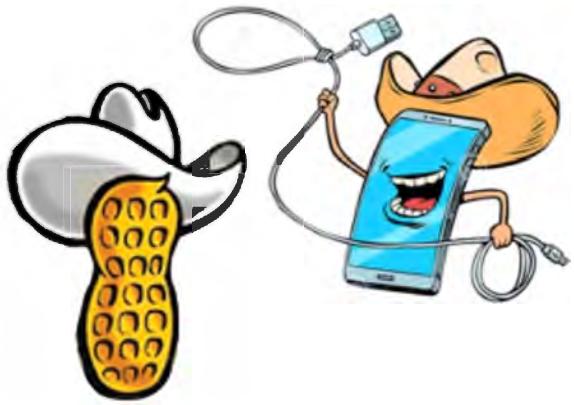
PROCEEDINGS

52ND ANNUAL MEETING

AMERICAN PEANUT RESEARCH AND EDUCATION SOCIETY

JULY 14-16, 2020
VIRTUAL FORMAT



52nd Annual Meeting

July 14-16, 2020 * Virtual Format

Sponsors

AMVAC
Bayer
BASF
Birdsong Peanuts
Corteva™ Agriscience
Fine Americas
Golden Peanut and Tree Nuts
National Peanut Board
National Peanut Buying Points Association
North Carolina Peanut Growers Association
Olam Edible Nuts
The J.M. Smucker Company
Syngenta
Texas Peanut Producers Board
Texas Tech University
Valent
Virginia Peanut Growers Association
Visjon Biologics

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2020 Awards

Appendix

AMERICAN PEANUT RESEARCH & EDUCATION SOCIETY
BOARD OF DIRECTORS
2019-20

President……. Barry Tillman (2021)

Past President…….. Rick Brandenburg (2020)

President-Elect……. Gary Schwarzlose (2022)

Executive Officer…….. Kimberly Cutchins (2020)

University Representatives:
- Virginia-Carolina……. Nathan Smith (2022)
- Southeast……..Bob Kemerait (2021)
- Southwest……..Mark Burow (2020)

USDA Representative…….. Lisa Dean (2022)

Industry Representatives:
- Production…….. Henry McLean (2021)
- Grower Association…… Bob Sutter (2022)
- Manufactured Products……Chris Liebold (2020)

Director of Science and Technology of the
American Peanut Council…… Steve Brown (2020)

National Peanut Board ……. Dan Ward (2020)

APRES Graduate Student Organization President……Chandler Levinson (2020)

* Industry Representative Gary Schwarzlose was elected as the 2019-20 President-elect; Henry McLean elected October 2019 to fulfill the remainder of Gary's Industry Rep term.

Amended 10-3-2019

AMERICAN PEANUT RESEARCH & EDUCATION SOCIETY
BOARD OF DIRECTORS
2020-21

President
Gary Schwarzlose (2022)

President-Elect
David Jordan (2023)

Past President
Barry Tillman (2021)

University Representatives:
- Virginia-Carolina..... Nathan Smith (2022)
- Southeast..... Bob Kemerait (2021)
- Southwest..... Mark Burow (2023)

USDA Representative..... Lisa Dean (2022)

Industry Representatives:
- Production..... Henry McLean (2021)
- Grower Association..... Bob Sutter (2022)
- Manufactured Products..... Victor Nwosu (2023)

Director of Science and Technology of the
- American Peanut Council..... Steve Brown (2023)

National Peanut Board ..... Dan Ward (2023)

APRES Graduate Student Organization President..... Nick Hurdle (2021)

PAST PRESIDENTS

Barry Tillman	2019-20			
Rick Brandenburg	2018-19		Walton Mozingo	1992-93
Peter Dotray	2017-18		Charles E. Simpson	1991-92
C.Corley Holbrook	2016-17		Ronald E. Henning	1990-91
H. Thomas Stalker	2015-16		Johnny C. Wynne	1989-90
Naveen Puppala	2014-15		Hassan A. Melouk	1988-89
Timothy B. Brenneman	2013-14		Daniel W. Gorbet	1987-88
Ames Herbert	2012-13		D. Morris Porter	1986-87
Todd Baughman	2011-12		Donald H. Smith	1985-86
Maria Gallo	2010-11		Gale A. Buchanan	1984-85
Barbara Shew	2009-10		Fred R. Cox	1983-84
Kelly Chenault Chamberlin	2008-09		David D.H. His	1982-83
Austin K. Hagan	2007-08		James L. Butler	1981-82
Albert K. Culbreath	2006-07		Allen H. Allison	1980-81
Patrick M. Phipps	2005-05		James S. Kirby	1979-80
James Grichar	2004-05		Allen J. Norden	1978-79
E. Ben Whitty	2003-04		Astor Perry	1977-78
Thomas G. Islieb	2002-03		Leland Tripp	1976-77
John P. Damicone	2001-02		J. Frank McGill	1975-76
Austin K. Hagan	2000-01		Kenneth Garren	1974-75
Robert E. Lynch	1999-00		Edwin L. Sexton	1973-74
Charles W. Swann	1998-99		Olin D. Smith	1972-73
Thomas A. Lee, Jr.	1997-98		William T. Mills	1971-72
Fred M. Shokes	1996-97		J.W. Dickens	1970-71
Harold Pattee	1995-96		David L. Moake	1969-70
William Odle	1994-95		Norman D. Davis	1968-69
Dallas Hartzog	1993-94			

APRES Committees
2019-20

Bailey Award Committee
Scott Monfort, Chair (2021)
Jack Davis (2020)
Peggy Ozias-Akins (2020)
Hillary Mehl (2021)
Brendan Zurweller (2022)
Alicia Massa (2022)

Coyt T. Wilson Distinguished Service Award Committee
Dan Anco, Chair (2021)
Tim Brenneman (2020)
William Pearce (2022)
Alicia Massa (2022)

Corteva™ Agriscience Awards Committee
Nick DuFault, Chair (2021)
Tim Grey (2020)
Tom Stalker (2020)
John Richburg (2020)
Travis Faske (2021)
Barry Tillman (2021)
Soraya Bertioli (2022)
Cristiane Pilon (2022)

Fellows Committee
David Jordan, Chair (2021)
Todd Baughman (2020)
Kelly Chamberlin (2022)
Steve Brown (2022)

Finance Committee
Maria Balota, Chair (2020)
Scott Tubbs (2020)
Victor Nwosu (2021)
Julie Marshall (2022)

Joe Sugg Graduate Student Award Committee
Robert Kemerait, Chair (2020)
Steve Li (2020)
James Grichar (2020)
Abraham Fulmer (2021)
Mark Burow (2021)

Nominating Committee
Rick Brandenburg, Chair (2020) Past President
Julie Marshall – University Rep (2020)
Keith Rucker - Private Industry Rep (2020)
Rebecca Bennett – USDA Rep (2020

Peanut Quality Committee
William Pearce, Chair (2021)
Chris Liebold (2020)
Ken Barton (2021)
Naveen Puppala (2021)
Ricky Hartley (2022)
Lyndsay Bashore (2022)
Lisa Dean (2022)

Program Committee
Gary Schwarzlose, Chair (2020)
John Cason – Technical Committee Chair
Emmi Kimura – Local Arrangements Chair
Peter Dotray – Fun Run Chair
To Be Confirmed - Spouse Program Chair

Publications and Editorial Committee
Josh Clevenger, Chair (2021)
Allison Floyd (2020)
Kira Bowen (2021)
Nino Brown (2022)

Public Relations Committee
Dylan Wann, Chair (2020)
Gary Schwarzlose (2021)
Shane Powell (2022)
Wen Carter (2022)

Site Selection Committee
Gary Schwarzlose, Chair (2020)
Shelly Nutt (2020)
David Jordan (2021)
Jeff Dunne (2021)
Jianping Wang (2022)
Jamie Rhoads (2022)

APRES Committees
2020-21 Terms

Bailey Award Committee
Scott Monfort, Chair (2021)
Hillary Mehl (2021)
Alicia Massa (2022)
Brendan Zurweller (2022)
Marshall Lamb (2023)
Peter Dotray (2023)

Coyt T. Wilson Distinguished Service Award Committee
Dan Anco, Chair (2021)
Alicia Massa (2022)
William Pearce (2022)
Tim Grey (2023)

Corteva™ Agriscience Awards Committee
Nick DuFault, Chair (2021)
Travis Faske (2021)
Barry Tillman (2021)
Soraya Bertioli (2022)
Cristiane Pilon (2022)
Connor Ferguson (2023)
John Richburg (2023) **Renew**

Fellows Committee
David Jordan, Chair (2021)
Kelly Chamberlin (2022)
Steve Brown (2022)
Eric Prostko (2023)

Finance Committee
Victor Nwosu, Chair (2021)
Julie Marshall (2022)
Hannah Jones (2023)
Zack Barnes (2023)

Joe Sugg Graduate Student Award Committee
Robert Kemerait, Chair (2021)
Abraham Fulmer (2021)
Mark Burow (2021)
Emi Kimura (2023)
Jim Scruggs (2023)

Nominating Committee
Barry Tillman Chair (2021) Past President
David Bertioli (2023)
Gibbs Wilson (2023)
Renee Arias (2023)

Peanut Quality Committee
William Pearce, Chair (2021)
Ken Barton (2021)
Naveen Puppala (2021)
Ricky Hartley (2022)
Lyndsay Bashore (2022)
Lisa Dean (2022)
Pending Appointment (2023)

Program Committee
David Jordan, Chair (2021)
Dan Anco – Technical Committee Chair
Jeff Dunne – Local Arrangements Chair
David Langston – Fun Run Chair
Sally Taylor - Spouse Program Chair

Publications and Editorial Committee
Josh Clevenger, Chair (2021)
Kira Bowen (2021)
Nino Brown (2022)
Dylan Wann (2023)

Public Relations Committee
Gary Schwarzlose, Chair (2021)
Shane Powell (2022)
Wen Carter (2022)
Darlene Cowart (2023)

Site Selection Committee
Jeff Dunne, Chair (2020)
David Jordan (2021)
Jeff Dunne (2021)
Jianping Wang (2022)
Jamie Rhoads (2022)
Johnny Cason (2023)
Todd Baughman (2023)

APRES
GRADUATE STUDENT ORGANIZATION

Officers 2020-21

President:	Nick Hurdle, University of Georgia
President-Elect:	Cassie Newman, North Carolina State University
Social Chair:	Sayantar Sarkar, Virginia Tech
Reporter:	Katelyn Fritz, North Carolina State University

Past Presidents

2019-20	Chandler Levinson
2018-19	Sara Beth Pelham

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
2017 – Albuquerque, NM
2018 – Williamsburg, VA
2019 – Auburn, AL
2020 -- Virtual Meeting

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

FELLOWS of the SOCIETY

Dr. Timothy Grey	2020			
Mr. Michael Baring	2019		Dr. Jack E. Bailey	1999
Dr. Peter Dotray	2019		Dr. James R. Sholar	1999
Dr. Barry Tilman	2019		Dr. John A. Baldwin	1998
Dr. Steve Brown	2017		Mr. William M. Birdsong, Jr.	1998
Dr. Eric Prostko	2016		Dr. Gene Sullivan	1998
Dr. Robert Kemerait, Jr.	2015		Dr. Timothy H. Sanders	1997
Dr. Todd A. Baughman	2014		Dr. H. Thomas Stalker	1996
Dr. Austin K. Hagan	2014		Dr. Charles W. Swann	1996
Mr. Emory Murphy	2014		Dr. Thomas B. Whitaker	1996
Dr. Jay W. Chapin	2013		Dr. David A. Knauft	1995
Dr. Barbara B. Shew	2013		Dr. Charles E. Simpson	1995
Mr. Howard Valentine	2013		Dr. William D. Branch	1994
Dr. Kelly Chenault	2012		Dr. Frederick R. Cox	1994
Dr. Robin Y.Y. Chiou	2012		Dr. James H. Young	1994
Dr. W. Carroll Johnson III	2012		Dr. Marvin K. Beute	1993
Dr. Mark C. Black	2011		Dr. Terry A. Coffelt	1993
Dr. John P. Damicone	2011		Dr. Hassan A. Melouk	1992
Dr. David L. Jordan	2011		Dr. F. Scott Wright	1992
Dr. Christopher L. Butts	2010		Dr. Johnny C. Wynne	1992
Dr. Kenneth J. Boote	2009		Dr. John C. French	1991
Dr. Timothy Brenneman	2009		Dr. Daniel W. Gorbet	1991
Dr. Albert K. Culbreath	2009		Mr. Norfleet L. Sugg	1991
Mr. G.M. "Max" Grice	2007		Dr. James S. Kirby	1990
Mr. W. James Grichar	2007		Mr. R. Walton Mozingo	1990
Dr. Thomas G. Isleib	2007		Mrs. Ruth Ann Taber	1990
Mr. Dallas Hartzog	2006		Dr. Darold L. Ketring	1989
Dr. C. Corley Holbrook	2006		Dr. D. Morris Porter	1989
Dr. Richard Rudolph	2006		Dr. Donald J. Banks	1988
Dr. Peggy Ozias-Akins	2005		Mr. J. Frank McGill	1988
Mr. James Ron Weeks	2005		Dr. Donald H. Smith	1988
Mr. Paul Blankenship	2004		Dr. James L. Steele	1988
Dr. Stanley Fletcher	2004		Mr. Joe S. Sugg	1988
Mr. Bobby Walls, Jr.	2004		Dr. Daniel Hallock	1986
Dr. Rick Brandenburg	2003		Dr. Olin D. Smith	1986
Dr. James W. Todd	2003		Dr. Clyde T. Young	1986
Dr. John P. Beasley, Jr.	2002`		Mr. Allen H. Allison	1985
Dr. Robert E. Lynch	2002		Dr. Thurman Boswell	1985
Dr. Patrick M. Phipps	2002		Mr. J. W. Dickens	1985
Dr. Ronald J. Henning	2001		Dr. William V. Campbell	1984
Dr. Norris L. Powell	2001		Dr. Allen J. Norden	1984
Mr. E. Jay Williams	2001		Dr. Harold Pattee	1983
Dr. Gale A. Buchanan	2000		Dr. Kenneth H. Garren	1982
Dr. Thomas A. Lee, Jr	2000		Dr. Ray O. Hammons	1982
Dr. Frederick M. Shokes	2000		Mr. Astor Perry	1982

COYT T. WILSON DISTINGUISHED SERVICE AWARD

HONOREES

2020	Dr. Kelly Chamberlin
2019	Dr. Timothy Grey
2018	Dr. Craig K. Kvien
2017	Dr. Austin K. Hagan
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. Smith

BAILEY AWARD RECIPIENTS
1976 - 2020

2020	**S. Tubbs,** S. Monfort, University of Georgia
2019	**Y. Chu,** P. Ozias-Akins, P. Chee, A. Culbreath, University of Georgia; T. G. Isleib, North Carolina State University; C. C. HOLBROOK, USDA- Agricultural Research Service
2018	**M.D. Burow**, R. Chopra, R. Kulkarni, T. Tengey, V. Belamkar, J. Chagoya, J. Wilson, M. G. Selvaraj, C. E. Simpson, M. R. Baring, F, Neya, P. Sankara, and N. Denwar, Texas Tech University
2017	**J. Wang**, H. Zhou, Z. Peng, J. Maku, L. Tan, F. Liu, Y. Lopez, and J. Wang of University of Florida; and, M. Gallo, Delaware Valley University
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

Three-time Winner: Tim Brenneman
Two-time Winners: Albert Culbreath
Craig Kvien – Back to Back Winner

CORTEVA AGRISCIENCE™
AWARD FOR EXCELLENCE IN RESEARCH

2020	Ye Chu
2019	David Bertioli
2018	Barry Tillman
2017	Marshall Lamb
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	No Award Given
2005	William D. Branch
2004	Stanley M. Fletcher
2003	John W. Wilcut
2002	W. Carroll Johnson, III
2001	Harold E. Pattee and Thomas G. Isleib
2000	Timothy B. Brenneman
1999	Daniel W. Gorbet
1998	Thomas B. Whitaker
1997	W. James Grichar
1996	R. Walton Mozingo
1995	Frederick M. Shokes
1994	Albert Culbreath, James Todd and James Demski
1993	Hassan Melouk
1992	Rodrigo Rodriguez-Kabana

1992-1996 DowElanco Award for Excellence in Research
1997 Changed to DowElanco Award for Excellence in Research
1998 Changed to Dow AgroSciences Award for Excellence in Research
2018 Changed to Corteva Agriscience™, Agriculture Division of DowDuPont™ Award for Excellence in Research
2019 Changed to Corteva Agriscience™ Award for Excellence in Research

CORTEVA AGRISCIENCE™
EXCELLENCE IN EDUCATION AWARD

2020	Corley Holbrook
2019	No Nominees
2018	Peggy Ozias-Akins
2017	No Recipient
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
2018 Changed to Corteva Agriscience™, Agriculture Division of DowDuPont™ Award for Excellence in Education
2019 Changed to Corteva Agriscience™ Award for Excellence in Education

JOE SUGG GRADUATE STUDENT COMPETITION AWARD RECIPIENTS

Sponsored by: North Carolina Peanut Growers Association

2020	C. Levinson
2019	A. Kaufman
2018	D.J. Mahoney
2017	J. Fountain[1]
2017	O. Carter[2]
2017	L. Christman[3]
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

GRADUATE STUDENT POSTER COMPETITION WINNERS

2020 Sponsor: National Peanut Board

2020	Pin Chu Lai
2019	Alan Peper
2018	Caleb Weaver

PEANUT RESEARCH AND EDUCATION AWARD RECIPIENTS

2020	No Award		
2019	David & Soraya Bertioli	1989	R.J. Henning
2018	Howard Valentine	1987	L.M. Redlinger
2017	Tim Brenneman	1986	A.H. Allison
2016	Bob Kemerait	1985	E.J. Williams and J.S. Drexler
2015	Tom Stalker and Noelle Barkley	1984	Leland Tripp
2015	Emory Murphy	1983	R. Cole, T. Sanders, R. Hill and P. Blankenship
2014	Baozhou Guo	1982	J. Frank McGill
2013	John Beasley	1981	G.A. Buchanan and E.W. Hauser
2012	Tom Isleib and Corley Holbrook	1980	T.B. Whitaker
2011	No Nominee	1979	J.L. Butler
2010	P. Ozias-Akins	1978	R.S. Hutchinson
2009	A. Stephens	1977	H.E. Pattee
2008	T.G. Isleib	1976	D.A. Emery
2007	E. Harvey	1975	R.O. Hammons
2006	D.W. Gorbet	1974	K.H. Garren
2005	J.A. Baldwin	1973	A.J. Norden
2004	S.M. Fletcher	1972	U.L. Diener and N.D. Davis
2003	W.D. Branch and J. Davidson	1971	W.E. Waltking
2002	T.E. Whitaker and J. Adams	1970	A.L. Harrison
2001	C.E. Simpson and J.L. Starr	1969	H.C. Harris
2000	P.M. Phipps	1968	C.R. Jackson
1999	H. Thomas Stalker	1967	R.S. Matlock and M.E. Mason
1998	J.W. Todd, S.L. Brown, A.K. Culbreath and H.R. Pappu	1966	L.I. Miller
1997	O.D. Smith	1965	B.C. Langleya
1996	P.D. Blankenship	1964	A.M. Altschul
1995	T.H. Sanders	1963	W.A. Carver
1994	W. Lord	1962	J.W. Dickens
1993	D.H. Carley and S.M. Fletcher	1961	W.C. Gregory
1992	J.C. Wynne		
1991	D.J. Banks and J.S. Kirby G. Sullivan		
1990	R.W. Mozingo		

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

2020
Annual Meeting Abstracts

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APRES 52nd Annual Meeting
July 14-16, 2020 - Virtual Format

GENERAL SESSION

July 14, 2020

9:00AM - 11:00AM CST
10:00AM - 12:00PM EST
Via Zoom Webinar

Time	Presentation Title & Link	Speaker
9:00 am CST 10:00 am EST	Welcome and Call to Order https://youtu.be/sqKaoCOSmcI	Dr. Barry Tillman President - APRES
9:05 am CST 10:05 am EST	Welcome to Texas https://youtu.be/OiqTi3dh9Xg	Sid Miller Texas Commissioner of Agriculture
9:10 am CST 10:10 am EST	Welcome to Texas https://youtu.be/t0YXvmnPJnU	Dr. Patrick Stover Vice-Chancellor and Dean for Agriculture and Life Sciences Texas A&M AgriLife
9:15 am CST 10:15 am EST	A Look at the Global Peanut Market https://youtu.be/ahaXYV_vQ0g	Patrick Archer President American Peanut Council
9:35 am CST 10:35 am EST	Trade Issues and Opportunities for the Peanut Industry https://youtu.be/IrN6Fh-_2FA	Dr. Luis Ribera Professor and Extension Economist in the Department of Agricultural Economics Texas A&M University
9:55 am CST 10:55 am EST	Nutrition for The Peanut Industry: Challenges and Opportunities https://youtu.be/BDw2gJ__BDI	Dr. Samara Sterling Research Director The Peanut Institute
10:15 am CST 11:15 am EST	Production, Challenges and Strategies; a Grower Perspective https://youtu.be/HmrHq0m9zaU	Texas Peanut Producers Panel Discussion
10:45 am CST 11:45 am EST	Presidential Address https://youtu.be/jMOjh6nZXHs	Dr. Barry Tillman President - APRES
11:00 am CST 12:00 pm EST	Session Close	

AMERICAN PEANUT RESEARCH & EDUCATION SOCIETY INC

52nd Annual Meeting

July 14-16, 2020 - Virtual Format

AFLATOXIN SYMPOSIUM

July 14, 2020

1:00PM - 3:00PM CST
2:00PM - 4:00PM EST
Via Zoom Webinar

Time	Presentation Title & Link	Speaker
	Welcome https://youtu.be/sH7ZMHEvfog	Moderator: Johnny Cason Texas A&M University
1:00 PM CST 2:00 PM EST	Economic Impacts and Overview of the Issue https://youtu.be/DNMUp4P83Ww	Dr. Marshall Lamb USDA/ARS
1:20 PM CST 2:20 PM EST	Improved System Assessment of Aflatoxin Risk Utilizing Novel Data and Sensing Approaches at Points of Vulnerability https://youtu.be/l_yvJaNSh18	Dr. Diane Rowland University of Florida
1:40 PM CST 2:40 PM EST	Dealing with Aspergillus in Peanut Seed – An Old Enemy Learns Some New Tricks https://youtu.be/31wi2yA7uqo	Dr. Timothy Brenneman University of Georgia
2:00 PM CST 3:00 PM EST	Breeding for Preharvest Aflatoxin Resistance https://youtu.be/KINxOHmArWQ	Dr. Coley Holbrook USDA/ARS
2:20 PM CST 3:20 PM EST	Advances in RNA Interference Technology for the Control of Aflatoxins in Peanut Presentation locked until Published	Dr. Renée Arias USDA/ARS
2:40 PM CST 3:40 PM EST	Aflatoxin: An Industry Perspective https://youtu.be/tyfX3B1z8O4	Dr. Darlene Cowart Birdsong Peanut Co.

