER*, Cooperative Extension, University of Georgia, 434 Barney Avenue, Millen, GA 30442; S. Ingram, Cooperative Extension, University of Georgia, 284 Hwy 119 S, Springfield, GA 31329; S. MONFORT, J.P. PAULK, Department of Crop and Soil Science, University of Georgia, Tifton, GA 31793.

Peanut variety selection is often difficult and, in many cases, leaves growers wondering whether they made the right variety selection decision. The historical standard for variety testing information was to have two to three years of data prior to release of any give variety. Three variety trials were conducted for crop years 2013-2015 in on-farm trials in Jenkins County and at the Midville Research Center for 2014-2015. The Jenkins and Midville sites were replicated three and five times respectively and were planted in an irrigated environment; all trials were in a randomized complete block experimental design. Yield and grade (total sound mature kernels {TSMK}) were determined, and each plot was rated for tomato spotted wilt virus (TSWV). Varieties assessed in Jenkins for all three years included: Georgia 06G, Georgia 09B, Georgia 07W, Florida 07W, and FloRun 107. Varieties assessed at Midville for two years included: Georgia 13M, Georgia 06G, Georgia 12Y, TUFRunner 727, TUFRunner 511, Georgia 09B, and FloRun 107.

Characterizing Small RNA Populations in Non-Transgenic and Aflatoxin-Reducing-Transgenic Peanut Lines.

I. POWER*, R. ARIAS, V. SOBOLEV, P. DANG, and M. LAMB. USDA-ARS National Peanut Research Laboratory, 1011 Forrester Dr., SE, Dawson, GA 39842.

Aflatoxin contamination is a major constraint in the food production worldwide. In peanut (*Arachis hypogaea* L.) these aflatoxins are mainly produced by *Aspergillus flavus* (Link) and *A. parasiticus* (Speare). The use of RNA interference (RNAi) is a promising method to reduce or prevent the accumulation of aflatoxin in peanut seed. A method to evaluate the effectiveness of RNAi is to study the profiles of small RNAs (sRNAs), in particular those derived from the RNAi construct. In this study, we performed high-throughput sequencing of small RNA populations in two peanut lines that expressed an inverted repeat targeting five genes involved in the aflatoxin-biosynthesis pathway, and that showed 84-100% less aflatoxin B1 than the controls, with the aim to determine the putative involvement of these sRNAs in aflatoxin reduction. In total, 132 known micro RNA (miRNA) families and more than 300 putative novel miRNAs were identified. Among those, 23 known and four novel miRNAs were differentially expressed in the transgenic lines. We furthermore found two sRNAs derived from the inverted repeat as well as 94 sRNAs that mapped without mismatches to *A. flavus* and were only present in the transgenic lines. This information will increase our understanding of the effectiveness of RNAi, and enable the possible improvement of the RNAi construct.

Validation and Adoption of a Novel Method of Aflatoxin Detection in Peanut Using a Tablet Reader

J. RHOADS*, D. HOISINGTON, J. WANG, A. SEAWRIGHT, University of Georgia, Athens; D. COOPER, Mobile Assay, Boulder, CO; K. MALIKARJUNAN, Virginia Polytechnic and State University, Blacksburg, VA; W. APPAW, KNUST, Kumasi, Ghana; N. OPOKU, University of Development Studies, Tamale, Ghana.

Accurate quantitation of aflatoxin contamination generally requires sophisticated, expensive laboratory equipment, potentially dangerous solvents, and skilled laboratory technicians. These limitations create barriers to improved aflatoxin detection and control for markets, as well as research in developing countries. Beginning in 2014, PMIL began collaboration with Mobile Assay, the producer of mReader, a lab on mobile platform software application, to validate and beta test their technology for use with peanuts in target countries. Comparative analysis with uHPLC and other systems using spiked and naturally contaminated samples have shown the method to be adequately sensitive and accurate. Use of non-reagent grade ethanol for extraction is less toxic than other solvents and cost and durability have proven to be favorable to other methods. The tablet is now deployed in 9 countries for use in both research and commercial analysis in peanuts.

Thrips Management: Utilizing Both In-Furrow and Foliar Insecticides for Thrips Control in Peanut.

R. L. BRANDENBURG, **B. M. ROYALS*,** Department of Entomology, North Carolina State University, Raleigh, NC 27695-7613; and D. L. JORDAN, Department of Crop Science, North Carolina State University, Raleigh, NC 27695-7620.

Tobacco thrips, *Frankliniella fusca* (Hinds) is the most common species in the Virginia-Carolina peanut (*Arachis hypogaea L.)* crop. Thrips have traditionally been effectively managed with common insecticides including Temik (aldicarb) and Thimet (phorate) applied in furrow and Orthene (acephate) applied post emergence. With the loss of Temik, peanut growers sought alternative ways to reduce plant injury caused by thrips feeding and tomato spotted wilt virus (TSWV) suppression. Replicated test plots were established at multiple locations in North Carolina in 2012-2015. Studies included Thimet, Orthene, Admire Pro (imidacloprid), and Velum Total (fluopyram + imidacloprid). Products were applied as a seed treatment, in- furrow at planting, or postemergence spray. Plots were evaluated for thrips damage by taking visual injury observations on newly formed plant leaflets on a visual injury scale 0-10. The incidence of TSWV was determined by visual inspection of all plants showing possible symptoms of the virus. Results indicate consistent and reliable control providing effective alternatives to Temik. The incidence of TSWV was lower in 2014 and 2015 than previous years, but results were inconclusive. Additional trials are needed to validate these treatment effects on TSWV.

Development of DNA Markers for Newly Identified High-Oleate Peanut Mutants.

M-L. WANG, **B. TONNIS*,** G-A PEDERSON, USDA-ARS, PGRCU, Griffin, GA 30223-1797; Z-B CHEN, Department of Crop and Soil Sciences, The University of Georgia, Griffin, GA 30223-1797; and C-Y CHEN, Department of Crop, Soil and Environmental Sciences, Auburn University, Auburn, AL 36849.

Development of high-oleate cultivars is one of the important objectives of peanut breeding because consuming products containing high oleate can benefit human health in many aspects. By screening the entire USDA cultivated peanut collection, we have identified two new high-oleate mutants (PI 342664 and PI 342666 containing 80% oleic acid in seeds). Both mutant lines contained a substitution of G448A in *FAD2A* and a substitution of C301G in *FAD2B*. Our mutants do not have flowers on the main stem (subspecies *hypogaea*), but a previously identified natural high-oleate mutant 'F435' does have flowers on the main stem (subspecies *fastigiata*). Therefore, we have identified a class of natural mutants from the subspecies *hypogaea* and provided breeders with new additional genetic resources to use for developing high-oleate cultivars. Utilizing new mutant lines to develop high-oleta cultivars may help to broaden their genetic diversity and reduce their vulnerability in peanut cultivation.

Previously our laboratory developed genotyping assays for identifying high-oleate peanuts in molecular breeding programs by real-time PCR and allele-specific PCR platforms. To facilitate peanut molecular breeding, we are developing a real-time PCR genotyping assay for the newly identified mutants. Instead of detecting one substitution on *FAD2A* and one insertion on *FAD2B*, the new genotyping assay will detect one substitution each on *FAD2A* and *FAD2B*, respectively. The detailed results will be reported on the meeting.

Cloning and Functional Analysis of Phytochrome A and Phytochrome B During Peanut Early Pod Formation.

S-Z. Zhao, Y. Zhang, L. Hou, and **X-J. Wang*,** Biotechnology Research Center, Shandong Academy of Agricultural Sciences; Shandong Provincial Key Laboratory of Crop Genetic Improvement, Ecology and Physiology, Jinan 250100, PR China.

Arachis hypogaea L. geocarpy is a unique feature from other legume plants. Flowering and fertilization are achieved above ground, while pod formation and development completed in the soil. The zygote divides only few times forming pre-embryo and further development of embryo stopped when exposed to light condition or normal day/night period. Previous study indicated that phytochromes, sensing red and far-red light, play an important role for modulating peanut embryo development.

In this study, full CDS of *AhphyA*, *AhphyA-like* and *AhphyB* were cloned base on RACE and sequence information from peanut database. Protein structure analysis showed that 7 conservative coding domains, which were analogues of phytochromes from a number of other plant species were existed in these proteins. The C-terminal of AhphyA, AhphyA-like and AhphyB could interact with phytochrome-interacting factor 3 in vitro. The expression patterns of these genes were analyzed in varying tissues by qRT-PCR, and significant difference was observed. The changes of expression pattern of *AhphyA* and *AhphyB* were not much during gynophore growth, while the changes of *AhphyA-like* expression level were distinct. Protein accumulation of AhphyA and AhphyB in gynophore was different during peanut pod early development stage. We speculated that these genes might be involved in regulating pod early development by response to light signal.

Multi-year Evaluation of Cultivars and Advanced Breeding Lines for Resistance to Verticillium Wilt and Peanut Pod Rot.

J.E. WOODWARD*, Texas A&M AgriLife Extension Service and Plant and Soil Science, Texas Tech University, Lubbock, TX 79403.

Verticillium wilt, caused by the soilborne fungus *Verticillium dahliae*, and the pod rot complex, caused by *Rhizoctonia solani* and several *Pythium* spp, are major diseases of peanut in west Texas. Field tests were conducted from 2010 to 2015 to evaluate cultivars in fields with a history of pod rot and/or Verticillium wilt. Tests included various commercially available Runner, Spanish and Virginia market-types, as well as advanced Runner breeding lines. Disease assessments were made throughout each growing season and pod yields were used to compare cultivars. The onset of Verticillium wilt varied by both year and by location. High levels of wilt (>20% incidence) were observed each season. Overall, wilt incidence was highest for the cultivars Tamnut OL06 (Spanish), Flavor Runner 458 (Runner) and Jupiter (Virginia). Incidence ratings varied between other Runner and Virginia entries. Runner-types consistently exhibiting lower levels of Verticillium wilt consisted of Georgia-09B, Florida 07, Tamrun OL11, as well as two breeding lines. The Virginia cultivars Bailey, Sugg and Perry had among the lowest Verticillium wilt ratings, whereas, ratings for Florida Fancy were intermediate. Likewise, pod rot ratings varied by year and location; however, differences among cultivars were observed. In general, pod rot was more severe for Virginia-types followed by Runner cultivars, with Tamnut OL06 having considerably less pod rot. The Runner cultivars Georgia-09B and TUFRunner™ '727' exhibited pod rot levels similar to those of Flavor Runner 458. In contrast, the lowest levels of pod rot were observed in Tamrun OL07 and ACI 149. Pods of several breeding lines appear to possess resistance to *R. solani* and/or *Pythium* spp. Pod yields did not correlate with final Verticillium wilt incidence ratings; however, a positive correlation was found to exist between pod rot ratings and damaged kernels. These results suggest that differences exist between different market-type and cultivars within a market-type. Additional fields studies will be conducted using these and other cultivars to better characterize disease reactions to both pod rot and Verticillium wilt.

Genetic Diversity of Local Peanut Varieties in Henan of China Based on SSR Markers.

H. YANG*, Y. HU, P. LI, R LIU, L. ZHU, Zhengzhou Institute of agricultural and Forestry Sciences, Zhengzhou 450005, China; S. HAN, Industrial Crops Research Institute, Henan Academy of Agricultural Sciences, Zhengzhou 450002, China; M. YUAN, Shandong Peanut Research Institute, Qingdao, China; and G. HE, Department of Agricultural and Environmental Sciences, Tuskegee University, Tuskegee, AL 36088.

Peanut is an important economic oil crop in the world. Evaluation of the genetic diversity of released peanut cultivars and intermediate breeding lines can provide important guidance for peanut breeders. In this study, sixty peanut varieties (lines) that have been released and cultivated in Henan province of China were used for DNA fingerprinting to reveal their genetic diversity using 200 pairs of polymorphic SSR markers. Genetic similarity among these genotypes was 0.3, indicating their quite diverse genetic background might be due to a broad range of materials including wild species used as parents in peanut breeding programs in Henan. Several groups were formed based on the population structure and cluster analysis. Molecular markers tracing pedigree of these genotypes will be discussed.

Resveratrol Accumulation during Peanut Germinate with Phenylalanine Feeding & Ultrasound Treatment.

M. YU *, X-H. WANG, M. LU, H-Z. LIU, Y. YANG, Q. WANG, Institute of Food and Processing, Liaoning Academy of Agricultural Sciences, Shenyang 110161, China; and Institute of Food Science and Technology, Chinese Academy of Agricultural Sciences, P.O. Box 5109, Beijing 100193, China.

Peanut sprout is a kind of high quality natural food which has important effect on health-care. It contains abundant bioactive substances such as resveratrol and lower fat. Resveratrol is a natural occurring stilbene phytoalexin phenolic compound produced in response to a variety of biotic and abiotic stresses. In this study, we investigated the effects of ultrasonic (US) treatments and phenylalanine (PHE) feeding simultaneously on enhancing resveratrol during peanut germination. Based on Box-Behnken design, interactive effects of US & PHE treatment parameters were evaluated. The optimum conditions for resveratrol accumulation were: PHE concentration at 0.8 mM, US power at 240 W，US treatment time at 30 min, US treatment temperature at 35C. By using the optimum condition, resveratrol concentration in germinated peanuts reached 36.99μg /g (DW), which was almost 9.4 times higher than that in the non-germinating peanut. Overall, the study results indicated that US treatment combined with PHE feeding can be an effective method for producing enriched-resveratrol peanut sprout as a functional vegetable.

MINUTES

BOARD OF DIRECTORS MEETING
48th Annual Meeting
Clearwater, FL
13 July 2016

Board Members Present:

President Tom Stalker	Yes
President-elect Corley Holbrook	Yes
Past President Naveen Puppala	Yes
Darlene Cowart	Yes
Peter Dotray	Yes
Wilson Faircloth	Yes
David Jordan	Yes
Marshall Lamb	Yes
Jim Elder	Yes
Barry Tillman	Yes
Howard Valentine	Yes
Dan Ward	Yes
Executive Officer Kim Cutchins	Yes

President Tom Stalker called the meeting to order at 5 p.m. Members present are noted above and constitute a quorum.

Minutes of June 13, 2016 meeting

Minutes of the June 13, 2016 Board meeting were distributed to the Board for review prior to the meeting. President Stalker asked for any changes and/or additions. It was noted that the amount of the 2017 registration fee for 2017 was not included in the motion that passed. The minutes will be amended to include $25 increase in the registration fee for all membership categories, except students. President Stalker called for approval of the minutes. It was moved by Jim Elder, seconded by Naveen Puppala, and unanimously passed to:

Approve the minutes of the June 13, 2016 Board meeting, with the addition of the words "by $25" to the motion to increase the 2017 Annual Meeting registration fee.

Executive Officer Report

Kim Cutchins reported that APRES operations are in good order, stated she now has solutions in place to deal with some personal distractions and will be able to catch up on her major objective for the year *(increasing APRES membership).* She recognized Tom Stalker, Corley Holbrook, Greg McDonald, Ramon Leon, Jennifer Tillman, Donna Holbrook and Jack Davis for their tremendous effort in putting together this year's meeting, which is on target to match or exceed last year's attendance. Operationally, she reported systems are in now in place that help APRES run efficiently and effectively, allowing her to add new things to her plate without adding too much burden. New this year was the Constant Contact email marketing system (at a cost of $20 per month), which gives membership emails a more professional look and provides feedback how effective each email is at reaching the APRES membership. Kim also related that she will continue to attend as many industry meetings as her time allows, stating that it gives APRES greater visibility and helps in membership retention and support. She thanked the Board for their understanding and support and is ready to assist the APRES Board and

Committees as it moves into the 2016-17 membership year.

NEW BUSINESS

The following Committee reports were presented to and approved by the Board. Action taken by the Board is in italics. Unless changes were made or action taken for parts of the reports during the business meeting, in which case a note is made that the revisions were accepted, the Board voted to accept each report as presented. Full reports from each committee are to be presented at the July 14th Business Meeting and Awards Ceremony in the Ballroom at 5:00 p.m.

FINANCE COMMITTEE:

Chairman Todd Baughman reported the Finance Committee met July 12th to discuss the APRES financial statements and ways to increase APRES resources.

Balance Sheet

APRES financial statements are now being reported using the accrual system as requested by the Board at its July 2015 meeting. Current assets are $311,152, primarily in cash—checking, CDs. Accounts receivables of $27,549 are noted.

Liabilities are employment taxes and withholdings of $473 and total equity of $310,679.

Profit & Loss Statement

Income through June 30, 2016 is $112,685 and expense is $35,032. Todd noted the majority of expenses for APRES occur in July/August when the bills for the Annual Meeting arrive and are paid. Kim highlighted the amount for Contract labor is the new email marketing service she mentioned earlier. Net income for the 6-month period is $78,165.

Budget 2016

Chairman Baughman related the budget is right on target at the 6-month mark. It should be noted that the sponsorships income includes a $10,000 accounts receivable from 2015. Actual sponsorship totals to date for 2016 are $38,952. Administrative expenses are on target; however, the program committee has informed the Committee that expenses for the Clearwater meeting may run a little higher than budgeted due to increased attendance levels--More people means increased expenses with same level of sponsorships. Kim added that book sales have been brisk at the meeting with potential for selling out the first order of 50 books.

Fundraising Ideas

Chairman Baughman noted that there are currently two major sources of income for APRES—membership dues and Annual Meeting income (registration fees/sponsorships). He noted that with attendance on the rise, APRES must find additional sources of income to support the Annual Meeting while retaining the “family feel” of the meeting. The Committee bounced around several ideas for potential sources of revenue, from increasing the registration beyond the $25 increase approved by the Board in June to writing grants to the National Peanut Board and Peanut Foundation for support of Peanut Science and is asking the Board to consider these two suggestions.

Annual Meeting Registration Fee Increase

The Board discussed whether APRES should charge a fee for spouses or increase the 2017 registration fee for attendees by $50 from the 2016 level (excluding student registration fees from the increase). It was moved by Dan Ward, seconded by Corley Holbrook, and unanimously approved to:

Increase the 2017 Annual Meeting registration fee by $50 over the 2016 level. Student registration fees will remain the same.

Early Bird Registration fees for 2017 will be $250 for members; $350 for non-members; and,

$50 for students. Late registration fees will be $350 for membership; $450 for non-members; and, $100 for students.

<u>Grant Opportunities</u>
The Board discussed the pros and cons of seeking a grant to help support Peanut Science and whether doing so would affect the integrity of the journal. It was noted that most scientific journals are moving to open access and reducing/eliminating author page charges and, if Peanut Science is to compete, it must find ways to reduce expenses or find additional revenue to compete with other journals. On the expense side, APRES has re-negotiated its contract with Allen Press for one year (YE2016), but the savings is not enough unless it brings the journal in-house. APRES staff and the Publications Committee are examining this option. It was moved by Corley Holbrook, seconded by Jim Elder and unanimously approved:

That the Chairman of the Finance Committee will discuss the feasibility of a grant from the National Peanut Board to partially support the publication of Peanut Science.

It was moved by David Jordan, seconded by Dan Ward, and unanimously approved to:

Accept the report of the Finance Committee.

NOMINATING COMMITTEE

The Nominating Committee met on June 28th via conference call to discuss positions on the APRES President-Elect and Board of Directors which will be coming open at the July Board meeting. All members of the Committee except Dr. Noel Barkley were present. Committee members discussed requirements for being a Board member, which are 5-year member of APRES, served on 3 different Committees, and familiar with APRES and its members. Using the stated criteria, the Committee recommends the following slate of nominees for the APRES 2016-2017:

Officer Nominees:

2016-17 President	Dr. Corley Holbrook USDA-ARS
2016-17 President-Elect	Dr. Peter Dotray Texas A&M University
2016-17 Past President	Dr. Tom Stalker North Carolina State University

Board of Directors Nominees:

VC area:	Dr. Rick Brandenburg (2019) North Carolina State University
SE area:	Dr. Peggy Ozias-Akins (2019) University of Georgia
SW area:	Michael Baring (2017) Texas A&M University *(Complete Peter Dotray's Term as SW Rep)*
USDA Representative:	Dr. Marshall Lamb (2019) National Peanut Research Lab
Industrial Representative:	Darlene Cowart (2019) Birdsong Peanuts
American Peanut Council:	Howard Valentine (2017)

National Peanut Board: Dan Ward (2019)

Each nominee has been contacted and has agreed to serve, if elected. In concluding his report, Naveen re-emphasized the need to get more people involved on APRES Committees in order to expand the number of potential Board nominees.

Incoming APRES President Corley Holbrook stated he has almost completed his Committee roster assignments for 2016-17.

Barry Tillman made the motion, seconded by Howard Valentine, and unanimously approved:
To accept the report of the Nominating Committee.

PUBLICATIONS & EDITORIAL COMMITTEE

Chris Liebold reported for Chairman Chris Butts who is recovering from a heart attack. He shared that Dr. Butts is recovering well and will be leaving the hospital shortly.

Peanut Science

Dr. Grey's report on the status of Peanut Science will be covered in full at the business meeting. Dr. Liebold stated the Committee discussed the issues of impact factor, competing journals, etc. which are factors when an author decides which journal to publish research. As APRES finances have stabilized and are showing a net income over expense for the last 3 years, the Committee is asking the Board to approve their recommendation of making Peanut Science a completely Open Access journal which will hopefully increase viewing which is a critical determination in acquiring an impact factor. The Board unanimously agreed to add this recommendation for a vote at the Membership Business meeting.

Peanut: Production and Management Book

Dr. Chris Liebold will be lead editor; Dr. Shyam Tallury and Dr. Nick Dufault have agreed to be co-editor of the book. A list of chapters with outlines and proposed lead authors was voted upon and approved by the Committee. Dr. Liebold presented the outline to the Board for their review and approval. During discussion, Dr. Liebold shared that the audience for the book will be the APRES membership with a North American focus. The lead publishing choice is Amazon with its Create Space platform—free to use the service; print on demand service. Editors and lead authors will have to format the book using the Amazon template. Amazon pays a royalty for each book published. A Fall 2017 publication date is anticipated. After discussion of the outline, the Board gave its approval with the caveat to ensure there is balanced representation from all growing regions in the authorship of the book and where appropriate include international authors. Additionally, each chapter should have sustainability as a core ingredient.

PEANUT QUALITY COMMITTEE

The Committee has no action to bring before the Board and will report at the Business Meeting. Mark Kline informed that he will be taking a new position with Hershey that may take him away from attending APRES and regretfully resigned as Chairman of the Committee. John Bennet has agreed to serve as Chairman; Robert Moore as Secretary.

PUBLIC RELATIONS COMMITTEE

Resolutions

Jason reported he received a resolution for Ellis Hauser, USDA-ARS and would like to have a moment of silence at the Annual Meeting for the following members of the peanut industry who deserve remembrance:

Russell Schools – Virginia Peanut Growers Association
Antonio Krapovickas – Father of Peanut Taxonomy

Ted Webster – University of Georgia
Ellis Hauser – USDA-ARS

Tiered Sponsorship Platform
Last year the Committee in conjunction with Kim developed a new flyer to help Program Committee members approach potential Annual Meeting sponsors. The Board has reviewed the platform and made no recommendations for changes. Therefore, the Committee would like the Board to seek the membership's approval for the creation of a new membership category—Diamond Level for APRES supporters who give $5,000 or more—to be added to the current levels of Silver Gold, and Platinum.

Opportunities to Increase Membership and Meeting Attendance
The Committee discussed several ideas:

- Develop outreach to local colleges at meeting
- Identify similar groups to contact
- Collegiate/media outreach
- APRES Ad
- Identify opportunities to promote the new book
- Suggest Allison Floyd, PMIL as a potential Committee member

It was unanimously approved to seek approval at the Business meeting to:

Conduct an electronic membership vote (after 30 days notice) for approval of a new Diamond membership category for APRES supporters at the $5000 and above level.

BAILEY AWARD COMMITTEE

Chairman Scott Monfort reported that nominations were received from all nine eligible sessions of the 2015 Annual Meeting and nominees were notified shortly after the meeting. Six manuscripts were received and accepted for final evaluation. They were ranked and the Committee came to a unanimous decision. The winning paper will be presented at tomorrow's Awards ceremony.

FELLOWS COMMITTEE

Chairman David Jordan forwarded one name for the attribute of Fellow of the Society. The Committee unanimously recommended and the Board unanimously agreed to bestow the honor of Fellow of the Society in a recognition ceremony at the 48th APRES Business Meeting in Clearwater, FL on:

Eric Prostko , University of Georgia.

SITE SELECTION COMMITTEE

2018 Meeting
Barry Tillman, Committee Chairman, reported that under the guidance of Maria Balota the Committee is recommending that APRES choose Williamsburg, VA as the site for the 2018 Annual Meeting. He asked the Board to empower Executive Officer Kim Cutchins to finalize the negotiations between the Doubletree Williamsburg and the Williamsburg Lodge and make the final hotel selection.