2020 Combined Breakout Sessions Presentations Pre-Recorded

The APRES YouTube link to each pre-recorded presentation can be found on their abstract.

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Comparison of Practices Designed to Increase Yield and Financial Return and Minimize Aflatoxin Contamination in Peanut in Northern Ghana

M. ABUDULAI*, G. MAHAMA, A. SEIDU, I. SUGRI, J.A. NBOYINE, and M.H. ALHASSAN, Council for Scientific and Industrial Research-Savanna Agricultural Research Institute, Tamale and Wa, Ghana; I DZOMEKU and N. OPOKU, University of Developmental Studies, Tamale, Ghana; W. APPAW, W.O. ELLIS, and R. AKROMAH, Kwame Nkrumah University of Science and Technology, Kumasi, Ghana; M.B. MOCHIAH and A. DANKYI, Council for Scientific and Industrial Research-Crops Research Institute, Kumasi, Ghana; D.L. JORDAN and R.L. BRANDENBURG, North Carolina State University, Raleigh, NC 27695; B.E. BRAVO-URETA and J. JELLIFFE, University of Connecticut, Storrs, CT 06269; K. BOOTE and G. MACDONALD, University of Florida, Gainesville, FL 32611; J. CHEN and R.D. PHILLIPS, University of Georgia, Griffin, GA 30223; K. MALLIKARJUNAN and M. BALOTA, Virginia Polytechnic Institute and State University, Blacksburg, VA 24061; D. HOISINGTON and J. RHOADS, Feed the Future Innovation Lab for Peanut, University of Georgia, Athens, GA 30602.

Peanut (*Arachis hypogaea* L.) yield and financial returns are often low for smallholder farmers in Ghana. Additionally, aflatoxin concentration in foods derived from peanut can be high enough to adversely affect human health. Eight experiments were conducted in 2016 and 2017 in northern Ghana to compare yield, financial returns, pest reaction, and aflatoxin contamination at harvest with traditional farmer versus improved practices. Relative to the farmer practice, the improved practice consisted of weeding one extra time, applying local potassium-based soaps to suppress arthropods and pathogens, and either homogenized oyster shells or a commercial blend of fertilizer containing calcium. Each of these field treatments were followed by either drying peanut on the soil surface and storing in traditional poly bags or drying peanut on tarps and storing in hermetically-sealed bags for 4 months. Peanut yield and financial returns were significantly greater when a commercial blend of fertilizer or oyster shells were applied compared to the farmer practice of not applying any fertilizer. Yield and financial returns were greater when a commercial fertilizer blend was applied compared with oyster shells. Severity of early leaf spot (caused by *Cercospora arachidicola* Hori) and late leaf spot [caused by *Cercosporidium personatum* (Berk. & M.A. Curtis) Deighton], scarring and penetration of pods by arthropods, and the number of arthropods at harvest were higher for the farmer practice than for either fertility treatment; no difference was noted when comparing across fertility treatments. Less aflatoxin was observed for both improved practices in the field compared with the farmer practice. Drying peanut on tarps resulted in less aflatoxin compared to drying peanut on the ground regardless of treatments in the field. Aflatoxin concentration after storage was similar when comparing post-harvest treatments of drying on soil surface and storing in poly bags vs. drying on tarps and storing in hermetically-sealed bags. These results demonstrate that substantial financial gain can be realized when management in the field is increased compared with the traditional farmer practice. While aflatoxin concentrations differed between the farmer practice and the improved practices at harvest and after drying, these differences did not translate into differences after storage.

Presentation Link:
https://youtu.be/mttZzjFY6Po

Molecular Characterization and Sensitivity to Quinone Outside Inhibitor (QoI) Fungicides of *Aspergillus flavus* Isolated from Peanut Seeds in Georgia

E. ALI *, T. STACKHOUSE, S. WALIULLAH, A. K. CULBREATH, and T. B. BRENNEMAN. Dept of Plant Pathology, University of Georgia, Tifton, GA 31794.

Aspergillus flavus is an important pathogenic fungus affecting peanuts by production of aflatoxin, a potent human carcinogen. In infected peanuts, it can also cause seed rot and reduce seed viability and germination. The first aim of this study is to characterize the *Aspergillus* population obtained from sixhighly colonized commercial peanut seed lots in Georgia. We collected 76 *Aspergillus* isolates and initial identification was based on their morphological characteristics. Isolates were further confirmed as *A. flavus* using nucleic acid-based molecular methods with species-specific primers. Another objective of this study was to test the sensitivity to quinone outside inhibitor (QoI) fungicides and elucidate the molecular mechanism of QoI resistance in *A. flavus*. *In vitro* plates assay showed that the reduced efficacy of QoI fungicide (azoxystrobin) against *A. flavus* isolates. It is widely reported that resistance to QoIs has been associated with the presence of amino acid substitution in the cytochrome b gene. For further confirmation of the QoI resistance phenotype, we examined 70 isolates for the presence of substitution using DNA sequencing. Results showed that we have a high percentage of the population with known resistance mutations to the QoI fungicides. The majority of the mutations (65%) are Cyt B G143A which confers complete immunity to the QoI's. We also observed Cyt B F129L mutation, which has been documented for QoI resistance, in another 20% of the isolates. These findings explained the cause of developing resistance in peanut seed lots so abruptly this year in GA. More detailed studies are being performed to assay the efficacy of other fungicides for controlling *A. flavus* population in the colonized commercial peanut seed.

Presentation Link:
https://youtu.be/U9hjwW5VhdQ

Improving the Scale of Marker-Assisted Selection in Virginia-type Peanut

R.J. ANDRES*, A.T. OAKLEY, J.C. DUNNE, Department of Crop and Soil Science, North Carolina State University, Raleigh, NC 27695; and N.H. BAIN, R.H. HICKMAN, Department of Biological and Agricultural Engineering, North Carolina State University, Raleigh, NC 27695

While relatively straightforward in theory, marker-assisted selection (MAS) has proven difficult to implement, particularly at a scale equivalent to that of phenotypic selection and in small, public-sector breeding programs. Furthermore, the ability to perform genotyping directly from seed tissue, as opposed to leaf tissue, offers the ability to rapidly accelerate the process while reducing resources committed to greenhouse and field space. Here we described a three step approach tailored to peanut consisting of 1) A novel, high-throughput approach for the non-destructive collection of seed tissue; 2) A rapid, inexpensive crude DNA isolation from that seed tissue and; 3) A custom multiplex approach with integrated data processing to score multiple markers from a single PCR reaction.

Presentation Link:
https://youtu.be/aIjIPRBLdpo

Approaches to Minimizing Aflatoxin Contamination in the Field, During Drying, and in Storage in Southern Ghana

W. APPAW*, W.O. ELLIS, and R. AKROMAH, Kwame Nkrumah University of Science and Technology, Kumasi, Ghana; M.B. MOCHIAH and A. DANKYI, Council for Scientific and Industrial Research-Crops Research Institute, Kumasi, Ghana; M. ABULULAI, Council for Scientific and Industrial Research-Savanna Agricultural Research Institute, Tamale, Ghana; D.L. JORDAN and R.L. BRANDENBURG, North Carolina State University, Raleigh, NC 27695; B.E. BRAVO-URETA and J. JELLIFFE, University of Connecticut, Storrs, CT 06269; K. BOOTE and G. MACDONALD, University of Florida, Gainesville, FL 32611; J. CHEN and R.D. PHILLIPS, University of Georgia, Griffin, GA 30223; K. MALLIKARJUNAN and M. BALOTA, Virginia Polytechnic Institute and State University, Blacksburg, VA 24061; D. HOISINGTON and J. RHOADS, Feed the Future Innovation Lab for Peanut, University of Georgia, Athens, GA 30602.

Aflatoxin in peanut (*Arachis hypogaea* L.) and other crops can negatively affect human health, especially in countries where regulatory agencies do not have limits on aflatoxin entering the food supply chain. While considerable research has been conducted addressing aflatoxin contamination in peanut at individual steps in the supply chain, studies that quantify aflatoxin contamination following combinations of interventions to crop management, drying, and storage are limited. Research was conducted during 2016 and 2017 in two villages in southern Ghana to follow aflatoxin contamination along the supply chain and to compare improved practices with traditional farmer practices used by smallholders. The farmer practice of only a single weeding was compared with improved practices during the growing season up to harvest that included applying local soaps to suppress aphids (*Aphis gossypii* Golver) that transmit peanut rosette virus disease (*Umbravirus*: *Tombusviridae*e), one additional weeding, and calcium applied at pegging. The improved practice for drying included placing pods removed from plants onto tarps compared with the traditional practice of drying on the ground. Storing peanut for four months in hermetically-sealed bags was the improved practice compared with storing in traditional poly bags. All improved practices individually resulted in lower aflatoxin contamination as compared to the farmer practices. While aflatoxin levels were very low (<1 µg/kg) at harvest, the levels increased significantly during drying and storage, with the improved methods resulting in lower levels. Greater estimated financial returns were noted when at least one improved practice along the supply chain was implemented through either increased yield or maintenance of quality kernels. Results from this research demonstrate progression of aflatoxin contamination at pre- and especially post-harvest in villages in Ghana. Future research needs to consider the effects of improved practices as components of packages that farmers can consider, and not just as individual interventions.

Presentation Link:
https://youtu.be/3-vakIoyCVE

Transpiration of Peanut in the Field under Rainfed Production

M. BALOTA*, and S. SARKAR, Tidewater AREC, Virginia Tech, Suffolk, VA 23437.

We have examined the relationship between transpiration and vapor pressure deficit (VPD) in field grown peanut across several years, tests, and genotypes. Limited transpiration (LT) in response to increasing VPD was proposed as a mechanism of drought avoidance; and peanut genotypes expressing LT may be more drought tolerant than those not expressing the trait. While LT was documented for very few genotypes in laboratory, i.e. its expression was dependent upon temperature, little is known on how LT performs for field grown plants. We monitored transpiration of field grown peanut genotypes in two ways, by directly measuring stomatal conductance at several times during the day and growing cycle, and indirectly from canopy temperature depression (CTD; $T_{air} - T_{canopy}$). As temperature and VPD increased, transpiration rate estimated from CTD increased from 8:00 to 10:00 EST, i.e., VPD went from 0 to 1.5 kPa during this time; CTD decreased at midday, i.e. from 11:00 to14:00 when VPD went from 1.5 to 2.5 kPa; then CTD increased again in the afternoon until 15:00 when it started to decline, one hour after VPD began to decline. Negative linear relationship between transpiration rate and VPD from 11:00 to 14:00 EST for field grown peanut was confirmed by directly measured stomatal conductance of peanut genotypes. This result agrees with the classical model of partial stomata closure in response to mid-day temperature and VPD increase, regardless of temperature and soil moisture content; and all peanut genotypes expressed mid-day LT when grown in the field. Therefore, expression of LT did not explain yield variation among genotypes in rainfed production in a sub-humid environment.

Presentation Link:
https://youtu.be/HnBaFn3pR3I

Summary of On-Farm Testing in Bertie County, North Carolina

J. HURRY, **B. BARROW***, D.L. JORDAN, B.B. SHEW, and R.L. BRANDENBURG, North Carolina Cooperative Extension Service, Raleigh, NC 27695.

Peanuts are an important crop in Bertie County, North Carolina and are a part of diversified cropping systems often found in northeastern North Carolina. On-farm experiments were conducted in 2019 to develop recommendations for peanut growers and included: comparison of Velum Total and Admire Pro applied in the seed furrow at planting, peanut response to the number of Apogee applications, thrips control with Thimet versus AgLogic, comparison of commercially-available peanut cultivars, and weed and peanut response to contact herbicides applied alone and with *S*-metolachlor or Zidua. All experiments were replicated 3 or 4 times within each field. Plot size was considerably larger than small-plot trials and yields were determined using portable scales to weigh trailers and peanuts. Nematodes in soil did not differ when samples were taken in the fall prior to digging or when reproduction was compared based on samples collected soon after planting in four trials. Yield was similar when comparing the in-furrow treatments. Although Apogee improved row visibility, no difference in yield or market grade characteristics were observed when Apogee was applied once, twice, or three times compared with non-treated peanut in one trial. Thrips control and peanut was similar when comparing Thimet and AgLogic in two trials. Weed control was similar when contact herbicides were applied with either residual herbicide in one trial. Yield of the cultivars Bailey, Bailey II, Sullivan, and Wynne was similar and exceeded yield of Emery in one trial. However, all varieties were dug on the same day, and yields do not reflect possible differences in pod maturity at digging.

Presentation Link:
https://youtu.be/Q2BcpHWq344

Cakes, Crafts, and Cash: The Role of Home Demonstration and Extension Programs as a Source of Income for Rural Alabama and Florida Women 1919-1929

K.L. BEASLEY*, Department of History, Florida State University, Tallahassee, FL 32306.

In Alabama and Florida between 1919-1929, the Cooperative Extension Service and Home Demonstration Agents played a critical role in helping rural white and African American women with healthier foods, sanitary practices, beneficial lifestyles, and aesthetically-based improvements directed towards their homes and overall personal appearance. The presence and roles of the home demonstration and Extension programs helped in modernizing and improving these aspects of rural life. The rural women of Alabama and Florida took control and turned these programs into ways of creating extra revenue streams—they could financially help themselves and their families by using curb markets and other marketing/economic ventures to contribute to a farm income, family income, or their own personal income. However, this also extended far beyond just selling food or other sundry goods in order to earn money. Rural Alabamian and Floridan women became producers and consumers, creating a way of their own making to gain disposable income and using an Extension-based economic system, forging their own independent economic path.

Presentation Link:
https://youtu.be/vGPHas8c7m0

Arachis stenosperma, New Sources of Nematode, Rust and Leaf Spot Resistance Incorporated Into Peanut Elite Lines

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Root-Knot Nematode causes substantial yield losses, reduces pod and grain quality, affects plant growth and increases production cost; Late Leaf Spot is one of the most damaging diseases of peanut worldwide; and Rust is a devastating fast-developing disease especially in hot, humid tropical growing conditions. Wild diploid species of peanut harbor very strong sources of resistance to these pests and diseases. Over the last few years, we have explored the utilization of the wild species *Arachis stenosperma* as a source of resistance for the peanut crop. First a peanut-compatible allotetraploid was developed from *A. stenosperma* (A genome) and *A. batizocoi* (B genome *sensu lato*). Then we backcrossed for three generations with elite peanut lines, using DNA markers to maintain two loci controlling nematode resistance, and selected genome regions that harbor clusters of disease resistance genes. The resulting population of about 300 plants was genetically profiled. Depending on lineage, plants harbored between 2 and 20% genetic contribution from the wild species. Assays showed that the population harbors resistance, not only to nematode, but also late leaf spot and rust, even in lineages with a low contribution from the wild species. The segregating progeny, that have cultivated peanut growth habit, pod type and seed size, are now being used to genetically identify the wild genome regions that confer the resistances. These new sources of resistance have great potential to be incorporated into new peanut varieties, reducing the need for plant protection products and increasing yield.

Presentation Link:
https://youtu.be/trRjkYVhy_U

Arachis Genus In-Depth Characterization for Conservation and Peanut Breeding

M.C.C. CHAVARRO, Institute of Plant Breeding, Genetics & Genomics, University of Georgia, Athens, GA; D.J. BERTIOLI, Institute of Plant Breeding, Genetics & Genomics, University of Georgia, Athens, GA and Department of Crop & Soil Sciences, The University of Georgia, Athens GA; S. TALLURY, United States Department of Agriculture-Agricultural Research Service, Griffin, GA; C.H. SIMPSON, Texas A&M AgriLife Research, Stephenville, TX; G.J. SEIJO, Institute of Botanics of Northeast – IBONE, Corrientes, Argentina; M.C. MORETZSOHN, Embrapa Genetic Resources and Biotechnology, Brasilia, Brazil; J.F.M. VALLS, Embrapa Genetic Resources and Biotechnology, Brasilia, Brazil; H.T. STALKER, Crop and Soil Department, North Carolina State University, North Carolina (NCSU); and **S.C.M. LEAL-BERTIOLI*, I**nstitute of Plant Breeding, Genetics & Genomics, University of Georgia, Athens, GA and Department of Plant Pathology, The University of Georgia, Athens, GA.

Peanut belongs to the genus Arachis, that contains 83 described species grouped into nine taxonomical sections, according to their morphology, chromosome cytology, geographic distribution and cross-compatibility relationships. During the 50's throughout the late 80's, many trips were made in South America to collect wild Arachis species, generating a great body of knowledge and invaluable asset to the research and breeding communities. The main repositories of wild Arachis species are at EMBRAPA (Brazil), IBONE (Argentina), ICRISAT (India) and PGRCU (USA) and TAMU. PGRCU holds 65 out of all *Arachis* species. Its primary goal is to preserve this valuable germplasm for all researchers worldwide for use in breeding programs, genomics, or other scientific research. This resource is constantly utilized by the peanut breeders and other researchers worldwide to provide the necessary genetic variability in their respective programs to improve cultivated peanut. Because of the International treaties, there has been a halt in germplasm exchange and therefore, accessions of local seed banks are almost irreplaceable. The goal of this research is to genotype all accessions of Arachis species in the USDA-PGRCU genebank, and selected accessions of the TAMU, NCSU, IBONE and EMBRAPA using the 48K Affymetrix chip to create a database that will help understand the structure of the genus and serve as a species 'barcode'. A positive and precise identification of Arachis species will help researchers select materials for bridge crosses for introgression programs. It will also help maintain purity of the collections, thus ensuring its high quality as a living legacy for the next generation of researchers, the industry and the consumers.

Presentation Link:
https://youtu.be/q1DZAwn9Ido

Simulating Aflatoxin Contamination of Peanut with the CROPGRO-Peanut-Aflatoxin Model

K.J. BOOTE*, V. SHELIA, G. HOOGENBOOM, Univ. Florida, Gainesville, FL, and P.V. VARA PRASAD, Kansas State Univ., Manhattan, KS.

Aflatoxin contamination of peanut (*Arachis hypogaea* L.) seed poses a continuing health risk to consumers around the world. Our objective was to add capability to the CROPGRO-Peanut model to simulate infection of pods by *Aspergillus* and subsequent synthesis of aflatoxin in peanut seed. The model simulates soil water status, soil temperature of the podding zone, and tracks daily cohorts of peanut pods. *Aspergillus* infection and aflatoxin synthesis of pod cohorts are simulated as a function of daily plant water status, soil water status of the podding zone, and soil temperature of the podding zone. The corresponding algorithm is coded in Fortran and linked to the CROPGRO-Peanut model. Rate constants and temperature thresholds for *Aspergillus* infection and aflatoxin synthesis were calibrated based on 4 years of data on percent infection and aflatoxin concentrations in seeds of the JL-24 cultivar in Sadore, Niger (Waliyar et al., 2003; Peanut Sci. 30, 79–84). The experiments had the following irrigation schedules: 1) 7-day irrigation, 2) 14-day irrigation, 3) 21-day irrigation, and 4) rainfed. The solved soil temperature sensitivity of aflatoxin synthesis was a 4-point lookup function (Tb=26, Topt1=28, Topt2=30, and Tceiling=38 ^{o}C), while the soil temperature sensitivity of percent infection was 22, 32, 35, and 45 ^{o}C (also a 4-point lookup function). These temperature functions were required along with simulated pod zone soil water status and plant water status. After calibration, the simulated versus observed aflatoxin had an R_2=0.57. Sensitivity analysis with rainfall data from Tifton, Georgia, indicates that 1 in 12 years had aflatoxin greater than 20 ppb, and 2 in 12 years greater than 2 ppm. Simulated aflatoxin concentration had a strong negative relationship to simulated peanut yield, both controlled by drought.

Presentation Link:
https://youtu.be/KHve6e6GKOM

Increased Incidence of *Aspergillus flavus* in Peanut Seed and Relative Efficacy of Commercial Peanut Seed Treatments

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

For years, Dynasty PD (azoxystrobin, fludioxonil, and mefenoxam) has been the standard seed treatment for peanuts in the southeastern United States. Rancona V PD (ipconazole, carboxin, and metalaxyl) is also effective but has played a lesser role. Commercial peanut seed testing in early 2020 showed lower than expected germination, especially with Dynasty. *Aspergillus niger* has been a growing problem in seed, but plating treated seed on PDA demonstrated very high frequencies of *A. flavus*. *Aspergillus flavus* is a well-known producer of aflatoxins that are of great concern in edible peanuts, but it is also a virulent seed pathogen. The percent colonization of *A. flavus* in 8 commercial seed lots averaged 68% and ranged from 34-92% on seed treated with Dynasty, while averaging 2% and ranging from 0-5% on seed treated with Rancona. *Rhizopus* spp. can also rot peanut seed and were found at a frequency of 15% (range of 3-32%) in Dynasty treated seed, and only 1% (range of 0-3%) with Rancona-treated seed. The percent seed producing a root on the PDA plates was 40% and 72% for the Dynasty and Rancona-treated seed, respectively. The percent seed producing a shoot with leaves on the PDA plates was 10% and 25% for the Dynasty and Rancona-treated seed, respectively. Testing of 200 seed samples at the Georgia State Seed Lab showed an average percent germ of 70% (range of 37-92%) for Dynasty-treated seed, and 86% (range of 70-94%) for the Rancona-treated seed. One lot had the same germination with both treatments, but 6 of 8 lots were at least 10% higher on Rancona, with one being 33% higher. Further studies are underway to determine if changes in fungicide sensitivity have occurred that may help explain the development of unexpected high frequencies of this aflatoxin-producing pathogen in peanut seed treated with Dynasty.

Presentation Link:
https://youtu.be/BGdy9CzTAbc

Planting Date Effect upon Leafspot Disease and Pod Yield across Years and Peanut Genotypes.

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Between 2012, 2015, and 2018 a set of 18 peanut (*Arachis hypogaea* L.) genotypes (some common and some different) were used to evaluate the effect of planting dates (April, May, and June) upon leafspot disease and pod yield. However, during each of the three years, the same set of 18 peanut genotypes were grown at the Gibbs Farm near the Coastal Plain Experiment Station, Tifton, GA using a randomized complete block design with five replications without any fungicides or insecticides but with irrigation. Each year, significant differences ($P \leq 0.05$) were found among these 18 genotypes during each of these three planting dates for leafspot disease ratings (0-9 scale) and pod yields. 'Georganic', GA 132705, 'Georgia-19HP', and 'Georgia-14N' had among the lowest leafspot ratings, and Georgia-12Y had the highest pod yield each year. During this three-year study, a significant increase in leafspot rating averaged across the same 18 genotypes were found with April planting date being the lowest and June planting date having the highest leafspot disease ratings. Percent coefficient of variation (CV) was consistently lower at the June planting date which suggest the least variability among the peanut genotypes. However, the overall pod yield means decreased across the three planting dates with April planting date having the significantly highest pod yield each year and June planting date having the significantly lowest average pod yield. In summary, April planting dates resulted in the highest pod yields, and the lowest leafspot ratings across each of the three years with 18 peanut genotypes evaluated each year without any fungicides or insecticides but with irrigation. It should also be noted that these field tests were in a good crop rotation following corn and cotton during this peanut study.

Presentation Link:
https://youtu.be/7kjqJWZ2lU8

Quantifying Genetic Diversity of Peanut Cultivars Released by the University of Georgia Using Genotyping by Sequencing.

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Over the course of the University of Georgia's peanut breeding effort, which spans over 80 years, 33 peanut (*Arachis hypogaea* L.) cultivars have been developed and released to the public. Thirty-two of these cultivars were recently genotyped using the targeted genotyping by sequencing (tGBS) method to quantify genetic diversity within and among cultivars. Two spanish, 2 valencia, 7 virginia, and 21 runner types were evaluated. From each cultivar, a total of 12 plants were individually sampled and genotyped to measure variability within inbred lines. The tGBS method used restriction enzyme *Bsp 1286 I* and sequencing was conducted on an Illumina HiSeq X. A total of 37,036 polymorphic SNPs were used to characterize the genetic diversity of these cultivars. Limited variation within inbred lines existed, thus genotype data was combined across individual samples within cultivars to create a composite, and more complete genotype for each of the cultivars. Average genetic similarity of Spanish botanical types to the panel ranged 62.6-63.1%; valencia types 71.0-73.1%; and 82.4-99.2% for Virginia and runner market types. Comparing coefficient of parentage calculations based on pedigree data, revealed a statistically significant, but weak correlation with tGBS-based measurement of genetic similarity (r_2=0.223, $p<0.0001$). This tGBS-based genetic diversity study provides an improved understanding of genetic relationships among these peanut cultivars which have had a significant impact on the peanut industry and could be of value to breeding programs for improved crossing decisions.

Presentation Link:
https://youtu.be/TrX2KeJKrKs

Use of Marker-Assisted Breeding to Combine Tolerance to Water Deficit Stress with Disease Resistance and Edible Seed Quality.

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A population was developed to combine tolerance to water deficit with resistance to root-knot nematodes and high oleic fatty acid content. Selection and testing were performed in the F_2 generation. Accessions were advanced and breeding lines were grown as replicated trials from 2015 to 2019. Progeny of accessions selected in the F_2 generation based on the best 3 SSR markers from GWAS outyielded the other accessions by 20%. Several accessions yielded well repeatedly under water deficit compared to commercial varieties. Large differences in rankings based on yield between irrigated and water deficit conditions suggest that certain accessions possess tolerance to water deficit, as opposed to high yield potential in general. However, low shellout among accessions is thought to be a result of the use of the unadapted minicore material as parent. Backcrossing will be needed to improve shellout.

Presentation Link:
https://youtu.be/cKLOj0CR-XU

Storing Shelled Peanuts in PICS Bags

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Low oxygen or hermetic storage has been successfully used to store several commodities such as small grains, cocoa, and coffee. A Feed the Future project team at Purdue University developed a hermetic storage system initially called the Purdue Improved Cowpea Storage or PICS. The system consists of two polyethylene bags, one placed inside the other, and an outer woven polypropylene bag. Producers fill the inner polyethylene bag with the commodity to be stored, then manually squeeze the air out of the bag and securely close the top. The air is the squeezed out of the outer polyethylene bag and securely closed. The outer woven polypropylene bag is then securely closed. The polyethylene bags provide a semi-permeable membrane that minimizes the movement of air and moisture into and out of the commodity stored in the bag. The outer polypropylene bag provides some protection against punctures and abrasions to the inner polyethylene bags. Oxygen inside the bag is consumed during the respiration process of the commodity and any insects in the commodity, and the carbon dioxide (CO_2) concentration increases. The low oxygen/high CO_2 minimizes oxidative deterioration of the commodity and damage due to insects.

Previous research using hermetic storage for peanut or groundnut has had mixed results. Some international research has reported successful hermetic storage in PICS bags. This research was conducted to determine the feasibility of storing shelled peanuts in PICS bags for up to 12 months. Treatments for the study included: 1) normal and high oleic peanuts, 2) two initial moisture contents, and 3) four storage treatments. The four storage treatments were 1) burlap/jute bags as the control, 2) PICS bags, 3) PICS bags with air extracted by vacuum, and 4) PICS bags with sachets of chlorine dioxide (ClO_2) dry fumigant added. There were three replications of each treatment combination. The PICS and jute bags were filled with 23 kg and 27 kg of shelled peanuts, respectively. Peanuts were stored in a room where the temperature followed ambient conditions while a heater maintained the temperature above 21C. Peanuts were placed in storage on 13 Oct 2017 and removed after 301 d of storage on 10 Aug 2018. The initial seed germination of the normal oleic and high oleic peanuts was 77 and 80%, respectively. The initial aflatoxin concentration in all peanuts was less than the detectable limit of 2 ppb. The bags were opened, sampled, and resealed according to the storage protocol after 60, 159, 249, and 301 d storage. In spite of best efforts to keep rodents out of the storage structure, approximately half of the 12 burlap bags suffered significant rodent damage and all had significant infestation by Indianmeal moth (*Plodia interpunctella*). Of the 36 PICS bags used in the study, only 4 had any rodent damage with most of the damage limited to the outer polypropylene bag. There were no live insects in the PICS bags. When the storage facility was unloaded, rodent nesting using both the jute and polypropylene fabric was found. At the end of the study, seed germination had decreased for all samples to an average of 6.3%. The peanuts stored in the jute bags had an average germination of 19.2% compared to 2.1% for the peanuts stored in PICS bags. Only two samples had more than 2 ppb aflatoxin. The aflatoxin concentration in one of the jute bags with normal oleic peanuts was 75 ppb, and one of the PICS bags with high oleic peanuts had an aflatoxin concentration of 12 ppb. All the other samples had aflatoxin below the detectable limit of 2 ppb. Most of the peanuts in the PICS bags had a white, powdery mold on the surface of the peanut, the identification and morphology are pending publication. There was no mold observed on the peanuts in the jute bags.

Presentation Link:
https://youtu.be/gVoyeSrfF9U

Effects of Elemental Sulfur Mixed with Fungicides for Management of Late Leaf Spot

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A recent study showed that adding micronized elemental sulfur to demethylation inhibitor (DMI) fungicides improved control of late leaf spot, caused by *Nothopassalora personata,* in fields where the efficacy of DMI fungicides alone was not adequate. An experiment was conducted to see if a similar effect would occur for a QoI fungicide with poor efficacy against *N. personata*, and with DMI and QoI fungicides with adequate efficacies. Treatments included a nontreated control, an elemental sulfur control, and plots treated with tebuconazole, mefentrifluconazole, azoxystrobin, or pyraclostrobin, either alone or mixed with sulfur. Applications began 30 days after planting and were repeated every two-weeks. Leaf spot disease was assessed using the Florida 1-10 scale, and as percent necrosis and leaflet defoliation for 5 tagged leaves per plot. Yield was also estimated. Sulfur mixtures had lower disease severity ratings for each fungicide evaluated. In general, the effect increased as fungicidal activities against *N. personata* decreased. With the exception of the untreated control, yield was not significantly improved when sulfur was added to the fungicide treatments.

Presentation Link:
https://youtu.be/9r5mjGmiqeE

GWAS Combining with Principal Component Analysis Identifies QTLs Associated with Flavor Related Traits in Peanuts

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Peanut flavor is a complex trait affected by raw material and processing technology and it is an important research area due to its significant influence on consumer preference. In this study, principle component analysis (PCA) on 33 typical traits associated with flavor revealed that the first three principle components (PCs): total sugars, sucrose, and total tocopherols, provided more information related to peanut flavor. Genome wide association studies (GWAS) using 102 U.S. peanut mini core collection were performed to study associations between 12,526 single nucleotide polymorphic (SNP) markers and the three PCs. A total of seven significant quantitative trait loci (QTLs) and four genes nearby were identified for total sugars and 22 significant QTLs with eight genes for sucrose were also obtained. In addition, two and five stable QTLs were identified for total sugars and sucrose in both years separately. No significant QTLs were detected for total tocopherols. Results from this research provide useful knowledge about the genetic control of peanut flavor, which will aid in elucidating the genetic and molecular mechanisms of flavor research in peanut.

Presentation Link:
https://youtu.be/LNG3gCIbpFg

Homeologous Recombination is Captured in the Nascent Synthetic Allotetraploid [*A. ipaensis* x *A. correntina*]$_{4x}$ and its Derivatives

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Wild introgression from diploid species provides the opportunity to broaden the gene pool of cultivated peanut for disease resistance and quality improvement. However, the genome stability and recombination of newly synthesized allotetraploids is not well characterized. A new interspecific hybrid *A. ipaensis* x *A. correntina* was made and produced fertile progenies after chromosome doubling via colchicine treatment. Selfed progenies of the new allotetraploid, and F_1 hybrids and F_2 progenies from the [*A. ipaensis* x *A. correntina*]$_{4x}$ by *A. hypogaea* crosses were genotyped by the Axiom_Arachis version 2 SNP array. Homeologous exchange between the *A. ipaensis* and *A. correntina* sub-genomes was observed in the S_0 generation and segregation of recombined segments followed Mendelian inheritance among the S_1 progenies. New events of homeologous exchange were found in the S_1 generation. The genomic region with segmental recombination was found to segregate in the F_1 hybrids between the [*A. ipaensis* x *A. correntina*]$_{4x}$ and *A. hypogaea*. Segregation of this region among the F_2 progenies followed a disomic recombination pattern. Yet, new events of segmental recombination were found in the F_1 hybrids as well as the F_2 progenies. From the breeding perspective, sub-genome instability could be a double-edged sword since desirable traits from the wild species may be either lost or fixed across sub-genomes during generation advance.

Presentation Link:
https://youtu.be/sgCFiCaPJDM

Assembly of *de novo* Genome Sequence Increases Candidate Gene Discovery: A Case of NC94022 and TSWV Resistance

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To facilitate fine mapping and candidate gene discovery for the strong Tomato Spotted Wilt Virus (TSWV) resistance from the *Arachis hypogaea* var hirsuta – derived line NC94022, a *de novo* genome assembly was constructed using Pacific Bioscience long reads. A final assembly of 2.5 Gb with a contig N50 of 1.8 Mb was scaffolded into 20 pseudomolecules. Comparative analysis with Tifrunner shows low single nucleotide polymorphism (SNP) diversity, further supporting extremely low SNP diversity within *A. hypogaea*. Of note are significant insertions and deletions that contribute differential gene content. Targeted analysis of the mapped region on A01 controlling TSWV resistance identified only 1 SNP per 22 kb, and only 7 SNPs in the estimated 200 kb region controlling resistance. An insertion was identified in the region resulting from a duplication of two genes. The comparative genome analysis reveals how *de novo* genome assembly delivers the toolset needed to identify candidate functional variation, and even genes, for marker development rapidly and effectively. We recommend that any mapping experiment include *de novo* assembly of parental genomes for effective marker development and gene discovery.

Presentation Link:
https://youtu.be/vCzQx68azXk

Relative Incidence of Tomato Spotted Wilt in Phorate-Treated and Nontreated Peanut

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In-furrow application of phorate (Thimet) insecticide is a key part of the integrated program for managing tomato spotted wilt, caused by *Tomato spotted wilt virus*, in peanut (*Arachis hypogaea*). Response to phorate has been variable, often with less noticeable benefit in cultivars with higher levels of field resistance. The objective of this study was to determine the relationship between incidence of spotted wilt in plots treated with phorate and plots with no phorate. Field experiments conducted in Tifton, GA during 2015-2019 were used for the analysis. Experiments included multiple cultivars with a range of field resistance to TSWV based on previous reports. Final incidence, in percentage of the linear row noticeably affected by tomato spotted wilt was assessed. Incidence of spotted wilt and pod yield with phorate was paired with the incidence of spotted wilt without phorate within each respective cultivar and replication. A total of 263 data pairs were subjected to regression analysis. Across all experiments and entries, incidence of spotted wilt with phorate (IncP) increased with increasing incidence without phorate (IncN) according the function: IncP = 2.62 + 0.49*IncN ($P < 0.0001$, R square = 0.58). Pod yield (kg/ha) of plots that received phorate (YldP) increased as yield with no phorate (YldN) increased according to the function: YldP = 2849 + 0.62*YldN ($P< 0.0001$, R Square = 0.45).

Presentation Link:
https://youtu.be/P_t1F-6e9s4

Identification of Disease Resistance (*R*) Genes Associated with Leaf Spot Resistance in Cultivated Peanut and the Conversion of Gene-Expression Markers to DNA Markers for Applications in Marker-Assisted Plant Breeding

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Early and Late Leaf Spot are fungal diseases in peanuts that can significantly reduce yield and quality without a costly fungicide program. Breeding for resistance in cultivated peanut has been elusive due to both low genetic resistance and strong environmental factors. To identify candidate resistance (*R*) genes involved in leaf spot resistance, 45 advance breeding lines and 3 peanut variety checks were field evaluated for leaf spot diseases. Based on visual disease ratings, 4 susceptible lines, 4 resistant lines and 3 variety checks were utilized in leaf gene-expression studies. Out of a 120 candidate *R*-genes evaluated to associate leaf spot resistance, 24 *R*-genes were significantly associated with resistant peanut lines. All 24 gene-expression patterns were negatively correlated (suppressed) compared to susceptible lines. PCR products of these *R*-genes were cloned and sequenced. Results identified that 4 *R*-genes are different at the nucleotide level between susceptible and resistant lines. These *R*-gene sequence differences will be validated through utilization of single nucleotide polymorphism (SNP) genotyping methods. Results of this research will be incorporated into peanut breeding programs to facilitate development of high yielding and leaf spot resistant peanut varieties.

Presentation Link:
https://youtu.be/s6vUHR1knJs

PeanutBase: Making Genetic and Genomic Data Accessible and Relevant for Peanut Improvement

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PeanutBase was started in 2013 to serve as the primary repository for peanut genetic and genomic data generated by the International Peanut Genomics Initiative. The website and database, which has been supported by The Peanut Research Foundation over this period, has matured in concert with the Genomics Initiative, and now provides tools that allow researchers to explore the diploid ancestral genomes (A. duranensis and A. ipaensis) and the cultivated peanut (Tifrunner) genome.

The website integrates most major data types involved in peanut genetics and genomics, including: genetic markers from numerous genetic maps and from the main genotyping chip (Affy 48k SNP set); images of accessions/varieties in the U.S. peanut collection; an interactive map of the geographic origins of all *Arachis* material in the U.S. collection; mapped traits; and gene expression data for all genes and for a wide range of tissues and developmental stages. The current efforts are directed to keep PeanutBase current with rapidly-progressing research in peanut.

This has required integrating large amounts of new data, including: genome assemblies for several new wild *Arachis* species, the densely genotyped U.S. core collection and phenotypic descriptions of the core, and genetic markers for high-value traits, for direct use in crop breeding programs. Tools are also being developed in parallel to visualize such data and aid in its utilization in crop improvement. They include: the PeanutMine for ease in mining genomic and genetic data, the Genotype Chromosome Visualization Tool (GCViT) that provides side-by-side visualization and comparison of genotype data to quickly identify large-scale differences (haplotypes) in different accessions, the Genomic Context Viewer (GCV) enabling researchers to explore similarity between regions on the peanut and related genomes, and a tool for viewing of GWAS results.

Abstract Accepted

Measurements of High Oleic Purity in Peanut Lots Using Rapid, Single Kernel Near Infrared Reflectance Spectroscopy

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High oleic peanuts have an improved post-roast shelf life versus normal oleic peanuts. High oleic purity (percentage of high oleic peanuts in a lot) is critical to ingredient performance, and hence the value of high oleic peanut lots. Contamination (percentage of non-high oleic peanuts within a lot) can result from accidental mix ups at the breeder/seed level, improper handling through the production chain, or due to physiologically immature high oleic kernels that do not meet established thresholds in oil chemistry to be true high oleic peanuts. Therefore, industry has established purity requirements to monitor and control contamination in high oleic lots. Sample size will impact the accuracy and variability of high oleic purity measurements when using samples to estimate the purity of bulk lots. Increasing the sample size will decrease the variability among replicated sample test results and increase the accuracy of the estimated lot purity. To allow for larger sample sizes, a rapid, robust instrument based upon near infrared technology was used for purity measurements. The objectives of this study were to (1) assess the performance of this device to accurately predict the high oleic purity of artificially mixed peanut lots at different contamination rates and (2) assess the impact of sample size on the precision of purity measurements. Three grades of “mini-lots” each at seven different contamination rates (0, 5, 10, 20, 30, 50, and 100 %) were prepared. High oleic purity of samples was assessed by scanning (20 kernels per second) multiple (8 replications) 500 gram samples with near infrared reflectance spectroscopy using a QualySense Qsorter Explorer sorting device. Using variability and distributional measurements among sample test results, operating characteristic curves were calculated to evaluate the performance of oleic sampling plan designs. The impact of sample size (from 500+ kernels to 10 kernels) and lot contamination on returned purity values is discussed in context of binomial statistics.