50th APRES Anniversary
Chairman Tillman reminded the Board that the 2018 will be the 50th Anniversay of the APRES Annual Meeting. He suggested that the Board put together an ad hoc committee to plan 50th Anniversary celebration event and historical remembrance for this special occasion. **Incoming**

President Corley Holbrook was asked to put together this ad hoc committee in consultation with President-Elect Peter Dotray and Maria Balota.

2019 Meeting
Auburn University has requested to be the lead university in the search for the 2019 property. Dr. Charles Chen and Hannah Jones will be the Committee's 2019 search representatives.

Proposed Committee Representation Change
The Committee is also asking the Board for approval to present the following change to the APRES by-laws for adoption by the APRES membership. This announcement at the Board of Directors meeting will start the 30-day clock. An electronic vote will be conducted for approval.

Article IX. Committees; Secton 2; Point h; first sentence shall be changed to read as follows *(changes and addtions are in* ***bold****; eliminated words have been ~~struck through~~):*

h. *Site Selection Committee*: This committee shall consist of **six** (~~four~~) members, **two members from each region** that represent the diverse membership of the Society and with each serving three-year terms.

It was unanimously approved to give notice of this proposed by-law change at the APRES Business meeting.

COYT T. WILSON DISTINGUISHED SERVICE COMMITTEE

Chairman Corley Holbrook reported the Coyt T. Wilson Service Award Committee reached a unanimous recommendation for the 2016 award: Dr. Timothy B. Brenneman.

Committee members for 2016 were Austin Hagan, Emily Cantonwine, Jason Woodward, and Corley Holbrook, Chair. All business for this committee was conducted electronically. After reviewing all nominations, the committee unanimously recommended that the 2016 Coyt T. Wilson Distinguished Service Award be presented to Dr. Timothy B. Brenneman. Dr. Brenneman has been an active member and strong supporter of APRES for 32 years. His outstanding contributions to the society make him richly deserving of the 2016 Coyt T. Wilson Distinguished Service Award.

It was moved by Darlene Cowart, seconded by Marshall Lamb, and unanimously approved to bestow the 2016 Coyt T. Wilson Distinguished Service Award on::

Dr. Timothy B. Brenneman

JOE SUGG GRADUATE STUDENT COMPETITION COMMITTEE

Chairman Bob Kemerait reported the Joe Sugg Graduate Student Competition will take place tomorrow morning. This year's competition has attracted the most participants (30) in the competition's history however due to visa issues and flight cancellations, we are expecting 26 participants (still the most participants). Due to the overwhelming number of competitors the competition was divided into two sections and thanks to the generosity of our sponsors we will have a first and second place winner in both sections with a $500/$250 prize respectively. Winners of the Award will be announced during the awards ceremony tomorrow evening.

DOW AGROSCIENCES AWARDS COMMITTEE

Chairman Kelly Chamberlin reported the Dow AgroSciences Award Committee did not meet at the APRES annual meeting in 2016 because committee business was taken care of prior to the APRES annual meeting. Information on the award was sent to the membership and the committee received nominations for both the Dow AgroSciences Award for Excellence in

Research and the Award for Excellence in Education. Nomination packets were distributed to committee members electronically, and the vote on the nominations was conducted electronically. Winners will be announced at the Business Meeting tomorrow.

Award Guidelines Review

At the June 2016 Board meeting, the Board agreed that the Committee should continue as an ad hoc committee until such time as Dow AgroSciences chooses to discontinue it support for the award they created. The Board then asked the Committee to review the guidelines on the number of times a recipient may receive the award. Currently, a person/team may win each award once. Chairman Chamberlin reported the Committee was surveyed and is in agreement to continue the guidelines as is—an individual/team can win each award once.

It was moved by Naveen Puppala, seconded by Peter Dotray, and unanimously approved to:

Accept the report of the Dow AgroSciences Awards Committee.

PROGRAM COMMITTEE

Program Chairman Corley Holbrook recognized the outstanding help and support of Technical Program Chairman Ramon Leon and Local Arrangements Chairman Greg MacDonald. Attendance for 2016 is 356 total; 234 registrants; 64 spouses; 58 children. Feedback from the Opening Session speakers has been outstanding. The symposium was a huge success. We have a great group of sponsors: Florida Peanut Producers donated the registration bags. Romer Labs was the sole sponsor of the thumb drives this year which are pre-loaded with the 2016 abstracts, program and attendance list. BASF and Bayer Crop Sciences were recognized as sponsors of Wednesday night dinner. Dow AgroSciences was recognized as the sponsor of the Thursday night reception. Syngenta donated Elatus cooling towels JLA sponsored the Fun Run with another record number of participants. Georgia Peanut Commission sponsored the Spouses Hospitality Suite. Jennifer Tillman and Donna Holbrook put together 2.5 days of activities in the hospitality suite with lots of prize giveaways. The North Carolina Peanut Growers Association once again sponsored the Joe Sugg Graduate Student Competition. A host of sponsors supported the Ice Cream Social. APRES continues to have a great group of peanut product suppliers who support our meeting breaks.

Technical Program Chairman Ramon Leon reported the 48th Annual Meeting scheduled 148 technical presentations, including this year's symposium *"Translating Genome Sequence to Peanut Improvement*" and 44 posters. Additionally, Josh Clevenger gave a workshop on *SWEEPing up SNPS: A Practical Workshop for SNP Identification in Peanut* which attracted approximately 50 participants.

OTHER BUSINESS

APRES Signature Authority

President Tom Stalker stated that the President of the Society serves as an official signature authority on all APRES accounts. He advised the Board that if (when) Dr. Corley Holbrook is elected President at tomorrow's business session, APRES will need to designate another authorized signatory, as USDA personnel are not allowed to conduct business in their official capacity as an employee of USDA. President Stalker stated that Article VIII; Section 6 of the APRES by-laws give the APRES Board the authority to handle contingencies not provided for elsewhere in the by-laws in a manner they deem advisable. President Stalker suggested the Board give signature authority to soon-to-be elected President-Elect Peter Dotray, as he will automatically be given authority when he is elected President in 2017. Peter Dotray agreed to this assignment if the Board deems it advisable.

It was moved by Barry Tillman, seconded by Jim Elder, and unanimously approved to:

Give President-Elect Peter Dotray signature authority on all APRES accounts for the 2016-17 membership year.

Publication of APRES Membership List
President Tom Stalker requested that the Board approve the publication of an official APRES Membership list. He suggested the list contain name, affiliation, address, phone number, and email. **After discussion, the Board unanimously agreed to publish a membership list on the APRES website in a Members Only area which will be password protected.**

Proposed ByLaws Committee
President Tom Stalker raised the question whether APRES should establish a new committee whose purpose would be to monitor the by-laws to be certain they are up-to-date; ascertain whether actions taken by the Board is in compliance; suggest changes to the by-laws; and serve as a interpreting body when needed. The Board discussed the pros and cons of creating a standing committee vs. ad hoc advisory group and consensus was to continue addressing by-laws issues via an ad hoc advisory group.

Recognition of Retiring Board Members
President Stalker announced the creation of a recognition gift for retiring Board members. APRES Board members give three years (and sometimes more) of volunteerism and he felt this service deserved some type of recognition. After much contemplation, a unique gift in the form of a canvas print of Erdnus (*Arachis hypogeae* Linne print), a German botanical teaching Poster from the Economic Botany Archives of Oakes Ames at Harvard University's Herbaria Library with an inscribed brass plaque with the Board member's name and dates of service will be given to all retiring APRES Board members. Tom will present the prints and recognize the outgoing Board members at the Business meeting tomorrow.

Executive Officer Performance Review
The Board discussed the activities and performance of the Executive Officer, Kim Cutchins. The members of the Board believe that Kim is doing an excellent job and has greatly improved the membership and operations of the Society during her tenure. A unanimous vote was made to present the Executive Officer a monetary bonus for her performance during the past year.

The meeting was adjourned at 6:30 p.m.

BUSINESS MEETING AND AWARDS CEREMONY

AMERICAN PEANUT RESEARCH AND EDUCATION SOCIETY
48th Annual Meeting
Hilton Clearwater Beach
Clearwater Beach, FL
JULY 14, 2016

1. **President's Report**...Tom Stalker

2. **Reading of Minutes of Previous Meeting**

3. **Awards Presentation**
   Coyt T. Wilson Distinguished Service Award…..…………………......……...…….. Corley Holbrook
   Dow AgroSciences Awards for Research and Education..…………......…….Kelly Chamberlin
   Bailey Award ……………………………………………………........……...……Scott Monfort
   Joe Sugg Graduate Student Competition……………..……………….....……….Robert Kemerait
   Fellows Awards…………………………………………...........………...……Mark Burow

4. **New Business**
   Committee Reports:
   (a) Nominating Committee .... Naveen Puppala
   (b) Finance Committee..Todd Baughman
   (c) Public Relations Committee ....Jason Woodward
   (d) Peanut Quality Committee ....…………….Mark Kline
   (e) Site Selection Committee.. Barry Tillman
   (f) Publications and Editorial Committee.. Chris Butts
   (g) Program Committee...Corley Holbrook

5. **Other Business**

6. **Installation of New Officers** …………………………………………..……..........……Tom Stalker
   Past President's Award…………………………......……………......………..Corley Holbrook

5. **Adjourn**……………………………………………………...………..........……..Corley Holbrook

MINUTES

BUSINESS MEETING AND AWARDS CEREMONY
AMERICAN PEANUT RESEARCH AND EDUCATION SOCIETY
48th Annual Meeting
Hilton Clearwater Beach
Clearwater Beach, FL
July 15, 2016

President's Report

The American Peanut Research and Education Society is a healthy organization that is growing in membership. There is a good mixture of university, federal and industry people in the society as well as both young and aging members. This is my 40th annual meeting and I've seen the beginnings of a vibrant organization expand, shrink with the state and federal budget cuts at public institutions; and we appear to have reversed the downward trend and are growing again. I strongly encourage everyone to help the Society stay vibrant by asking co-workers, employees, and students to join APRES.

The annual meeting gives all of us an opportunity to interact with colleagues and learn new information within and apart from our normal job activities. Associated meetings with APRES, including the Peanut Germplasm Committee, Peanut Genomics Initiative and Seed Summit further adds great value to the membership by both conducting business, but also by providing the membership at large updates on activities of each group. Importantly, industry priorities are explained to public researchers and visa versa. This is the only Society that actively encourages family participation, a tradition that has greatly enhanced the environment of the meetings. I would like to thank all the sponsors of meals, breaks, the fun run, bags, awards, and the spouse's program because without your support, the Society could not function.

At the opening ceremony I challenged the membership to introduce yourselves to someone who you did not know prior to coming to the meetings. I hope that everyone made an effort to do so. For myself, I met several people who are relatively new members and who are at the beginning of their careers. Sometimes it's easy to forget that they are worried about the same things all young professions worry about – promotion, tenure, service activities. They have administrators pressuring them to publish, which can lead to papers with the least amount of data possible for publication. My advice to them is the same as it is to all our membership: Perform high quality work to the best of your abilities, try to accomplish goals that you set for yourselves regarding your jobs, and have the highest levels of integrity regarding research and outreach programs, and recognition by peers will take care of itself. Be excited to write your stories about the discoveries you make, and publication will come naturally. Lastly, write nominations for your peers because few people will take the time to recognize others. I have attempted to write at least one nomination every year I've held a job for someone else, whether the person was in my department, at the same university, or working in another state or country.

I thank everyone for attending this year's meetings and for the support you have given to the Society during my tenure as President. I believe that we have had a great week of meetings and social activities and hope to see everyone again next summer in Albuquerque.

<u>READING OF THE PREVIOUS MEETING'S MINUTES</u>

The minutes of the 47th Annual Meeting Business Session were distributed via email to the membership and posted online; therefore, the reading of the minutes was waived. It was moved by and seconded,

the minutes of the 47th Annual Meeting Business Session be approved.

NEW BUSINESS

COMMITTEE REPORTS

NOMINATING COMMITTEE

The Nominating Committee met on June 28th via conference call to discuss positions on the APRES President-Elect and Board of Directors which will be coming open at the July Board meeting. All members of the Committee except Dr. Noel Barkley were present. Committee members discussed requirements for being a Board member, which are 5-year member of APRES, served on 3 different Committees, and familiar with APRES and its members. Using the stated criteria, the Committee recommends the following slate of nominees for the APRES 2016-2017.

Officer Nominees:

2016-17 President	Dr. Corley Holbrook USDA-ARS
2016-17 President-Elect	Dr. Peter Dotray Texas A&M University
2016-17 Past President	Dr. Tom Stalker North Carolina State University

Board of Directors Nominees:

VC area:	Dr. Rick Brandenburg (2019) North Carolina State University
SE area:	Dr. Peggy Ozias-Akins (2019) University of Georgia
SW area:	Michael Baring (2017) Texas A&M University *(Complete Peter Dotray's Term as SW Rep)*
USDA Representative:	Dr. Marshall Lamb (2019) National Peanut Research Lab
Industrial Representative:	Darlene Cowart (2019) Birdsong Peanuts
American Peanut Council:	Howard Valentine (2017)
National Peanut Board:	Dan Ward (2019)

Each nominee has been contacted and has agreed to serve, if elected. In concluding his report, Naveen re-emphasized the need to get more people involved on APRES Committees in order to expand the number of potential Board nominees.

President Stalker called for additional nominations from the floor. There being none, it was moved by Tom Isleib, seconded by Scott Monfort to close the nominations. It was moved by Howard Valentine, seconded by Albert Culbreath, to:

approve the election of the nominees to the APRES 2016-17 Board of Directors.

Committee Reports Continued:

The reports of all other APRES Committees can be found following the announcements of the 2016 Awards winners, which are presented out of order in these Proceedings to allow special recognition of the individuals.

Presentation of Awards

JOE SUGG GRADUATE STUDENT COMPETITION

President Tom Stalker reported this year's competition attracted the most participants (30) in the competition's history however due to visa issues and flight cancellations, twenty-six (26) 26 students participated (still a record). Due to the overwhelming number of competitors the competition was divided into two sections and thanks to the generosity of our sponsors North Carolina Peanut Growers Association and an anonymous donor, a first and second place winner will be awarded in both sections with a prize of $500/$250 prize respectively. This year's winners are:

Session 1: Breeding/Genetics/Plant Pathology

1st Place: **Josh Clevenger**
University of Georgia

RNA Sequencing of Contaminated Seeds Reveals the Permissive State for Pre-harvest Aflatoxin Contamination and Points to a Potential Susceptibility Factor
J. CLEVENGER*, K. MARASIGAN, and P. OZIAS-AKINS, Department of Horticulture and Institute of Plant Breeding, Genetics & Genomics, The University of Georgia, Tifton, GA 31793; B. LIAKOS, G. VELLIDIS, Department of Crops and Soil Sciences, The University of Georgia, Tifton, GA 31793; V. SOBOLEV, USDA-ARS National Peanut Research Laboratory, Dawson, GA 39842; and C.C. HOLBROOK, USDA-ARS, Tifton, GA 31793. (Peggy Ozias-Akins, major professor)

2nd Place: **Ze Peng**
University of Florida

Genes and Gene Network Involved in Peanut Nodulation
Z. PENG*, F. LIU, L. WANG, and J. WANG, Agronomy Department, The University of Florida, Gainesville, FL 32611.

Session 2:   Production Technology/Mycotoxins/Weed Science/Other

1st Place: **Kelly A. Racette**
University of Florida

Generational Priming Memory Induces by Primed Acclimation in Early in Early Root Traits of Peanut (Arachis hypogaea L.).
K.A. RACETTE*, D.L. ROWLAND, Agronomy Department, The University of Florida, Gainesville, FL 32611; and B.L. TILLMAN, North Florida Research and Education, Marianna, FL 32446.

2nd Place: **Abraham Fulmer**
University of Georgia

Effect of Inoculum Level, Planting Date and Variety on the Onset and Predominance of Early and Late Leaf Spot of Peanut.
A. FULMER* and R. KEMERAIT, JR., Department of Plant Pathology, The University of Georgia, Tifton, GA 31793.

THE BAILEY AWARD

Chairman Scott Monfort reported nominations were received from all nine eligible sessions of the 2015 Annual Meeting and nominees were notified shortly after the meeting. Six manuscripts were received and accepted for final evaluation. They were ranked and the Committee came to a unanimous decision. The 2016 Bailey Award for the best paper from the 2015 APRES Annual Meeting was presented to:

Jack P. Davis
JLA, Inc.

"Measurements of Oleic Acid Among Individual Kernels Harvested from Test Plots of Purified Runner and Spanish High Oleic Seed".
Authors:
J.P. Davis, J.M. Leek, JLA, Inc., Albany, GA; D.S. Sweigart, The Hershey Company, Hershey, PA; P. Dang, C.L. Butts, R.B. Sorensen and M.C. Lamb, USDA-ARS-NPRL, Dawson, GA.

DOW AGROSCIENCES AWARDS FOR EXCELLENCE IN RESEARCH & EDUCATION

Chairman Kelly Chamberlin reported information on the award was sent to the membership in early 2016 and the committee received nominations for both the Dow AgroSciences Award for Excellence in Research and the Award for Excellence in Education. Nomination packets were distributed to committee members electronically, and the vote on the nominations was conducted electronically. Chairman Chamberlin thanked Dow AgroSciences for once again sponsoring the awards which recognizes the value of great research and education. In addition to a plaque, recipients receive a check for $1,000. The 2016 awardees are:

Dow AgroSciences Research Award - Dr. H. Thomas Stalker
North Carolina State University

Dr. H. Thomas Stalker has conducted research with peanut during the past 39 years. He maintains a large germplasm collection of *Arachis* species, worked with the USDA curator to increase seed supplies for distribution to the user community, and has served many years on the S9 Germplasm Committee to advise the USDA regarding germplasm maintenance. Dr. Stalker identified new and important sources of resistance to many diseases and insect pests, several of which are being incorporated into the cultivated peanut. His cytogenetic and molecular genetic research has led to a better understanding of species relationships and germplasm utilization in the genus. He coauthored the first molecular map of peanut, associated the first resistance gene with a molecular marker in peanut, and demonstrated that introgression from wild species into the cultivated peanut genome is possible for both the A and B genomes. He has released 18 interspecific breeding lines have been selected with extremely high levels of multiple disease and insect resistances, and the germplasm is widely used in North Carolina and internationally. Dr. Stalker has mentored more than 20 undergraduate interns, hosted 8 scientists on sabbatical assignments, was major advisor to 17 graduate students and mentored three post docs. He has published 105 peer-reviewed journal articles, 33 book or proceeding chapters, and edited 7 books. Dr. Stalker has been active in several societies where he was named Fellow of the Crop Science Society of America, Fellow of the American Society of Agronomy, and was awarded the Research and Education Award by the American Peanut Council in 1999 and in 2015. In APRES, he previously was awarded the Bailey Award in 1996, Fellow in 1996, the DowElenco Award for Education and Extension in 2000, and the Coyt T. Wilson Distinguished Service Award in 2002.

Dow AgroSciences Education Award – Dr. Tim Grey
University of Georgia

Dr. Timothy Grey is currently a Professor of Weed Science at the University of Georgia in Tifton, GA, where he has been employed since 1998. Dr. Grey received his B.S. degree in Agronomy in 1986 from the University of Kentucky and subsequently received his M.S. and Ph.D. degrees from Auburn University in 1992 and 1996, respectively. Dr. Grey has a renowned research program but has also established himself as an excellent teacher and mentor. Since The University of Georgia began offering undergraduate classes at the Tifton Campus, Dr. Grey has also shown quite a talent and passion for teaching. He has been a leader growing both the undergraduate and graduate programs at the Tifton Campus. He has taught courses in Weed Science, Agroecology, Pesticides and Transgenic Crops. His courses are known for being practical, with direct applications for “real world” situations, not to mention thorough and challenging. His efforts and success in the educational aspects of his program are evidenced by his receiving the University of Georgia Tifton Campus Award for Excellence in Teaching in 2011 and the Southern Weed Science Society Outstanding Educator Award in 2013. Dr. Grey is also very active in several professional organizations. He has served as Associate Editor for Weed Science and as reviewer for Weed Science, Weed Technology and others. Dr. Grey has made over 200 contributed and invited presentations at various professional meetings including the American Society of Agronomy, Weed Science Society of America, Southern Weed

Science Society, American Peanut Research and Education Society, Beltwide Cotton Conference, International Research Conference on Methyl Bromide Alternatives and Emissions Reduction and International Weed Science Congress. Dr. Grey is currently serving as Editor of Peanut Science, was nominated for the APRES Bailey Award in 2006, 2008, 2009 and 2015, and previously received the 2011 Dow AgroSciences Award for Excellence in Research.

COYT T. WILSON DISTINGUISHED SERVICE AWARD

The Coyt T. Wilson award is given to APRES members who have contributed two or more years of distinguished service to the Society. The award was established in honor of Dr. Coyt T. Wilson who provided leadership in the formative years of the Society. His contributions helped make possible the early and current success of the Society.

Committee members for 2016 were Austin Hagan, Emily Cantonwine, Jason Woodward, and Corley Holbrook, Chair. All business for this committee was conducted electronically. After reviewing all nominations, the committee unanimously recommended that the 2016 Coyt T. Wilson Distinguished Service Award be presented to Dr. Timothy B. Brenneman. Dr. Brenneman has been an active member and strong supporter of APRES for 32 years. His outstanding contributions to the society make him richly deserving of the 2016 Coyt T. Wilson Distinguished Service Award.

Respectfully submitted,
C. Corley Holbrook, Chair

Dr. Timothy B. Brenneman
2016 Coyt T. Wilson Award Recipient

Dr. Timothy B. Brenneman is the recipient of the 2016 Coyt T. Wilson Award. Dr. Brenneman has been a dedicated workhorse in APRES, being constantly involved in various vital activities of the society. He has served on many committees, with multiple terms on several. His efforts to promote and enhance the quality of APRES publications are especially noteworthy, with service for two consecutive terms each as Associate Editor of Peanut Science and on the Publications and Editorial Committee. He chaired that committee one or more years in each of those terms, and in 2009, chaired the subcommittee to review applicants for the Editor of *Peanut Science*. He has been an integral part of planning and conducting the APRES annual meetings, serving on the program committees in 1990, 2000, and 2006, as Technical Program Committee Chair in 2000, and Program Chair in 2013. He is currently serving in his third term on the Finance Committee, and chaired that committee in 2012. He served as President of APRES during a time that included the transition to a new executive director and of moving the business center of the Society to Georgia. These, plus service on other committees, organizing and chairing special sessions, and helping in countless ways that are not listed in a proceeding or in a resume are evidence of a strong dedication to and love for APRES.

Dr. Brenneman has also conducted a large research program that is on the 'cutting edge' of science for disease management in peanut and pecan. Beginning with his graduate studies at Virginia Tech and during his tenure at the University of Georgia, Dr. Brenneman has established himself as a leader in the area of ecology, epidemiology, and integrated management of diseases of peanut, with emphasis on soil-borne pathogens. Research conducted by Dr. Brenneman and his students has had major impacts on control of critical diseases of peanut, and played a key role in development of the TSWV risk index and the subsequent Peanut Rx. His productivity is documented by his authorship on over 120 refereed journal articles and book chapters and over 250 abstracts, proceeding and other publications.

APRES is fortunate to have benefited from Dr. Brenneman's membership and tireless contributions. His outstanding contributions to the society make him richly deserving of the Coyt T. Wilson Distinguished Service Award.

About the Award: The Coyt T. Wilson Distinguished Service Award was established to recognize those persons within APRES who have provided outstanding service to the society for a long period of time, and deserve special recognition. It is given in honor of Dr. Coyt T. Wilson who contributed freely of his time and service to the organization in its formative years.

FELLOW OF THE SOCIETY

Chairman David Jordan stated the Committee forwarded one name for the attribute of Fellow of the Society. The Committee unanimously recommended and the Board unanimously agreed **to bestow the honor of Fellow of the Society to:**

Eric Prostko
University of Georgia.

Dr. Eric P. Prostko is a Professor and Extension Weed Specialist in the University of Georgia's Department of Crop & Soil Sciences. He has been a faculty member at the University of Georgia since 1999. With a 100% extension appointment, Eric is responsible for the statewide weed science programs in field corn, peanut, soybean, sunflower, grain sorghum, and canola. The farm gate value of these commodities in Georgia exceeds $1.5 billion dollars.

Eric has earned degrees from Delaware Valley College (B.S.), Rutgers University (M.S.), and Texas A&M University (Ph.D.). Dr. Prostko is the author or co-author of 58 refereed journal articles, 179 scientific abstracts, and 820 extension publications. His monthly popular press column entitled "Tailgate Talk", published in the *Southeast Farm Press,* is read by more than 46,000 subscribers.