Presentation Link:
https://youtu.be/w6lQ0JWeY9s

Lipid Compounds in Runner and Virginia Type Peanuts

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Raw runner and Virginia-type peanuts were obtained from 3 different warehouses as 10 pound samples from 5 individual commercial lots (n=15 for each market-type) for a metabolomics type study. Samples were split into two five-pound subsamples with one subsample remaining raw while the other was roasted (Hunter L-value 48±1). Although the request for the samples specified normal oleic peanuts, seven of the samples of the runner type were actually high oleic cultivars. The samples were subjected to targeted (total fat, fatty acid profiles, tocopherols) and non-targeted analyses (LC-MS, GC-MS) for secondary metabolites.

As the Virginia type samples were all normal oleic, the fatty acid profiles were not statistically different. The runner type samples had O/L ratios in a range of 2.06 to 2.44 for the normal oleic samples and 23.71 to 35.42 for the high oleic samples. The tocopherol profiles followed the normal pattern for peanuts in all samples, that is a ratio close to 1 for alpha compared to gamma. Principal Components Analysis of the tocopherol data showed a clear clustering of all the Virginia type samples as one grouping and the high oleic runners clustering both apart from the Virginia-type and into separate clusters for high and normal oleic cultivars. Of the metabolites determined by the non-targeted analyses, oxygenated compounds originating from fatty acids predominated. These were present at higher levels in the normal oleic samples than the high oleic ones.

Presentation Link:
https://youtu.be/TRhcRPi81sw

Sensory Quality and Composition of Germplasm Resources in the North Carolina State University Peanut Breeding Program

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To keep the sensory improvement objective of the NCSU peanut breeding project moving forward, sensory panel and other chemical analysis data needs to be collected on germplasm from the NCSU peanut breeding project. This project was developed to evaluate sensory quality and composition of the germplasm seed bank collected by the North Carolina State University (NCSU) peanut breeding project. Currently, there is a collection of ~740 plant introductions (PI) and/or accessions in the NCSU germplasm seed bank. A subset of these lines (210) were selected as samples to submit for flavor, sensory and other chemical evaluations. The samples were roasted to a common color, ground to a paste and submitted to the USDA Market-Quality and Handling Research Unit (MQHRU) in the Department of Food, Bioprocessing and Nutrition Sciences. Flavor score data was returned by the USDA-MQHRU for analysis by the NCSU peanut breeding project. When selecting genotypes for crossing, a priority is placed on roasted peanut flavor and/or sweetness; however, these high priority traits are often negatively or positively associated with other traits of interest or unwanted traits, respectively. Therefore, a multivariate approach was used to categorize the data into flavor profile groups based on the correlations among the sensory attributes. The resulting principal components and cluster analysis segregated the flavor samples into three distinct groups with one group showing superior roast peanut flavor, sweetness and roasting color and a reduced bitterness score. These data will be used in making decisions on which germplasm to utilize in future crossing programs for the development of breeding lines with superior flavor and sensory quality attributes.

Presentation Link:
https://youtu.be/uCToPbGtsu8

Yield Response of Root-Knot Susceptible and Resistant Peanut Cultivars as Impacted by Nematicide Inputs

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In 2017, 2018, and 2019 at the Wiregrass Research and Extension Center in Headland, AL, yield response of the peanut root-knot susceptible Georgia-06G along with the root-knot resistant Georgia-14N and TifN/V-High-O/L peanut cultivars as influenced by in-furrow applications of 18 fl oz/A Velum Total and 7 lb/A AgLogic 15G was assessed on an irrigated site with an established *Meloidogyne arenaria* Race 2 population. A no-nematicide control was included. A factorial design arranged in a split split-plot with year as the whole plot, cultivar as the split plot, and nematicide as the split split-plot treatment was used. While peanut followed peanut in 2017, a one year out cotton-peanut rotation was followed in 2018 and 2019. Leaf spot defoliation, stem rot incidence, pod and root damage, final root-knot nematode counts, along with stand counts and year-end plant vigor were also recorded. Stand density and plant vigor differed by year and cultivar with AgLogic reducing stand density across all cultivars in 2019 compared with Velum Total and the no-nematicide control. Of the three cultivars, TifN/V-High O/L often had superior vigor ratings than Georgia-06G and to a lesser extent Georgia-14N. Similar plant vigor, pod damage, root-knot and ring nematode counts, as well as pod yield were often noted across all nematicide treatments, including the no-nematicide control. While leaf spot pressure was low in all study years, defoliation was less on TifN/V-High O/L and Georgia-14N in one and two study years, respectively, than on Georgia-06G. Less defoliation was also noted with Velum Total than AgLogic or the no nematicide control. While stem rot incidence were lower in all three years for TifN/V- High O/L and Georgia-14N, Georgia-06G had greatest and least disease indices in 2017 and 2019, respectively. While TifN/V-High O/L and Georgia-14N had lower root-knot juvenile counts and negligible pod damage compared with Georgia-06G, the former cultivar produced significantly greater yield than the latter two cultivars, which had similarly lower yields. Year impacted root-knot and ring nematode populations but not yield. Overall, the peanut cultivar TifN/V-High O/L produced greater pod yields with less damage from diseases and root-knot nematode when compared with the current industry standard Georgia-06G, while no yield protection was provided by either nematicide.

Presentation Link:
https://youtu.be/p2RXSKGKgsY

Evaluation of Three Years of On-Farm Peanut Fungicide Programs for Yield and Value in Southwest Georgia

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Peanut (*Arachis hypogea)* is the second largest agronomic commodity in Georgia and was planted on over 37,000 acres in Mitchell County in 2019. Fungicides are critical to protect the crop from *Sclerotium rolfsii*, *Cercospora arachidicola, and Cercosporidium personatum*. Peanut fungicide programs vary greatly in cost. Careful selection of fungicides can bring increased profit to a farmer, even if the cost of the "best" program is higher than other less-effective programs. In 1994, the standard fungicide program for growers in Mitchell County was based on tebuconazole and chlorothalonil. Today, newer products have been developed for use by peanut growers. The objective of this study was to evaluate the differential profitability of fungicide programs available to peanut farmers in Mitchell County.

Large-plot, on-farm fungicide studies have been conducted at four commercial fields in southwestern Georgia since 2017. Cultivar 'Georgia-06G' was planted on May 10th (Miller County) and June 10th (Decatur County) in 2017, May 20th (Decatur County) in 2018, and May 9th (Mitchell County) in 2019. At each location, five commercial fungicide programs were initiated approximately 30 DAP with subsequent applications on a 14-day interval until approximately 115 DAP. Fungicides included in this study where Elatus, Miravis, Muscle ADV, Fontelis, Propulse, Provost/Provost Silver, Alto, and chlorothalonil. Treatments in each trial were replicated three times. Prior to harvest plots were assessed for leaf spot and ratings ranged from 2.5 to 5 on the Florida 1-10 leaf spot scale. After inverting the plots, incidence of white mold was assessed and ranged from 0 to 40 hits per 200 feet of row. Peanuts at each location were harvested at maturity (~145 DAP) and plot weights (lb ac^{-1}) were collected and averaged over each fungicide treatment replication. Yields ranged from 5219 to 8143 lb ac^{-1}, depending on treatment, location and year. At all locations programs that included ELATUS (azoxystrobin + benzovindiflupyr/solatenol) in combination with additional fungicides for leaf spot control had lowest disease ratings and statistically higher yields that did other fungicide programs. Our standard fungicide program of tebuconazole/chlorothalonil had the highest disease ratings and lowest yields of all tested programs.

Growers in southwestern Georgia are dependent on profitability now more than ever. The average cost of an Elatus-based program has been approximately $100 per acre; the less-expensive Muscle ADV programs has been $50 per acre. At current peanut prices, a grower must make an additional 250 pounds of peanuts per acre to cover this increased fungicide cost. In all trials, the increase in yield observed between Elatus-based and tebuconazole-based programs more than covered the increased cost of the fungicide program. Therefore growers should consider investing in programs that protect yield and profit even if there is an increased cost to the program.

Presentation Link:
https://youtu.be/9g6R_E0cY5I

Sustainability of US Peanut Production

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Sustainable production of agricultural commodities has moved to the forefront due to changing demographics and traits desired by consumers. Gen-Z and Millennials now comprise 46% of the current US population and these groups are twice as likely (75% vs 34%) to change purchase patterns to reduce their impact of the environment. Data further indicates that age isn't the only factor as 60% of American consumers are in the "Sustainable Mainstream" category (Nielson Natural Marketing Institute's Segmentation Study). The sustainable footprint of US peanuts is related to numerous positive inherent properties of peanuts as well as proactive industry and research initiatives. To document the sustainability of US peanut production, a nationwide study of peanut producers was conducted during the 2016-2019 crop years. Numerous metrics were analyzed including, but not limited to: land use efficiency, water use efficiency, greenhouse gases, energy efficiency, management practices, pesticide and fertilizer usage, technology adoption, and other sustainability related metrics. Compared to other previous studies (UNESCO (1996-2005) and USDA-ARMS (1999, 2004, and 2013)), continual significant improvements in the sustainable footprint of US peanut production are demonstrated. The survey data also provides opportunities for educational purposes to inform consumers and highlight practices that lead to improved sustainable practices and economic returns for producers.

Presentation Link:
https://youtu.be/oDOdeDbnUls

Economics of Crop Insurance for U.S. Peanut Enterprises

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The current state of the agricultural economy lends prudence to management decisions on U.S. agricultural operations to minimize not only costs of production but also risk and uncertainty. Crop insurance is one risk management tool often regarded as providing a safety net for agricultural producers. However, the effectiveness of crop insurance as a risk management tool is impacted by a multitude of factors including the commodity produced, the region of production, the enterprise size, farm management practices, and natural disasters among others. This study investigates the economics of crop insurance for U.S. peanut enterprises from a multi-year and multi-region perspective. It further compares the economics of crop insurance for peanuts to other commodities traditionally produced on a peanut operation. It further investigates the potential relationship between crop insurance and the economic stability of peanut enterprises in the U.S.

Abstract Accepted

Evaluation of Leaf Spot Resistance in Wild *Arachis* Species of Section *Arachis*

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Wild diploid *Arachis* species are a valuable source of resistance to early (ELS) and late (LLS) leaf spot diseases caused by *Passalora arachidicola* (syn. *Cercospora arachidicola* Hori), and *Nothopassalora personata* (syn. *Cercosporidium personatum* (Berk. & Curt.) Deighton], respectively. Within section *Arachis*, limited information is available on the extent of genetic variation for resistance to these fungal pathogens. The present study evaluated 148 accessions of 20 diploid species of section *Arachis* from the U.S peanut germplasm collection to identify novel sources of resistance to both ELS and LLS. Screening for resistance was conducted under field conditions at the NPRL in Dawson, Georgia, during 2017-2018. The extent of genetic diversity within and between species was determined by genome-wide single nucleotide polymorphism (SNP) genotyping using a 48K SNP Array. Relatively high levels of resistance were identified for both diseases, with LLS being the predominant pathogen during the two years of observation. On average, 56% of the field plots exhibited symptoms of ELS (13%), LLS (27%), or both (16%). Patterns of genetic variation within and between species were resolved with more than four thousand SNPs distributed across the ten peanut chromosomes. The presence of both ELS and LLS enabled the selection of promising germplasm for further introgression and pre-breeding. Additional studies are in progress to better understand the genetic basis of naturally occurring variation in leaf spot resistance.

Presentation Link:
https://youtu.be/PTU-cp87WyI

Computational Fluid Dynamics Modeling of Air Flow Through In-Shell Peanuts in a Drying Trailer

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In-shell peanuts do not dry uniformly in drying trailers even when air is blown through them at recommended rates. Non-uniform drying causes deterioration in peanut quality during subsequent farmer stock storage and loss in value to processors. To understand the problem of non-uniform drying, a person must know what the air flow characteristics are in the interior of masses of peanuts in drying trailers. Direct measurement of air flow characteristics in the interior of masses of peanuts is very difficult. An alternative to direct measurements is Computational Fluid Dynamics (CFD) modeling which has proven valuable in other applications where an understanding of flow was required. Autodesk CFD modeling software was used to simulate air flow characteristics through peanut masses 1.24 m in depth in drying trailers. The modeled trailer was a typical 6.4 m (21 ft) long drying trailer 1.6 m (5.2 ft) high and 2.4 m (7.9 ft) wide. A perforated floor was located 0.2 m above the bottom of the trailer which formed an air plenum beneath the floor into which forced air could be blown from one end of the trailer. The 2.4 m end of the trailer where air was blown into the trailer was designated the air inlet wall. The 6.4 m long sides of the trailer were designated sidewalls. The forced air entered the plenum and then passed through the perforated floor upwards through the peanuts and out through the uncovered top of the trailer. Peanuts were modeled as a permeable resistance material using previously reported permeability parameters related to peanut depth and moisture content. Numeric solution process control parameters were adjusted to produce stable converging solutions. Model computed bulk air flow of 283 m_3/min, velocity distribution at the top surface of the peanut mass, and plenum static air pressure of 124 Pa at the experimental measurement point agreed favorably with reported experimental results which indicated model results should be representative of experimental results. Model results indicated air flow that started at the end of the air inlet ramp 0.37 m from the air inlet wall at the centerline of the trailer and proceeded from the trailer floor upwards through the peanut mass to the top surface of the peanuts had flow velocities that ranged from 22 m/s to 0.7 m/s and had static air pressures that ranged from 320 Pa to 1 Pa. Starting again at the end of the air inlet ramp at the centerline of the trailer and proceeding along the trailer floor toward a trailer sidewall, air flow velocities ranged from 22 m/s flowing away from the air inlet wall to 4 m/s flowing toward the air inlet wall. Starting again at the end of the air inlet ramp at the centerline of the trailer and proceeding along the trailer floor toward a trailer sidewall, static air pressure was 320 Pa at the centerline of the trailer then decreased to 92 Pa and then increased again to 126 Pa at a sidewall. Going to the opposite end of the trailer from the air inlet and starting 0.37m from the end wall at the centerline of the trailer and proceeding from the trailer floor upwards through the peanuts to the top surface of the peanuts, air flow velocities ranged from 1.4 m/s to 0.75 m/s and static air pressures ranged from 318 Pa to 5 Pa. Starting again at the previous point at the opposite end of the trailer from the air inlet at the centerline of the trailer and proceeding along the trailer floor to a trailer sidewall, air flow velocities ranged from 1.3 m/s to 0.9 m/s with all the air flowing upwards with a constant static air pressure of 318 Pa. The CFD modeling results indicate that air flow velocity and static pressure distribution patterns were three-dimensionally complex in a peanut mass and also in the air plenum beneath a peanut mass. The complex air flow indicated by modeling results had not been indicated by experimental measurements of air flow characteristics at the top surface of peanuts in a drying trailer. The next step in solving the non-uniform peanut drying problem is investigating if altering the air flow characteristics below and in a peanut mass would improve peanut drying. The CFD modeling of air flow in peanuts facilitates evaluation of peanut processing and storage methods and peanut handling equipment designs before implementation. Design optimization using the CFD model can greatly reduce cost, increase understanding of the problem and expand freedom in design choices.

Presentation Link:
https://youtu.be/YUyjP7dD3rg

Physiological Analysis of Drought Stress Response in Groundnut (*Arachis hypogaea* L.)

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Groundnut (*Arachis hypogaea* L.) is an important legume widely cultivated in West Africa where it represents the main source of agricultural income, rich in protein and essential vitamins that compliments the diets of urban and rural people in the region. It is usually grown under rain fed conditions, most of the sub-Saharan countries were known to be particularly vulnerable to climate change and climate projections show closer frequencies of extreme weather events, higher temperatures, and increasingly scarce water resources leading to drought which is widely known as the major abiotic factor limiting global agricultural production.

The purpose of the study is to use physiological markers to screen some groundnut varieties as drought tolerant and sensitive using the physiological approach. The evaluation was conducted in a greenhouse at Texas A&M Agrilife research station with Nine groundnut varieties using a randomized complete block design with four replications under two water regimes; well watered and water stressed. Five drought tolerant traits; Spad chlorophyll meter reading(SCMR), Chlorophyll a fluorescence ratio (Fv/Fm), Stomatal conductance, Specific leaf area and Relative water content were measured and analyzed. All the drought sensitive varieties showed gradual and significant decrease with respect to the drought related indices, which showed that three of the varieties were drought tolerant(CV3, CV4 and CV9), while others are susceptible to drought.

Abstract Accepted

Economic Impact of Increased Seeding Rates of Single Row Peanuts in Georgia

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The foundation for achieving maximum yield potential of peanut (Arachis hypogaea L.) is acquiring a uniform plant stand. Plant stands can be affected by many factors like environmental conditions, seed quality, and/or seeding rate. In the last few years, growers have experienced problems with varying environmental conditions and seed quality causing a perception that increased seeding rate is needed to get adequate stands. However, growers have also adopted the idea that increased seeding rates above the UGA Extension recommendations are needed to obtain the largest yield possible. On-farm trials were conducted in Jeff Davis and Colquitt counties to determine the influence of seeding rates on plant height, and yield potential for single row peanut. Seeding rate treatments consisted of: 1.) 13.1 seed m-1 using a large edible bean seed plate 2.) 19.7 seed m-1 using a large edible bean seed plate, 3.) 19.7 seed m-1 using a Virginia peanut seed plate, and/or 4.) 26.3 seed m-1 using a Virginia peanut seed plate. Plant stands increased significantly as seeding rates increased with plant stands ranging from 18.3 to 24.3 and 11.8 to 23.6 plants m-1 for the Jeff Davis and Colquitt county trials, respectively. Plant height (cm) and yield were significantly increased from 12.9 to 17.4 cm and 9,558 to 10,713 kg/ha, respectively, with the increase in seeding rates at the Colquitt county trial. Weather conditions had an impact on plant stands at the Colquitt county trial which could have contributed to the yield and growth differences. In the Jeff Davis County trial, increased seeding rates above 19.7 seed m-1 did not achieve more plant height nor greater yields. Based on these trials, increased seeding rates above UGA recommendations may be warranted during situations where environmental conditions or seed quality are an issue but not where these factors have minimal influence.

Presentation Link:
https://youtu.be/ioiTEZLDkcw

How Much Peanut Nitrogen Is Available to a Subsequent Wheat Crop?

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Although Extension recommendations generally advise a 22-45 kg N/ha reduction in mineral fertilizer application after peanut, recent research has reported that these may be overestimated. Field experiments were conducted over five site-years in Florida to quantify N availability from peanut to a subsequent wheat crop. The experiment was a randomized complete block split-plot design with four replications, with main plots as summer crop (cotton, peanut and fallow) and subplots as four levels of mineral N applied to a subsequent wheat crop. Results indicated that wheat yields after peanut were similar to those after a summer fallow and lower after cotton. The results indicate a yield reduction after cotton rather than a yield increase after peanut – a result that would not be observed without a summer fallow treatment, and would appear as a N credit after peanut without such a treatment. It is possible that the yield reduction after cotton may be due to N immobilization by cotton residues. Further research is needed to determine peanut N environmental fate.

Presentation Link:
https://youtu.be/FvvlNhXUxr0

Dh 256 – High Yielding Drought Tolerant Groundnut Cultivar for Water Limited Environments of Southern India

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Main Agriculture Research Station (MARS), University of Agricultural Sciences, Dharwad, India (15o 13' N, 75o 07' E, 678 m above mean sea level) receives 800 mm of average annual rainfall and thus comes under transitional tract of Karnataka state of India. This location has typical bimodal distribution of rainfall with one peak during July month that coincides with sowing and other during October month of the year that enables harvesting of groundnut. Under the changing climatic scenario, this location also witnessed irregular rainfall during rainy season of 2015 with June month receiving 160 mm rainfall as against 64-year average of 104 mm which enabled sowing of groundnut breeding material (developed specifically for drought tolerance) during second fortnight of June. Then, the location received 43, 34 and 22mm during July, August and September as against 64 years average of 155, 102 and 108 mm, respectively during the corresponding months. Hence, moisture stress during the post flowering to pod formation stage differentiated F2 segregating material into drought tolerant and susceptible plants. Among the 24 drought tolerant plants from the cross R 2001-2 x GM 4-3, five high yielding progenies studied during summer 2016 under irrigated and water stress conditions. Among these R 2001-2 x GM 4-3-1 recorded higher pod yield (4858 kg/ha) compared to high yielding check cultivar G 2-52 (2716 kg/ha) under irrigated condition. The same progeny also recorded moderate pod yield of 3996 kg/ha compared to 1862 kg/ha of check cultivar G 2-52 under water stress condition. The genotype was designated as Dh 256 had higher relative water content (> 70 %) as against 50 % relative water content in case of susceptible check TMV 2. This genotype Dh 256 was released for cultivation under drought prone regions of Southern states of India during 2019.

Abstract Accepted

Breeding for Enhanced Antioxidant Content in Peanuts

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Peanuts contain polyphenol antioxidants which protect against diseases involving oxidative stresses produced by cellular respiration and commonly present in inflammation, cancers, neurodegenerative and cardiovascular disorders. Research by our groups over the past decade has demonstrated very large genetic variation exists in total antioxidant content in peanut kernels, with nearly 3 fold differences among contrasting breeding lines (e.g. from ~ 580 to 1700 Trolox equivalence (μmg^{-1})).. Significant potential exists to breed and select high antioxidant genotypes for ultimate development of commercial cultivars. A population (P27) of recombinant inbred lines (RILs) was developed from the hybridization of low (D147-p3-115) x high (Farnsfield) antioxidant expressing parental lines, and evaluated across a range of contrasting environments. The genotype (G), environment (E) and G x E influence on antioxidant expression in the RIL population (as measured using the Oxygen radical absorbance capacity assay (ORAC) assay) showed significant genotypic and environmental effects, but non-significant G x E effects suggesting strong genetic control, moderate heritability and good potential for selection for this trait in peanut breeding programs. Quantifications of known polyphenols in high antioxidant expressing RILs showed increased ferulic acid, *p*-coumaric acid, salicylic acid, resveratrol and daidzein, with levels of these compounds being closely related to genotypic ORAC assay values. A novel, rapid and low cost phenotypic screening technique was then developed for antioxidant expression utilizing silver nanoparticles (AgNP) technology via their reductive capacity during shape transformation. A linear dose-response between AgNP transformation and polyphenol content was observed for sinapic acid, *t*-cinnamic acid, caffeic acid, gallic acid, protocatechuic acid, vanillic acid and syringic acid, as well as rutin, polydatin and resveratrol at extremely low concentrations (detection range: 1×10^{-2} M – 1×10^{-6} M). A rapid colorimetric antioxidant capacity assay has subsequently been developed where methanolic extracts from defatted peanut kernels show a significant correlation (r=0.52) against the ferric-reducing antioxidant power (FRAP) chemical assay. Further research on optimizing the AgNP assay is underway, however it shows significant potential as a simple, rapid and low cost colorimetric nanoparticle-based antioxidant capacity assay for screening of high antioxidant phenotypes in peanut breeding programs.

Abstract Accepted

High-throughput and Economical Marker-assisted Selection for Peanut

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Peanut breeders currently have limited resources to apply molecular breeding tools in their programs and most are only able to afford single marker analysis for specific traits rather than genome-wide genotyping. In order to facilitate translation of marker discovery to marker-assisted breeding, we have tested the accuracy of a genotyping service using a panel of 10 markers designed for the ICRISAT breeding program, but also containing a common marker of interest for a mutant allele of FAD2B conferring high oleic to linoleic acid ratio in some genetic backgrounds, including those in our breeding program. At the time, the genotyping service had only used dried leaf punches delivered by the breeder for DNA extraction. Our breeding program has transitioned to seed chips so that at least 15,000 seeds per year can be screened off season. Seed chips also simplify tracking and planting. Using a population expected to segregate for the mutant *fad2b* allele, both leaf punch and seed chip tissues were assayed in Tifton, GA and at Intertek Sweden. Genotypes from both locations and tissue types were 100% in agreement with very little missing data. The cost for DNA extraction and genotyping with a 10-marker panel is 2 USD per sample. Marker panels now can be customized for the needs of individual programs by selection of marker subsets relevant to the breeding materials in a program. This flexibility of design and low cost for 10 data points per sample should be affordable for many US breeding programs.

Presentation Link:
https://youtu.be/xkDfjq8frxo

Evaluation of Screening Methods for Heat Stress Tolerance in Peanut at Reproductive Stage

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Heat causes adverse effects on crop's production and quality. Due to the inconsistent and seasonal limitation when screening for heat tolerance in the field, the necessity of developing a reliable protocol under controlled conditions that allows simultaneous screening of multiple genotypes is needed. In this study, selected peanut accessions from the U.S. minicore collection along with checks were evaluated in two independent greenhouse studies, in which accessions were subjected to severe heat stress at the reproductive stage to identify superior genotypes based on physiological performance. Significant variation was observed among all physiological measurements studied. Correlation analysis revealed that enhanced respiratory biodemand under stress showed significant positive correlation with relative heat injury ($r=0.757$ $p = 0.002$). A positive and significant correlation was found between pollen fertility and flower ratio under stress ($r=0.833$ $p = 0.014$). Interestingly, acquired thermotolerance (ATT) had a highly significant positive correlation with pollen fertility under stress ($r=0.60$ $p= 0.0001$) and negative correlation with relative heat injury ($r=-0.50$ $p= 0.005$). The findings in this study suggest that screening based on ATT could be used as a rapid measure of heat tolerance.

Presentation Link:
https://youtu.be/8KDpKbU3g-A

Impact of Climate on Quantity and Quality of Virginia-Type Peanut.

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We examined the impact of warming temperatures on quantity and quality of virginia-type peanuts. Using value formulas from the Commodity Credit Corporation, changes in quantity and quality were mapped to changes in revenue. We then used regression approaches to jointly model the relationship between peanut yield and sample shares of extra-large kernels (ELK) and total sound mature kernels (TSMK). The regression models were applied to 33 years of data from the multi-state Peanut Variety and Quality Evaluation (PVQE) program which were linked to fine-scale weather data. We found negative impacts of weather warming on revenue through both yield and quality channels. Studies on climate change on agriculture production that fail to consider impacts on crop quality may underestimate the damage to farm revenue.

Presentation Link:
https://youtu.be/u3pXkhMKdy4

Leaf Hyperspectral Data and Different Regression Models Used to Estimate Photosynthetic Parameters in Peanut and Soybean

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One of the keys to improving crop yield under different stresses is studying is photosynthesis. Photosynthetic parameters, such as the maximum rate of carboxylation of RuBP (Vcmax), and the maximum rate of electron transport driving RuBP regeneration (Jmax) vary in response to climate conditions and have been identified as target for improvement. However, the techniques used to measure these physiological parameters are very time consuming. On the other hand, spatial and temporal variation in plant photosynthesis can be estimated using remote sensing-derived field spectrometer vegetation indices. In this study, we developed and assessed estimates of Vcmax and Jmax through four different advanced regression models: PLS, BR, ARDR and LASSO based on leaf reflectance metrics measured with an ASD FieldSpec4 Hi-RES of different crops under different environmental conditions such as: (1) peanut under water stress (2) soybean under high [CO2] and high temperature. Both phenotypic variability and varying levels of stress were employed with each crop to ensure adequate ranges of responses. Model sensitivities were assessed for each crop and treatment separately and in combination in order to better understand the strengths and weaknesses of each model in all the different conditions. The models suggest a robust prediction of Vcmax around R2:0.67 and the same for the Jmax R2: 0.55 for the combination of three species. Field spectrometer remote sensing brings light to this challenge and shows promising results for predicting photosynthetic capacity based on more detailed leaf optical properties.

Abstract Accepted

Disease Management Programs for Bailey II Peanut in North Carolina

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The cultivar Bailey dominated Virginia-type peanut production in the Virginia-Carolinas area after its release, producing high yields in diverse environments. In 2017, the NC State breeding program released Bailey II as a high oleic alternative to Bailey. Bailey II has performed as well or better than the original Bailey or the high oleic cultivar Sullivan in breeding, PVQE, and yield trials. However, pest management recommendations specific to this cultivar need to be developed in advance of widespread planting. At the same time, leaf spot control has become more difficult in NC, indicating that one or two additional sprays per season may be required to manage leaf spot on most cultivars. The cultivars Sullivan and Bailey II were planted at the Peanut Belt Research Station in Lewiston, NC and at the Upper Coastal Plain Research Station near Rocky Mount, NC in 2019. Treatments were replicated four times in a split-plot design, with cultivars as whole plots and fungicide schedules as subplots. Fungicides were applied biweekly 1) 6 times from 45 days after planting (DAP) to 120 DAP; 2) 5 times from 45 to 105 DAP; 3) 5 times from 60 DAP to 120 DAP; or 4) were not applied. The same fungicides were used in all schedules and were selected based on performance in the previous two seasons. Leaf spot and defoliation were evaluated separately on a percentage scale and stem rot incidence was determined on freshly inverted plants. Late leaf spot was the predominant foliar disease and incidence reached nearly 100% in untreated controls at both locations. Excellent disease control was maintained in all sprayed treatments at both locations. Disease and yield did not differ between Sullivan and Bailey II at either location ($P > 0.05$) and responses to spray schedules did not depend on cultivar ($P > 0.05$). The three fungicide programs did not differ from each other in disease or yield at Rocky Mount. At Lewiston, the 5-spray program started at 60 days had more leaf spot and defoliation than the 6-spray program or the 5-spray program started at 45 days, but yields were not different among schedules ($P > 0.05$). Yield impacts at both locations may have been mitigated by unusually hot, dry weather from mid-September to harvest.

Presentation Link:
https://youtu.be/GNQRLS4FFhA

Predicting Shelling Rate of Peanut Genotypes from the Uniform Peanut Performance Tests

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The rate, or rapidity, of shelling is an important factor in acceptance of a peanut cultivar by the shelling industry, but breeding programs do not have an easy way to measure or predict the shelling rate of breeding lines. This is because of the large volume of pods needed and the time-consuming nature of the process. Fortunately, the USDA-ARS National Peanut Research Laboratory working with public plant breeding programs within the cooperative Uniform Peanut Performance Tests (UPPT) evaluates breeding lines from multiple locations and seasons for their shelling characteristics in machines designed to mimic commercial shellers. Using UPPT information from one location (Marianna, FL), over four years 2015-2018, we evaluated regression equations for potential to predict the total shelling rate (TSR) and the initial shelling rate (ISR) from common grade factors such as other kernels (OK), sound splits (SS), medium kernels (Med), jumbo kernels (ELK), seed count per pound, and meat content. These common factors are obtained in the grading process for most breeding programs. Market types were not uniform in their response, so separate analyses were conducted for runner and Virginia types. The total shelling rate (TSR), defined as the total grams shelled per minute in all stages of the shelling process was not predicted by the same variables as the initial shelling rate (ISR), which is the grams shelled per minute on the first stage of shelling. This preliminary analysis suggests that the percentage of sound splits is loosely predictive of both TSR and ISR with varying degrees of precision. Other grade factors such as OK, ELK and seed count per pound were sometimes beneficial in predicting TSR and/or ISR. Results of regression analyses will be presented.

Presentation Link:
https://youtu.be/KahDmHL6Eys

Efficacy of Select Insecticides Against Threecornered Alfalfa Hopper in Peanut

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Threecornered alfalfa hopper (TCAH), *Spissistilus festinus*, is an insect commonly found in Georgia peanut fields. TCAH has a wide host range, but little is known concerning the economic impact of its feeding in peanut. Though the insect is often treated with insecticides, efficacy data from trials conducted in Georgia are limited. To address this concern, an on-farm insecticide efficacy trial was established in an irrigated peanut field in Grady County, GA in 2019. The abundance of TCAH nymphs was assessed using a 1m beat sheet immediately prior to the application of experimental treatments and 3 and 6 days after treatment (DAT). Pre-treatment populations averaged 6.56 nymphs per row meter. Four insecticides were evaluated in this study: Bifenture EC (bifenthrin), Sivanto 200 SL (flupyradifurone), Warrior II w Zeon 2.08 CS (lamda-cyhalothrin) and Diamond 0.83 EC (novaluron). The peanut cultivar GA-16HO was planted on 25 April 2019, and insecticide treatments were applied 47 days after planting.

At 3 DAT the mean number of TCAH nymphs in Diamond, Bifenture and Warrior II w Zeon treatments did not differ significantly from the untreated check. Sivanto significantly reduced TCAH nymphs compared to untreated check (95% control) but not compared to the other insecticides at 3 DAT. At 7 DAT the mean number of TCAH nymphs in Diamond and Warrior II w Zeon treatments did not differ from that in the untreated check. Bifenture and Sivanto significantly reduced nymph abundance compared to the untreated check at 7 DAT (73 and 100% respectively). The mean number of TCAH nymphs was significantly lower in the Sivanto treatment compared to all other treatments at 7 DAT.

Presentation Link:
https://youtu.be/Z1WP6-f0TnU

Developing a Convenient Gene Editing System in Peanut

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The precise genome-editing technology CRISPR/Cas9 has provided novel tools not only for basic biology research in plant but also for creating new varieties in plants through applied biology. However, the CRISPR tools have not been fully applied in peanut research. We have developed several constructs for CRISPR-mediated genome-editing, such as Cas9 and Cpf1-based gene editing including indel generated for functional study, cytidine deaminase for point mutation, and promoter modification for gene regulation. Our results showed substitutions as edits in protoplast and leaf infiltration, while in hairy root, substitution, insertion and deletion were observed as edits. Furthermore, we developed a peanut flower transformation system via injection of Agrobacterium with the CRISPR component directly into calyx tube. Analysis of fatty acid content in the T0 generation seeds is still underway. These results confirmed the usefulness of the constructs and could be applied in other genes of interest in peanut; therefore, developing new peanut lines with improved traits.

Abstract Accepted

Rotating Soybean with Peanut Affects Pod Yield, Grade, and *Meloidogyne arenaria* Root Galling

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Common rotational crops for peanut (PN) (*Arachis hypogaea* L.) include cotton (*Gossypium hirsutum* L.) and field corn (CR) (*Zea mays* L.). Although, soybean (SY) (*Glycine max* [L.] Merr.) is another row crop often grown in PN producing areas. Since SY and PN are both legumes and are hosts to similar pests, they are not recommended to be grown in the same crop rotations. However, they are often found in short-term sequence in some fields. The primary objectives of this study were to evaluate the effects on PN yield, grade (% total sound mature kernels), and root galling by peanut root-knot nematode (PRKN) (*Meloidogyne arenaria*) of various crop rotation sequences with CR and SY and duration between peanut plantings. Nine different crop sequences were planted so that 1-, 2-, 3-, and 4-yr rotations all cycled to PN in 2018. A secondary objective included a split-plot effect to compare a PRKN susceptible cultivar (Georgia-06G) to a PRKN resistant cultivar (Georgia-14N). When PN was grown after 3 consecutive years of CR, yield was 31% greater than a PN-CR-SY-PN rotation and 88% greater than a PN-SY-PN rotation. The PN-SY-PN rotation also resulted in a 2-4 % lower grade than any other rotation. There were no yield or grade differences between cultivars. Yet, PRKN galling resulted in an interaction between rotation sequence and cultivar. There was no galling on Georgia-14N regardless of the rotation. But Georgia-06G had greater galling than Georgia-14N in all rotations that included SY, continuous PN, and PN following 2-yr weedy fallow. There was also greater galling incidence within Georgia-06G plots for the continuous PN, PN-SY-PN, and PN after 2-yr weedy fallow compared to any other rotation. This data shows that inclusion of SY in rotation with PN is detrimental to yield and grade, and if a susceptible cultivar is used, poor rotation can also support PRKN populations by providing a host. It is a validation of the recommendation that SY should not be grown in rotation with PN unless in rotations that are long enough for at least one year of a non-leguminous crop between each legume.

Presentation Link:
https://youtu.be/C4wj004se1A

Evaluating Peanut White Mold Fungicide Programs in Bulloch County, Georgia

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White mold is a critical problem for peanut producers in Bulloch County and must be addressed with additional on-farm research to establish “best management” practices. The producers’ current best line of defense to combat the problem involves selection of more-resistant varieties and judicious use of fungicides. Further research is needed to provide recommendations to growers with regard to use of newer fungicides and application strategies for the management of white mold. In this demonstration conducted in 2019, the effectiveness of ten different fungicide programs was evaluated. The experimental design was a randomized complete block design with three replications. Data collected throughout this study included severity of leaf spot and incidence of white mold. Means were separated using Fisher’s protected LSD. From this research, the effectiveness of the fungicide treatments in reducing the incidence of white mold was evaluated as part of a disease management program to improve yield and quality. This data will play an important role in recommendations for future use of peanut fungicide selection to reduce white mold in Bulloch County and the Southeast.

Presentation Link:
https://youtu.be/GxUKibt9XSA

Genome Sequence of a *Bradyrhizobium* Strain Isolated from Peanut Nodules

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In many legumes, the colonization of roots by rhizobia is via “root hair entry” and its molecular mechanisms have been extensively studied. However, the nodulation of peanuts (*Arachis hypogaea* L.) by *Bradyrhizobium* strains requires an intercellular colonization process called “crack entry,” which is understudied. To understand the intercellular crack entry process, it is critical to develop the tools and resources related to the rhizobium in addition to focus on investigating the mechanisms of the plant host. In this study, we isolated a *Bradyrhizobium* sp. strain, Lb8 from peanut root nodules and sequenced it using PacBio long reads. The complete genome sequence was a circular chromosome of 8,718,147 base-pair (bp) with an average GC content of 63.14%. No plasmid sequence was detected in the sequenced DNA sample. A total of 8,433 potential protein-encoding genes, one rRNA cluster, and 51 tRNA genes were annotated. Fifty-eight percent of the predicted genes showed similarity to genes of known functions and were classified into 27 subsystems representing various biological processes. The genome shared 92% of the gene families with *B. diazoefficens* USDA 110T. A presumptive symbiosis island of 778 Kb was detected, which included two clusters of *nif* and *nod* genes. A total of 711 putative protein-encoding genes were in this region, among which 455 genes have potential functions related to symbiotic nitrogen fixation and DNA transmission. Of 21 genes annotated as transposase, 16 were located in the symbiosis island. Lb8 possessed both Type III and Type IV protein secretion systems, and our work elucidated the association of flagellar Type III secretion systems in bradyrhizobia. These observations suggested that complex rearrangement, such as horizontal transfer and insertion of different DNA elements, might be responsible for the plasticity of the *Bradyrhizobium* genome.

Presentation Link:
https://youtu.be/eBIeoKun0zk

2020 Joe Sugg Graduate Student Competition
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Evaluation of Perceptions, Preferences and Quality of Peanut Seed in Ghana

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In Ghana, peanut is the largest leguminous crop cultivated and, the most important source of plant protein in the country. It is a major crop that contributes to food security and income generation in the country. It is cultivated by about 74% of households in Northern Savannah of Ghana, mainly as a support crop to augment the household's source of income. Despite the many benefits accrued from peanut and the recognition of its potential to reduce malnutrition and poverty in the country, estimates from Ministry of Food and Agriculture (MoFA) indicate a fluctuating trend of peanut production in the country with respect to both yield per hectare and area cultivated. Limited access to high quality seeds of improved varieties is one major constraint to high productivity of peanut. The awareness by farmers of various seed sources, quality of seeds from these sources and characteristics of available peanut varieties, will increase farmer's chances of using high quality seeds. This research will bring to light the quality status of peanut seeds that farmers in the country use for production. Moreover, analysis of genetic variations of peanut genotypes in the country together with the preferences and perceptions of farmers regarding seed quality will present information useful for crop improvement. Thus, the research seeks to evaluate seed quality attributes of peanut seeds obtained informally from farmer-saved, local seed markets and research institutions, as well as to assess farmers' perceptions and preferences of peanut seeds in relation to seed quality. The research will be conducted at Kwame Nkrumah University of Science and Technology (KNUST), Kumasi and the Crops Research Institute (CRI), Fumesua. Seeds will be collected from farmers, open seed markets from Northern, Upper East, Upper West, Bono East and Ashanti regions of Ghana, as well as from Crops Research Institute (CRI) and Savanna Agricultural Research Institute (SARI). Seed samples will be tested for seed moisture content, seed purity, seed viability and seed health following the ISTA testing rules. Morphological and molecular characterization will also be conducted using the peanut descriptor (IBPGR and ICISAT 1992) and Simple Sequence Repeats (SSR) markers respectively. A structured questionnaire will be administered to randomly selected farmers to assess their perceptions and preferences. On a five (5) Likert scale, farmers will score statements on perceptions and preferences based on their level of agreement or disagreement. It is expected that the quality status of farmer-saved seed lots, seeds obtained from local markets and research institutions for peanut production in Ghana would be known. Also, the perceptions of farmers about seed sources in relation to quality and their preferred seed sources would be known.

Presentation Link:
https://youtu.be/UOf3cJ4RKms

Financial Returns for Weed and Disease Management Inputs in Peanuts in Southern Ghana

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Peanut (*Arachis hypogaea* L.) yield and financial return can be negatively affected by weeds and leaf spot disease [caused by *Cercospora arachidicola* Hori and *Cercosporidium personatum* (Berk. & M.A. Curtis) Deighton] in Ghana. Research was conducted in southern Ghana to evaluate hand weeding, herbicide applied preemergence (PRE), herbicide applied postemergence (POST), a combination of PRE and POST herbicides, and PRE or POST herbicides supplemented with hand weeding and disease management practices (i.e., no fungicide or a two sequential fungicide applications 45 and 60 days after planting). Peanut grain yield and financial return based on yield and cost of pest management practices were affected by weed management and disease management practices individually but seldom interacted with one another. The weed management practices with the highest financial return included a POST herbicide with or without hand weeding and a PRE herbicide followed by hand weeding or a POST herbicide. Control of pathogens by fungicide provided greater grain yield and financial return with the leaf spot susceptible cultivar Konkoma than with the leaf spot tolerant cultivar Yenyawoso.