As a former county extension agent, Dr. Prostko is strongly committed to the land-grant mission and county delivery system. During his career, he has provided 92 in-service training programs for county extension agents and has made educational presentations at 702 local county crop production meetings. He has made more than 190 invited extension presentations to allied agricultural industry groups.

Dr. Prostko is a member of the American Society of Agronomy (ASA), Weed Science Society of America (WSSA), American Peanut Research and Education Society (APRES), Southern Weed Science Society (SWSS), and the Georgia Association of County Agricultural Agents (GACAA). He has received numerous awards including the Michael J. Bader Award of Excellence for Junior Scientist - Extension (UGA 2004), Outstanding Young Weed Scientist Award (SWSS 2005), Dow AgroSciences Award for Excellence in Education (APRES 2005), Senior Specialist Award (GACAA 2010), D.W. Brooks Award for Excellence in Extension (UGA 2010), Outstanding Educator Award (SWSS 2011), Outstanding Extension Award (WSSA 2011), Award of Excellence for Senior Scientist – Extension (UGA 2011), the Walter B. Hill Award for Distinguished Service in Public Service and Outreach (UGA 2012), the Walter B. Hill Fellow Award for Distinguished Service in Public Service and Outreach (UGA 2015).

Eric has been married to the former Joann M. Carroll for 29 years and together they have three children: Nicholas (25); Shelby (21); and Isabelle (19). In his spare time, Eric enjoys reading, physical fitness, playing the piano (poorly), shooting sports, and working around his small hobby farm.

RECOGNITION OF RETIRING APRES BOARD MEMBERS

President Stalker announced the creation of a recognition gift for retiring Board members. APRES Board members give three years (and sometimes more) of volunteerism and he felt this service deserved some type of recognition. After much contemplation, a unique gift in the form of a canvas print of Erdnus (*Arachis hypogeae* Linne print), a German botanical teaching Poster from the Economic Botany Archives of Oakes Ames at Harvard University's Herbaria Library with an inscribed brass plaque with the Board member's name and dates of service will be given to all retiring APRES Board members. In recognition of their service to APRES, President Stalker presented retiring Board members Naveen Puppala, David Jordan, and Barry Tillman

PAST PRESIDENT AWARD

As his first order of business, newly-elected President Corley Holbrook presented outgoing President Tom Stalker with the Past President's award.

Committee Reports

PUBLIC RELATIONS COMMITTEE

Resolutions

Jason reported he received a resolution for Ellis Hauser, USDA-ARS and would like to have a moment of silence at the Annual Meeting for the following members of the peanut industry who deserve remembrance:

The Committee was informed of the passing of four people associated (directly or indirectly) with the Society:

- **Russell Schools**, Virginia Peanut Growers Association

  Mr. Schools was highly active in his community of South Hampton County and served the peanut industry as the executive secretary for the Virginia Peanut Growers for almost 40 years. Mr. Schools was also very active in the Society in the 1970s and 1980s, serving on the Board of Directors, Finance Committee, Nominating Committee, Public Relations Committee, Program Committee-Local Arrangements Committee, Peanut Quality Committee and a contributor to "The Peanut".

- **Dr. Ellis Hauser**, Researcher USDA-ARS Tifton

  Dr. Hauser was a distinguished weed scientist with USDA-ARS in Tifton, GA and recipient of numerous awards recognizing his contributions to the understanding o f weeds and the losses they cause in peanut. Dr. Hauser served as Peanut Science Associate Editor from 1975-1980.

- **Dr. Antonio Krapovickas**

  Dr. Krapovickas considered as the Father of peanut Taxonomy by many was a mentor to many peanut taxonomists. Dr. Kropovickas led peanut germplasm collection efforts for more than 50 years in South America and published a monograph to describe species of *Arachis* and their relationship to each other He died in Argentina of natural causes at the age of 95.

-**Ted Webster** UGA scientist

Dr. Webster, a research agronomist with the USDA Crop Protection and Management Research Unit in Tifton, worked on various aspects of yellow nutsedge biology.

Tiered Sponsorship Platform

Chairman Woodward presented a tiered sponsorship platform that will be used by the Program Committee to describe the benefits of supporting the APRES Annual Meeting, hopefully leading to increased support. Support levels are outlined below.

<table>
<tr><td rowspan="15">We value your support and offer the following sponsorship levels as a guidepost to assist you in your decision-making process.

Feel free to partner up for any of our social events.</td><th>Sponsorship Opportunity</th><th>Sponsorship Level</th></tr>
<tr><td>Diamond</td><td>$5,000 and above</td></tr>
<tr><td>Platinum</td><td>$1,000 and above</td></tr>
<tr><td>Gold</td><td>$500 and above</td></tr>
<tr><td>Silver</td><td>$300 and above</td></tr>
<tr><td>Social Event Sponsor</td><td></td></tr>
<tr><td>Ice Cream Social</td><td>$7,500</td></tr>
<tr><td>Meeting Breaks</td><td>$1,500 per break
(4 opportunities)</td></tr>
<tr><td>Reception & Dinner</td><td>$20,000</td></tr>
<tr><td>Spouses' Hospitality Suite</td><td>$3,000</td></tr>
<tr><td>Spouses' Tour</td><td>Event Cost x # of Participants</td></tr>
<tr><td>Pre-Meeting Tour Transportation</td><td>$1,000</td></tr>
<tr><td>Fun Run</td><td>T-Shirts and Bottled Water</td></tr>
<tr><td>Pre-Meeting Activity</td><td>$3,000</td></tr>
<tr><td>Customized Sponsorship Partnership</td><td>Peanut Products, Gift Bags, Thumb Drives, Lanyards, Note Pads, etc…</td></tr>
</table>

Within this new platform, the Committee is proposing the creation of a new membership category (Diamond) to recognize cash contributions of $5,000 and above. This proposal requires an amendment to the APRES by-laws and approval of a majority of the APRES membership. The Committee is also suggesting that this be conducted via an online vote so that, if approved, it can be incorporated in advertising material for the 2017 Annual Meeting. An announcement about the proposed action will need to be made 30 days before the vote.

It was unanimously approved to:

Conduct an electronic membership vote (after 30 days notice) for approval of a new Diamond membership category for APRES supporters at the $5000 and above level.

Opportunities to Increase Membership and Meeting Attendance

Committee discussed several ideas:

- Several ideas were discussed to increase membership and meeting attendance.
- Identify similar groups internationally that would be interested in peanut information
- Advertise to the University of New Mexico the opportunities in the peanut industry Efforts will be made to increase manufacturer and sheller membership.
- Efforts will also be made to increase the attendance of county agents.
- Chris Liebold proposed running an advertisement in Peanut Grower Magazine (or some other outlet) to see how it affects membership at the next meeting. Updates on societal activities will be sent to additional outlets including collegiate groups, alumni organizations and others.

Allison Floyd of PMIL - alfloyd@uga.edu, volunteered to serve on the committee

The committee was approached by Chris Liebold to help identify opportunities to promote the new peanut book

It was moved by Michael Baring, seconded by John Damicone and approved to:

Acccept the report of the Public Relations Committee.

FINANCE COMMITTEE

Chairman Todd Baughman reported the Finance Committee met July 12th to discuss the APRES financial statements and ways to increase APRES resources.

Balance Sheet

APRES financial statements are now being reported using the accrual system as requested by the Board at its July 2015 meeting. Current assets are $311,152, primarily in cash—checking, CDs. Accounts receivables of $27,549 are noted.

Liabilities are employment taxes and withholdings of $473 and total equity of $310,679.

Profit & Loss Statement

Income through June 30, 2016 is $112,685 and expense is $35,032. Todd noted the majority of expenses for APRES occur in July/August when the bills for the Annual Meeting arrive and are paid. Kim highlighted the amount for Contract labor is the new email marketing service she mentioned earlier. Net income for the 6-month period is $78,165.

Budget 2016

Chairman Baughman related the budget is right on target at the 6-month mark. It should be noted that the sponsorships income includes a $10,000 accounts receivable from 2015. Actual sponsorship totals to date for 2016 are $38,952. Administrative expenses are on target; however, the program committee has informed the Committee that expenses for the Clearwater meeting may run a little higher than budgeted due to increased attendance levels--More people means increased expenses with same level of sponsorships. Kim added that book sales have been brisk at the meeting with potential for selling out the first order of 50 books.

Fundraising Ideas

Chairman Baughman noted that there are currently two major sources of income for APRES—membership dues and Annual Meeting income (registration fees/sponsorships). He noted that with attendance on the rise, APRES must find additional sources of income to support the Annual Meeting while retaining the “family feel” of the meeting. The Committee bounced around several ideas for potential sources of revenue, from increasing the registration beyond the $25 increase approved by the Board in June to writing grants to the National Peanut Board and Peanut Foundation for support of Peanut Science and asked the Board to consider these two suggestions.

Annual Meeting Registration Fee Increase

The Board unanimously agreed APRES Annual Meeting registration fee by $50 over the 2016 level, beginning with the 2017 Annual Meeting. Registration fees for student will remain the same. Registration for spouses and children continue to be complimentary. The new fees for 2017 will be:

Early Bird Registration: $250 for members; $350 for non-members; $50 for students.
Late Registration: $350 for members; $450 for non-members; $100 for students.

Grant Opportunities

At the Committee’s request, the Board discussed the pros and cons of seeking a grant to help support Peanut Science and whether doing so would affect the integrity of the journal. It was noted that most scientific journals are moving to open access and reducing/eliminating author page charges and, if Peanut Science is to compete, it must find ways to reduce expenses or find additional revenue to compete with other journals. On the expense side, APRES has re-negotiated its contract with Allen Press for one year (YE2016), but the savings is not enough unless it brings the journal in-house. APRES staff and the Publications Committee are examining this option. The Board voted to allow the Chairman of the Finance Committee to discuss the feasibility of a grant from the National Peanut Board to partially support the publication of Peanut Science.

It was moved by David Jordan, seconded by Dan Ward, and unanimously approved to:

Accept the report of the Finance Committee.

APRES Financial Statements as of July 1, 2016 and the 2016 Budget Follow on the Next Page

American Peanut Research and Education Society
Balance Sheet
As of June 30, 2016

	Jun 30, 16
ASSETS	
Current Assets	
Checking/Savings	
Vanguard	31,058.63
Paypal	2,625.20
Cash - Checking - 2629	108,884.63
Cash - MMA - 7397	88,283.08
Cash - CD 0308	14,736.14
Cash - CD 4885	18,330.72
Cash - CD 4647	13,522.44
Cash - Bayer-1934	6,162.45
Total Checking/Savings	283,603.29
Accounts Receivable	
Accounts Receivable	27,549.06
Total Accounts Receivable	27,549.06
Total Current Assets	311,152.35
TOTAL ASSETS	**311,152.35**
LIABILITIES & EQUITY	
Liabilities	
Current Liabilities	
Other Current Liabilities	
State W/H Tax	92.83
FICA/FWH Payable	422.22
FUTA Payable	-42.00
Total Other Current Liabilities	473.05
Total Current Liabilities	473.05
Total Liabilities	473.05
Equity	
Unrestricted Fund Balances	232,514.23
Net Income	78,165.07
Total Equity	310,679.30
TOTAL LIABILITIES & EQUITY	**311,152.35**

American Peanut Research and Education Society
Profit & Loss
January through June 2016

			Jan - Jun 16
Ordinary Income/Expense			
Income			
Dividend Income			121.02
Book Sales			
Shipping & Handling		45.15	
Peanut-Genetics, Processing & U		1,130.00	
Total Book Sales			1,175.15
Sponsorship-Annual Meeting			
Meeting Breaks		6,000.00	
Awards		2,000.00	
Thursday Reception		3,000.00	
Wednesday Dinner		27,000.00	
Sponsorship-Annual Meeting - Other		10,952.44	
Total Sponsorship-Annual Meeting			48,952.44
Peanut Science			
Peanut Science Journal		40.00	
Page Charges		9,247.00	
Total Peanut Science			9,287.00
Annual Dues			
Sustaining-Gold Level		1,300.00	
Institutional		1,400.00	
Individual-Student		875.00	
Individual-Post Doc/Tech Supp		250.00	
Individual-Retired		100.00	
Individual-Regular		13,050.00	
Total Annual Dues			16,975.00
Meeting Registration			
Meeting Registration-Regular		33,025.00	
Meeting Registration-Gold		1,300.00	
Meeting registration-Student		1,850.00	
Total Meeting Registration			36,175.00
Total Income			112,685.61
Expense			
Book Purchases			4,681.25
Administrative Expense			
Wages - Executive Officer		11,499.96	
Taxes - Payroll		879.78	
Postage		32.25	
Office Expenses		78.35	
Credit Card Charges		970.18	
Bank Charges			
Paypal Fees	1,373.64		
Total Bank Charges		1,373.64	
Dues and Subscriptions		30.00	
Contract Labor		40.00	
Accounting		1,295.00	
Total Administrative Expense			16,199.16
Peanut Science Publishing			
Peanut Science Editor Stipend		3,000.00	
Peanut Science Publishing - Other		11,151.50	
Total Peanut Science Publishing			14,151.50
Total Expense			35,031.91

American Peanut Research and Education Society
Profit & Loss
January through June 2016

	Jan - Jun 16
Net Ordinary Income	77,653.70
Other Income/Expense	
Other Income	
Interest Income	511.37
Total Other Income	511.37
Net Other Income	511.37
Net Income	**78,165.07**

Proposed
2016 APRES Budget

Document 6

BOD Approved 6-13-2016

Income	Budget 2015	Actual 2015	Proposed Budget 2016	2016 Budget Rationale
Annual Dues	**$22,000**	**$28,000**	**$28,000**	Budget same as YE2015; Will work to expand membership base, especially institutional
AnMeeting Registrations	**$40,000**	**(VC) 39,750**	**$40,000**	Budget same as YE2015
Sponsorships –	**$25,000**	**$25,800**	**$35,000**	Budget same as last year's commitments; will work to expand
Ice Cream Social	$0	$800	$3,000	
Wednesday Dinner	$0	**$9000	$19,000	
Thursday Reception	$0	$3,000	$3,000	
Meeting Breaks		$6,000	$6,000	
Awards	$0	$2,750	$2,750	
Fun Run		$250	$250	
Other	$0	$4,000	$1,000	
Peanut Science	**$20,050**	**$10,465**	**$20,050**	Anticipate billing 2 issues @ $10k per issue based on history
Book Sales	**$7,500**	**$336**	**$6,000**	Anticipate selling 50 copies @ $120/copy
Book Shipping			**$300**	Shipping for 50 books @ average $6.45/book; sales at AnMtg where no shipping charge
Miscellaneous Income	**$100**	**$658**	**$650**	Dividends and capital gains from Vanguard investment fund
TOTAL	**$114,650**	**$105,009**	**$130,000**	
Interest	$1,300	$830	$750	Interest from CDs; less anticipated due to movement to other investments
Total + Interest	**$115,950**	****$105839**	**$130,750**	
		$120,973 w/Receivables		
Expenses	**Budget 2015**	**Actual 2015**	**Proposed Budget 2016**	
Annual Meeting	**$45,000**	**$61,554**	**$60,000**	
Awards	$5,000	$5,465	$5,500	Budgeted same as actual YE2015; not anticipating increase
Hotel Charges	$33,000	$47,010	$45,000	Do not anticipate extra costs associated with outgrowing meeting space in 2016
Supplies/Equip/AV	$1,000	$1,603	$1,500	Badge stock, printing of signs/program, etc.
Travel - Ext. Agents	$5,000	$1,769	$5,000	Sponsored by Bayer; reimbursed for actual expense
Other	$1,000	$5,707	$3,000	Potential speaker fees and travel costs
Peanut Science	**$20,000**	**$13,463**	**$18,500**	
Publishing	$3,600	$4,458	$4,500	Anticipating 3 issues billed in 2016 $1,500/issue; using $1k credit
Editor Stipend	$3,000	$3,000	$3,000	Same as 2015
Website Hosting	$10,312	$5,109	$10,000	Extended Allen Press for one year with $2,200 reduction in web hosting
Peer Review	$387	$621	$650	20 manuscripts @ average of $31.21 in 2015; will be slight increase in fee for 2016
Other	$2,701	$275	$350	Cross Ref member fee $275; CR now billing for doi journal deposits estimate $75
Book Purchase - AOCS	**$4,125**	**$0**	**$4,681**	50 books purchased in January 2016 (actual amount)
Book Shipping			**$300**	Shipping for 50 books @ $6.45 per book average

Expenses, Continued	Budget 2015	Actual 2015	Proposed Budget 2016	2016 Budget Rationale
Administrative Expenses	**$33,475**	**$29,992**	**$34,105**	
Dues - CAST	$0	$0	$0	No longer a CAST member
Corp. Registration Fees	$50	$0	$30	Renewed January 2016
Legal Fees	$250	$525	$525	Anticipate need to review contracts for new book and Peanut Science in 2016
Insurance	$100	$100	$100	Same as 2015
Executive Officer	$23,000	$23,000	$23,000	Same as 2015
Taxes: Payroll	$2,000	$1,802	$2,000	Same as 2015
Administrative Assistant	$0	$0	$0	
Web Page Maintenance	$1,500	$648	$1,500	Anticipate hiring network security specialist for assistance when needed
Accounting Services – Herring CPA	$1,950	$1,650	$2,175	Moving to accrual system increase monthly fee to $125/month; Taxes $675
Contract Labor	$350	$0	$350	Surveys or assistance at annual meeting
Postage	$50	$88	$50	Stamps
Office Expenses	$250	$50	$250	Purchase easles for use at Annual Meeting
Travel - Officers	$1,200	$0	$1,200	Travel to Annual Meeting or other industry meeting
Bank Charges	$25	$159	$175	PayPal fees are included in bank charges
PayPal/Credit Card Fees	$2,500	$1,967	$2,500	Anticipate more payments via PayPal due to book purchases
Miscellaneous	$250	$3	$250	Contingency fund
Depreciation	$0	$0	$0	
Total Expenses	**$102,600**	**$105,009**	**$117,586**	
Income Over Expense	**Budget 2015**	**Actual 2015**	**Proposed Budget 2016**	
Total Income + Interest	$115,950	$105,839	$130,750	
Total Expenses	$102,600	$105,009	$117,586	
Net Income	**$13,350**	****$830**	**$13,164**	
**Accounts Receivables as of 12-31-2015		$15,134		
Net Income with Receivables		**$15,964**		APRES will change from a cash accounting to accrual accounting system in 2016 which recognizes accounts payable and accounts receivables.
**Accounts Receivables as of 3-10-2016		$2,911		

PUBLICATIONS AND EDITORIAL COMMITTEE REPORT

Chris Liebold reported for Chairman Chris Butts who is recovering from a heart attack. He shared that Dr. Butts is recovering well and will be leaving the hospital shortly.

Peanut: Production and Management Book

Dr. Chris Liebold will be lead editor; Dr. Shyam Tallury and Dr. Nick Dufault have agreed to be co-editors of the book. A list of chapters with outlines and proposed lead authors was voted upon and approved by the Committee. Dr. Liebold presented the outline to the Board for their review and approval. During discussion, Dr. Liebold shared that the audience for the book will be the APRES membership with a North American focus. The lead publishing choice is Amazon with its Create Space platform—free to use the service; print on demand service. Editors and lead authors will have to format the book using the Amazon template. Amazon pays a royalty for each book published. A Fall 2017 publication date is anticipated. After discussion of the outline, The Board gave its approval with the caveat to ensure there is balanced representation from all growing regions in the authorship of the book and where appropriate include international authors. Additionally, each chapter should have sustainability as a core ingredient.

Peanut Science

Dr. Liebold stated the Committee discussed the issues of impact factor, competing journals, etc. which are factors when an author decides which journal to publish research. As APRES finances have stabilized and are showing a net income over expense for the last 3 years, the Committee is asking the Board to approve their recommendation of making Peanut Science a completely Open Access journal which will hopefully increase viewing which is a critical determination in acquiring an impact factor. The Board unanimously agreed to bring this recommendation to a vote at the Membership Business meeting. Dr. Liebold asked the membership present at the Business meeting to vote with a show of, stating a simple majority vote is needed for implementation.

The motion was unanimously approved by a show of hands of all APRES members present to implement full Open Access for Peanut Science as soon as legally possible.

Peanut Science - Editors Report – January 1, 2015 to December 31, 2015

The Associate Editors of *Peanut Science* meeting is set for Tuesday, July 12th, 2016 at the Annual APRES meeting at the Hilton Clearwater Beach in FL. *Peanut Science* Volumes 42-1 was released online in June 2015, with Volume 42-1 released December 2015 online via the website with AllenPress. *Peanut Science* Volume 43-1 was released in March 2016 with 9 articles, and Volume 43-2 will be released by Oct 2016.

Associate editor terms expiring in 2015 include Michael Marshall, who agreed to continue to serve a 2nd three year term. Diane Rowland requested to be rolled off as an Associate Editor beginning in 2016.

Two new associate editors have been appointed to the committee with term beginning in 2015:
Mark Abney
Chris Liebold

Newly added for 2015 was the addition of *Peanut Science* to ResearchGate at www.researchgate.net. While there is currently no impact factor for Peanut Science, this is another step in getting the journal in front of the scientific community where articles can be sited and referenced. This is one of the goals set forth in the past and we hope to continue to establish an Impact Factor for *Peanut Science*. If you go to Google.com and enter '*Peanut Science'*, the journal is the first return and listed returns for *Peanut Science* are the first 4 websites along with APRES (#3). At scholar.google.com the request for *Peanut Science* returns 467,000 hits, with many journal articles, and Dr. Boote's 'Growth Stages of Peanut' from 1982 listed first if sorted by relevance. The goal of APRES is to continue the promotion of *Peanut Science* to a wider audience, improve the number of submissions, and increase the relevance of the journal. Additionally, Kim has been working with Allen Press to address issues with the *Peanut Science* website at http://www.peanutscience.com/. Kim has conducted an examination and review of the Allen Press contract which is in place until December 2016, with a 90 day notification clause. With the advances in technology, we are examining if there are more effective and less expensive ways to publish *Peanut Science*, while maintaining the user friendly search engine.

For the 12-month time period from January 1, 2015 to Dec 31, 2015 for manuscripts assigned to Dr. Grey as editor, there were 19 total submissions in 2015.

Table 1. Performance statistics of reviewers for articles submitted to Peanut Science between 01 January and 31 December.

Reviewer Performance Metric	2014	2015
Number of invitations	67	74
Number of Reviews	42	41
Number of Reviews declined	13	10
Un-invited before agreeing	12	18
Days to Respond to Invitation	1.1	1.4
Days to Complete Review (from Date Invited)	16.8	29.2
Number of Reviews per Reviewer	0.88	1.4
Number of Late Reviews	16	13
Average Days Late	0.8	17
Submitted on or ahead of time	26	37
Average Days Early	—	11.3

Table 2. Submissions by year

Month	2010	2011	2012	2013	2014	2015	2016
Jan	0	2	2	2	0	1	0
Feb	2	2	2	2	0	1	1
Mar	1	1	1	3	3	2	1
Apr	1	2	0	0	0	3	3
May	4	0	3	1	1	1	1
Jun	0	2	0	1	1	1	4
Jul	8	0	1	0	0	1	1
Aug	1	2	3	5	1	2	2
Sep	3	3	1	2	5	2	4
Oct	2	3	2	1	1	2	
Nov	0	4	3	3	3	2	
Dec	1	1	2	1	5	1	
Totals	**23**	**22**	**20**	**21**	**20**	**19**	**17**

It was moved by Albert Culbreath, seconded by Ramon Leon, and approved to:

Accept the report of the Publications and Editorial Committee.

PEANUT QUALITY COMMITTEE

1. The meeting was called to order by Chairman Mark Kline at 2:00 pm.

2. Meeting Minutes from 2015 were reviewed by John Bennett.

3. Foreign Material:
   Foreign material, depending on the material, can be classified based on size and shape to determine risk of laceration and choking hazard. Mars is investigating to adopt a similar type of approach to classify foreign material. Shellers' capabilities have improved and maintain a low levels (i.e. pieces per lot).

4. Emerging Risks that could impact the Peanut Industry:
   John Bennett raised a question to the attendees about emerging concerns:
   - Peanut Allergen - A recall occurred this year with peanut contamination in flour. The root cause was determined to be caused from cross-contamination in railcars. Many food manufacturers were impacted. Protective measures are being put in place.
   - Emerging risks such as Aflatrem (a tremorgenic mycotoxin produced by A. Flavus) and 4-Chlorophenol Acetic Acid and N- Fosetyl Al (residues in Fungicide and of concern by the EU but not regulated) were noted by Victor Nwosu as potential risks to the industry.
   - In general with any concerns, the industry needs to be proactive.

5. Quality/Nutrition Attributes for Genomics Project:
The peanut industry has a good story to tell about nutrition. The genomics work to date has focused mainly on disease resistance and there is an opportunity to also focus efforts on nutritional improvements. A guideline for targets on micronutrients range would be beneficial for breeders to target. Natural and non-GMO are also current consumer trends. Peanut varieties will be more efficiently developed as new genetic tools are utilized. The health and wellness benefits of peanuts need to be prioritized by the Peanut Institute so that the appropriate peanut traits can be measured and benchmarked. New peanut varieties, at the minimum, should not compromise the current health and wellness benefits and hopefully will enhance the important traits.

6. Peanut Specification Updates:
The Standards Board approved the specification changes for damage to 3.5% based on weight. Next steps are the release of the changes by the USDA and could be implemented for the 2016 crop. Darlene expressed that Freeze Damage is a concern in the VC but shellers should be able to manage because it is a subjective test.

7. Raw Peanut Storage Conditions:
USDA/Birdsong/Mars conducted an alternative raw peanut storage study. At 38-42 °F storage, mold can develop in super sacks. A study investigating the impact of storage at 55 °F and 70 °F was conducted. Samples were being pulled for sensory, FFA's, PV's, seed germination, water activity and wetness (utilizing leaf wetness sensors). Benefits of increasing the storage temperature include minimizing mold and reducing carbon footprint. At 50^{o} to 55^{o}F, the peanuts stored well from an infestation, mold, flavor, chemical and physical perspective for 12 mos. It was recommended that shellers understand the risk factors associated with the change. The rusty grain beetle is an emerging pest and new fumigation strategies may need to be in place to address. The industry and manufacturers to send concerns to Mars, Birdsong, and the USDA to address. Blanched peanut storage is an area of future focus.

8. Runner Seed Size Distribution:
High size variability has been observed particularly with the Jumbo runners. Jumbo peanuts can vary from riding a 21/64" screen up to a 27/64" screen. The wide range contributes to roast variability. A request for a new large size classification (Ex. extra large super jumbo), will need to go through the Standards Board. A market for the new large classification could be in peanut butter or new product development. Mark Kline mentioned that roast kernel variability for bars continues to be a challenge.

Meeting was adjourned at 2:42 pm.

Respectively submitted,
Mark Kline, Chair

PROGRAM COMMITTEE REPORT

Program Chairman Corley Holbrook recognized the outstanding help and support of Technical Program Chairman Ramon Leon and Local Arrangements Chairman Greg MacDonald. Attendance for 2016 is 356 total; 234 registrants; 64 spouses; 58 children. Feedback from the Opening Session speakers has been outstanding. The symposium was a huge success despite the blackout. We have a great group of sponsors: Florida Peanut Producers donated the registration bags. Romer Labs was the sole sponsor of the thumb drives this year which are pre-loaded with the 2016 abstracts, program and attendance list. BASF and Bayer Crop Sciences were recognized as sponsors of Wednesday night dinner. Dow AgroSciences was recognized as the sponsor of the Thursday night reception. Syngenta donated Elatus cooling towels JLA sponsored the Fun Run with another record number of participants. Georgia Peanut Commission sponsored the Spouses Hospitality Suite. Jennifer Tillman and Donna Holbrook put together 2.5 days of activities in the hospitality suite with lots of prize giveaways. The North

Carolina Peanut Growers Association once again sponsored the Joe Sugg Graduate Student Competition. A host of sponsors supported the Ice Cream Social. APRES continues to have a great group of peanut product suppliers who support our meeting breaks.

Technical Program Chairman Ramon Leon reported the 48th Annual Meeting scheduled 148 technical presentations, including this year's symposium *"Translating Genome Sequence to Peanut Improvement*" and 44 posters. Additionally, Josh Clevenger gave a workshop on *SWEEPing up SNPS: A Practical Workshop for SNP Identification in Peanut,* which attracted approximately 50 participants.

SITE SELECTION COMMITTEE REPORT

2018 Meeting

Barry Tillman, Committee Chairman, reported that under the guidance of Maria Balota the Committee is recommending that APRES choose Williamsburg, VA as the site for the 2018 Annual Meeting. He asked the Board to allow Executive Officer Kim Cutchins to finalize the negotiations between the Doubletree Williamsburg and the Williamsburg Lodge and make the final hotel selection. The Board agreed with this recommendation and the Executive Officer will finalize the contract with one of the two properties—Doubletree Williamsburg or Williamsburg Woodlands.

50th APRES Anniversary

Chairman Tillman reminded the Board that the 2018 meeting will be the 50th Anniversary of the APRES Annual Meeting. He suggested that the Board put together an ad hoc committee to plan a 50th Anniversary celebration event and historical remembrance for this special occasion. At the request of the Board, incoming President Corley Holbrook was asked to put together this ad hoc committee in consultation with President-Elect Peter Dotray and Maria Balota.

2019 Meeting

Auburn University has requested to be the lead university in the search for the 2019 property. Dr. Charles Chen and Hannah Jones will be the Committee's 2019 search representatives.

Proposed Committee Representation Change

The Committee and the Board approved the following by-laws change to be presented to the APRES membership for adoption by electronic membership vote. The by-law change affects Article IX. Committees; Secton 2; Point h; first sentence shall be changed to read as follows *(changes and additions are in **bold**; eliminated words have been ~~struck through~~):*

Proposed By-Laws Change:

h. *Site Selection Committee*: This committee shall consist of **six** (~~four~~) members, **two members from each region** that represent the diverse membership of the Society and with each serving three-year terms.

It was unanimously approved that the above proposed by-laws change may move forward for an electronic membership vote, following a 30 day notification to the APRES membership.

Other Business

Publication of APRES Membership List

President Tom Stalker notified the membership that the Board has approved the publication of an official APRES Membership list. It will contain name, affiliation, address, phone number, and email and will be hosted on the APRES website in a Members Only area which will be password protected.

Recognition of Retiring APRES Board Members

President Stalker announced the creation of a recognition gift for retiring APRES Board members. He unveiled a canvas print of Erdnus (*Arachis hypogeae* Linne print), a German botanical teaching poster from the Economic Botany Archives of Oakes Ames at Harvard University's Herbaria Library, personalized with an inscribed brass plaque of the retiring Board member's name and dates of service. This gift will be given to all retiring APRES Board members. Tom announced the first recipients of this gift are Naveen Puppala, David Jordan, and Barry Tillman. Tom asked them to come forward, presented each with their personalized print, and thanked them for their service to APRES.

Adjournment

Outgoing President Tom Stalker handed the gavel to newly-elected President, Corley Holbrook, who after taking a moment to add his words of praise to Jennifer Tillman and Donna Holbrook for putting together a wonderful Spouses Program, adjourned the meeting.

APPENDIX

BY-LAWS
of the
AMERICAN PEANUT RESEARCH and EDUCATION SOCIETY, INC.

ARTICLE 1. NAME

Section 1. The name of this organization shall be "AMERICAN PEANUT RESEARCH AND EDUCATION SOCIETY, INC."

ARTICLE II. PURPOSE

Section 1. The purpose of this Society shall be to instruct and educate the public on the properties, production, and use of the peanut through the organization and promotion of public discussion groups, forums, lectures, and other programs or presentation to the interested public and to promote scientific research on the properties, production, and use of the peanut by providing forums, treatises, magazines, and other forms of educational material for the publication of scientific information and research papers on the peanut and the dissemination of such information to the interested public.

ARTICLE III. MEMBERSHIP

Section 1. The several classes of membership which shall be recognized are as follows:

a. Individual memberships:

1. *Regular*, any person who by virtue of professional or academic interests wishes to participate in the affairs of the society.

2. *Retired*, persons who were regular members for at least five consecutive and immediately preceding years may request this status because of retirement from active employment within the peanut or academic community. Because of their past status as individual members and service to the society, retired member would retain all the right and privileges of regular individual membership.

3. *Student*, persons who are actively enrolled as a student in an academic institution and who wish to participate in the affairs of the society. Student members have the all rights and privileges of regular members except that they may not serve on the Board of Directors. Student members must be proposed by a faculty member from the student's academic institution and that faculty member must be regular or retired member of the society.

b. Sustaining memberships:
Industrial organizations and others that pay dues as fixed by the Board of Directors. Sustaining members are those who wish to support this Society financially to an extent beyond minimum requirements as set forth in Section 1c, Article III. Sustaining members may designate one representative who shall have individual member rights. Also, any organization may hold sustaining

memberships for any or all of its divisions or sections with individual member rights accorded each sustaining membership.

1. *Silver Level*, this maintains the current level and is revenue neutral. Discounted meeting registration fees would result in revenue loss with no increase in membership fee. Registration discounts can be used as an incentive for higher levels of membership.

2. *Gold Level*, the person designated by the sustaining member would be entitled to a 50% discount on annual meeting registration. This benefit cannot be transferred to anyone else.

3. *Platinum Level*, the person designated by the sustaining member would be entitled to a 100% discount on annual meeting registration. This benefit cannot be transferred to anyone else.

Section 2. Any member, participant, or representative duly serving on the Board of Directors or a committee of this Society and who is unable to attend any meeting of the Board or such committee may be temporarily replaced by an alternate selected by such member, participant, or representative upon appropriate written notice filed with the president or committee chairperson evidencing such designation or selection.

Section 3. All classes of membership may attend all meetings and participate in discussions. Only individual members or those with individual membership rights may vote and hold office. Members of all classes shall receive notification and purposes of meetings, and shall receive minutes of all Proceedings of the American Peanut Research and Education Society, Inc.

ARTICLE IV. DUES AND FEES

Section 1. The annual dues shall be determined by the Board of Directors with the advice of the Finance Committee subject to approval by the members at the annual business meeting.

Section 2. Dues are receivable on or before July 1 of the year for which the membership is held. Members in arrears on July 31 for the current year's dues shall be dropped from the rolls of this Society provided prior notification of such delinquency was given. Membership shall be reinstated for the current year upon payment of dues.

Section 3. A registration fee approved by the Board of Directors will be assessed at all regular meetings of the Society.

ARTICLE V. MEETINGS

Section 1. Annual meetings of the Society shall be held for the presentation of papers and/or discussion, and for the transaction of business. At least one general business session will be held during regular annual meetings at which reports from the executive officer and all standing committees will be given, and at which attention will be given to such other matters as the Board of Directors may designate.

Opportunity shall be provided for discussion of these and other matters that members wish to have brought before the Board of Directors and/or general membership.

Section 2. Additional meetings may be called by the Board of Directors by two-thirds vote, or upon request of one-fourth of the members. The time and place shall be fixed by the Board of Directors.

Section 3. Any member may submit only one paper as senior author for consideration by the program chairperson of each annual meeting of the Society. Except for certain papers specifically invited by the Society president or program chairperson with the approval of the president, at least one author of any paper presented shall be a member of this Society.

Section 4. Special meetings in conjunction with the annual meeting by Society members, either alone or jointly with other groups, must be approved by the Board of Directors. Any request for the Society to underwrite obligations in connection with a proposed special meeting or project shall be submitted to the Board of Directors, who may obligate the Society as they deem advisable.

Section 5. The executive officer shall give all members written notice of all meetings not less than 60 days in advance of annual meetings and 30 days in advance of all other special meetings.

ARTICLE VI. QUORUM

Section 1. Those members present and entitled to vote at a meeting of the Society, after proper notice of the meeting, shall constitute a quorum.

Section 2. For meetings of the Board of Directors and all committees, a majority of the members duly assigned to such board or committee shall constitute a quorum for the transaction of business. The Board of Directors and all committees may conduct meetings and votes by conference call or by electronic means of communication as needed to carry out the affairs of the Society.

ARTICLE VII. OFFICERS

Section 1. The officers of this Society shall consist of the president, the president-elect, the most recent available past-president and the executive officer of the Society, who may be appointed secretary and treasurer and given such other title as may be determined by the Board of Directors.

Section 2. The president and president-elect shall serve from the close of the annual meeting of this Society to the close of the next annual meeting. The president-elect shall automatically succeed to the presidency at the close of the annual meeting. If the president-elect should succeed to the presidency to complete an unexpired term, he/she shall then also serve as president for the following full term. In the event the president or president-elect, or both, should resign or become unable or unavailable to serve during their terms of office, the Board of Directors shall appoint a president, or both president-elect and president, to complete the unexpired terms until the next annual meeting when one or both offices, if necessary, will be filled by normal elective procedure. The most recent available past president shall serve as president until the Board of Directors can make such appointment.

Section 3. The officers and directors, with the exception of the executive officer, shall be elected by the members in attendance at the annual business meeting from nominees selected by the Nominating Committee or members nominated from the floor. The president, president-elect, and most recent available past-president shall serve without monetary compensation. The executive officer shall be appointed by a two-thirds majority vote of the Board of Directors.

Section 4. The executive officer may serve consecutive annual terms subject to appointment by the Board of Directors. The tenure of the executive officer may be discontinued by a two-thirds vote of the Board of Directors who then shall appoint a temporary executive officer to fill the unexpired term.

Section 5. The president shall arrange and preside at all meetings of the Board of Directors and with the advice, counsel, and assistance of the president-elect, and executive officer, and subject to consultation with the Board of Directors, shall carry on, transact, and supervise the interim affairs of the Society and provide leadership in the promotion of the objectives of this Society.

Section 6. The president-elect shall be program chairperson, responsible for development and coordination of the overall program of the education phase of the annual meeting.

Section 7. (a) The executive officer shall countersign all deeds, leases, and conveyances executed by the Society and affix the seal of the Society thereto and to such other papers as shall be required or directed to be sealed. (b) The executive officer shall keep a record of the deliberations of the Board of Directors, and keep safely and systematically all books, papers, records, and documents belonging to the Society, or in any wise pertaining to the business thereof. (c) The executive officer shall keep account of all monies, credits, debts, and property of any and every nature accrued and/or disbursed by this Society, and shall render such accounts, statements, and inventories of monies, debts, and property, as shall be required by the Board of Directors. (d) The executive officer shall prepare and distribute all notices and reports as directed in these By-Laws, and other information deemed necessary by the Board of Directors, to keep the membership well informed of the Society activities.

Section 8. The editor is responsible for timely publication and distribution of the Society's peer reviewed scientific journal, Peanut Science, in collaboration with the Publications and Editorial Committee. Editorial responsibilities include:

1. Review performance of associate editors and reviewers. Recommend associate editors to the Publications and Editorial Committee as terms expire.

2. Conduct Associate Editors' meeting at least once per year. Associate Editors' meetings may be conducted in person at the Annual Meeting or via electronic means such as conference calls, web conferences, etc.

3. Establish standard electronic formats for manuscripts, tables, figures, and graphics in conjunction with Publications and Editorial Committee and publisher.

4. Supervise Administrative/Editorial assistant in:
    - Preparing routine correspondence with authors to provide progress report of manuscripts.
    - Preparing invoices and collecting page charges for accepted manuscripts.

5. Screen manuscript for content to determine the appropriate associate editor, and forward manuscript to appropriate associate editor.

6. Contact associate editors periodically to determine progress of manuscripts under review.

7. Receive reviewed and revised manuscripts from associate editor; review manuscript for grammar and formatting; resolve discrepancies in reviewers' and associate editor's acceptance decisions.

8. Correspond with author regarding decision to publish with instructions for final revisions or resubmission, as appropriate. Follow-up with authors of accepted manuscripts if final revisions have not been received within 30 days of notice of acceptance above.

9. Review final manuscripts for adherence to format requirements. If necessary, return the manuscript to the author for final format revisions.

10. Review final formatting and forward compiled articles to publisher for preparation of first run galley proofs.

11. Ensure timely progression of journal publication process including:
    - Development and review of galley proofs of individual articles.
    - Development and review of the journal proof (proof of all revised articles compiled in final publication format with tables of contents, page numbers, etc.)
    - Final publication and distribution to members and subscribers via electronic format.

12. Evaluate journal publisher periodically; negotiate publication contract and resolve problems; set page charges and subscription rates for electronic formats with approval of the Board of Directors.

13. Provide widest distribution of *Peanut Science* possible by listing in various on-line catalogues and databases.

ARTICLE VIII. BOARD OF DIRECTORS

Section 1. The Board of Directors shall consist of the following:

a. The president

b. The most recent available past-president

c. The president-elect

d. Three University representatives - these directors are to be chosen based on their involvement in APRES activities, and knowledge in peanut research, and/or education, and/or regulatory programs. One director will be elected from each of the three main U.S. peanut producing areas (Virginia-Carolinas, Southeast, Southwest).

e. United States Department of Agriculture representative – this director is one whose employment is directly sponsored by the USDA or one of its agencies, and whose relation to peanuts principally concerns research, and/or education, and/or regulatory pursuits.

f. Three Industry representatives - these directors are (1) the production of peanuts; (2) crop protection; (3) grower association or commission; (4) the shelling, marketing, and storage of raw peanuts;(5) the production or preparation of consumer food-stuffs or manufactured products containing whole or parts of peanuts.

g. The President of the American Peanut Council or a representative of the President as designated by the American Peanut Council.

h. The Executive Officer - non-voting member of the Board of Directors who may be compensated for his services on a part-time or full-time salary stipulated by the Board of Directors in consultation with the Finance Committee.

i. National Peanut Board representative, will serve a three year term.

Section 2. Terms of office for the directors' positions set forth in Section 1, paragraphs d, e, f, and g shall be three years with elections to alternate from reference years as follows: d(VC area), e and f(2), 1992; d (SE area) and f(3), 1993; and d(SW area) and f(1), 1994.

Section 3. The Board of Directors shall determine the time and place of regular and special board meetings and may authorize or direct the president by majority vote to call special meetings whenever the functions, programs, and operations of the Society shall require special attention. All members of the Board of Directors shall be given at least 10 days advance notice of all meetings; except that in emergency cases, three days advance notice shall be sufficient.

Section 4. The Board of Directors will act as the legal representative of the Society when necessary and, as such, shall administer Society property and affairs. The Board of Directors shall be the final authority on these affairs in conformity with the By-Laws.

Section 5. The Board of Directors shall make and submit to this Society such recommendations, suggestions, functions, operation, and programs as may appear necessary, advisable, or worthwhile.

Section 6. Contingencies not provided for elsewhere in these By-Laws shall be handled by the Board of Directors in a manner they deem advisable.

Section 7. An Executive Committee comprised of the president, president-elect, most recent available past-president, and executive officer shall act for the Board of Directors between meetings of the Board, and on matters delegated to it by the Board. Its action shall be subject to ratification by the Board.

Section 8. Should a member of the Board of Directors resign from the board before the end of their term, the president shall request that the Nominating Committee nominate a qualified member of APRES to fill the remainder of the term of that individual and submit their name for approval by the Board of Directors.

ARTICLE IX. COMMITTEES

Section 1. Members of the committees of the Society shall be appointed by the president and shall serve three-year terms unless otherwise stipulated. The president shall appoint a chairperson of each committee from among the incumbent committee members. The Board of Directors may, by a two-thirds vote, reject committee appointees. Appointments made to fill unexpected vacancies by incapacity of any committee member shall be only for the unexpired term of the incapacitated committee member. Unless otherwise specified in these By-Laws, any committee member may be re-appointed to succeed him/herself, and may serve on two or more committees concurrently but shall not chair more than one committee. Initially, one-third of the members of each committee will serve one-year terms, as designated by the president. The president shall announce the committees immediately upon assuming the office at the annual business meeting. The new appointments take effect immediately upon announcement.

Section 2. Any or all members of any committee may be removed for cause by a two-thirds approval by the Board of Directors.

a. *Finance Committee:* This committee shall consist of four members that represent the diverse membership of the Society, each appointed to a three-year term. This committee shall be responsible for preparation of the financial budget of the Society and for promoting sound fiscal policies within the Society. They shall direct the audit of all financial records of the Society annually, and make such recommendations as they deem necessary or as requested or directed by the Board of Directors. The term of the chairperson shall close with preparation of the budget for the following year, or with the close of the annual meeting at which a report is given on the work of the Finance Committee under his/her leadership, whichever is later.

b. *Nominating Committee:* This committee shall consist of four members appointed to one-year terms, one each representing State, USDA, and Private Business segments of the peanut industry with the most recent available past-president serving as chair. This committee shall nominate individual members to fill the positions as described and in the manner set forth in Articles VII and VIII of these By-Laws and shall convey their nominations to the president of this Society by June 15 prior to that year's annual meeting. The president will then distribute those nominations to the Board of Directors for their review. The committee shall, insofar as possible, make nominations for the president-elect that will provide a balance among the various segments of the industry and a rotation among federal, state, and industry members. The willingness of any nominee to accept the responsibility of the position shall be ascertained by the committee (or members making nominations at the annual business meeting) prior to the election. No person may succeed him/herself as a member of this committee.

   Nominees to the APRES Board of Directors shall have been a member of APRES for a minimum of five (5) years, served on at least three (3) different committees, and be familiar with a significant number of APRES members and the various institutions and organizations that work with peanut.

c. *Publications and Editorial Committee:* This committee shall consist of four members that represent the diverse membership of the Society and who are appointed to three-year terms. The members may be appointed to two consecutive three-year terms. This committee shall be responsible for the publication of Society-sponsored publications as authorized by the Board of Directors in consultation with the Finance Committee. This committee shall formulate and enforce the editorial policies for all publications of the Society subject to the directives from the Board of Directors.

d. *Peanut Quality Committee:* This committee shall consist of seven members, one each actively involved in research in peanuts-- (1) varietal development, (2) production and marketing practices related to quality, and (3) physical and chemical properties related to quality--and one each representing the Grower, Sheller, Manufacturer, and Services (pesticides and harvesting machinery in particular) segments of the peanut industry. This committee shall actively seek improvement in the quality of raw and processed peanuts and peanut products through promotion of mechanisms for the elucidation and solution of major problems and deficiencies.

e. *Public Relations Committee:* This committee shall consist of four members that represent the diverse membership of the Society and are appointed for a three-year term. The primary purpose of this committee will be to publicize the meeting and make photographic records of important events at the meeting. This committee shall provide leadership and direction for the Society in the following areas:

- Membership: Development and implementation of mechanisms to create interest in the Society and increase its membership. These shall include, but not be limited to, preparing news releases for the home-town media of persons recognized at the meeting for significant achievements.
- Cooperation: Advise the Board of Directors relative to the extent and type of cooperation and/or affiliation this Society should pursue and/or support with other organizations.
- Necrology: Proper recognition of deceased members.
- Resolutions: Proper recognition of special services provided by members and friends of the Society.

f. *Bailey Award Committee:* This committee shall consist of six members, with two new appointments each year, serving three year terms. This committee shall be responsible for judging papers which are selected from each subject matter area. Initial screening for the award will be made by judges, selected in advance and having expertise in that particular area, who will listen to all papers in that subject matter area. This initial selection will be made on the basis of quality of presentation and content. Manuscripts of selected papers will be submitted to the committee by the author(s) and final selection will be made by the committee, based on the technical quality of the paper. The president, president-elect and executive officer shall be notified of the Award recipient at least sixty days prior to the annual meeting following the one at which the paper was presented. The president shall make the award at the annual meeting.

g. *Fellows Committee:* This committee shall consist of four members that represent the diverse membership of the Society and who are themselves Fellows of the Society. Terms of office shall be for three years. Nominations shall be in accordance with procedures adopted by the Society and published in the previous year's PROCEEDINGS of APRES. From nominations received, the committee shall select qualified nominees for approval by majority vote of the Board of Directors.

h. *Site Selection Committee:* This committee shall consist of four members that represent the diverse membership of the Society and with each serving three-year terms. The Chairperson of the committee shall be from the region in which the future meeting site is to be selected as outlined in subsections (1) – (3) and the Vice-Chairperson shall be from the region that will host the meeting the following year. The Vice-Chairperson will automatically move up to chairperson. *All of the following actions take place two years prior to the annual meeting for which the host city and hotel decisions are being made.*

Site Selection Committee shall:

- •Identify a host city for the annual in the designated region;
- •Solicit and evaluate hotel contract proposals in the selected host city;
- •Recommend a host city and hotel for consideration and decision by the Board of Directors.

Board of Directors shall:

- •Consider proposal(s) submitted by the Site Selection Committee;
- •Make final decision on host city and hotel;
- •Direct the Executive Officer to sign the contract with the approved hotel.

i. *Coyt T. Wilson Distinguished Service Award Committee:* This committee shall consist of four members that represent the diverse membership of the Society, each serving three-year terms. Nominations shall be in accordance with procedures adopted by the Society and published in the previous year's PROCEEDINGS of APRES. This committee shall review and rank nominations and submit these rankings to the committee chairperson. The nominee with the highest ranking shall be the recipient of the award. In the event of a tie, the committee will vote again, considering only the two tied individuals. Guidelines for nomination procedures and nominee qualifications shall be published in the Proceedings of the annual meeting. The president, president-elect, and executive officer shall be notified of the award recipient at least sixty days prior to the annual meeting. The president shall make the award at the annual meeting.

j. *Joe Sugg Graduate Student Award Committee:* This committee shall consist of five members. For the first appointment, three members are to serve a three-year term, and two members to serve a two-year term. Thereafter, all members shall serve a three-year term. Annually, the President shall appoint a Chair from among incumbent committee members. The primary function of this committee is to foster increased graduate student participation in presenting papers, to serve as a judging committee in the graduate students' session, and to identify the top two recipients (1st and 2nd place) of the Award. The Chair of the committee shall make the award presentation at the annual meeting.