Presentation Link:
https://youtu.be/TtPfBwCIBo4

Effect of Winter Cover Crops on Peanut in Rotation with Cotton

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Winter cover crops can potentially decrease inputs on crop production, improve yield and soil health, reduce soil erosion, conserve moisture and protect water quality. They can also be harvested to supply biomass used to feed livestock or for bio-based fuels. Row crops such as peanut (*Arachis hypogaea* L.) and cotton (*Gossypium hirsutum* L.) are important summer crops in Georgia and could benefit from the use of winter cover crops. The objectives of this study are to evaluate three winter crops (lupin (*Lupinus sp*.); narrow-leaf lupin (*Lupinus angustifolius L*.); cereal rye (*Secale cereale L*)) and their combination for biomass production and crop quality, and their subsequent effect on the production of a peanut – cotton rotation. The study was conducted at three sites in South Georgia: Tifton, Fort Valley, and Shellman. The experimental design is a split-plot, with peanut and cotton as the main plot treatments and cover crop as subplot treatments. Measurements for cover crops included percent ground cover, biomass and final yield. Measurements for peanuts included final yield, imagery of canopy coverage and final biomass. Results for the first year did not show a clear relationship between the yield of peanuts and cover crops. Winter cover crops showed significant biomass differences, with lupin and narrow-leaf-lupin having the largest final biomass production, and rye the lowest for the first two years of the study. Yields were lower during the second year of the rotation due to a hot and dry season.

Presentation Link:
https://youtu.be/02MqkVFYZ5U

Image Analysis and Regression Modeling for Peanut Symptom Identification

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Disease is one of the most yield limiting factors in peanut production. Several foliar diseases and disorders can be challenging to differentiate without practice. Providing a tool for fast diagnosis of foliar symptoms could potentially aid decision making by increasing the rate and accuracy of symptom identification and prevent wasted resources. The objective of this study was to use image analysis to provide peanut growers with a fast, easy to use, and accurate tool for diagnosing foliar diseases and disorders. Images of foliar peanut symptoms were collected and sorted by disease or disorder. Canopy images and individual cropped leaflets were processed in Batch Load Image Processor v.1.1. (BLIP), software developed by Clemson University. BLIP extracted colorspace data for each image pixel. For each image, binary symptoms were classified and recorded in a master database where 0 = absent and 1 = present. Data were analyzed using regression techniques using JMP Pro 14 to determine the parameters for each respective disease model. Model results and potential for implementation will be discussed.

Presentation Link:
https://youtu.be/ARH7DU1v4jA

Strip Tillage versus Conventional Tillage: Fresh Insight on a Long-Standing Controversy

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The desirability of tillage systems has long been an object of debate. This is of particular importance to agriculture in the Southeast given the capital role played by row crops such as peanut (*Arachis hypogea* L.). Using the eddy-covariance technique, this study evaluates both water-use efficiency (WUE) and yield in conservation/strip-tillage versus conventional tillage. Initial results from the present study suggest that during early, mid and late stages of peanut growth, strip tillage peanuts resulted in significantly greater WUE i.e. 105%, 51% and, 32% improvement than those grown in conventional tillage. Furthermore, strip-tillage yielded 33% more pods than conventional tillage. Additional studies in contrasting environmental conditions are underway to provide growers more effective cultivation practices and irrigation strategies.

Presentation Link:
https://youtu.be/4GLZH_sWK38

Evaluation of Wild Peanut Genotypes for Resistance to Thrips and Thrips-transmitted Tomato Spotted Wilt Orthotopsovirus

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Spotted wilt disease in peanut is caused by Tomato spotted wilt orthotopsovirus (TSWV). TSWV has been a major concern for peanut production in the Southeast over the last three decades. Tobacco thrips, *Frankliniella fuca* (Hinds), is the most important vector of TSWV in Georgia and other neighboring states. Peanut breeding programs have been engaged in developing resistant cultivars by introgressing TSWV resistance from wildtype diploid peanut species into cultivated peanut. A number of crosses and wild species need to be evaluated against thrips and TSWV. TSWV resistance evaluations in the past have relied on mechanical inoculation, which tends to not reflect the natural infection process under field conditions. Our optimized thrips-mediated transmission assay has the potential to serve as a high throughput screening platform for the genotypes developed in breeding programs. In this study, 17 wild species genotypes and their crosses were screened by thrips-mediated transmission assays in greenhouse. Tobacco thrips acquired TSWV were released on peanut plants for TSWV inoculation. TSWV infection rate and severity of thrips feeding injury on foliage were evaluated. Preliminary results indicated that some wild peanut genotypes such as BatDur2, *Arachis villosa* V12912 had reduced thrips damage and/or virus accumulation compared with the cultivated susceptible peanut genotype Georgia Green.

Presentation Link:
https://youtu.be/23iG3OnRxmc

Seed Coat Biochemicals Mediates *Aspergillus flavus* Resistance in Peanut

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Aflatoxins are the most potent mycotoxins produced by *Aspergillus flavus* infection and pose a serious health hazard to the consumers of peanuts and peanut products. *A. flavus* contamination occurs during pre- or post- harvest stage, at this stage there is no active genetic resistance from the live cells. However, peanut seed coat serves as the outer layer in physically protecting the endosperm from pathogen infection. We aimed to exploit the physical and biochemical resistance mediated by seed coat against *A. flavus*. *In vitro Seed Colonization* Assay (IVSC) showed that line 55-437 is resistant to *A. flavus* infection compared to TMV2. To assess, if the resistance is due to the seed coat biochemicals, the seed coat extracts from 55-437 and TMV-2 and was used for radial growth bioassay using Aflatoxin producing *A.flavus* strain. 55-437 showed a greater level of inhibition than TMV-2 in radial growth bioassays in three independent replicates. Thirteen lines were obtained from USDA using seed coat color as a criteria and two lines (PI 561680 with pinkish tan color and PI 544346 with tan color) showed higher resistance to *A. flavus* compared to 55-437 during in vitro seed colonization. The result observed indicates that seed coat biochemical plays a critical role in *A.flavus* resistance observed in peanut germplasm.

Presentation Link:
https://youtu.be/SJpNJvIAPQQ

Spatial Assessment of Tomato Spotted Wilt Virus to Varying Gap Lengths Within Uniform Peanut Stands.

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Peanut (*Arachis hypogaea* L.) producers in Georgia every year are faced with the concern of Tomato spotted wilt virus (*Tospovirus*; TSWV) reducing yields. Incidence of TSWV is often more prevalent in reduced plant populations and at the ends of rows or adjacent to missing areas of row. Field experiments were conducted at the University of Georgia's Lang-Rigdon Farm in Tifton, GA and duplicated in 2018 and 2019. The objectives were to determine the most optimum method of replanting a uniform stand based on varying length of gaps to minimize TSWV incidence on grade and yield. A second objective was to quantify the differences in TSWV incidence from gap edges or adjacent rows to missing segments of row. Plots were thinned to 6.6 plants/m except for one standard 13.1 plants/m check plot. Plants were removed from random sections of row to establish 0.61 m, 1.22 m, or 1.83 m of consecutive row length where no plants would grow. Each length was pulled either once or twice per 10.36 m row as separate treatments. All gap scenarios were factorially replicated with replant treatments as follows: 1) no replant, 2) replant only in the length of gaps, and 3) replant the entire length of row. All replant treatments were made at a rate of 13.1 seed/m at 19 days after original planting, approximately 8 cm to the side of the original row. Tomato spotted wilt virus was assessed on an 8 cm basis for the entire length of each row. All data were pooled over the two years of the study. There was a negative linear correlation between pod yield and percentage of TSWV, with a 389 kg/ha decrease in yield for every 10% increase of TSWV. There was no difference in percentage of TSWV between no replant (35%) and replanting only in the gap (33%), but there was less virus in the full row replant (26%) treatment. Full row supplemental replanting was beneficial in decreasing TSWV incidence resulting in an increased yield over the two year period of this study.

Presentation Link:
https://youtube/uob8_I9snJc

Development of Diagnostic Tools Against Important Quarantine Viruses of Peanut

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Virus diseases limit crop production and threaten agricultural sustainability worldwide. Increased globalization and widespread movement of agricultural products may allow introduction of viruses and their vectors to new geographical regions, causing disease outbreaks with serious consequences. There are various quarantine regulations established to lower the chances of an imported article carrying a pest or pathogen of quarantine significance. Preventing the entry of exotic pathogens into a new region relies in part on precise detection of the pathogens. Peanut is a major crop in the southeastern United States. Therefore, it is important to prevent the introduction of new viruses to maintain regional sustainability. This research presented is aimed at developing precise, reproducible, and economical diagnostic tools for detecting exotic peanut viruses, Groundnut bud necrosis Orthotospovirus (GBNV), Peanut clump virus (PCV) and Indian peanut clump virus (IPCV). Freeze-dried plant tissues of different isolates of GBNV and IPCV were obtained from ICRISAT-India under a USDA-APHIS permit. Specific primers were designed to target conserved regions of the coat protein gene (N), movement protein gene (MP) and Triple Gene Block genes (TGB) of the three viruses. Total RNA was used for RT-PCR to amplify the targeted gene segments followed by sequencing to confirm the virus identity. SYBER-Green-based RT-qPCR tools were developed and standardized for N, MP and TGB genes along with plant genes as controls. Further, research is underway to develop one-step multiplex RT-qPCR to detect the simultaneous detection of these quarantine pathogens.

Presentation Link:
https://youtu.be/ipezv2LfVeg

Determining Flumioxazin Dissipation and Effects on Peanut Using a Thermal Gradient Table

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Georgia growers achieve high yields by starting the season with clean, weed-free fields. It is better to take preventative action, than it is to respond. One critical aspect of weed control in crop production is the critical weed free period. This is the period in which crops need to be maintained weed free and if not, can suffer yield reductions due to weed competition. With peanuts not being very competitive, it is imperative growers keep their fields clean for those 3 to 8 weeks. One way growers can stay weed-free early in the season is to use preemergence herbicides.

Flumioxazin is a commonly used preemergent herbicide in peanut. It has 51% active ingredient and is typically applied at 107 g ai/ha. Flumioxazin is classified as a group 14 herbicide, also known as the PPO's. Flumioxazin has only a 2 month cotton rotation and 30 corn rotation. While flumioxazin can provide a wide range of weed control, some Georgia growers are seeing early season damage attributed to flumioxazin in unfavorable weather conditions. Research was conducted using a thermal gradient table to see the effects of temperature over time on flumioxazin dissipation and flumioxazin effects on peanut seed radical length. Results will be added.

Presentation Link:
https://youtu.be/jdbff5j-zA0

Yield Loss and Grade Effects of Peanut Combine Speed Settings

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A research project was conducted to understand and quantify yield losses and grade associated with peanut combine harvesting. Research into this subject had not been previously reported to the extent of what was necessary for relevant results for current peanut producers. A primary objective was to quantify where peanut yield losses were most prevalent on a peanut harvester, header losses or tailings losses, by changing three key operational variables: ground speed, PTO speed, and header speed.

The study was conducted on commonly grown varieties for South Carolina producers, Virginia variety in 2018 and Runner variety in 2019. Tests were conducted on 4-row wide (3.86 m, 12.67 ft) plots that were 19.20 m (63 feet) in length, or 14.16 m_2 (798.2 ft_2) in area; yield data and grade samples were collected for each plot.

In 2018 we found that tailings losses increased by 156 kg/ha (140 lb/ac) per each 10 percent increase in PTO speed and in 2019 tailings losses increased by 64 kg/ha (58 lbs/ac). An optimal vine/material throughput of 20,082 lbs/hr was found in 2018 to produce the lowest tailings losses, though in 2019 there was no relation between tailings losses and material throughput. Header losses were determined to be insignificant for both research years in comparison to tailings losses. Knowledge of yield and grade effects of combine settings will assist growers in making economic decisions for peanut combine operation.

Presentation Link:
https://youtu.be/dKUFpwrXPVE

Peanut Response and Weed Control Following Norflurazon Applied Preemergence and At-Crack

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Texas is the second largest peanut growing state in the nation. In 2019, Texas produced 496 million pounds on 165,000 acres worth nearly $145 million. Weeds pose a threat to peanut yields across the state. Norflurazon, a carotenoid biosynthesis inhibiting herbicide which was first labelled for use in peanuts in 2001, is effective at controlling broadleaf and grass weeds. Current weed management practices in peanut include the use of flumioxazin and diclosulam, WSSA Group 14 and 2 herbicides, respectively. Norflurazon is a Weed Science Society of America (WSSA) Group 12 herbicide and currently the only herbicide in its class labelled for use in peanut. If integrated as a component of a season-long weed management program, it could diversify peanut herbicide systems and help slow the spread of weeds resistant to Group 2 and 14 herbicides.

In 2019, field experiments were conducted at Seminole and Yoakum, Texas to determine the response of GA09-B runner peanut to norflurazon applied preemergence (PRE) or at-crack (AC) as well as to determine the efficacy of norflurazon applied preplant incorporated (PPI) or PRE. Peanut variety response experiments at Seminole and Yoakum included norflurazon at 0.5 or 1.0 lb ai/acre applied PRE or AC. At Seminole, peanut injury following norflurazon at 1.0 lb ai/acre applied either AC or PRE was greatest (13.5 and18%, respectively) thirty days after planting (DAP). At Yoakum, herbicide injury following norflurazon AC was greatest fourteen DAP (28%) at the 1.0 lb ai/acre rate while injury following norflurazon PRE never exceeded 1%. At both locations, no peanut injury was observed sixty DAP and peanut yield was similar to the nontreated, weed-free control.

In a weed control experiment at Yoakum, treatments included norflurazon at 0.5 or 1.0 lb ai/acre applied either PPI or PRE, norflurazon at either 0.5 or1.0 lb ai/acre + pendimethalin at 1.0 lb ai/acre PRE, ethalfluralin at 0.75 lb ai/acre PPI followed by (fb) norflurazon at either 0.5 or 1.0 lb ai/acre PRE, and pendimethalin at 1.0 lb ai/acre + S-metolachlor at 1.25 lb ai/acre PRE. Norflurazon alone was up to 40% more effective at controlling Texas millet [Urochloa *texana* (Buckl.)] when applied PRE rather than PPI. The greatest season-long Texas millet control was achieved using ethalfluralin PPI fb norflurazon PRE. Treatments including pendimethalin or ethalfluralin were more effective at controlling smellmelon (*Cucumis melo,* L.) than norflurazon alone. Palmer amaranth (*Amaranthus palmeri* S. Wats.) was controlled >90% when norflurazon was applied PRE alone and best (>97%) when norflurazon was used in combination with either pendimethalin or ethalfluralin. When used at the labelled rate of 0.5 lb ai/acre, norflurazon has the potential to be an effective component of a season-long weed management program in peanut production with no adverse effects on yield.

Presentation Link:
https://youtu.be/BN_uiZl_S1s

Peanut Response to Vegetative Injury Occurring at Different Intensities and Growth Stages.

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Physical injury of crops can occur from a variety of sources such as hail damage, foraging by animals, or other acts of nature. This damage may result in reduced production depending on the growth stage and intensity at which it occurs. This study was conducted in 2019 in Tifton, Georgia on peanut (*Arachis hypogaea* L.) to quantify vegetative response in Normalized Difference Vegetation Index (NDVI), digging losses, and yield reduction from physical vegetative injury. At approximately 30, 60, 90, and 120 days after planting (DAP), physical injury was administered to the vegetative canopy using a weed trimer with flexible rubber impact points at low RPM to simulate vegetative injury of 33%, 66%, and 99%. A non-treated control with 0% injury was maintained throughout the experiment. NDVI was recorded 11 days after each treatment. Regrowth for the 30 and 60 DAP treatments at 33% and 66% damage returned to normal by the next sample date, and by the end of the season at 99% injury. Injury at the 90 and 120 DAP treatments did not return to normal NDVI values for any of the injury intensities, and NDVI value was progressively less with increasing damage intensity for both late treatment dates at the end of the season. Undamaged plots had an average yield of 8,880 kg/ha. At the 99% damage level, yields were reduced by 56% at 30 DAP, 81% at 60 DAP, 97% at 90 DAP, and 84% at the 120 DAP treatments. Yields were also reduced with increasing injury intensity within any given injury timing. Yields were lowest when injury occurred at the 90 DAP timing. Physical damage resulted in the pegs being detached or weakened to the point that they were unable to be inverted and harvested. Digging losses were measured post-harvest by sifting through the inversion zone soil in a 1.83 m X 1.83 m area to a 15 cm depth. Treatments of 99% damage at 90 and 120 DAP had the most detached pods along with the most yield loss (7 and 14 times greater yield loss than the undamaged plants, respectively). All treatments at the 120 DAP timing had the greatest number of detached pods in comparison to the same intensity of damage at any of the previous timings. Physical damage to the vegetative canopy after flower initiation reduces yield compared to undamaged plants. Further analyses of additional year replicates and economic analysis will aid in determining whether continued crop management is feasible or not worth continued input costs depending on the severity and/or timing of injury sustained.

Presentation Link:
https://youtu.be/Kmztz-swrPk

Evaluation of High-Oleic Peanut Germination on Thermogradient Table

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As varieties are being developed with a higher tolerance to TSWV, growers are able to plant peanut earlier in the year, such as mid-April. Proper seed germination and stand establishment is critical to allow growers a maximum yield. A study was performed in 2019 evaluating the 4 market-type peanut seed germination rate from multiple states on a thermogradient table across multiple temperatures. Varieties included Bailey with high and low oleic content, high oleic Tif 62-15, low oleic Tifguard, low oleic Valencia A, high oleic Valencia #5, a low oleic Spanish variety, and high oleic Olé. Each variety was grown in Oklahoma, New Mexico, Georgia, and North Carolina. Temperatures per individual cell on a thermogradient table ranged from 11C to 32C. Germination counts were collected from 72 hours to 168 hours after study initialization with seeds considered germinated if radicle length was >5mm. Germination counts will be modeled using SigmaPlot 14 in order to determine optimal germination temperature for each peanut variety.

Presentation Link:
https://youtu.be/XFChphKdMA0

Modeling for Ambiguous SNP Calls in Allotetraploid Peanut

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Cultivated peanut is an allotetraploid crop with highly similar A and B sub-genomes, and a relatively large genome size of around 2.7 Gbps. Accurate genotype of allotetraploid peanut is challenging due to alignment ambiguities caused by homology leading to an excess of heterozygous calls. In this study we propose an allotetraploid specific method that carefully assesses the strength of A and B alignments to estimate the genotype of a sequenced individual at a single locus in a homoeologous region. The proposed method does not require evidence of haplotypes, in contrast to other methods which have been developed earlier. This method was validated on WGS re-sequenced data and simulated amplicon sequences. In providing this tool, we hope to benefit plant breeding programs by genotyping allotetraploids with greater accuracy and thereby better revealing the true variations among genotypes.

Presentation Link:
https://youtu.be/E7YfnnXazjs

Understanding and Enhancing Drought Tolerance in Virginia Type Peanut

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Peanut (*Arachis hypogea* L.) is a high value crop ranking second most important legume in production after soybean, generally grown as a rain-fed crop in the world. Drought is among one of the major limiting factors for peanut yield and quality. Over 90% of peanut production in Virginia-Carolina growing region is under rainfed condition (no supplemental irrigation). Drought poses major challenges to peanut growers under rainfed conditions for yield and quality to maintain their competitiveness in the market. The most reliable solution for peanut growers to mitigate drought in rainfed conditions is to adopt drought tolerant cultivars. To achieve this objective, our research focuses on phenotyping and genotyping of established three populations (consisting of 722 lines) of recombinant inbred lines (RILs) for drought tolerance. Five parents for these populations were selected on the basis of previous studies which showed contrasting traits for drought tolerance. Phenotype these large populations (RILs) at field by taking ground measurement for plant height, canopy width, Normalized Difference vegetation index (NDVI), canopy temperature (CT), wilting, disease rating and pod yield. Based on 2018-19 phenotypic data, we have selected about 15% of lines from each population. These selected sub-set of lines will be further studied for physiological traits for drought tolerance in controlled field conditions using rainout shelters, with and without irrigation. Genotyping of the RILs is done by using standard Genotyping-by-sequencing approach. This will facilitate the identification of genomic markers associated with drought tolerance in these RIL populations and allow generation of reliable markers to enable marker-assisted selection for drought tolerance in peanut breeding. P

Presentation Link:
https://youtu.be/jMWFRjcr4Qc

Anatomical Characteristics Correlated to Peg Strength in *Arachis* Species

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Wild, diploid *Arachis* species are a great source of biotic and abiotic stress resistances and tolerances for peanut breeding programs; however, these species also have undesirable characteristics such as small seed size, low yield, and weak peg strength. Peg strength has been shown to have a positive, linear relationship with yield in cultivated peanut. Therefore, the weak peg strength of wild *Arachis* species could be detrimental to yield and might need to be selected against when introgressing useful alleles from wild species. To enable breeders to effectively utilize these wild species, we sought to characterize peg strength and anatomical characteristics correlated with peg strength in seven *Arachis* species, as well as four allotetraploids, six (cultivated peanut lines x allotetraploid) F_1 hybrids, and two cultivated peanut breeding lines. For each genotype, five mature pegs were tested for peg strength and subsequently cross-sections for three of the five pegs were taken and analyzed for peg anatomical characteristics including total peg cross-section area, average bundle cap area, total bundle cap area, bundle cap as a percent of peg area, bundle cap number, average distance between bundle caps, total distance between bundle caps, and tannin cell count. Genotype was a significant indicator for peg strength and all the anatomical characterization parameters ($P < 0.05$). Peg strength was positively and highly correlated with peg area, average bundle cap area, total bundle cap area, and bundle cap number. Peg strength comparable to that of peanut breeding lines was recovered in the F_1 hybrids. Because weak peg strength in the wild species appears to be recessive, it will likely be selected against in the process of introgression.

Presentation Link:
https://youtu.be/hQV1uAH4L54

Physiological Quality Gain in Peanut Seeds During Development.

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Use of high-quality seed is an important strategy for successful peanut (*Arachis hypogaea* L.) production. Since peanut is an indeterminate crop, the accurate harvest time for greatest seed quality is a challenge. Seed acquire the physiological components of quality during development. However, the pattern of physiological quality acquisition is not clear in peanut seed. This study aimed to characterize the gain of physiological quality components in peanut seed during their development. The field research was conducted in Dawson, GA where seed from the cultivar Georgia-06G were planted on May 30, 2019. The plots received supplemental irrigation to provide required water by the plants. Plants were harvested at 140 days after planting (DAP) corresponding to 2300 growing degree days. Seed were separated into eight groups according to the peanut maturity profile board. For analyses in fresh seed, seed were split into two groups, in which one group was treated with ethephon to release potential dormancy and the other group remained untreated. Germination and vigor were tested by quantifying radicle protrusion (2 mm). For germination, the reading was taken 10 days after the test was started, whereas for vigor, readings were performed every 6 hours starting from test setup for a total of 240 hours. In seed from both groups (treated and untreated with ethephon), germination ability was acquired at early seed development (white stage) and dormancy was acquired after stage yellow 2. For treated seed, germination reached its maximum potential at stage brown 1, whereas for untreated seed, the maximum potential for germination was reached at stage yellow 2. Dormancy was naturally released 25 days after pod harvest. For treated seed, maximum vigor was reached at stage brown 2, whereas for untreated seed, the maximum vigor was reached at stage brown 1. Analysis to identify the desiccation tolerance and longevity patterns are still in process, and when completed, the acquisition pattern model will be built.

Presentation Link:
https://youtu.be/nth3XKKJyy4

Genotypic Characterization of the U.S. Peanut Core Collection

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Cultivated peanut (*Arachis hypogaea*) is an important oil, food, and feed crop worldwide. The USDA peanut germplasm collection currently contains 8,982 accessions. In the 1990s, 812 accessions were selected as a core collection based on phenotype and country of origin. The present study reports genotyping results for the entire available core collection. Each accession was genotyped with Arachis_Axiom2 SNP array, yielding 14,430 high-quality, informative SNPs across the collection. Additionally, a subset of the core collection was replicated, using between two and five seeds per accession to assess heterogeneity within these accessions.

The genotypic diversity of the core is mostly captured in five genotypic clusters, which have some correspondence with botanical variety and market type. There is little genetic clustering by country of origin, reflecting peanut's rapid global dispersion in the 18$_{th}$ and 19$_{th}$ centuries. A genetic cluster associated with the *hypogaea*/*aequatoriana*/*peruviana* varieties, with accessions coming primarily from Bolivia, Peru, and Ecuador, is consistent with these having been the earliest landraces. The genetics, phenotypic characteristics, and archaeological records are all consistent with previous reports of tetraploid peanut originating in Southeast Bolivia. The present genotype results indicate an early genetic radiation, followed by regional distribution of major genetic classes through South America, and then global dissemination that retains much of the early genetic diversity in peanut. Comparison of the genotype data relative to alleles from the diploid progenitors also indicates that sub-genome exchanges, both large and small, have been major contributors to the genetic diversity in peanut.

Presentation Link:
https://youtu.be/ySU1oU3q8AM

Can Calcite Dissolving Bacteria Promote Pod Growth?

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Calcium is critical for the development and stress response of a peanut pod. Calcium-deficiency leads to aborted embryo development and high susceptibility to soil-borne pathogens. Accumulating evidence indicates that microbes associated with plants can be used for growth promoting and biocontrol agents. Little is known about how the microbiome in soil affects calcium availability to peanuts. As a geocarpy plant, peanut pods grow in the same soil environment as roots do, which set an obstacle to distinguish pod-specific response to calcium deficiency from secondary responses derived from root physiology. Here, we describe a "Growth-in-Tube" system to support the growth of individual pegs on a peanut plant. This system can be used to study pod development with controlled microbial community and nutritional conditions. Our primary goal is to investigate pod-specific response to calcium starvation and isolate bacteria that can improve calcium uptake/availability.

We have isolated 65 strains of calcite dissolving bacteria (CDB) from peanut fields in Tifton, Georgia. These CDB can dissolve calcite using a plate assay and increase calcium availability in sand. Using the "Growth-in-Tube" system, we are investigating whether CDB strains can be used as a biofertilizer to enhance calcium availability in pegging zone and improve seed quality.

Presentation Link:
https://youtu.be/lCaRWvQhld4

Assessing Photosynthetic Response of Peanut to Different Planting Dates Using UAV-based Multispectral Images

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Remote sensing is an alternative method that can be used to evaluate physiological response to environmental conditions and plant status, which could potentially complement, reduce or replace manual measures. However, information on the use of remote sensing on the physiological response of peanut plants to environmental conditions is still needed. This study's objective was to identify vegetation indices calculated from UAV-based multispectral images that can strongly correlate with physiological processes in order to identify the status of peanut plants. The experiment was conducted in Tifton, Georgia using the cultivar Georgia-06G. The field was divided in three planting dates in order to simulate different environmental conditions, with 12 replications per planting date. Different photosynthetic component processes were evaluated. Chlorophyll a fluorescence transient and pigment contents were collected weekly starting when the plants had accumulated 1470 growing degree days (GDD) until 2300 GDD. Additionally, a 3DR solo with a Parrot Sequoia multispectral camera was flown weekly on the same day physiological measurements were obtained. Vegetation indices that could reduce or replace manual measures have been developed from UAV images. Overall, the VIs showed higher correlation with physiological parameters at the 3rd planting date. A strong non-linear relationship (R_2= 0.69) was observed between Modify Non-Liner Index (MNLI) and internal leaf CO_2 concentration. Simple Ratio and Non-linear Index showed strong relationship with stomatal conductance with R_2 of 0.63 and 0.73, respectively.

Presentation Link:
https://youtu.be/KHnh_Va_1dU

High-Throughput Techniques to Estimate Above Ground Biomass in Peanut.

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Biotic and abiotic stresses diminish growth and development of shoots and leaves of peanut (*Arachis hypogaea* L.) affecting the total above ground biomass (AGB). Above ground biomass is also influenced by peanut canopy architecture which varies among peanut biotypes. This makes AGB is an important physiological trait to monitor in relation to crop health. Manual measurement of AGB is time-consuming, but remote estimation, i.e. using aerial sensors for leaf reflectance, is possible. Remote sensing of AGB could be useful for the breeding programs when fast and relatively inexpensive selection of AGB is required. The objective of this study was to high-throughput (HTP) phenotype AGB from leaf reflectance using several sensors on an unmanned aerial vehicle (UAV) platform. The study included eight peanut genotypes, Virginia-, runner, and Spanish-types, planted in four replications and harvested for AGB four times over the growing season. Aerial red-green-blue (RGB), near-infrared, and thermal images were taken before destructive sampling for AGB. Results showed that manually measured AGB was correlated ($r = 0.88$, $p < 0.0001$) to green area (GA) ($r = 0.75$) and greener area (GGA) ($r = 0.80$) derived from RGB reflectance. Our results show that peanut biomass can be monitored throughout the growing season and estimated from aerial pictures with fair accuracy.

Presentation Link:
https://youtu.be/xlEwQsYvmPY

The Evaluation of Vegetation Indices to Assess Yield and Crop Quality Parameters in Peanut

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Growers and industry could greatly benefit from a decision aid tool that estimates crop yield quality across a field. This information can be used by buying points to prepare for post-harvest storage decisions for peanuts. With this idea in mind, an objective was created to evaluate vegetation indices (VI) using aerial imagery to determine correlations to yield (kg/ha) and crop quality parameters such as total sound mature kernels (TSMK), loose sound kernels (LSK), other kernels (OK), sound splits (SS), and foreign material (FM). Aerial images, consisting of red (R), green (G), and near infrared (NIR) wavelength bands, were taken of 3 peanut fields in 2018 and 12 fields in 2019. Fields were separated into zones using the NIR image based on previous research in Australia and zones were harvested independently of each other. Yield and crop quality parameters were recorded for each of the 22 zones in 2018 and 46 zones in 2019. Images were then processed in ArcMap 10.5 to create 10 different VIs and mean pixel values for each zone were recorded for each VI. All zone data were compiled, and correlations were run to compare yield, TSMK, LSK, OK, SS, and FM to mean pixel values for R, G, and NIR images as well as derived VIs. Results showed that yield was correlated to TSMK, LSK, and FM with correlation coefficients of 0.73, 0.74, and 0.80 respectively. Yield and LSK had the strongest correlations with the green ratio VI with a correlation coefficient of 0.73 and 0.98, respectively. TSMK and OK had the strongest correlations with the normalized R VI with correlation coefficients of -0.93 and -0.70, respectively. SS had the strongest correlation with the normalized G VI with a correlation coefficient of 0.54, and FM had the strongest correlation with the difference VI with a correlation coefficient of 0.64. Using the VIs with strong correlations to yield and crop quality parameters, a model can be created that can estimate peanut yield and quality before the crop has been harvested.

Presentation Link:
https://youtu.be/0rjPRLm6zuY

Effect of Irrigation Levels on Peanut Production and Profitability

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The Ogallala Aquifer has been depleting rapidly, and this poses a significant long-range challenge to agriculture in the southern High Plains area of Texas. Peanut is one of the most important crops in this region but requires more water relative to some crops. Therefore, it is important to develop peanut varieties that are profitable in production under water deficit. This research was designed to test for 24 accessions under three different irrigation levels: 75% ET replacement, 50%, and long-range dryland modeling irrigation, which can be considered as “full”, “limiting”, and “drought” treatments, respectively. It has been known that when peanut plants are under water deficit stress, pod yield decreases, and the number of immature seeds increases. However, some accessions may have good yield with less irrigation, and might be profitable under water deficit irrigation. In this research, yield from each plot was calculated for economic analysis. After three years of tests, results showed that the accessions and irrigation treatments were both significant. This indicates not only that yield is influenced significantly by irrigation treatments, but also some accessions can have higher yield than others under drought stress. Seed quality was also graded based on industry standards for estimating profitability. Revenue ($/ac) was calculated based on yield (tons of pods/ac) times the value per ton for each plot, and it shows a significant interaction between irrigation treatment and genotypes. One of the breeding lines had the highest revenue among all genotypes including some current varieties when under water deficit stress. This has a potential to be released or used as breeding material for developing drought tolerant peanut varieties.

Presentation Link:
https://youtu.be/w0bgqpuuxGk

Crop Emergence and Yield Response of Peanuts Planted at Different Seeding Depths and Planter Downforces in Loamy Sand Soils

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Consistent and uniform seeding depth across the field helps in rapid seed germination and uniform stand establishment. On most row-crop planters, row-unit downforce is adjusted during initial planter setup to achieve the desired seeding depth throughout the field. Lack of adequate downforce during planting can result in seed depth variations leading to non-uniform or delayed emergence. Limited research exists on the influence of planter depth and downforce settings on crop emergence and yield in peanuts. Therefore, research studies were conducted at the University of Georgia's Southeastern Research and Extension Center located in Midville, GA from 2017 to 2019 to investigate the aforementioned effect in peanuts. During all three years, study treatments consisted of three seeding depths of 1.5, 2.5, and 3.5 inches each depth paired with three different downforces of 100, 200 and 400 lbs. The fields consisted predominantly of Dothan loamy sand soils. All treatments were replicated four times and planted in plots that measured 6 ft. wide (4-rows) by 30 ft. long. Plots were planted using a 4-row Monosem NG*Plus* planter (36 inch row-spacing) equipped with a mechanical downforce system. For data collection, stand counts were collected in center two rows (10 ft. sections) at one, two and three weeks after planting. Yield data was collected by harvesting the full-length (30 ft.) of the center two rows. Results suggested that full crop emergence in all plots was mostly achieved by two WAP in each year and no subsequent increase in crop emergence occurred after two weeks. Data analysis indicated that seeding depth had a more profound effect on crop emergence than planter downforce during all three years. In 2017 and 2019, peanuts planted at the 2.5 inch seeding depth exhibited the highest emergence (60 - 70%) followed by the emergence at 3.5 and 1.5 inch seeding depths (56 – 66% and 53 – 57 %, respectively). In 2018, crop emergence decreased from 76% to 46% with an increase in seeding depth from 1.5 to 3.5 inches. Observed variations in crop emergence among seeding depths were primarily attributed to differences in local weather and soil conditions at planting between the study years. Lack of downforce effect of crop emergence was likely due to the relatively low downforce requirements in sandy soils, where the lowest planter downforce of 100 lbs was sufficient to achieve the desired seeding depths of 1.5, 2.5 and 3.5 inches. Peanut yield was not affected by seeding depth or downforce during all three years. Yield variations as large as 1000 lbs/ac were observed among the study treatments during each year. The highest yields were attained at the 1.5 – 2.5 inch seeding depths irrespective of the planter downforce. Future studies need to evaluate seeding depth and planter downforce in other soil types including medium and heavy textured soils to identify how downforce requirements change with soil texture to maintain a desired seeding depth when planting peanuts.

Presentation Link:
https://youtu.be/c-vuwlYoyWg

Screening Peanut Recombinant Inbred Lines for Aflatoxin Contamination using in vitro Seed Colonization of *Aspergillus flavus*

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Peanut (*Arachis hypogaea*) production is challenged by contamination from one of the most carcinogenic substances ever discovered. Aflatoxins are dangerous mycotoxins which can cause disease and death to humans and livestock. The *Arachis hypogaea* ssp. *fastigiata* genotype, ICG 1471 has demonstrated some resistance to aflatoxin contamination in replicated studies. In order to better characterize the genetic mechanisms for resistance in this genotype, reciprocal crosses between ICG 1471 and Florida-07 (*A. hypogaea* ssp. *hypogaea*), a known aflatoxin susceptible and high oleic acid cultivar, were made to generate a recombinant inbred line (RIL) population to use for phenotypic screening.

Advanced generation F_6 seeds were inoculated with a transgenic isolate of the aflatoxigenic fungus, *Aspergillus flavus*, strain AF-70-GFP, which constitutively expresses a green fluorescent protein (GFP). Inoculations were performed using a unique in vitro seed colonization method. Seeds from F_6 RILs were assayed one-week post-inoculation for aflatoxin concentration. The RILs demonstrating the highest and lowest levels of resistance to aflatoxin contamination were selected for further testing after an additional cycle of generation advancement in the field. After completing the additional testing on the selected lines, phenotyping data from the F_7 seeds were combined with data from the F_6 seeds to be analyzed. Statistical analyses revealed four unique RILs that exhibited the greatest resistance to aflatoxin contamination among the selected lines. These four lines along with four lines which demonstrated definitive susceptibility will be used for genetic analysis to discover mechanisms for aflatoxin resistance.

Presentation Link:
https://youtu.be/MrJzQKF3Coc

Physiological Responses of Peanut Varieties to Drought Stress in Field Trails

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Peanut is an economic cash crop mainly planted in arid and semi-arid regions where the drought causes around 20% loss of peanut production every year. Researches suggested that crops have various physiological mechanisms against drought stress, such as reduction of photosynthetic rate, closure of stomatal, amelioration of water use efficiency (WUE), and differences in the partitioning of dry matter to pods. There are few field studies about which physiological characteristics are responsible to drought tolerant traits in the Southeast United States due to the fact that several rain events can happen during the season. To study the physiological effects of drought stress on peanuts, 36 varieties of peanut were planted in rain-out shelters. Plants were grown under irrigated conditions until 60 days after plant (DAP), moment at which the drought treatment started and lasted until 100 DAP. Photosynthetic rate, leaf relative water content, and specific leaf area were measured 4 times at different development stages. After harvest, leaf area, pod yield, pod number, and HI were collected. Different varieties have significant differences in photosynthetic rate, and pod yield. In order to increase and stabilize peanut yield under drought conditions, integrated application of physiology-genetic methods is needed to be further explored.

Presentation Link:
https://youtu.be/Rso5-B2L6VQ

Stable GFP-tagging of *Bradyrhizobia* Lb8 and Observing its Colonization of Peanut (*Arachis hypogaea* L.) in the Nodulation Process

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Bradyrhizobium is a genus of slow-growing soil bacteria which can infect the roots of some legume species and fix nitrogen through symbiosis. However, *Bradyrhizobium* is recalcitrant to genetic modification due to the lack of endogenous plasmids and quick loss of broad host range plasmids without selection pressure.

In this study, we labeled the *Bradyrhizobium* strain Lb8 stably. Plasmid holding the GFP and the tetracycline resistance genes was transmitted into the Bradyrhizoibum through tri-parental conjugation, then it was integrated into the bacterial genome though homologous recombination. The successfully transformed Bradyrhiozobium was selected on the agar YEM plate with tetracycline and chloramphenicol. An infection test of the GFP tagged Lb8 using cultivated peanut Tifrunner further confirmed the success and stability of the GFP tagging. The GFP labeled Bradyrhizobia provides a new tool for the plant-microbe studies such as the peanut and the Bradyrhizobia, which could help to elucidate the process of crack entry of the symbiosis process.

Presentation Link:
https://youtu.be/SW0gM6cDMjs

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The APRES YouTube link to each pre-recorded presentation can be found on their abstract.

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Spatial Abundance and Temporal Flight Activity of Peanut Burrower Bug, *Pangaeus bilineatus*, in Georgia

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The peanut burrower bug, *Pangaeus bilineatus*, is a potentially severe insect pest of peanut in the Southeast USA, yet relatively little is known about its biology. Light traps were placed in or adjacent to peanut fields in at least 10 counties each year from 2015 through 2019 to assess the local abundance and seasonal flight activity of the insect. Collections were made four nights each week during the peanut growing season (May until September at most locations). A sub-sample of bugs was examined each week to determine sex ratios during the season. Total trap capture varied by location and year, and timing of peak trap capture also varied by year. These results provide baseline data for assessing burrower bug population trends and will be used in the development of integrated management tactics.

Presentation Link:
https://youtu.be/d0tZz8oFMiQ

Establishment of the Ghana Groundnut Working Group (GGWG): A Legacy of the American Peanut Research and Education Society (APRES)

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The American Peanut Research and Education Society (APRES) celebrated 50 years of existence in 2018. The organization has provided an important forum for information exchange, collaboration among members across all segments of the peanut industry, and a journal that provides an outlet for discovery to the scientific community. In 2019, indiviuals representing the peanut industry in Ghana along with colleagues from the United States established the Ghana Groundnut Working Group (GGWG) with the goal of creating a forum similar to APRES. The theme of the first meeting held in July 23, 2019 in Tamale was *Developing Partnerships to Create Greater Value of Groundnut through Innovation*. Approximately 50 indiviuals attended the one day session that included a discussion of challenges and solutions to many of the issues facing the peanut industry in Ghana. The second meeting of the GGWG was held March 10-11, 2020 in Tamale. Future goals of the GGWG included expansion of representation across all segments of the peanut supply chain in Ghana and developing a leadership structure that will assist in ensuring the long-term sustainability and positive impact of the GGWG.

Presentation Link:
https://youtu.be/9eo3_kHbDz8

Statewide Monitoring and Molecular Characterization of Viral Diseases of Georgia Peanut

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Virus diseases, mainly tomato spotted wilt virus (TSWV), has a great potential economic impact on peanut production in Georgia. Typical symptoms of tomato spotted wilt virus include necrosis (primarily leaves and stems), chlorosis, ring patterns, mosaic, mottling, stunting, and local lesions. To minimize the impact of TSWV and other virus diseases, it is essential to have an up-to-date survey record in Georgia. In this study, we conducted a statewide virus disease survey for monitoring virus isolates present and examine the causes of the increasing virus disease pressure on peanut production in Georgia. In May through August 2019, a total of 380 peanut leaf samples were collected from peanut sites in 19 Georgia counties (20 samples/county) and tested for the presence of the TSWV or other viruses. The collected samples were evaluated for TSWV or other virus presence using ImmunoStrip, ELISA and RT- PCR methods at the Molecular Diagnostic Laboratory in Tifton. In total, 351/380 (92.3%) samples tested positive for TSWV by RT-PCR, with 29/380 (7.6%) negative. To rule out the possibility of the presence of others tospoviruses, we have tested TSWV negative samples with other virus markers. Our results showed negative for groundnut ringspot virus (GRSV) and tomato chlorotic spot virus (TCSV) which were reported in Florida but have not been reported in Georgia. On the basis of these results, we hypothesized that all of these TSWV negative sample symptoms might non-pathogenic (nutrition problems) or infected with untested pathogens. It is well reported that the severity of TSWV epidemics fluctuates significantly from year to year. This variability has not yet been fully explained; however, this may be linked to the introduction of a new, severe strain of TSWV or mutations caused by TSWV strains mixing. To investigate this issue, we have amplified and sequenced a 587 bp region of the N gene (nucleoprotein gene-S RNA) from 10 TSWV positive samples. After comparing among themselves and with one published sequence of TSWV-GA isolate, our results indicated that the sequences among the N gene showed highly identical, ranging from 97%-99% at both nucleotides and amino acid levels. Due to the limited extent of sequence variability within a small number of TSWV isolates, no significant relationships were identified among populations. We also compared the efficiency and the functionality of the three most common detection methods to identify TSWV. Our result showed that RT-PCR was the most sensitive and reliable assay but requires a laboratory setting with a real-time thermocycler. The immunostip method was not only the fastest, but also is portable for field detection. DAS-ELISA was the least sensitive assay in this study and requires lengthy, time consuming work from skilled labor to perform. Based on our survey results, only one virus disease, TSWV, was found in Georgia peanut. The slight variation of the N gene among TSWV isolates in peanut might have a potential role for the fluctuation of severity, but further study would be required to establish the relationship between amino acid changes with disease severity of TSWV in peanut.