ARTICLE X. AMENDMENTS

Section 1. These By-Laws may be amended consistent with the provision of the Articles of Incorporation by a two-thirds vote of all the eligible voting members present at any regular business meeting, provided such amendments shall be submitted in writing to each member of the Board of Directors at least thirty days before the meeting at which the action is to be taken.

The By-Laws may also be amended by votes conducted by mail or electronic communication, or a combination thereof, provided that the membership has 30 days to review the proposed amendments and then votes cast within a subsequent 30 day period. For such a vote to be valid at least 15% of the regular members of the society must cast a vote. In the absence of a sufficient number of members voting, the proposed amendment will be considered to have failed.

Section 2. A By-Law or amendment to a By-Law shall take effect immediately upon its adoption, except that the Board of Directors may establish a transition schedule when it considers that the change may best be effected over a period of time. The amendment and transition schedule, if any, shall be published in the "Proceedings of APRES".

Amended at the Annual Meeting of
the American Peanut Research and Education
Society
14 July 2011, San Antonio, Texas

MEMBERSHIP (1975-2006)

	Individuals	Institutional	Organizational	Student	Sustaining	Total
1975	419	--	40	--	21	480
1976	363	45	45	--	30	483
1977	386	45	48	14	29	522
1978	383	54	50	21	32	540
1979	406	72	53	27	32	590
1980	386	63	58	27	33	567
1981	478	73	66	31	39	687
1982	470	81	65	24	36	676
1983	419	66	53	30	30	598
1984	421	58	52	33	31	595
1985	513	95	65	40	29	742
1986	455	102	66	27	27	677
1987	475	110	62	34	26	707
1988	455	93	59	35	27	669
1989	415	92	54	28	24	613
1990	416	85	47	29	21	598
1991	398	67	50	26	20	561
1992	399	71	40	28	17	555
1993	400	74	38	31	18	561
1994	377	76	43	25	14	535
1995	363	72	26	35	18	514
1996	336	69	24	25	18	472
1997	364	74	24	28	18	508
1998	367	62	27	26	14	496
1999	380	59	33	23	12	507
2000	334	52	28	23	11	448
2001	314	51	34	24	11	434
2002	294	47	29	34	11	415
2003	270	36	30	23	10	369
2004	295	43	22	19	11	390
2005	267	38	28	15	8	356
2006	250	33	27	25	7	342

MEMBERSHIP (2007-2015)

	2007	2008	2009	2010	2011	2012	2013	2014	2015
Individual, Regular	228	185	184	172	162	204	238	266	262
Individual, Retired	13	13	14	13	10	9	9	15	14
Individual, Post Doc/Tech	6	9	7	11	4	5	3	8	8
Individual, Student	20	16	28	22	14	30	26	35	50
Sustaining, Silver	7	8	6	9	6	9	11	6	9
Sustaining, Gold	1	2	3	5	3	2	2	4	6
Sustaining, Platinum	1		1	1	2	1	1	0	8
Sustaining, Diamond									3
Institutional	6	21	21	19	21	23	24	26	27
TOTAL	**280**	**254**	**264**	**252**	**215**	**283**	**314**	**360**	**387**

GUIDELINES for AMERICAN PEANUT RESEARCH AND EDUCATION SOCIETY

FELLOW ELECTIONS

Fellows

Fellows are active members of the Society who have been nominated to receive the honor of fellowship by other active members, recommended by the Fellows Committee, and elected by the APRES Board of Directors. Up to three active members may be elected to fellowship each year.

Eligibility of Nominators

Nominations may be made by an active member of the Society. A member may nominate only one person for election to fellowship in any one year.

Eligibility of Nominees

Nominees must be active members of the Society at the time of their nomination and must have been active members for a total of at least five (5) years. The nominee should have made outstanding contributions in an area of specialization whether in research, extension or administration and whether in public, commercial or private service activities. Members of the Fellows Committee are ineligible for nomination.

Nomination Procedures

Preparation. Careful preparation of the nomination for a distinguished colleague based principally on the candidate's record of service will assure a fair evaluation by a responsible panel. The assistance of the nominee in supplying accurate information is permissible. The documentation should be brief and devoid of repetition. The identification of the nominee's contributions is the most important part of the nomination. The relative weight of the categories of achievement and performance are given in the attached "Format."

Format. Organize the nomination in the order shown in the "Format for Fellow Nominations." The body of the nomination, excluding publications lists and supporting letters, should be no more than eight (8) pages.

Supporting letters. The nomination shall include a minimum of three supporting letters (maximum of five). Two of the three required letters must be from active members of the Society. The letters are solicited by, and are addressed to, the nominator, and should not be dated. Those writing supporting letters need not repeat factual information that will obviously be given by the nominator, but rather should evaluate the significance of the nominee's achievements.

Deadline. Nominations are to be submitted electronically to the committee chair by the date listed in the call for nominations on the APRES website (www.apresinc.com).

Basis of Evaluation

A maximum of 10 points is allotted to the nominee's personal achievements and recognition. A maximum of 50 points is allotted to the nominee's achievements in his or her primary area of activity, i.e., research, extension, service to industry, or administration. A maximum of 10 points is also allotted to the nominee's achievements in secondary areas of activity. A maximum of 30 points is allotted to the nominee's service to APRES and to the profession.

Processing of Nominations

The Fellows Committee shall evaluate the nominations, assign each nominee a score, and make recommendations regarding approval by April 1. The President of APRES shall mail the committee recommendations to the Board of Directors for election of Fellows, maximum of three (3), for that year. A simple majority of the Board of Directors must vote in favor of a nominee for election to fellowship. Persons elected to fellowship, and their nominators, are to be informed promptly. Unsuccessful nominations will be reconsidered the following year and nominators will be contacted and given the opportunity to provide a letter that updates the nomination. After the second year unsuccessful nominations will be reconsidered only following submission of a new, complete nomination package.

Recognition

Fellows shall receive a plaque at the annual business meeting of APRES. The Fellows Committee Chairman shall announce the elected Fellows and the President shall present each a certificate. The members elected to fellowship shall be recognized by publishing a brief biographical sketch of each, including a photograph and summary of accomplishments, in the APRES PROCEEDINGS. The brief biographical sketch is to be prepared by the Nominator.

Distribution of Guidelines

These guidelines and the format are to be published in the APRES PROCEEDINGS. Nominations should be solicited by an announcement published on the APRES website (www.apresinc.com).

GUIDELINES for AMERICAN PEANUT RESEARCH & EDUCATION SOCIETY

BAILEY AWARD

The Bailey Award was established in honor of Wallace K. Bailey, an eminent peanut scientist. The award is based on a two-tier system whereby nominations are selected based on the oral paper presentation in sessions at the annual APRES meeting, and final awards are made after critiquing manuscripts based on the information presented during the respective meeting.

For initial selection, the session chairman shall appoint three persons, including him/herself if desired, to select the best paper in the session. None of the judges can be an author or co-author of papers presented during the respective session. No more than one paper from each session can be nominated for the award but, at the discretion of the session chairman in consultation with the Bailey Award chairman, the three-member committee may forego submission of a nomination. Symposia and poster presentations are not eligible for the Bailey Award.

The following should be considered for eligibility:

1. The presenter of a nominated paper, whether the first or a secondary author, must be a member of APRES.

2. Graduate students being judged for the Joe Sugg Award are also eligible for the Bailey Award if they meet all other criteria for eligibility.

Oral presentations will be judged for the Award based on the following criteria:

1. Well organized.
2. Clearly stated.
3. Scientifically sound.
4. Original research or new concepts in extension or education.
5. Presented within the time allowed.

A copy of these criteria will be distributed to each session chair and judge prior to the paper session.

Final evaluation for the Award will be made from manuscripts submitted to the Awards Committee, after having been selected previously from presentations at the APRES meetings. These manuscripts should be based on the oral presentation and abstract as published in the PROCEEDINGS.

Authorship of the manuscript should be the same (both in name and order) as the original abstract. Papers with added author(s) will be ruled ineligible.

Manuscripts are judged using the following criteria:

1. Appropriateness of the introduction, materials and methods, results and discussion, interpretation and conclusions, illustrations and tables.
2. Originality of concept and methodology.
3. Clarity of text, tables and figures; economy of style; building on known literature.
4. Contribution to peanut scientific knowledge.

The Bailey Award chair for the current year's meeting will complete the following:

1. Notify session moderators for the upcoming meeting of their responsibilities in relation to judging oral presentations as set in the guidelines in APRES PROCEEDINGS,
2. Meet with committee at APRES meeting,
3. Collect names of nominees from session moderators by Friday a.m. of Annual Meeting,
4. Provide Executive Officer and Bailey Award committee members the name of Bailey Award nominees,
5. Notify nominees within two months of meeting,
6. Set deadline in late Fall or early winter for receipt of manuscripts by Bailey Award chair,
7. Distribute manuscripts to committee members,
8. Provide Executive Officer with Bailey Award winner and paper title by the date provided in the Call for Nominations, and
9. Bailey Award chair's responsibilities are completed when the Executive Officer receives Bailey Award recipient's name and paper title.

The presentation of peanut bookends will be made to the speaker and other authors appropriately recognized.

Amended 7-16-2015

GUIDELINES FOR THE AMERICAN PEANUT RESEARCH & EDUCATION SOCIETY'S

COYT T. WILSON DISTINGUISHED SERVICE AWARD

The Coyt T. Wilson Distinguished Service Award will recognize an individual who has contributed two or more years of distinguished service to the American Peanut Research and Education Society. It will be given annually in honor of Dr. Coyt T. Wilson who contributed freely of his time and service to this organization in its formative years. He was a leader and advisor until his retirement in 1976.

Eligibility of Nominators

Nominations may be made by an active member of the Society except members of the Award Committee and the Board of Directors. However, the nomination must be endorsed by a member of the Board of Directors. A nominator may make only one nomination each year and a member of the Board of Directors may endorse only one nomination each year.

Eligibility of Nominees

Nominees must be active members of the Society and must have been active for at least five years. The nominee must have given of their time freely and contributed distinguished service for two or more years to the Society in the area of committee appointments, officer duties, editorial boards, or special assignments. Members of the Award Committee are ineligible for nomination.

Nomination Procedures

Deadline.

The deadline date for receipt of the nominations by the chairman shall be established in the Call for Nominations each year.

Preparation.

Careful preparation of the nomination based on the candidate's service to the Society is critical. The nominee may assist in order to assure the accuracy of the information needed. The documentation should be brief and devoid of repetition. An Electronic copy (including supporting letters) of the nomination packet should be sent to the committee chair who will forward to the members of the Committee for review.

Format.

TITLE:

Entitle the document "Nomination of_____for the Coyt T. Wilson Distinguished Service Award presented by the American Peanut Research and Education Society".

(Insert the name of the nominee in the blank).

NOMINEE:

Include the name, mail address (with zip code) and telephone number (with area code).

NOMINATOR AND ENDORSER:

Include the typewritten names, signatures, mail addresses (with zip codes) and telephone numbers (with area codes).

SERVICE AREA:

Designate area as Committee Appointments, Officer Duties, Editorial Boards, or Special Assignments. (List in chronological order by year of appointment.)

Qualifications of Nominees

Personal Achievements and Recognition:

- Education and degrees received: Give field, date and institution
- Membership in professional organization
- Honors and awards
- Employment: Give years, locations and organizations

Service to the Society:

- Number of years membership in APRES
- Number of APRES annual meetings attended
- List all appointed or elected positions held
- Basis for nomination
- Significance of service including changes which took place in the Society as a result of this work and date it occurred.

Supporting letters:

Two supporting letters should be included with the nomination. These lettters should be from Society members who worked with the nominee in the service rendered to the Society or is familiar with this service. The letters are solicited by and are addressed to the nominator. Members of the Award Committee and the nominator are not eligible to write supporting letters.

Re-consideration of nominations.

Unsuccessful nominations will be reconsidered the following year and nominators will be contacted and given the opportunity to provide a letter that updates the nomination. After the second year unsuccessful nominations will be reconsidered only following submission of a new, complete nomination package.

Award and Presentation

The award shall consist of a $1,000 cash award and a bronze and wood plaque both provided by the Society and presented at the annual meeting.

Amended 7-16-2015

GUIDELINES for

DOW AGROSCIENCES AWARDS FOR EXCELLENCE IN RESEARCH AND EDUCATION

I. Dow AgroSciences Award for Excellence in Research

The award will recognize an individual or team for excellence in research. The award may recognize an individual (team) for career performance or for an outstanding current research achievement of significant benefit to the peanut industry. One award will be given each year provided worthy nominees are nominated. The recipient will receive an appropriately engraved plaque and a $1,000 cash award. In the event of team winners, one plaque will be presented to the team leader and other team members will receive framed certificates. The cash award will be divided equally among team members.

Eligibility of Nominees

Nominees must be active members of the American Peanut Research and Education Society and must have been active members for the past five years. The nominee or team must have made outstanding contributions to the peanut industry through research projects. An individual may receive either award only once as an individual or as a team member. Members of the Dow AgroSciences Awards Committee are ineligible for the award while serving on the committee.

II. Dow AgroSciences Award for Excellence in Education

The award will recognize an individual or team for excellence in educational programs. The award may recognize an individual (team) for career performance or for an outstanding current educational achievement of significant benefit to the peanut industry. One award will be given each year provided worthy nominees are nominated. The recipient will receive an appropriately engraved plaque and a $1,000 cash award. In the event of team winners, one plaque will be presented to the team leader and other team members will receive framed certificates. The cash award will be divided equally among team members.

Eligibility of Nominees

Nominees must be active members of the American Peanut Research and Education Society and must have been active members for the past five years. The nominee or team must have made outstanding contributions to the peanut industry through education programs. Members of the Dow AgroSciences Awards Committee are not eligible for the award while serving on the committee. Eligibility of nominators, nomination procedures, and the Dow AgroSciences Awards Committee are identical for the two awards and are described below:

Eligibility of Nominators

Nominators must be active members of the American Peanut Research and Education Society. Members of the Dow AgroSciences Awards Committee are not eligible to make nominations while serving on the committee. A nominator may make only one nomination each year.

Nomination Procedures

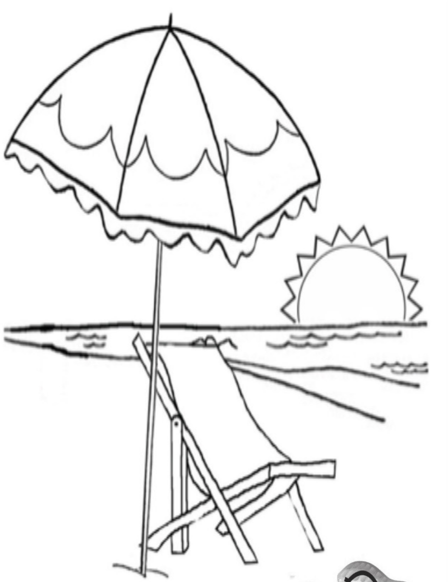
Nominations will be made on the Nomination Form for Dow AgroSciences Awards. Forms are available from the Executive Officer of APRES. A nominator's submittal letter summarizing the significant professional achievements and their impact on the peanut industry must be submitted with the nomination. Three supporting letters must be submitted with the nomination. Supporting letters may be no more than one page in length. Nominations must be postmarked by the date established in the Call for Nominations and mailed (electronically or postal) to the committee chair. Unsuccessful nominations will be reconsidered the following year and nominators will be contacted and given the opportunity to provide a letter that updates the nomination. After the second year unsuccessful nominations will be reconsidered only following submission of a new, complete nomination package.

Dow AgroSciences Awards Committee
The APRES President is responsible for appointing the committee. The committee will consist of seven members with one member representing the sponsor. After the initial appointments, the President will appoint two new members each year to serve a term of three years. If a sponsor representative serves on the awards committee, the sponsor representative will not be eligible to serve as chair of the committee.

Amended 7-16-2015

AMERICAN PEANUT RESEARCH AND EDUCATION SOCIETY

48th Annual Meeting
July 12-14, 2016
Hilton Clearwater Beach
Clearwater, FL



PROGRAM AND SCHEDULE OF EVENTS

AMERICAN PEANUT RESEARCH & EDUCATION SOCIETY, INC.

48th Annual Meeting

July 12-14, 2016 * Clearwater Beach, FL

Sponsors

Wednesday Night Reception & Dinner
Bayer
BASF

Meeting Breaks
Birdsong Peanuts
Fine Americas, Inc.
Olam Edible Nuts
Syngenta

Ice Cream Social
AmVac
Arysta Life Sciences
DuPont
Golden Peanut & Tree Nuts
Monsanto
National Peanut Board
National Peanut Buying Points Association
North Carolina Peanut Growers Association
The J.M. Smucker Company
U.S. Gypsum
Valent
Virginia Peanut Growers Association

Registration Bags & Product Donations
Florida Peanut Producers Association
Romer Labs
Verdesian Life Sciences
American Peanut Shellers Association
Syngenta

Awards Reception
Dow AgroSciences

Spouses Hospitality Suite
Georgia Peanut Commission

Joe Sugg Graduate Student Competition
North Carolina Peanut Growers Association
Anonymous Donor

Fun Run
JLA, Inc.

Peanut Snacks
Alabama Peanut Producers Association
Bell Plantation
Florida Peanut Producers Association
Georgia Peanut Commission
Hershey's Chocolate
Hormel Foods
Mars Chocolate
Mississippi Peanut Growers Association
National Peanut Board
North Carolina Peanut Growers Association
The J.M. Smucker Company
Snyder's/Lance
South Carolina Peanut Board
Texas Peanut Producers Board
Virginia Peanut Growers Association

AMERICAN PEANUT RESEARCH & EDUCATION SOCIETY
BOARD OF DIRECTORS
2015-16

President…………………………………………………………………………. Tom Stalker (2017)

Past President……………………………………………………………. Naveen Puppala (2016)

President-Elect…………………………………………………………. Corley Holbrook (2018)

Executive Officer……………………………………………………. Kimberly Cutchins (2016)

University Representatives:
- Virginia-Carolina……………………………………………………. David Jordan (2016)
- Southeast…………………………………………………………….Barry Tillman (2016)
- Southwest…………………………………………………………. Peter Dotray (2017)

USDA Representative…………………………………………………. Marshall Lamb (2016)

Industry Representatives:
- Production……………………………………………………. Wilson Faircloth (2018)
- Shelling, Marketing, Storage………………………………… Darlene Cowart (2016)
- Manufactured Products…………………………………………… Jim Elder (2017)

Director of Science and Technology of the
American Peanut Council………………………………… Howard Valentine (2016)

National Peanut Board ………………………………………………………. Dan Ward (2016)

2016 PROGRAM COMMITTEE
Corley Holbrook, Chair

Local Arrangements
Greg MacDonald, Chair
Chris Liebold, Co-Chair
Craig Kvien
Will Dezern

Technical Program
Ramon Leon, Chair

Spouses Program
Donna Holbrook
Jennifer Tillmman

Fun Run
Jack Davis, Chair

APRES Committees
2015-16

Bailey Award Committee
Scott Monfort, Chair (2016)
Charles Chen (2017)
Peter Dotray (2017)
Phat Dang (2018)
John Damicone (2018)
Jason Sarver (2016)

Coyt T. Wilson Distinguished Service Award Committee
Corley Holbrook, Chair (2016)
Jason Woodward (2018)
Austin Hagan (2016)
Emily Cantowine (2017)

Dow AgroSciences Awards Committee
Kelly Chamberlain, Chair (2017)
Michael Baring (2018)
Scott Tubbs (2016)
Lisa Dean (2016)
Bill Branch (2018)
Victor Nwosu (2017)
John Richburg (2017)

Fellows Committee
David Jordan, Chair (2017)
Mark Burow (2017)
Chris Butts (2016)
Jack Davis (2016)
Diane Rowland (2017)

Finance Committee
Todd Baughman, Chair (2017)
Howard Valentine (2018)
Tim Brenneman (2018)
Naveen Puppala (2017)
Scott Tubbs (2017)

Joe Sugg Graduate Student Award Committee
Robert Kemerait, Chair (2017)
Hillary Mehl (2018)
Juliet Chu (2018)
Wilson Faircloth (2016)
Maria Balota (2017)
Rebecca Bennett (2017)
Jianping Wang (2016)

Nominating Committee
Naveen Puppala, Chair (2016)
Peggy Ozias-Akins (2018)
Corley Holbrook (2018)
Noelle Barkley (2017)
Tom Stalker (2017)
Barry Tillman (2017)

Peanut Quality Committee
Mark Kline, Chair (2017)
Lisa Dean (2018)
Michael Franke (2017)
Darlene Cowart (2018)
Marshall Lamb (2018)
Barry Tillman (2016)
Chris Liebold (2017)

Program Committee
Corley Holbrook, Chair (2016)
Ramon Leon, Technical Program Chair
Greg MacDonald, Local Arrangements Chair
Jack Davis, Fun Run Chair
Donna Holbrook, Spouses Program Chair

Publications and Editorial Committee
Chris Butts, Chair (2017)
Nick Dufault, (2016)
Baozhou. Guo (2018)
Emily Cantowine (2016)
Shyam Tallury (2017)
Jianping Wang (2017)
Chris Liebold (2018)
Michael J. Mulvaney
(2018)

Public Relations Committee
Jason Woodward, Chair (2017)
Ron Sholar (2018)
Julie Marshall (2016)
Bob Sutter (2016)
Jamison Cruce

Site Selection Committee
Barry Tillman, Chair (2016)
Michael Baring, Chair
(2017) Barbara Shew (2018)
Tom Isleib (2018)
Nick Dufault (2016)
Rebecca Bennett (2017)

APRES 48th Annual Meeting
Schedule at A Glance

Tuesday, July 12 Time	Meeting/Agenda	Room
All Day	Registration	ECF Foyer
8:00 - 9:45 am	Seed Summit	Waters Edge A&B
10:00 am - 12 Noon	Crop Germplasm Committee	Waters Edge A&B
1:00 - 4:30 p.m.	Spouses' Hospitality Suite	White Sands
12 Noon	Program Committee	Marlin
1:00 p.m.	Publications and Editorial Committee Associate Editors Peanut Science Nominating Committee	Waters Edge C
2:00 p.m.	Peanut Quality Committee Site Selection Committe Dow Awards Committee Fellows Award Committee	Waters Edge AB Waters Edge C
3:00 p.m.	Public Relations Committee Coyt T. Wilson Award Committee Bailey Award Committee	Waters Edge C
4:00 p.m.	Finance Committee Joe Sugg Graduate Student Competition Committee	Waters Edge C
3:00 - 6:00 p.m.	Presentation Uploading	Dolphin
6:30 - 8:00 p.m.	Ice Cream Social	Flamingo & Sandpiper Decks
Wednesday, July 13 Time	**Meeting/Agenda**	**Room**
All Day	Registration	ECF Foyer
All Day	Presentation Uploading	Dolphin
All Day	Spouses' Hospitality Suite	White Sands
8:00 - 10:00am	General Session	Salon D - overflow to ABC
10:00am - 10:30am	Networking Break	ABC Foyer Area
10:30am - 12:30pm	Symposium: Translating Genome Sequence to Peanut Improvement	Salon D - overflow to ABC
12:30 - 1:30pm	Lunch on Own	
1:30 - 3:30 p.m.	Production Technology/Weed Science I	Waters Edge A
	Harvesting, Curing Shelling, Storing & Handling Processing and Utilization Economics	Waters Edge B
	Plant Pathology/Nematology I	Waters Edge C
	Breeding, Biotechnology and Genetics I	Salon D
3:30 - 4:00 p.m.	Networking Breaks	Salons ABC & Blue Heron Deck
4:00 - 4:30 p.m.	Harvesting, Curing Shelling, Storing & Handling Processing and Utilization Economics	Waters Edge B
4:00 - 5:30 p.m.	Plant Pathology/Nematology II	Waters Edge C
4:00 -5:00 p.m.	SWEEPing up SNPS: A Practical Workshop for SNP Identification in Peanut	Salon D
5:00 - 6:00 p.m.	Board of Directors Meeting	Marlin
6:30 - 9:00 p.m.	Beach Side Southern Dinner	Flamingo & Sandpiper Decks

APRES 48th Annual Meeting
Schedule at A Glance

Thursday, July 14 Time	Meeting/Agenda	Room
6:30 a.m	APRES Fun Run/Walk	Beachside
All Day	Registration	ECF Foyer
8:00 a.m.-4:00 p.m.	Spouses' Hospitality Suite	White Sands
8:00 - 10:00 a.m.	Joe Sugg Graduate Student Competition I Breeding/Genetics/Plant Pathology	Salon D
8:15 - 10:00 a.m.	Joe Sugg Graduate Student Competition II Production Technology/Mycotoxins/Weed Science/Other	Waters Edge ABC
10:00 - 10:30 a.m.	Networking Break	Salons ABC & Blue Heron Deck
10:30 - 11:45 a.m.	Joe Sugg Graduate Student Competition I *(continues)*	Salon D
10:30 - 11:45 a.m.	Joe Sugg Graduate Student Competition II *(continues)*	Waters Edge ABC
12 Noon - 1:30 p.m.	Lunch on Your Own	
1:30 - 3:15 p.m.	Production Technology/Weed Science II	Waters Edge A
1:30 - 4:00 p.m.	Bayer Extension Techniques and Technology	Waters Edge B
1:30 - 3:15 p.m.	Entomology/Mycotoxins	Waters Edge C
1:30 - 3:15 p.m.	Breeding and Genetics II	Salon D
3:15-3:45 p.m.	Networking Break	Salons ABC
3:30 - 4:30 p.m.	Poster Viewing and Discussions *(Authors Present)*	Ballroom ABC
4:30 - 5:30 p.m.	APRES Business Meeting and Awards Ceremony	Salon D
5:30 - 7:30 p.m.	Awards Reception	Flamingo & Sandpiper Decks

AMERICAN PEANUT RESEARCH AND EDUCATION SOCIETY
48TH ANNUAL MEETING
JULY 12-14, 2016
HILTON CLEARWATER BEACH, FL

PROGRAM	
Tuesday, July 12, 2016	
All Day ECF Foyer	**Registration**
Morning	**Golf on Your Own**
8:00 - 9:45 a.m. Waters Edge A&B	**Seed Summit**
10:00 a.m. - 12 Noon Waters Edge A&B	**Crop Germplasm Committee**
Mid-day	**Lunch on Your Own**
1:00 - 4:30 p.m. White Sands	**Spouses' Hospitality Suite Open** *Sponsored by: Georgia Peanut Commission* *A place to rest, relax, meet and greet, and get a snack to tide you over while you wait for family and friends.*
12 Noon Marlin	**Program Committee**
1:00 - 4:30 p.m.	**APRES Committee Meetings**
1:00 p.m. Waters Edge C	Publications and Editorial Committee Associate Editors Peanut Science Nominating Committee
2:00 p.m. Waters Edge C	Peanut Quality Committee Site Selection Committe Dow Awards Committee Fellows Award Committee
3:00 p.m. Waters Edge C	Public Relations Committee Coyt T. Wilson Award Committee Bailey Award Committee
4:00 p.m. Waters Edge C	Finance Committee Joe Sugg Graduate Student Competition Committee
3:00 - 6:00 p.m. Dolphin	**Presentation Uploading**
6:30 - 8:00 p.m. Flaming & Sandpiper Decks	**Ice Cream Social** *Sponsored by: APRES Sustaining Members* *The perfect event to kick off the social side of the 48th APRES Annual Meeting. Dessert (or a sweet tooth dinner) for all in a mix and mingle setting with your fellow attendees and guests. (Cash bar)*

Wednesday, July 13, 2016	
All Day ECF Foyer	**Registration**
All Day Dolphin	**Presentation Uploading**
8:00 a.m.-4:00 p.m. White Sands	**Spouses' Hospitality Suite Open** *Sponsored by: Georgia Peanut Commission* *A place to rest, relax, meet and greet, and get a snack to tide you over while you wait for family and friends.*
8:00 - 10:00 a.m. Salon D Overflow to ABC	**Opening General Session** Call to Order APRES President Tom Stalker
	Welcome to Florida and UFL Research Overview Dr. Jacqueline Burns Dean of Research University of Florida/IFAS
	The Perfectly Powerful Peanut Bob Parker President and CEO National Peanut Board
	Keynote Address: ***Dealing with Disasters--Stories From the Frontline of the War on Citrus Greening Disease*** Dr. Robert Shatters Research Molecular Biologist USDA-ARS, U.S. Horticultural Laboratory, Ft. Pierce, FL
	Peanut Diseases From An International Perspective--Potential Game Changers Dr. Tim Brenneman Professor of Plant Pathology University of Georgia
	Announcements
10:00 - 10:30 a.m. ABC Foyer	**Networking Break** *Sponsored by: Birdsong Peanuts*

10:30 a.m.-12:30 p.m. Salon D	**Symposium: Translating Genome Sequence to Peanut Improvement** *Opening Remarks - Peggy Ozias-Akins, University of Georgia*
	Impact of Genome Sequence for Legumes Scott Jackson, Professor of Plant Functional Genomics, University of Georgia
	Peanut Genetic Complexity and Molecular Signatures of Selection During Runner Peanut Breeding Josh Clevenger, PhD Candidate, University of Georgia
	Marker-assisted Selection for Biotic Stress Tolerance Ye Chu, Research Professional IV, University of Georgia
	Accelerating Introgression of Favorable Alleles from Wild Species Using Genomic Tools Daniel Fonceka, Researcher, Molecular Genetics, CIRAD
	Breeding for Abiotic Stress Tolerance Mark Burow, Professor, Dept of Soil & Crop Science, Texas A&M AgriLife Research and Professor, Dept. of Plant & Soil Science, Texas Tech University
	Innovative Molecular Breeding Methods Wayne Parrott, Professor at the Department of Crop Sciences and Institute for Plant Breeding, Genetics and Genomics, University of Georgia
	Industry Perspectives Steve Brown, Executive Director, The Peanut Foundation
	Closing Remarks, Questions & Discussion
12:30 - 1:30 p.m.	**Lunch on Your Own**
Concurrent Breakout Sessions	
1:30 - 3:30 p.m. Waters Edge A	**Production Technology/Weed Science I** *Chair and Moderator: Steve Li, Auburn University*
1:30 p.m	**Best Combination of Disease Resistance, Drought Tolerance, and Dollar Value among Runner and Virginia-Type Peanut Cultivars in Georgia.** **W. D. BRANCH*** and S. M. FLETCHER. Dept. of Crop and Soil Sciences, and Dept. of Agric. and Applied Economics, University of Georgia, Tifton and Griffin Campus, respectively.
1:45 p.m.	**The Need for Micronutrients in Peanut Production.** **G. HARRIS***, University of Georgia, Tifton, GA; J. HOWE and A. CALLAWAY, Auburn University, Auburn, AL.
2:00 p.m.	**Yield, Water Use Efficiency, and Water Footprint for Irrigated Peanut In Georgia** **M.C. LAMB***, R.B. SORENSON, and C.L. BUTTS, USDA-ARS, National Peanut Research Laboratory, Dawson, GA 39242.
2:15 p.m.	**The Influence of Plant Population on Peanut Varieties.** **J. C. OAKES*** and M. BALOTA, Virginia Tech Tidewater AREC, Suffolk, VA 23437
2:30 p.m.	**Irrigation Scheduling Methods for Peanuts a Continued Study.** **W. M. PORTER***, C. D. PERRY, W. S. MONFORT, J. L. SNIDER, G. VELLIDIS, Department of Crop and Soil Sciences, and A.R. SMITH, Department of Agricultural Economics, University of Georgia, Tifton, GA 31793-0748.

2:45 p.m.	**How Planting Date and Row Pattern Influence Peanut Pod Yield in Mississippi.** **J.M. SARVER*** and C.C. ABBOTT, Department of Plant and Soil Sciences, Mississippi State University, Mississippi State, MS 39762.
3:00 p.m.	**Planter Speed, Vacuum Pressure, and Seed Plate Effects on Peanut Plant Stand in Single Row Pattern.** **R.S. TUBBS***, G.A. HANCOCK, Crop and Soil Sciences Department, University of Georgia, Tifton, GA 31793; and J.M. SARVER, Department of Plant and Soil Sciences, Mississippi State University, Mississippi State, MS 39762.
3:15 p.m.	**Dynamic Variable Rate Irrigation Scheduling for Peanuts.** G. VELLIDIS, W. PORTER, **V. LIAKOS***, C. PERRY Department of Crop and Soil Sciences University of Georgia, Tifton, GA. And Xi LANG, Department of Plant, Soil, and Entomological Sciences, University of Idaho, Aberdeen Research and Extension Center, 1693 S 2700 W Aberdeen, ID 83210.
1:30 - 3:30 p.m. Waters Edge B	**Harvesting, Curing Shelling, Storing & Handling** **Processing and Utilization** **Economics** *Chair: Wes Porter, Univesity of Georgia* *Moderator: Nathan Smith, Clemson University*
1:30 p.m	**Influence of Planting Date, Irrigation, and Late Season Flower Termination on Harvested Single Kernel Oleic Acid (%) Distributions and Other Quality Factors of High Oleic Runner and Spanish Seed.** **J.P. DAVIS***, C.M. BAKER, J.M. LEEK, JLA International, Albany, GA 31721; M. KLINE, Technical Center, The Hershey Company, Hershey, PA 17033; C.L. BUTTS, R.B. SORENSEN, and M.C. LAMB, USDA, ARS, National Peanut Research Laboratory, Dawson, GA 39842.
1:45 p.m.	**Growing Degree Days, Harvest Dates and Peanut Quality Attributes** **F.D. MILLS, JR.*** and S.S. NAIR, Department of Agricultural Sciences and Engineering Technology, Sam Houston State University, Huntsville, TX 77341; C.L. BUTTS, R.B. SORENSEN and M.C. LAMB, USDA-ARS National Peanut Research Lab, Dawson, GA 39842; W.J. PEARCE, Golden Peanut Company, Camilla, GA 31730.
2:00 p.m.	**Intensities of Sensory Attributes in High- and Normal-Oleic Cultivars in the N.C. State University Performance Trials.** **H.E. PATTEE***, T.G. ISLEIB, S.C. COPELAND, W.G. HANCOCK, and F.R. CANTOR BARREIRO, Dept. of Crop, Soil, and Environmental Sciences, N.C. State Univ., Raleigh, NC 27695-7629, and M.A. DRAKE and M.D. YATES, Dept. of Food, Bioprocessing, and Nutrition Sciences, N.C. State Univ., Raleigh, NC 27695-7624.
2:15 p.m.	**Changes in Sensory and Physical Attributes of Multiple Peanut Varieties Grown in Several Locations and Roasted For a Range of Times.** **K.W. HENDRIX***, L.L. DEAN, Market Quality and Handling Research Unit, USDA-ARS, Raleigh, NC, 27695 and M. C. LAMB, National Peanut Research Lab, USDA-ARS, Dawson, GA 39842.
2:30 p.m.	**Impacts of Gender, Livelihood and Environment on Peanut Productivity and Post-harvest Practice: Baseline findings in Haiti.** **RHOADS, J.***, KOSTANDINI, G, University of Georgia, Athens, GA; CARROLL, E., JOHNSON, R., Acceso Peanut Enterprise Corp. Petionville, Haiti; SCHWARTZBORD, J., Cornell University, Ithaca, NY.

2:45 p.m.	**Alternative Storage Environments for Shelled Peanuts.** **C. L. BUTTS***, USDA, ARS, National Peanut Research Laboratory, Dawson, GA; K. HORM, Mars Chocolate NA, Elizabethtown, PA; S. POWELL, B. ANTHONY and J. BENNETT, Mars Chocolate NA, Elizabethtown, PA; D. COWART, Birdsong Peanuts, Blakely, GA; and M.C. LAMB, USDA, ARS, National Peanut Research Laboratory, Dawson, GA.
3:00 p.m.	**Peanut Warehousing Alternatives: Building vs. Shipping.** **C.J. RUIZ***, S.M. FLETCHER, Z. SHI, N. SMITH. National Center for Peanut Competitiveness, University of Georgia, Griffin, GA 30223-1797.
3:15 p.m.	**Peanut Warehousing: Future Implications.** **C.J. RUIZ***, S.M. FLETCHER, Z. SHI. National Center for Peanut Competitiveness, University of Georgia, Griffin, GA 30223-1797.
1:30 - 3:15 p.m. Salon D	**Breeding, Biotechnology and Genetics I** *Moderator: Charles Chen, Auburn University*
1:30 p.m	**Unlocking the Peanut Genomes to Provide Tools and Resources for Peanut Breeding, Genetics and Genomics.** **D.Y. GAO***, D.J. BERTIOLI, A. IWATA, X. HAN, S. JACKSON, Center for Applied Genetic Technologies (CAGT), University of Georgia, Athens, GA, USA; Y. CHU, J.P.CLEVENGER, P. OZIAS-AKINS. Department of Horticulture, The University of Georgia, Tifton, GA; L. FROENICKE, Genome Center-GBSF, University of California, Davis, California USA; X. LIU, BGI-Shenzhen, Shenzhen 518083, China and S. CANNON, Corn Insects and Crop Genetics Research Unit, US Department of Agriculture–Agricultural Research Service, Ames, Iowa, USA.
1:45 p.m.	**Dissecting the genetic bases of peanut nodulation.** H. ZHOU, Z. PENG, J. MAKU, L. TAN, F. LIU, , Y. LOPEZ, **J. WANG***, Agronomy Department, University of Florida, Gainesville, FL 32611, and M.GALLOW, College of Tropical Agriculture and Human Resources, University of Hawaii at Mānoa, Honolulu, HI 96822.
2:00 p.m.	**Analysis of Disease Resistance Gene Analogs (RGAs) Gene Expression to Associate Leaf Spot Resistance in Cultivated Peanut.** **P.M. DANG*** and M.C. LAMB, USDA-ARS National Peanut Research Laboratory, Dawson, GA 39842; K.L. BOWEN, Entomology and Plant Pathology Department, Auburn University, Auburn, AL 36849; C.Y. CHEN, Department of Crop, Soil and Environmental Sciences, Auburn University, Auburn, AL 36849.
2:15 p.m.	**Identification of genomic region controlling resistance to aflatoxin contamination in a peanut recombinant inbred line population (Tifrunner × GT-C20).** **G. AGARWAL***, M. VISHWAKARMA, S. KALE, S.N. NAYAK, M. PANDEY, R.K. VARSHNEY, International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), Patancheru, India, 502324; X. JI, X. GUO, J.C. FOUNTAIN, H. WANG, University of Georgia, Department of Plant Pathology, Tifton, GA, 31793; C.C. HOLBROOK, USDA-ARS, Crop Genetics and Breeding Research Unit, Tifton, GA; and B. GUO, USDA-ARS, Crop Protection and Management Research Unit, Tifton, GA.

2:30 p.m.	**Association Mapping of SSR Markers to TSWV Resistance in Cultivated Peanut.** J. LI, Y.Y. TANG, **C.Y. CHEN***, Department of Crop, Soil and Environmental Sciences, Auburn University, Auburn, AL 36849; P.M. DANG, USDA-ARS National Peanut Research Laboratory, Dawson, GA 39842; A. JACOBSON, A. HAGAN, Entomology and Plant Pathology Department, Auburn University, Auburn, AL 36849; M.L. WANG, USDA-ARS, PGRCU, Griffin, GA 30223; G.H. HE, Department of Agricultural and Environmental Sciences, Tuskegee University, Tuskegee, AL 36088.
2:45 p.m.	**"Kairi" – A New Foliar Disease Resistant Variety for the Australian Peanut Industry.** **G.C. WRIGHT***, Peanut Company of Australia, Kingaroy, Queensland, Australia, 4610; and N.V. HALPIN, D.B. FLEISCHFRESSER, L. OWENS, AgriSciences Queensland, Department of Agriculture and Fisheries, Kingaroy, Queensland, Australia, 4610.
3:00 p.m.	**Using the CROPGRO-Peanut Model to Simulate Genetic Yield Improvement of Peanut in West Africa.** **K. J. BOOTE***, University of Florida, Gainesville, FL; S. NARH, University of Ghana; J. NAAB, CSRI-SARI, Wa, Ghana; J. W. JONES and B. L. TILLMAN, University of Florida; M. ABUDULAI, CSRI-SARI, Tamale, Ghana; P. SANKARA and Z. M'BI BERTIN, University of Quagadougou, Burkina Faso; and D.L. JORDAN and R.L. BRANDENBURG, North Carolina State University, Raleigh, NC.
1:30 - 3:30 p.m. Waters Edge C	**Plant Pathology/Nematology I** *Chair & Moderator: Nicholas Dufault, University of Florida*
1:30 p.m	**Survey of Pod Rot Pathogens in Oklahoma.** **R.S. BENNETT***, USDA-ARS, Stillwater, OK 74075-2714; and J.P. DAMICONE, Department of Entomology and Plant Pathology, Oklahoma State University, Stillwater, OK 74078-3033.
1:45 p.m.	**Concentration of Azoxystrobin in the Soil that Affects Pod Rot.** **T. A. WHEELER***, Texas A&M AgriLife Research, Lubbock, TX 79403; R. D. FRENCH-MONAR, and Texas A&M AgriLife Extension Service, Amarillo, TX, 79106; and J. E. WOODWARD, Texas A&M AgriLife Extension Service, Lubbock, TX 79403.
2:00 p.m.	**Seeding Rate impact on Diseases and Yield of Selected Runner Peanut Varieties in a Rainfed Production System in Southeast Alabama.** **A.K. HAGAN***, H. L. CAMPBELL, K.L. BOWEN. Auburn University, AL 36849; L. WELLS. Wiregrass Research and Extension Center, Headland, AL 36849.
2:15 p.m.	**Evaluating Disease Management Programs on Newly Released Virginia-type Cultivars in North Carolina.** **B. B. SHEW***, Department of Entomology and Plant Pathology, T.G. ISLEIB and D.L. JORDAN, Department of Crop Science, NC State University, Raleigh, NC.
2:30 p.m.	**The Impact of Oscillating Soil Temperatures on the Seasonal Development of "White Mold" in Florida Peanut Fields.** **N. S. DUFAULT***, Department of Plant Pathology, The University of Florida, Gainesville, FL 32611-0680 and R. BAROCCO, W. ELWAKIL, Doctor of Plant Medicine Program, The University of Florida, Gainesville, FL 32611.

2:45 p.m.	**An Evaluation of Monocyclic Components of Late Leaf Spot on Six Peanut Genotypes** **L. GONG***, K. L. BOWEN, Entomology and Plant Pathology Department, Auburn University, Auburn, AL 36849, P.M. DANG, USDA-ARS National Peanut Research Laboratory, Dawson, GA 39842, C.Y. CHEN, Department of Crop, Soil and Environmental Sciences, Auburn University, Auburn, AL 36849.
3:00 p.m.	**Phosphite Fungicides for Peanut Disease Management: Efficacy and Regulatory Issues.** **T. B. BRENNEMAN*** and A. K. CULBREATH. Department of Plant Pathology, University of Georgia, Tifton, GA 31794.
3:30 - 4:00 p.m. Salons ABC & Heron Deck	**Networking Break** *Sponsored by: Syngenta*
4:00 - 4:30 p.m. Waters Edge B	*Continuation of* **Harvesting, Curing Shelling, Storing & Handling** **Processing and Utilization** **Economics** *Moderator: Nathan Smith, Clemson University*
4:00 p.m.	**Evaluation of 2015 Peanut Crop Insurance Program.** **SHI***, S.M. FLETCHER, C.J. RUIZ, N. SMITH. National Center for Peanut Competitiveness, University of Georgia, Griffin, GA 30223-1797.
4:15 p.m.	**Peanuts 2016: Payment Limit vs Acreage Planted.** **S.M. FLETCHER***, Z.SHI. National Center for Peanut Competitiveness, University of Georgia, Griffin, GA 30223-1797.
4:00 - 5:30 p.m. Waters Edge C	**Plant Pathology/Nematology II** *Moderator: Barbara Shew, North Carolina State University*
4:00 p.m.	**Changes in the Efficacy of Pyraclostrobin for Control of Peanut Leaf Spot Diseases.** **A.K. CULBREATH***, T.B. BRENNEMAN, R.C. KEMERAIT and K.S. STEVENSON, Department of Plant Pathology, Univ. of Georgia, Tifton, GA 31793-5766.
4:15 p.m.	**Vibrance®: A New Fungicide Active ingredient for Early Season Disease Control in Peanut.** **V. MASCARENHAS***, H. McLEAN, P. EURE, M. VANDIVER, R. JACKSON AND S. MARTIN, Syngenta Crop Protection, Greensboro, NC.
4:30 p.m.	**ADEPIDYN™: A New Fungicide Active Ingredient for Disease Control in Peanut.** **H. MCLEAN***, K. BUXTON, V. MASCARE NAS, T. HARP, and A. TALLY, Syngenta Crop Protection, LLC, 410 Swing Road, Greensboro, NC 27409.
4:45 p.m.	**Rancona® V PD: A New Broad-Spectrum Fungicide Seed Treatment for Peanuts** **J. YANES, JR.*** and K. J. DONOVAN, Arysta LifeScience North America, Collierville, TN 38017 and Cheshire, CT 06410.

5:00 p.m.	**Responses of High O/L Peanut Cultivars to Fungicide for Control of Sclerotinia Blight.** **J. DAMICONE***, Department of Entomology and Plant Pathology, Oklahoma State University, Stillwater, OK 74078-3033; and K. CHAMBERLIN and R. BENNETT, USDA/ARS, Stillwater, OK 74075-2714.
5:15 p.m.	**Assessment of ELATUS for Management of Southern Stem Rot and Leaf Spot Diseases.** **R. C. KEMERAIT***, T.B. BRENNEMAN and A.K. CULBREATH, Department of Plant Pathology, University of Georgia, Tifton, GA 31793, and H. MCLEAN and W. FAIRCLOTH, Syngenta Crop Protection, Greensboro, NC 27419.
4:00 -5:00 p.m. Salon D	**SWEEPing up SNPS: A Practical Workshop for SNP Identification in Peanut** Josh Clevenger, University of Georgia *A practical, step-by-step guide to SNP calling in peanut using the pipeline, SWEEP. SWEEP was designed specifically for peanut and was used successfully to design the new 58K SNP array for Arachis. Considerations for all types of next generation sequence data will be addressed and best practices will be recommended. Come learn how to successfully use next generation sequence data to efficiently identify and use SNPs for all peanut genomics applications.*
5:00 - 6:00 p.m. Marlin	**Board of Directors Meeting** *Committee Chairmen are asked to present their Committee status report. APRES members are welcome to attend.*
6:30 - 9:00 p.m. Flamingo & Sandpiper Decks	**Dinner** *Sponsored by Bayer and BASF Corporation* *You're invited to join our sponsors by the ocean for an evening of fun, relaxation, and casual dining. An expansive buffet sure to please all palates and diets Is planned. Served with coffee, tea, and desserts. (Cash bar)*

Thursday, July 14, 2016	
All Day ECF Foyer	**Registration**
6:30 a.m Beachside	**APRES Fun Run/Walk** *Sponsored by JLA, Inc.*
8:00 a.m.-4:00 p.m. White Sands	**Spouses' Hospitality Suite Open** *Sponsored by: Georgia Peanut Commission* *A place to rest, relax, meet and greet, and get a snack to tide you over while you wait for family and friends.*
8:00 - 10:00 a.m. Salon D	**Joe Sugg Graduate Student Competition I** Breeding/Genetics/Plant Pathology *Sponsored by North Carolina Peanut Growers Association* *Moderator: Maria Balota, Virginia Tech*
8:00 a.m.	**Sensitivity of Sclerotinia minor to Common Peanut Fungicides.** **M. D. CANNON*** and B. B. SHEW, Department of Entomology and Plant Pathology, North Carolina State University, Raleigh, NC 27695.
8:15 a.m.	**SNP Genotyping as a Tool for Peanut Breeding.** **C. CHAVARRO*,** University of Georgia, Institute of Plant Breeding Genetics and Genomics, Athens, GA; Y. CHU, University of Georgia, Institute of Plant Breeding Genetics and Genomics, Tifton, GA; J. CLEVENGER, University of Georgia, Institute of Plant Breeding Genetics and Genomics, Tifton, GA; C.C. HOLBROOK, USDA-ARS, Tifton, GA; T. G. ISLEIB, North Carolina State University, Department of Crop Science and Environmental Science, Raleigh, NC 27695- 7629; D BERTIOLI, University of Georgia, Institute of Plant Breeding Genetics and Genomics, Athens, GA; S. BERTIOLI, University of Georgia, Institute of Plant Breeding Genetics and Genomics, Athens, GA; R. VARSHNEY, M. PANDEY, G. AGARWAL, and S. NAYAK, International Crops Research Institute for the Semi-Arid (ICRISAT), Hyderabad 502324, India; and, S. JACKSON, University of Georgia, Institute of Plant Breeding Genetics and Genomics, Athens, GA; P. OZIAS-AKINS2, University of Georgia, Institute of Plant Breeding Genetics and Genomics, Tifton, GA.
8:30 a.m.	**RNA Sequencing of Contaminated Seeds Reveals the Permissive State for Pre-harvest Aflatoxin Contamination and Points to a Potential Susceptibility Factor** **J. CLEVENGER***, K. MARASIGAN, and P. OZIAS-AKINS, Department of Horticulture and Institute of Plant Breeding, Genetics & Genomics, The University of Georgia, Tifton, GA 31793, B. LIAKOS, G. VELLIDIS, Department of Crop and Soil Sciences, The University of Georgia, Tifton, GA 31793, V. SOBOLEV, USDA-ARS National Peanut Research Laboratory, Dawson, GA, 39842, and C.C. HOLBROOK, USDA-ARS, Tifton, GA 31793.
8:45 a.m.	**Phenotyping of Peanut Stem Rot in a RIL Population.** **R. CUI***, T.B. BRENNEMAN, Plant Pathology Department, The University of Georgia, Tifton, GA 31794; J.P. CLEVENGER, Y. CHU, P. OZIAS-AKINS, Department of Horticulture, The University of Georgia, Tifton, GA 31793; T.G. ISLEIB, Department of Crop Science, North Carolina State University, Raleigh, NC 27695-7620; and C. HOLBROOK, USDA-ARS, Tifton, GA 31794.

9:00 a.m.	**Sensitivity of Early and Late Leaf Spot Peanut Pathogens to QoI Fungicides and Genetic Variability Based on ITS Sequences.** **W. ELWAKIL***, Doctor of Plant Medicine Program, The University of Florida, Gainesville, FL 32611; and N. S. DUFAULT, Department of Plant Pathology, The University of Florida, Gainesville, FL 32611.
9:15 a.m.	**Breeding for Sclerotinia Blight Resistance in the NCSU Peanut Breeding Program.** **W.G. HANCOCK***, J.W. HOLLOWELL, S.C. COPELAND, F.R. CANTOR BARREIRO and T.G. ISLEIB, Dept. of Crop Science, N.C. State Univ., Raleigh, NC 27695-7629.
9:30 a.m.	**Effect of New Peanut Genotypes and Two Cultivars on Leaf Spot Severity and Yield When Grown without Fungicides for Possible Use in Organic or Limited Input Systems** **B.S. JORDAN***, Dept. of Plant Pathology, University of Georgia, Tifton, GA 31793-5766; W. D. BRANCH, Dept. of Crop and Soil Science, University of Georgia, Tifton, GA 31793-5766; and A.K.CULBREATH, Dept. of Plant Pathology, University of Georgia, Tifton, GA 31793-5766.
9:45 a.m.	**Variability Among Genotypes for *Aspergillus flavus* Seed Infection Monitored with a GFP-Engineered Strain.** **W. A. KORANI***, Y. CHU, and P. OZIAS-AKINS, Institute of Plant Breeding, Genetics and Genomics (IPBGG), University of Georgia (UGA), Tifton, GA 31793.
8:15 - 10:00 a.m. Waters Edge ABC	**Joe Sugg Graduate Student Competition II** Production Technology/Mycotoxins/Weed Science/Other *Sponsored by an Anonymous Donor* *Chair and Moderator: Peter Dotray, Texas Tech and Texas A&M University*
8:15 a.m.	**Evaluating the Impact of Canopy Defoliation at Multiple Timings in Peanut.** **C.C. ABBOTT***, and J.M. SARVER, Mississippi State University, Mississippi State, MS; J. GORE, and D. COOK, Mississippi State University, Stoneville, MS.
8:30 a.m.	**Drought Stress Reduces Symbiotic Nitrogen Fixation in Peanut Genotypes** **X. WANG***, Y. FENG and C. CHEN, Dept. of Crop, Soil and Environmental Sciences, Auburn Univ., Auburn, AL 36849, P. DANG and M. LAMB, USDA-ARS National Peanut Research Laboratory, Dawson, GA 39842; C. HOLBROOK, USDA-ARS, Crop Genetics and Breeding Research, Tifton, GA 31793; P. OZIAS-AKINS and Y. CHU, Dept. of Horticulture, Univ. of Georgia, Tifton, GA 31793; and T.G. ISLEIB, Dept. of Crop, Soil, and Env. Sci., N.C. State Univ., Raleigh, NC 27695.
8:45 a.m.	**Drought Stress in Peanuts: What Role Does Root Architecture Traits Play?** **A.S. KARIKARI***, C. KVIEN, J. CLEVENGER, J. CHU, W. KORANI, P. OZIAS-AKINS, Institute of Plant Breeding, Genetics and Genomics, The University of Georgia, Tifton, GA 31793-0748 and C. HOLBROOK, ARS-USDA, 115 Coastal Way Tifton, GA, 31793.
9:00 a.m.	**Generational Priming Memory Induced by Primed Acclimation in Early Root Traits of Peanut (*Arachis hypogaea L.*).** **K.A. RACETTE***, D.L. ROWLAND, Agronomy Department, The University of Florida, Gainesville, FL 32611; and B.L. TILLMAN, North Florida Research and Education Center, Marianna, FL 32446.

9:15 a.m.	**Land Preparation and Irrigation Method Impacts on Peanut Pod Yield.** **S.D. LEININGER***, L.J. KRUTZ, and J. GORE, Mississippi State University, Stoneville, MS; J.M. SARVER, and C.C. ABBOTT, Mississippi State University, MS.
9:30 a.m.	**Effect of Inoculum Level, Planting Date and Variety on the Onset and Predominance of Early and Late Leaf Spot of Peanut.** **A. FULMER*** and R. KEMERAIT, JR., Department of Plant Pathology, The University of Georgia, Tifton, GA 31793.
9:45 a.m.	**Tissue Analyses as a Late Season Peanut Seed Quality Prediction Tool** **A. K. PIERRE***, M. J. MULVANEY, Agronomy Department, The University of Florida, Jay FL 32565; D. L. ROWLAND, Agronomy Department, The University of Florida, Gainesville, FL 32611; T. GREY, Crop and Soil Science, University of Georgia, Tifton, GA 31794; B. TILLMAN, Agronomy Department, The University of Florida, Marianna, FL 32446; C. W. WOOD, West Florida Research and Education Center, The University of Florida, Jay FL 32565.
10:00 - 10:30 a.m. Salons ABC & Blue Heron Deck	**Networking Break** *Sponsored by Fine Americas*
10:30 - 11:45 a.m. Salon D	**Joe Sugg Graduate Student Competition I *(continues)*** *Moderator: Joseph Oakes, Virginia Tech*
10:30 a.m.	**Use of a Genotype-by-Targeted Resequencing Approach in Peanut.** **R. KULKARNI***, Department of Plant and Soil Science, Texas Tech University, Lubbock, TX 79409; R. CHOPRA, USDA-ARS, Lubbock, TX 79415; J.CHAGOYA, and M.D. BUROW Texas A & M, AgriLife Research, Lubbock, TX 79403, and Department of Plant and Soil Science, Texas Tech University, Lubbock, TX 79409.
10:45 a.m.	**Comparison of Four RIL Mapping Populations of Peanut for Field Response to Tomato Spotted Wilt and Late Leaf Spot.** **S. E. PELHAM***, Department of Plant Pathology, The University of Georgia, Tifton, GA 31793, C. C. HOLBROOK, B. GUO, The United States Department of Agriculture, Agriculture Research Services, Tifton, GA, 31793, Y. CHU, P. OZIAS-AKINS, Department of Horticulture, The University of Georgia, Tifton, GA 31793, and A. K. CULBREATH, Department of Plant Pathology, The University of Georgia, Tifton, GA 31793.
11:00 a.m.	**Genes and Gene Network Involved in Peanut Nodulation.** **Z. PENG*,** F. LIU, L. WANG, and J. WANG, Agronomy Department, The University of Florida, Gainesville, FL 32611.
11:15 a.m.	**Genetic variation and virulence diversity among three *Sclerotium rolfsii* isolates on two peanut cultivars.** **P.S. SORIA***, M.E. SMITH, and N.S. DUFAULT, Plant Pathology Department, University of Florida, Gainesville, FL 32611 – 0180.

11:30 a.m.	**Using Sub-Genome Specific Transcriptome-derived SNP Markers to Develop a Genetic Linkage Map for a BC1 Mapping population in Peanut (*Arachis hypogaea L.*)** **T.K. TENGEY***, Department of Plant and Soil Science, Texas Tech University, Lubbock, TX 79409; R. Chopra, USDA-ARS-CSRL, Lubbock, TX 79415; C.E SIMPSON, Texas A & M AgriLife Research, Stephenville, TX 76401; V. MENDU, Department of Plant and Soil Science, Texas Tech University, Lubbock, TX 79409; M.D. BUROW, Texas A & M AgriLife Research, Lubbock, TX 79403, and Department of Plant and Soil Science, Texas Tech University, Lubbock, TX 79409.
10:30 - 11:45 a.m. Waters Edge ABC	**Joe Sugg Graduate Student Competition II *(continues)*** *Chair and Moderator: Peter Dotray, Texas Tech University*
10:30 a.m.	**Evaluation of Diclosulam Efficacy on Yellow Nutsedge Development.** **A.A. DIERA***, T.L. GREY, R.S. TUBBS, W.K. VENCILL, D.B. SIMMONS Department of Crop and Soil Sciences, University of Georgia, Tifton, GA 31793 and Department of Crop and Soil Sciences, University of Georgia, Athens, GA, 30605.
10:45 a.m.	**Time of Day Effects on Peanut Weed Control Programs.** **O.W. CARTER*** and E.P. PROSTKO, Department of Crop and Soil Sciences, The University of Georgia, Tifton, GA 31793-0748.
11:00 a.m.	**Comparative Study of Sorting Raw and Blanched Peanuts as Pre-Storage Treatment in Reducing Aflatoxin Along the Peanut Value Chain.** **C. DARKO***, P. KUMAR MALLIKARJUNAN, Biological Systems Engineering Department, Virginia Tech, Blacksburg, VA 24060; K. DIZISI, Agricultural Engineering Department, Kwame Nkrumah University of Science & Technology, Kumasi, Ghana; M. ABUDULAI, CSIR-Savanna Agricultural Research Institute, Tamale, Ghana; M.B. MOCHIAH, CSIR-CRI, Kumasi, Ghana, and D.L. JORDAN, North Carolina State University, Raleigh, NC 27695.
11:15 a.m.	**Effect of Diclosulam on Purple Nutsedge Control in Peanut.** **D. SIMMONS***, T.L. GREY, R.S. TUBBS, W.K. VENCILL, A.D. DIERA, Department of Crop and Soil Sciences, University of Georgia, Tifton, GA, 31793 and Department of Crop and Soil Sciences, University of Georgia, Athens, GA, 30605.
11:30 a.m.	**Influence of Herbicides and Fungicides on Peanut Production and Quality in Ghana.** **S. ARTHUR***, G. BOLFREY-ARKU, and M. B. MOCHIAH, CSIR-Crops Research Institute, Kumasi, Ghana; J. SARKODIE-ADDO and W.O. APPAW, Kwame Nkrumah University of Science and Technology, Kumasi, Ghana; and D.L. JORDAN and R.L. BRANDENBURG, North Carolina State University, Box 7620, Raleigh, NC.
12 Noon - 1:30 p.m.	**Lunch on Your Own**

Concurrent Breakout Sessions	
1:30 - 3:15 p.m. Waters Edge A	**Production Technology/Weed Science II** *Chair and Moderator: Steve Li, Auburn University*
1:30 p.m	**Peanut Cultivar Response to Common Peanut Herbicides.** **B.J. BRECKE***, R.G. LEON, University of Florida, West Florida Research and Education Center, Jay, FL 32565 and B. TILLMAN, University of Florida, North Florida Research and Education Center, Marianna, FL 32446.
1:45 p.m.	**Exploring the Importance of Growth Habit and Canopy Architecture of Peanut Competitive Ability Against Weeds.** **R.G. LEON*** and M.J. MULVANEY, University of Florida, Jay, FL; and B.L. TILLMAN, University of Florida, Marianna, FL.
2:00 p.m.	**Efficacy of Fluridone Based Herbicide Programs in Peanut.** **M.W. MARSHALL***, C.H. SANDERS, and J. HAIR, Edisto Research and Education Center, Clemson University, Blackville, SC 29817.
2:15 p.m.	**Peanut Growth and Yield Response to Grazon P+D.** **E. PROSTCO***, O.W. CARTER, and M. DOWDY, Department of Crop & Soil Sciences, The University of Georgia, Tifton, GA 31793.
2:30 p.m.	**Exploratory Use of RGB-Derived Vegetation Indices for High-Throughput Phenotyping of Peanut Varieties.** **M. BALOTA***, J. OAKES, Tidewater Agric. Res. & Ext. Center, Virginia Tech, Suffolk, VA 23437-7099; T.G. ISLEIB, Dept. of Crop Sci., N.C. State Univ., Raleigh, NC 27695-7629; and C.C. HOLBROOK, USDA-Agric. Res. Ser., Tifton, GA 31793.
2:45 p.m.	**Adapting the Hull-Scrape Technique to Recently Released Peanut Varieties.** **C. K. KVIEN***, NESPAL, University of Georgia, C.C. HOLBROOK, USDA, Crop Genetics & Breeding, Tifton, GA, and P. OZIAS-AKINS, Department of Horticulture, University of Georgia, Tifton, GA 31793.
3:00 p.m.	**Variation in Transpiration Efficiency and its Related Traits in Valencia Mapping Population** **N. PUPPALA***, New Mexico State University, Agricultural Science Center at Clovis, 2346 State Road 288, Clovis, NM 88101; JYOSTNA DEVI MURA, New Mexico State University, Agricultural Science Center at Clovis, 2346 State Road 288, Clovis, NM 88101; VINCENT VADEZ, International Crop Research Institute for Semi Arid Tropics, Patancheru, Telangana, India 502324; HARI UPADHYAYA, International Crop Research Institute for Semi Arid Tropics, Patancheru, Telangana, India 502324; SUBE SINGH, MANISH PANDEY, International Crop Research Institute for Semi Arid Tropics, Patancheru, Telangana, India 502324; and RAJEEV VARSHNEY, International Crop Research Institute for Semi Arid Tropics, Patancheru, Andhra Pradesh, India 502324.

1:30 - 4:00 p.m. Waters Edge B	**Bayer Extension Techniques and Technology** *Moderator: Michael Mulvaney, University of Florida*
1:30 p.m	**Overview of 2015: A Challenging Year for Peanut Production in North Carolina.** **M. HUFFMAN***, R. GURGANUS. J. HURRY, R. RHODES, B. SPEARMAN, M. LEARY, M. SHAW, M. CARROL, K. BAILEY, A. BRADLEY, M. CARROL, P. SMITH, R. THAGARD, A. WHITEHEAD, B. PARRISH, M. SMITH, T. BRITTON, J. MORGAN, A. COCHRAN, C. ELLISON, M. SEITZ, L. GRIMES, M. MALLOY, D. KING, R. WOOD, A.B. STEWART, T. WALEY, N. HARRELL, C. SUMNER, D.L. JORDAN, R. BRANDENBURG, and B. SHEW. North Carolina Cooperative Extension Service, Raleigh, NC 27695.
1:45 p.m.	**Clemson Extension Agriculture Programming: Serving the Peanut Producers in Orangeburg County, South Carolina.** **J. CROFT***, Clemson University, 1550 Henley St., Suite 200, Orangeburg, SC 29115.
2:00 p.m.	**Stakeholder Engagement: Exploring Changes in Rainfall Intensity and Seasonal Variability** Daniel DOURTE, Agricultural and Biological Engineering, University of Florida; C. FRAISSE, Agricultural and Biological Engineering, University of Florida; W. BARTELS, Florida Climate Institute, University of Florida; **MACE BAUER***, IFAS Extension, University of Florida.
2:15 p.m.	**Burrower Bugs… A "New" Pest for Emanuel County Peanuts.** **P. M. CROSBY***, Cooperative Extension, University of Georgia, Swainsboro, GA. 30401; and M. R. ABNEY, Department of Entomology, University of Georgia, Tifton, GA. 31793.
2:30 p.m.	**Interactive Cooperative Extension Agent Training Session for Early Season Pest Management in Peanut.** **J. HURRY***, M. CARROL, A. BRADLEY, P. SMITH, R. THAGARD, A. WHITEHEAD, T. BRITTON, J. MORGAN, R. RHODES, A. COCHRAN, C. ELLISON, M. HUFFMAN, L. GRIMES, M. MALLOY, D. KING, A.B. STEWART, C.L. SUMNER, A. HARE, M.D. INMAN, D.L. JORDAN, R. BRANDENBURG, and B. SHEW. North Carolina Cooperative Extension Service, Raleigh, NC 27695.
2:45 p.m.	**Baker County 2015 Peanut at Plant In-Furrow Fungicide, Nematicide & Inoculant Test Plot** **E.L. JORDAN***, UGA Baker County Extension; A. SHIRLEY, UGA Mitchell County Extension, R B. KEMERAIT, UGA Plant Pathology, Coastal Plains Research Center, Tifton, GA.
3:00 p.m.	**2015 Bulloch County Peanut Fungicide and Nematode Research Results.** **W. G. TYSON***, University of Georgia Cooperative Extension, Bulloch County, Statesboro, GA 30458 and R. C. KEMERAIT, University of Georgia, Department of Plant Pathology, Tifton, GA 31794.
3:15 p.m.	**Assessment of Fungicide Program Efficacy Using On-Farm, Large Plot and Small Plot Trials in North Florida.** **K. WYNN***, University of Florida/Institute of Food and Agricultural Sciences, Jasper, FL 32052; D. FENNEMAN University of Florida/Institute of Food and Agricultural Sciences, Madison, FL. 32340; C. VANN University of Florida/Institute of Food and Agricultural Sciences, Mayo, FL. 32066; and N.S. DUFAULT, Department of Plant Pathology, University of Florida, Gainesville, FL. 32611-0680.

3:30 p.m.	**Updated Version of the Peanut Risk Management Tool for North Carolina.** **D.L. JORDAN***, G.G. WILKERSON, R.L. BRANDENBURG, B.B. SHEW, and G. BUOL, North Carolina State University, Raleigh, NC 27695.
3:45 p.m.	**Development of Multiuse Research/Demonstration Planter for Peanut.** **W.S. MONFORT***, W.M. PORTER, R. S. TUBBS, Crop and Soil Sciences Department, University of Georgia, Tifton, GA 31793.
1:30 - 3:15 p.m. Waters Edge C	**Entomology/Mycotoxins** *Moderator: Mark Abney, University of Georgia*
1:30 p.m	**Gene Expression Profiles of *Aspergillus flavus* Isolates Responding to Oxidative Stress in Different Culture Media.** B68 **J.C. FOUNTAIN***, L. YANG, R.C. KEMERAIT, University of Georgia, Department of Plant Pathology, Tifton, GA, 31793; P. BAJAJ, M. PANDEY, S.N. NAYAK, V. KUMAR, A.S. JAYALE, A. CHITIKINENI, R.K. VARSHNEY, International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), Patancheru, India, 502324; S. CHEN, University of Florida, Department of Biology, Gainesville, FL, 32601; R.D. LEE, University of Georgia, Department of Crop and Soil Sciences, Tifton, GA, 31793; B.T. SCULLY, U.S. Horticultural Research Laboratory, Fort Pierce, FL., 34945; and B. GUO, USDA-ARS, Crop Protection and Management Research Unit, Tifton, GA.
1:45 p.m.	**A Case for Regular Aflatoxin Monitoring in Peanut Butter in sub-Saharan Africa: Lessons from a 3-Year Survey in Zambia.** **S.M.C. NJOROGE***, International Crops Research Institute for the Semi-Arid Tropics (ICRISAT-Malawi); L. MATUMBA, Lilongwe University of Agriculture and Natural Resources, NRC Campus; K. KANENGA, Zambia Agriculture Research Institute, Chipata; M. SIAMBI, ICRISAT-Kenya; F. WALIYAR, ICRISAT-India; J. MARUWO, ICRISAT-Malawi; and E.S. MONYO, ICRISAT-Kenya.
2:00 p.m.	***Aspergillus* and Aflatoxin Contamination of Groundnut (*Arachis hypogaea L.*) and Food Products in Eastern Ethiopia.** **A. MOHAMMED***, M. DEJENE, College of Agriculture and Environmental Sciences, Haramaya University, Dire Dawa, Ethiopia; A. CHALA, College of Agriculture, Hawassa University, Hawassa, Ethiopia; D.HOISINGTON, College of Agriculture and Environmental Sciences, Peanut and Mycotoxin Innovation Lab, University of Georgia, Athens Georgia, 30602-4356; and V. S. SOBOLEV,R. S. ARIAS,USDA-Agricultural Research Services-National Peanut Research Laboratory, Dawson, GA 39842-0509.
2:15 p.m.	**Residual Toxicity of Neonicotinoids and Resistance Issues in Peanut Thrips Management** **R. SRINIVASAN***, P. LAI, M. ABNEY. Entomology Department, University of Georgia, Tifton, GA 31793; and A. CULBREATH, Department of Plant Pathology, University of Georgia, Tifton, GA 31793.
2:30 p.m.	**Effects of Combined Tobacco Thrips, *Frankliniella fusca*, and Herbicide Injury on Peanut Yield and Time to Maturity.** **W. GAY***, County Extension Agent, The University of Georgia, Ashburn, GA 31714; and M.R. ABNEY, The University of Georgia, Tifton, GA 31793-0748.

2:45 p.m.	**Effect of Tillage Type on Peanut Burrower Bug, *Pangaeus bilineatus*, Damage in Non- irrigated, Runner-Type Peanut.** **S.M. HOLLIFIELD***, B. SHIRLEY, M.L. HARRIS, The University of Georgia Cooperative Extension, Quitman, GA 31643 and M.R. ABNEY, Department of Entomology, The University of Georgia, Tifton, GA 31793.
3:00 p.m.	**DuPont™ Exirel® Insect Control: Novel Insecticide for Crop Protection and Yield Optimization in Peanuts.** **H.E. PORTILLO***, DuPont Crop Protection, 1090 Elkton Rd, Newark, DE 19702; R.W. WILLIAMS, DuPont Crop Protection, 2310 Lake Drive, Raleigh, NC 27609; S. S. ROYAL, DuPont Crop Protection, Rocky Ford Rd., Valdosta GA 31601; D.A. HERBERT, Virginia Tech University, Tidewater AREC 6321 Holland Rd, Suffolk, VA 23437; and A. K. CULBREATH, Department of Plant Pathology, The University of Georgia, Tifton, GA 31793.
1:30 - 3:15 p.m. Salon D	**Breeding and Genetics II** *Moderator: Phat Dang, USDA-ARS*
1:30 p.m	**Enhancing Groundnut Productivity and Quality in Spanish Types using Cultivated and Wild Arachis Germplasm.** **HARI DEO UPADHYAYA***, International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), Patancheru PO, Telangana, India.
1:45 p.m.	**Breeding for Resistance to Spotted Wilt.** **B.L. TILLMAN***, University of Florida, Agronomy Department, North, Florida REC, Marianna, FL, 32446; YU-CHIEN TSENG, University of Florida, Agronomy Department, North, Florida REC, Marianna, FL, 32446; JIANPING WANG, University of Florida, Agronomy, Gainesville, FL 32611.
2:00 p.m.	**Yield and Grade of High- and Normal-Oleic Cultivars in the Uniform Peanut Performance Test.** **T.G. ISLEIB***, Dept. of Crop, Soil, and Environmental Science, Box 7629, N.C. State Univ., Raleigh, NC 27695-7629, and R. SCOTT TUBBS, Dept. of Crop and Soil Sciences, 2360 Rainwater Rd., Univ. of Georgia Coastal Plain Exp. Sta., Tifton, GA 31793.
2:15 p.m.	**Comparison of Large-Seeded NCSU Breeding Line N11020olJ with Gregory.** S.C. COPELAND, **T.G. ISLEIB***, W.G. HANCOCK and F.R. CANTOR BARREIRO, Dept. of Crop, Soil, and Environmental Science, Box 7629, N.C. State Univ., Raleigh, NC 27695-7629, and M. BALOTA, Virginia Polytechnic Univ. and State Univ. Tidewater Agric. Res. & Ext. Center, Suffolk, VA 23437-7099R.
2:30 p.m.	**Characterization of Improved Early-Maturing Peanut Breeding Lines.** **M. D. BUROW***, Texas A&M AgriLife Research, Lubbock, TX 79403, and Texas Tech University, Department of Plant and Soil Science, Lubbock, TX, 79409; J. CHAGOYA and D. BUSH, Texas A&M AgriLife Research, Lubbock, TX 79403; M. R. BARING, Texas A&M AgriLife Research, College Station, TX 77843; C. E. SIMPSON and J. CASON, Texas A&M AgriLife Research, Stephenville, TX 76401.
2:45 p.m.	**Initial Non-Targeted Analysis of the Peanut Seed Metabolome.** **L.L. DEAN***, Market Quality and Handling Research Unit, USDA, ARS, SEA, Raleigh, NC 27695-7624; C. M. KLEVORN, Department of Food, Bioprocessing and Nutrition Sciences, North Carolina State University, Raleigh, NC 27695-7624; and M.C.LAMB, National Peanut Laboratory, USDA, ARS, SEA, Dawson, GA 39842.

3:00 p.m.	**Where is my GRIN-Global peanut order?** **S. TALLURY***, M. SPINKS, L. CHALKLEY, T. FIELDS, S. JONES, A. LEWIS, D. PINNOW and G. PEDERSON, Plant Germplasm Resources Conservation Unit, USDA-ARS, Griffin, GA 30223-1797.
3:15 - 3:45 p.m. Salons ABC	**Networking Break** *Sponsored by Olam Edible Nuts*
3:30 - 4:30 p.m. Salons ABC	**Poster Viewing and Discussions** ***(Authors Present)*** *Chair: Greg MacDonald, University of Florida*
1	**Economic Injury Levels and Improved Monitoring for Tobacco Thrips, Frankliniella fusca, in Seedling Peanut.** **M.R. ABNEY***, Department of Entomology, University of Georgia, Tifton, Georgia 31794; R.L. BRANDENBURG, Department of Entomology and Plant Pathology, North Carolina State University, Raleigh, NC 27695; and, R. SRINIVASAN, Department of Entomology, University of Georgia, Tifton, Georgia 31794.
2	**Peanut (*Arachis hypogaea*) Response to Weed and Leaf Spot Management in Northern Ghana.** **M. ABUDULAI*** and S. SEINI, CSIR-SARI, Tamale, Ghana; I.K. DZOMEKU, University for Developmental Studies/CSIR-SARI, Tamale, Ghana J. NAAB, CSIR-SARI, Wa, Ghana; K. BOOTE, University of Florida, Gainesville, FL; and D.L. JORDAN and R.L. BRANDENBURG, North Carolina State University, Raleigh, NC.
3	**White Mold Control Efficacy Associated with Fungicide Management Intensity and Variety**. D.J. ANCO*, J.W. CHAPIN, and J.S. THOMAS, Agricultural and Environmental Sciences, Edisto Research and Education Center, Clemson University, Blackville, SC 29817.
4	**QTL mapping for disease resistance in a cultivated peanut x wild species F¬2 population.** **C. BALLEN-TABORDA*,** University of Georgia, Athens, GA; S. LEAL-BERTIOLI, University of Georgia, Athens, GA and EMBRAPA, Brasília, Brazil; J. MORRISSEY, Mars, Miami, Florida; E. ANTEPENCO, University of Georgia, Athens, GA; D. LIVINGSTON, Y. Chu, University of Georgia, Tifton, GA; C.C. HOLBROOK, USDA-ARS, Tifton, GA; P. OZIAS-AKINS, University of Georgia, Tifton, GA; S. JACKSON, University of Georgia, Athens, GA; and, D. BERTIOLI, University of Georgia, Athens and University of Brasília, Brazil.
5	**Effect of Storage Treatments on Aspergillus Growth and Aflatoxin Production in Peanuts.** C. DARKO, P. K. MALLIKARJUNAN, Biological Systems Engineering, Virginia Tech, Blacksburg, Virginia USA 24061; **M. BALOTA***, Virginia Tech Tidewater AREC, Suffolk, Virginia USA 23437, K. DIZISI, Agricultural Engineering Department, Kwame Nkrumah University of Science & Technology, Kumasi, Ghana AND D. JORDAN, Crop Science, North Carolina State University, Raleigh, NC 27695.

6	**Spanish-type Breeding Lines Developed in an Attempt to Transfer Resistance to Root-knot Nematodes.** **M.R. BARING***, Soil and Crop Sciences Dept., Texas AgriLife Research, College Station, TX 77843-2474; M.D. BUROW, Soil and Crop Sciences Dept., Texas AgriLife REC, Lubbock, TX 79403; C.E. SIMPSON, and J.M. CASON, Soil and Crop Sciences Dept., Texas AgriLife REC, Stephenville, TX 76401.
7	**Peanut Tolerance to Fluridone** **T.A. BAUGHMAN***, P.A. DOTRAY, W.J. GRICHAR, R.W. PETERSON, and D. TETER, Oklahoma State University and Texas A&M University
8	**Evaluation of Alternatives to Chlorothalonil for Peanut Disease Control in Alabama.** **H.L. CAMPBELL***, A.K.HAGAN, K.L. BOWEN, Dept. of Entomology and Plant Pathology, Auburn University, AL 36849; L. WELLS, Wiregrass Research and Extension Center, Headland, AL 36345 and M. PEGUES and J. JONES, Gulf Coast Research and Extension Center, Fairhope, AL 36532.
9	**Identification of QTL for pollen stainability of F2 Lines Developed From a Interspecific Cross of *Arachis duranensis* x *Arachis cardenasii*.** **J.M. CASON*** and C.E. SIMPSON, Texas A&M AgriLife Research, Texas A&M University System, Stephenville, TX 76401; M.D. BUROW, Texas A&M AgriLife Research, Texas A&M University System, Lubbock, TX 79403 and Department of Plant and Soil Science, Texas Tech University, Lubbock, TX 79409; R. CHOPRA, Department of Plant and Soil Science, Texas Tech University, Lubbock, TX 79409; D.C. WONDRACEK-LÜDKE5/EMBRAPA/CENARGEN, Brasilia, DF, Brazil;, A. HILLHOUSE, College of Veterinary Medicine and Biomedical Sciences, Texas A&M University, College Station, TX 77843.
10	**Release of Lariat Peanut.** **K.D. CHAMBERLIN***, R.S. BENNETT, USDA-ARS, Wheat, Peanut and Other Field Crops Research Unit, Stillwater, OK 74075-2714 and J. P. DAMICONE, Department of Entomology and Plant Pathology, Oklahoma State University, Stillwater, OK 74078-1056.
11	**Solar Drying of Peanuts** MAXWELL LAMPTEY and JAMES Y. ASIBUO, CSIR-Crops Research Institute, Kumasi, Ghana, ESTHER AKOTO, ROBERT D. PHILLIPS, and **JINRU CHEN***, Department of Food Science and Technology, The University of Georgia, Griffin, GA USA, MARK HEFLIN, Heflin & Associates, LLC, Jasper, GA USA, DAVID JORDAN, Department of Crop Science, North Carolina State University, Raleigh, NC USA, JAMIE RHOADS and DAVE HOISINGTON, PMIL Management Entity, The University of Georgia, Athens, GA USA.
12	**Composting: A Biological Process for Aflatoxin Decontamination in Agricultural Environment.** ESTHER Y. AKOTO, ROBERT PHILLIPS, and **JINRU CHEN***, Department of Food Science and Technology, The University of Georgia, Griffin, GA USA, MAXWELL LAMPTEY and JAMES Y. ASIBUO, CSIR-Crops Research Institute, Kumasi, Ghana, JACK DAVIS, Technical Service, J. Leek Associates, LLC, Albany, GA USA, DAVID JORDAN, Department of Crop Science, North Carolina State University, Raleigh, NC USA, JAMIE RHOADS and DAVE HOISINGTON, PMIL Management Entity, The University of Georgia, Athens, GA USA.

13	**Evaluating Peanut Cultivars Using a Reduced Cost and a Premium Fungicide Program** **CURRY***, D.S., University of Georgia Extension, Appling County, Baxley, GA 31519; KEMERAIT, R.C. and BRENNEMAN, T.B., Dept. of Plant Pathology, University of Georgia, Tifton, GA, 31793; C.M. RINER, HILL, C.R., and THIGPEN, D.R., University of Georgia Extension, Vidalia Onion & Vegetable Research Center, Lyons, GA 30436.
14	**Potential Use of Pyroxasulfone in Peanut in the Southwest.** **P.A. DOTRAY***, Texas Tech University, Texas A&M AgriLife Research, and Texas A&M AgriLife Extension Service, Lubbock, TX 79409-2122; W.J. GRICHAR, Texas A&M AgriLife Research, Corpus Christi, TX78406; T.A. BAUGHMAN, Oklahoma State University, Ardmore, OK 73401.
15	**Comparing Typical 8 Inch Twin-Row Planting Pattern to a Modified 12 Inch Twin-Row Planting Pattern in Peanut.** **P. EDWARDS***, Cooperative Extension, University of Georgia, 107 West 4th Street, Ocilla, GA 31774; S. MONFORT, Dept. of Crop and Soil Science, University of Georgia, Tifton, GA 31794; H. ANDERSON, Cooperative Extension, University of Georgia 406 West Palm Street, Fitzgerald, GA 31750; B. CRABTREE, Cooperative Extension, University of Georgia 204 East Franklin St #9, Sylvester, GA 3179; and J. PAULK, Dept. of Crop and Soil Science, University of Georgia, Tifton, GA 31793.
16	**Workflow to Study Genetic Biodiversity of Aflatoxigenic Aspergillus spp. in Georgia, USA.** **P. C. FAUSTINELLI***, E. R. PALENCIA, X. M. WANG, V. S. SOBOLEV, B. W. HORN, H. T. SHEPPARD, M. C. LAMB, R. S. ARIAS, USDA-ARS-National Peanut Research Laboratory (NPRL), Dawson, GA, 39842, U.S.A.; and J. MARTINEZ-CASTILLO Centro de Investigación Científica de Yucatán, Mérida, Yucatán, México.
17	**Informational Resources and Training on Peanuts and Mycotoxins Available from the Feed the Future Peanut & Mycotoxin Innovation Lab.** **A. FLOYD***, M. MCGEEHAN, J. RHOADS and D. HOISINGTON, University of Georgia, Athens.
18	**Performance Review: Thimet® for Thrips Management and Yield Protection in Peanuts in the Southeastern US.** **N. FRENCH*** & L. BEDNARSKI. AMVAC Chemical Corporation, Newport Beach, CA 92600.
19	**The Various Methods to Break Dormancy after Harvest for TUFRunnerTM '511' Cultivar** **GOMILLION*** M.W., B. L. TILLMAN, and G. PERSON. The University of Florida, Agronomy Department, NFREC, Marianna, FL, 32446.
20	**Evaluation of Root Traits among Peanut Cultivars.** **M. GOYZUETA***, B.L. TILLMAN, North Florida REC, Agronomy Department, University of Florida, Marianna, FL 32446; D.L. ROWLAND, Agronomy Department, University of Florida, Gainesville, FL 32611.
21	**Imazapic Effects on Purple Nutsedge (*Cyperus rotundus*) Tuber Production** **T.L. GREY*** and R.S. TUBBS, University of Georgia, Crop and Soil Science Dept, Tifton, GA 31793.
22	**Preliminary Evaluation of Peanut Response to Quick Sol® in North Carolina.** **A. HARE***, M.D. INMAN, and D.L. JORDAN, North Carolina State University, Raleigh, NC.

23	**Evaluation of Insecticide Efficacy Against Lesser Cornstalk Borer in Peanut** **B.W. HAYES1*,** University of Georgia Cooperative Extension, Grady County, Cairo, Georgia 39828; and M.R. ABNEY, Department of Entomology, University of Georgia, Tifton, Georgia 31794.
24	**The Feed the Future Peanut & Mycotoxin Innovation Lab – Facilitating US Scientists to Solve Global Problems.** **D. HOISINGTON*** and J. RHOADS, University of Georgia, Athens, GA.
25	**A Fact Sheet on Managing and Harvesting Peanut in Ghana.** **D.L. JORDAN*** and R.L. BRANDENBURG, North Carolina State University, Raleigh, NC; M. ABUDULAI, CSRI-SARI, Tamale, Ghana; I.K. DZOMEKU, University for Developmental Studies/CSIR-SARI, Tamale, Ghana, G. MAHAMA, CSIR-SARI, Wa, Ghana; M.B. MOCHIAH and M. OWUSU-AKAYAW, CSIR-CRI, Kumasi, Ghana; G. MACDONALD and K. BOOTE, University of Florida, Gainesville, FL; K. MALLIKARJUNAN and M. BALOTA, Virginia Tech, Blacksburg, VA; B. BRAVO-URETA, University of Connecticut, Stores, CT; and J. RHOADS, D. HOSINGTON, and A. FLOYD, University of Georgia, Athens, GA.
26	**Overview of the PMIL Ghana Value Chain.** **D.L. JORDAN*** and R.L. BRANDENBURG, North Carolina State University, Raleigh, NC; M. ABUDULAI, CSRI-SARI, Tamale, Ghana; I.K. DZOMEKU, University for Developmental Studies/CSIR-SARI, Tamale, Ghana J. NAAB, S. BUAH, and G. MAHAMA, CSIR-SARI, Wa, Ghana; M.B. MOCHIAH, G. BOLFREY+B113-ARKU, A. DANKYI, J. ASIBUO, M. OWUSU-AKAYAW, A. IBRAHIM, B. AMOABENG, J. LAMPTEY, and M. LAMPTEY, CSIR-CRI, Kumasi, Ghana; R. AKROMAH, W. ELLIS, and W.O. APPAW, Kwame Nkrumah University of Science and Technology, Kumasi, Ghana; A. BUDU, University of Ghana, Legon, Accra, Ghana; G. MACDONALD, K. BOOTE, and J. ERICKSON, University of Florida, Gainesville, FL; J. CHEN, D. PHILLIPS, M. CHINNAN, K. ADHIKARI, T. BRENNEMAN, University of Georgia, Griffin, GA; K. MALLIKARJUNAN and M. BALOTA, Virginia Tech, Blacksburg, VA; and B. BRAVO-URETA, University of Connecticut, Stores, CT.
27	**Comparative Study of Aflatoxin Evaluation Across Various Laboratories in the Peanut Mycotoxin Innovation Lab Program** H. KAYA-CELIKER, **P. KUMAR MALLIKARJUNAN***, Biological Systems Engineering Department, Virginia Tech, Blacksburg, VA 24060, J. RHOADS, and D. HOISINGTON, Peanut Mycotoxin Innovation Lab, University of Georgia, Athens, GA, 30602.
28	***Cercospora arachidicola* and *Cercosporidium personatum*, Genome Release and Comparison** **V.A. ORNER***, R.S. ARIAS, X.M. WANG, USDA-ARS National Peanut Research Laboratory, Dawson, GA, 39842; E.G. CANTONWINE, Department of Biology, Valdosta State University, Valdosta, GA, 31698; and A.K. CULBREATH, Department of Plant Pathology, University of Georgia, Tifton, GA, 31793.
29	**Multi-Year Performance of Peanut Varieties in an Irrigated Environment** **W. PARKER***, Cooperative Extension, University of Georgia, 434 Barney Avenue, Millen, GA 30442; S. INGRAM, Cooperative Extension, University of Georgia, 284 Hwy 119 S, Springfield, GA 31329; S. MONFORT, J.P. PAULK, Department of Crop and Soil Science, University of Georgia, Tifton, GA 31793.

30	**Characterizing Small RNA Populations in Non-Transgenic and Aflatoxin-Reducing-Transgenic Peanut Lines.** **I. POWER***, R.ARIAS, V. SOBOLEV, P. DANG, and M.LAMB. USDA-ARS National Peanut Research Laboratory, 1011 Forrester Dr., SE, Dawson, GA 39842.
31	**Validation and Adoption of a Novel Method of Aflatoxin Detection in Peanut Using a Tablet Reader** **J. RHOADS***, D. HOISINGTON, J. WANG, A. SEAWRIGHT, University of Georgia, Athens; D. COOPER, Mobile Assay, Boulder, CO; K. MALIKARJUNAN, Virginia Polytechnic and State University, Blacksburg, VA; W. APPAW, KNUST, Kumasi, Ghana; N. OPOKU, University of Development Studies, Tamale, Ghana.
32	**Thrips Management: Utilizing Both In-Furrow and Foliar Insecticides for Thrips Control in Peanut.** R. L. BRANDENBURG, **B. M. ROYALS***, Department of Entomology, North Carolina State University, Raleigh, NC 27695-7613; and D. L. JORDAN, Department of Crop Science, North Carolina State University, Raleigh, NC 27695-7620.
33	**Development of DNA Markers for Newly Identified High-Oleate Peanut Mutants** M-L. WANG, **B. TONNIS***, G-A PEDERSON, USDA-ARS, PGRCU, Griffin, GA 30223-1797; Z-B CHEN, Department of Crop and Soil Sciences, The University of Georgia, Griffin, GA 30223-1797; and C-Y CHEN, Department of Crop, Soil and Environmental Sciences, Auburn University, Auburn, AL 36849.
34	**Cloning and Functional Analysis of Phytochrome A and Phytochrome B during Peanut Early Pod Formation.** S-Z. ZHAO, Y. Zhang, L. HOU, and **X-¬J. WANG***, Biotechnology Research Center, Shandong Academy of Agricultural Sciences; Shandong Provincial Key Laboratory of Crop Genetic Improvement, Ecology and Physiology, Jinan 250100, PR China.
35	**Multi-year Evaluation of Cultivars and Advanced Breeding Lines for Resistance to Verticillium Wilt and Peanut Pod Rot.** **J.E. WOODWARD***, Texas A&M AgriLife Extension Service and Plant and Soil Science, Texas Tech University, Lubbock, TX 79403.
36	**Genetic Diversity of Local Peanut Varieties in Henan of China Based on SSR Markers.** **H. YANG***, Y. HU, P. LI, R LIU, L. ZHU, Zhengzhou Institute of agricultural and Forestry Sciences, Zhengzhou 450005, China; S. HAN, Industrial Crops Research Institute, Henan Academy of Agricultural Sciences, Zhengzhou 450002, China; M. YUAN, Shandong Peanut Research Institute, Qingdao, China; and G. HE, Department of Agricultural and Environmental Sciences, Tuskegee University, Tuskegee, AL 36088.
37	**Resveratrol Accumulation during Peanut Germinate with Phenylalanine Feeding & Ultrasound Treatment.** **M. YU***, X-H. WANG, M. LU, H-Z. LIU, Y. YANG, Q. WANG, Institute of Food and Processing, Liaoning Academy of Agricultural Sciences, Shenyang 110161, China; and Institute of Food Science and Technology, Chinese Academy of Agricultural Sciences, P.O. Box 5109, Beijing 100193, China.

4:30 - 5:30 p.m. Salon D	**APRES Business Meeting and Awards Ceremony** *Membership Votes on Nominations to the APRES Board of Directors; Action Reports from APRES Committees; Announcements of 2016 Awards Recipients and Winners. All members present please.*
5:30 - 7:30 p.m. Flamingo & Sandpiper Decks	**Awards Reception** *Sponsored by Dow AgroSciences* *Join us in congratulating the recipients of the 2016 APRES awards as well as celebrating the end of the 48th Annual Meeting. Heavy hors' d'oeuvres and a cash bar will be on hand for those who want a light evening meal or a start to a larger meal in the Clearwater area.*

- NOTES -

Overview

2016 APRES Annual Meeting

July 12-14 * Clearwater, FL

The 48th Annual Meeting of the American Peanut Research and Education Society (APRES) was held July 12-14, 2016 at the Hilton Clearwater Beach in Clearwater Beach, FL. Outgoing APRES President Tom Stalker (North Carolina State University) presided over the very well attended meeting of 346 attendees from every peanut producing state and 16 countries, grouped as 232 registrants, 61 spouses and 53 children.

Technical Program Chairman Greg MacDonald (University of Florida) arranged 148 presentations/posters from peanut scientists around the world. Highlights of the program included opening addresses by:

Dr. Jacqueline Burns, Dean of Research, University of Florida; welcomed the crowd to Clearwater, stating the University of Florida was thrilled to host APRES in their state. She gave an outstanding overview of the University of Florida's commitment to peanut research and Florida's peanut producers.

Bob Parker, President and CEO, National Peanut Board, gave an update on the Board's *The Perfectly Powerful Peanut* multi-faceted marketing campaign, focusing this year on social media, targeting millenials. A new website showcases snackable content and in-depth articles with stunning images. The snackable content shares nutrition info, allergy info, peanut product info, snacking trends, and recipes. In-depth video-articles such as Voices of Peanut Farmers give NPB the opportunity to target information on good farming practices, sustainability.

Dr. Robert Shatters, Research Molecular Biologist, USDA-ARS, U.S. Horticultural Laboratory, was the keynote speaker. His presentation, *Dealing with Diseases—Stories From the Frontline of the War on Citrus Greening Disease.* The scope and enormity of the problem the U.S. citrus industry is facing with citrus greening disease should be a wake-up call to all agricultural crops on the value of sharing research information and the importance of multi-faceted research.

Dr. Tim Brenneman, Professor of Plant Pathology, University of Georgia, presentation, *Peanut Diseases from An International Perspective—Potential Game Changers*. The historical journey from daylily rust to potato and chestnut blight to peanut stripe and tomato spotted wilt viruses was a great introductory lesson on the importance of genetic diversity; strong research and extension programs; and industry awareness of emerging issues from all parts of the world.

Two Symposiums on *Translating Genome Sequence to Peanut Improvement*, moderated by Peggy Ozias-Akins and the *Bayer Excellence in Extension and Extension Techniques*, moderated by Keith Rucker, Bayer CropScience were held.

Breakout Sessions topics included: Entomology, Weed Science & Mycotoxins; Harvesting, Curing, Shellling, Storing & Handling; Processing and Utilization, Economics; Breeding, Biotechnology and Genetics I and II; Plant Pathology and Nematology I and II; Physiology and Seed Technology; Production Technology.

Thirty-eight (44) scientific posters were also displayed.

Another highlight of the APRES meeting is the annual **Joe Sugg Graduate Student Competition**. The largest number of students ever competed in our Joe Sugg Graduate Student Competition. Due to the large number of competitors, the competition was divided into two competitions. Session 1 covered the topics of **Breeding, Genetics, and Plant Pathology**. Winners are: **First Place – Josh Clevenger** (University of Georgia) (Dr. Peggy Ozias-Akins, major professor) *"RNA Sequencing of Contaminated Seeds Reveals the Permissive State for Pre-harvest Aflatoxin Contamination and Points to a Potential Susceptibility Factor"* and **Second Place – Ze Peng,** University of Florida (Dr. Diane Rowland, major professor) *"Genes and Gene Network Involved in Peanut Nodulation"*. Session 2 covered the topics of **Production Technology, Mycotoxins, Weed Science, and Other**. Winners are: **First Place – Kelly Racette** (University of Florida) (Dr. Barry Tillman, major professor) *"Generational Priming Memory Induces by Primed Acclimation in Early in Early Root Traits of Peanut (Arachis hypogaea L.)."* and **Second Place – Abraham Fulmer,** University of Georgia (Dr. Bob Kemerait, major professor) *"Effect of Inoculum Level, Planting Date and Variety on the Onset and Predominance of Early and Late Leaf Spot of Peanut.*

During the Annual Meeting, APRES recognized several individuals for their achievements and service to APRES:

The highest honor the Society bestows on an individual, **Fellow of the Society**, was awarded to: Dr. Eric Prostko, University of Georgia.

The **Coyt T. Wilson Award for Distinguished Service** to APRES went to Dr. Timothy B. Brenneman, University of Georgia.

Dr. Tim Grey, University of Georgia, was selected as this year's recipient of **the Dow Agrosciences Award for Education**.

Dr. Tom Stalker of North Carolina State University was selected as this year's recipient of the **Dow Agrosciences Award for Research**.

The **Bailey Award** for the best paper from the 2015 Annual Meeting went to Jack Davis, JLA, Inc. (Presenting Author) and co-authors Jim Leek, JLA, Inc.; Dan Sweigart, The Hershey Company; Phat Dang, Chris Butts, Ron Sorenson, and Marshall Lamb, USDA-ARS-NPRL for their paper *Measurements of Oleic Acid among Individual Kernels Harvested from Test Plots of Purified Runner and Spanish High Oleic Seed.*

At the conclusion of the meeting, **new officers and directors** for the Society were inducted. Outgoing President, Dr. Tom Stalker (North Carolina State University) presented the gavel to incoming President, Dr. C. Corley Holbrook (USDA-ARS). President-Elect is Peter Dotray of Texas A&M University. Newly elected Board of Directors are Peggy Ozias-Akins, University of Georgia; Michael Baring, Texas A&M University; Marshall Lamb, USDA/ARS, Rick Brandenburg, North Carolina State University; Howard Valentine, American Peanut Council; and Dan Ward, National Peanut Board. Outgoing Board members David, North Carolina State University; Barry Tillman, University of Florida; and Naveen Puppala, New Mexico State University, were recognized for their support and service with a gift of a canvas print, entitled "Erdnuss". The first action of President Holbrook's term was to present Dr. Tom Stalker (NCSU) with the Past President's Award.

The 2017 APRES meeting will be held July 11-13 at the Hotel Albuquerque in Albuquerque, NM.

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