Presentation Link:
https://youtu.be/HmnA0iYMaNU

Efficacy and Profitability of Insecticide Treatments for Tomato Spotted Wilt Management on Peanut in South Carolina

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Tomato spotted wilt (TSW) is a common and serious disease of peanut (*Arachis hypogaea* L.) caused by *Tomato spotted wilt virus* (TSWV; family *Tospoviridae*, genus *Orthotospovirus*). Management frequently uses an integrated approach, with cultivar resistance and application of in-furrow insecticide as two critical components. In-furrow insecticides help suppress thrips, which can injure and stunt young growing plants and transmit TSWV, with postemergent application of acephate capable of providing additional thrips control. To examine effects of systemic insecticides (imidacloprid, imidacloprid plus fluopyram, phorate, and acephate) on TSW management, yield, and economic return across cultivar susceptibilities (susceptible, moderately susceptible, and resistant) in South Carolina, a meta-analysis was used to synthesize results from 32 studies conducted between 2009 and 2018.

Although efficacy and magnitude of individual treatments varied with susceptibility, imidacloprid increased, whereas phorate generally decreased TSW incidence relative to nontreated controls. In-furrow treatments followed by acephate further reduced TSW incidence and increased profitability. All examined treatments improved yield compared with untreated peanuts except for susceptible cultivars treated with imidacloprid. Imidacloprid plus fluopyram increased yield more than imidacloprid alone for the susceptible group, although there was little difference between these treatments in association with moderately susceptible cultivars. When comparing individual applications, phorate was overall the most profitable option across susceptibilities, although imidacloprid plus fluopyram exhibited analogous profitability for susceptible cultivars. Results from this study can be used to assist producer selection of management options for TSW in peanut.

Presentation Link:
https://youtu.be/TeOTLuDAAUM

Breeding for the Control of Peanut Smut Disease and Genetics of the Pathogen

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Peanut smut disease can cause up to 50 % loss in Argentina where the disease is endemic. Though peanut smut has not been reported in the United States, the USDA-ARS-National Peanut Research Laboratory has worked in collaboration with several research institutions in Argentina to develop molecular tools to understand both, plant resistance and the genetics of the pathogen. We sequenced the 123,773 bp mitochondrial genome and several nuclear genes of *Thecaphora frezii* (succinate dehydrogenase, ergosterol biosynthesis, cytochrome p450 and beta tubulin) that are target of fungicides applied to the peanut crop. This not only provided the basic molecular tools to study the population genetics of *T. frezii*, but also detected mutations that confer resistance to strobilurin fungicides. Introgression of resistance was studied in 94 recombinant inbred lines (RILs) from wild diploid peanuts, and 45 lines resulting from crosses with resistant landraces. In both cases, molecular markers linked to disease resistance were identified. The pathogen, *T. frezii* has shown resistance to most fungicides commonly used in the peanut crop. The study of the genetic diversity of *T. frezii* is still in progress, and a smut resistant variety has been released.

Presentation Link:
Under Publication Review

Nematode Resistance from *Arachis stenosperma* Incorporated into Elite Peanut

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Root-knot nematode (RKN) *Meloidogyne arenaria* is a devastating pathogen for peanut. Strong resistant to RKN is present in the peanut wild relative *Arachis stenosperma*, and the two loci controlling the resistance in chromosomes A02 and A09 have been incorporated into elite breeding lines through marker-assisted backcrossing. The advanced backcross population of 271 BC_3F_1 lines was genome-wide genotyped and introgressions were observed across the genome and not only in the target chromosomes (A02 and A09). We can suggest that the non-target introgressions could be controlling other traits of interest, such as fertility, resistance to leaf spot and growth habit as the population was in greenhouse. With the objective to validate the nematode resistance alleles in Chr A02 and A09, seven BC_3F_1 families harboring different sizes of the introgression of resistance alleles in A02 and five carrying the loci in A09, and that had a high recurrent genome recovery were selected for further testing and selections. From each of the 12 families, 12 BC_3F_2 seeds were planted in the greenhouse and genotyped with 10 KASP markers to confirm the presence of the resistance loci. Right now, 12 BC_3F_2 lines that best represent each family are being phenotyped for nematode resistance. This work will allow us to closely define the smallest introgression in A02 that is required to provide resistance and confirm that A09 is also involved in preventing infection. These genotypes that incorporate strong RKN resistance and the markers linked to this trait represent a valuable tool for introgression of this new and strong nematode and leaf spot resistance into new peanut cultivars and can significantly impact peanut production in RKN-affected areas.

Presentation Link:
https://youtu.be/sqt0TUNqwf0

Greenhouse Evaluation of Wild *Arachis* Species for Resistance to *Athelia rolfsii*

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Athelia rolfsii (Curzi) C.C. Tu & Kimbr. is the one of the most damaging pathogens of cultivated peanut, causing the soilborne disease known regionally as white mold, stem blight, or southern blight. Because the genetic base for cultivated peanut is narrow, wild *Arachis* species may possess novel sources of disease resistance. We evaluated 18 accessions representing 15 *Arachis* species (*batizcoi*, *benensis*, *cardenasii*, *correntina*, *cruziana*, *diogoi*, *duranensis*, *herzogii*, *hoehnei*, *kempff-mercadoi*, *kuhlmannii*, *microsperma*, *monticola*, *simpsonii*, *williamsii*) in the greenhouse for resistance to *Athelia rolfsii*. Inoculations were conducted on intact plants propagated from rooted cuttings inoculated with mycelial plugs. Plants were maintained in an enclosed chamber with high humidity, and lesion length was measured at 4, 6, 10, and 12 days after inoculation. Preliminary results indicate that *Arachis batizcoi* (PI 468326 and PI 468327), *Ar*. *herzogii* (PI 476008), and *Ar. cruziana* (PI 476003) were among the most susceptible entries with a mean lesion length >46 mm at 12 days after inoculation. *Arachis microsperma* (PI 666096 and PI 674407) and *Ar. diogoi* (PI 468354) were among the more resistant entries, along with the resistant controls Georgia-03L and U.S. mini-core entry CC650 (PI 478819), with mean lesion lengths <15 mm at 12 days after inoculation. These results should be useful to peanut geneticists seeking additional sources of resistance to *Athelia rolfsii*.

Presentation Link:
https://youtu.be/4VKaTJWBntM

Incorporating a Field Data Log into the Peanut Risk Tool Developed at North Carolina State University

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An Excel based peanut risk tool was developed at North Carolina State University and released in 2019. Funding has been provided by USDA-CAR, North Carolina Peanut Growers Association (NCPGA) and USAID Feed the Future Peanut Innovation. Development included input from research and extension specialists at North Carolina State University, Clemson University and Virginia Tech and Cooperative Extension agents (www.peanut.ces.edu). The risk tool assists peanut growers in selecting production and pest management practices to minimize potential risk of yield loss. Risks from several common diseases, insects and weeds found in peanut production systems are evaluated. The risk tool also provides cost guidance associated with the selected management practices. To further assist growers, the ability to generate field data logs has been incorporated into the risk tool. The logs allow growers to record field practices, growing conditions, crop development, yield components and pest notes so they can compare fields as well as track information across years. A log is generated by simply clicking on a button on the risk worksheet of the risk tool after selecting field production and pest management practices and evaluating potential risk. The user enters a name for the log which is then generated as a worksheet in an Excel workbook named Peanut_Logs.xlsx. The logs workbook contains all logs and is stored in the same directory as the risk tool workbook. The log worksheet automatically includes all practices selected in the risk tool combined with the empty log template worksheet found in the risk tool workbook. The log template is currently based on the production practices survey published in the annual North Carolina Peanut Information publication. Additional data cells have been added for recording peanut development dates, rainfall/irrigation dates and amounts, and grading information. The user has full control of the logs they generate and can record only the data they want as well as add additional information if needed. Additionally, the logs give growers a new option for recording field level management data. Based on farmer surveys during 2020 Cooperative Extension peanut production meetings in North Carolina, South Carolina, and Virginia, most growers do not use an electronic platform to store production and pest management data. In the survey (n = 276), approximately 66% of growers used paper copies for information collection with only 18% storing information in spreadsheets. Twenty-three percent used Worker Protection Standard (WPS) related documents. Four percent of growers indicated that their consultant maintained records while 8% relied solely on memory.

Presentation Link:
https://youtu.be/ztzIr9T5v-A

Evaluation of Peanut Rx Programs in Southeast Alabama

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Four peanut Rx programs were evaluated for their efficacy in controlling early leaf spot (ELS) caused by *Cercospora personatum* and late leaf spot (LLS) caused by *Cercosporidium arachidicola* along with white mold (WM) caused by *Sclerotium rolfsii* in southeast Alabama at the Wiregrass Research and Extension Center (WREC) in Headland, AL on 'Georgia-16HO' peanuts. Leaf spot intensity was evaluated using the Florida leaf spot scoring system then converted to percent defoliation. Stem rot incidence was assessed immediately after plot inversion by counting the number of disease loci per row. Yields were reported at <10% moisture.

Leaf spot defoliation, which significantly differed across fungicide programs, exceeded 77% in the untreated control. All fungicide programs reduced leaf spot defoliation when compared with the untreated control. Also, all low risk fungicide programs had greater leaf spot defoliation when compared with the medium and high-risk programs. Due to late season drought, white mold incidence was reduced when compared to previous years. However, all index programs reduced incidence of this disease when compared with the untreated control. The effect on drought was observed with yield. While most Rx programs yielded higher than the untreated control, no statistical differences were observed. Overall, no yield benefit was recorded for any peanut Rx program with the low, medium, and high index having comparable yields.

Presentation Link:
https://youtu.be/QoIHBF0rj3k

Developing Phenotyping Tools Using Unmanned Aircraft Systems (UAS) for Peanut (*Arachis hypogaea* L.)

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In the past, the collection of crop data was performed by expensive, labor-intensive and in some cases destructive hand sampling techniques. These constraints often lead to under-representative crop information due to limited sampling as well as the introduction of possible human errors. With the introduction of Unmanned Aircraft Systems (UAS), some of these hurdles can be overcome. The 2019 crop season was the first-time data was collected on peanut by the Texas A&M AgriLife Research peanut breeding program located in Stephenville, Tx. Flights were conducted at multiple locations to develop preliminary data for analysis as well as test flight and data collection protocols. A total of 5 flights were collected at 3 different locations and were processed and analyzed where applicable. Unmanned Aircraft Systems data collection (i.e. flights) were conducted beginning in August and ending in November. To improve the quality of the data and georeferencing, multiple Ground Control Points (GCPs) were used to survey plots using a post-processed kinematic GPS (PPK-GPS) device. Raw images were processed by the Structure from Motion (SfM) algorithm to generate Digital Surface Model (DSM), orthomosaic images, and 3D point cloud data. UAS-based phenotypic data including canopy cover, canopy height and Vegetation Index (VI) was extracted. Initial results on UAS-based phenotyping is promising and will be presented.

Presentation Link:
https://youtu.be/paJ2p2bTPR4

Using Remote Sensing Technologies to Differentiate Drought Tolerant Recombinant Inbred Lines of Peanut

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Worldwide peanut (*Arachis hypogaea*, L.) production is very sensitive to drought events that can limit yield and quality. While peanuts require a minimum of 600 mm of water regularly scattered throughout the growing season, the summer months of June, July and August are often deficient in precipitation, leading in recurrent drought events. This limited availability in water during these months is impacting yields. Water can be supplemented through irrigation but only 35 % of the peanut acreage in the U.S. are equipped of such systems, leaving most of the field under rainfed agriculture. Therefore, it is crucial to peanut producers to adopt drought tolerant cultivars, with improved yield and quality, in order to maintain the U.S. peanut stakeholder competitiveness in the market place. Phenotyping breeding is commonly used to select lines within the breeding pipeline. However, manual measurements of traits in field is laborious, time-consuming and sometime subjective. Development of platforms, such as unmanned aerial vehicles (UAV), equipped with remote sensing technologies can acquire data fast, with increased resolution, reliability and repeatability of the measurements. In this study, 340 recombinant inbred lines (RIL) were grown at two locations in Virginia and North Carolina. This RIL population was developed from the cross of N08086olJCT and ICGV 86015. N08086olJCT is a large seeded Virginia-type and high yielding line whereas ICGV 86015 is an early-maturing drought tolerant Spanish-type line coming from the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT). Regularly throughout the growing season, ground and aerial data were collected using standard red-green-blue, near-infrared and thermal cameras. Manual and remote sensing data were compared in order to more reliably differentiate and identify drought tolerant RILs.

Presentation Link:
https://youtu.be/mxyH0T4ro3E

Comparison of Germination Rates of Seed from High Oleic and Non High Oleic Near-Isogenic Peanut Lines

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Oxidative stability is an important factor considered by those in the peanut manufacturing industry. Product stability has been shown to increase up to 10-fold when high-oleic peanuts are used. The percentage of U.S. crop that is high-oleic continues to increase, but many producers are resistant to grow high-oleic cultivars due to the uncertainty of the high-oleic effect on agronomic traits, such as seed germination, yield and grade. Experiments were designed and conducted from 2017 to 2019 to examine the effect of the high oleic trait on peanut seed germination in field plots and in the laboratory on a thermal gradient table. Genotypes used in these experiments included cultivars or breeding lines from each peanut market-type along with their near-isogenic, high oleic counterparts. Seed germination was tested in the field in 4 geographically different regions, as well as in the laboratory on a thermal gradient table, eliminating environmental effects and allowing testing for the effect of temperature on germination of all seed-types. Near-isogenic line pairs were planted in field plots (CRB, 3 replications) in the following locations: OAES Caddo Research Station, Ft. Cobb, OK; NCDA Peanut Belt Research Station, Lewiston-Woodville, NC; Lingo, New Mexico; and Tifton, GA. Stand counts were taken on a weekly basis for 4 weeks after planting and averaged over replications. Thermal gradient table experiments on seed germination were conducted on the original seed sources and then on seed post-harvest collected from each location. Original seed and post-harvest seed were tested for oil composition to ensure purity. Results indicated a lag in germination in for high oleic genotypes when compared to their normal oleic counterparts. Thermal gradient table experimental results demonstrated a lag in germination in high oleic genotypes compared to normal oleic counterparts in all market-types, but the effect was lowest in the runner-type pair. Results from these experiments will increase the understanding of the agronomic properties of high-oleic peanut cultivars and could be used to create new standard protocols used by State agencies to test high-oleic peanut germination for registered and certified seed quality labeling.

Presentation Link:
https://youtu.be/ebFkqs1AfHA
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Peanut Response to Diclosulam in Texas

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Diclosulam (Strongarm®) is a Weed Science Society of America Group 2 herbicide that is used preplant incorporated, preplant surface, and preemergence through cracking. In some states, 24(c) labels allow early postemergence applications for suppression of tropical spiderwort (*Commelina benghalensis* L.). Weeds controlled by diclosulam include Palmer amaranth (*Amaranthus palmeri* S.Wats.), devil's-claw (*Proboscidea louisianica* P.Mill.), and morningglory (*Ipomoea* spp.) species. Strongarm® received Federal 3 label status over 15 years ago, but peanut stunt and yield loss was observed in the launch year in west Texas. The current label prohibits the use of diclosulam in New Mexico, Oklahoma, and Texas. A major factor involved in the initial injury was believed to be sensitivity in Flavor Runner 458, the common variety used during that time period. A peanut tolerance study was conducted in 2019 in Gaines County, TX and in south Texas near Yoakum under weed-free conditions. Diclosulam at 0.024 (0.45 oz Strongarm® = 1X) and 0.047 (2X) lb ai/A was applied preemergence (PRE) and at-crack (AC). Georgia 09B was planted at both locations. The soil type in Gaines County was an Arvana sandy loam (0.5% OM, pH 8.0) and the soil at Yoakum was a Tremona loamy fine sand (1% OM, pH 7.6). In Gaines County, when evaluated 30 days after planting (DAP), no difference in peanut stand was observed following any diclosulam treatment; however, peanut height and width were reduced following diclosulam applied PRE when compared to the non-treated control. At 60 DAP, all treatments caused peanut stunt except diclosulam at 0.024 lb/A applied AC. At 100 DAP, only the injury following diclosulam at 0.047 lb/A applied PRE was apparent. Peanut yield ranged from 5814 to 6414 lb/A and were not different from the non-treated control (5923 lb/A). At the Yoakum location, no peanut injury was noted with any diclosulam rate or application timing. Yield ranged from 2844 to 3292 lb/A, which was not different from the non-treated control (2971 lb/A). No difference in peanut grade (SMK, SS, SMK+SS, OK) was observed at either location. Although early season injury was observed in Gaines County, no adverse effects on yield and grade were noted when using modern peanut varieties in Texas.

Presentation Link:
https://youtu.be/lfZfWNJx4Lo

Peanut Response to Pyroxasulfone

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Peanut tolerance studies with pyroxasulfone (Zidua) were conducted in the High Plains of Texas near Seminole and in south Texas near Yoakum under weed-free conditions in 2019. Pyroxasulfone at 0.09 and 0.13 kg ha^{-1} was applied at three different peanut growth stages: 1) at ground crack (CRACK), 2) early postemergence (EPOST), and 3) mid-postemergence (MPOST). The CRACK treatments were applied 7 to 14 days after planting (DAP), EPOST treatments applied 22 to 30 DAP, and MPOST treatments applied 35 to 41 DAP depending on location. Georgia 09B was planted at both locations.

No peanut injury of any kind was noted at either location during the growing season. No yield differences were noted with the two pyroxasulfone rates at either location; however, at both locations, peanut yields were greatest following the pyroxasulfone CRACK application and trends of reduced yields following the EPOST and MPOST applications were noted. No differences in grade were observed with any pyroxasulfone rate or application timing.

In summary, pyroxasulfone caused no type of injury during the growing season with either rate or application timing. However, trends toward reduced yield with EPOST and MPOST pyroxasulfone applications need to be further investigated to determine the possible causes for these reductions in yield and determine if other cultivars may be affected.

Abstract Accepted

Feed the Future Innovation Lab for Peanut – Addressing Constraints to Peanut Productivity and Use

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Through the Feed the Future Innovation Lab for Peanut (Peanut Innovation Lab), leading experts in genetics, plant breeding, nutrition, gender dynamics, economics and other disciplines connect across the globe to address limitations in production, processing and consumption of peanut. The five-year program involves US and international partners connected to dozens of institutes of higher learning, research and business. The Peanut Innovation Lab jointly funds projects with the Peanut Foundation that provide dual benefits to both overseas partners and US agriculture. As part of the US Government's Global Food Security Strategy, the innovation lab addresses global hunger and food security by increasing resilience to shocks and focusing on nutrition and market-led development. Projects are focused on identifying diverse germplasm with better resistance to pest, diseases and drought; improved production packages that are effective and economical; post-harvest processing that maintains quality; nutritional impacts of peanut-based foods especially on children; and the impacts of gender along the peanut value chain.

Presentation Link:
https://youtu.be/ZhII5ePlQKc

Evaluation of Host Plant Resistance in Peanut Cultivars to Peanut Burrower Bug

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The peanut burrower bug *Pangaeus bilineatus* (Hemiptera:-Cydnidae), negatively impacts the quality of peanuts especially those produced on non-irrigated acres. In addition, peanuts grown using minimum tillage practices are at increased risk of burrower bug feeding damage compared to those produced using conventional tillage. Each year, significant peanut acreage is planted in non-irrigated fields and managed utilizing minimum tillage systems. Thus, it is important to develop effective management tactics that target burrower bug under these conditions. Host plant resistance has the potential to be a valuable tool against this important economic pest.

Experiments were conducted in Brooks County, GA in 2018 and 2019 to evaluate the resistance of peanut cultivars to burrower bug feeding and pod damage. The trials were implemented in three non-irrigated, commercial peanut fields with a history of burrower bug damage. Eleven cultivars were tested over the two year study. The treatments were planted in 18 by 30 feet plots and were replicated four times. Burrower bug populations were monitored throughout the season using pitfall traps and light traps. Yield was determined at harvest, and a subsample of harvested pods was randomly collected from each plot for analysis of injury and grade. Burrower bugs were present at all test locations, but pest numbers and feeding injury varied by test site. GA-12Y had numerically lower injury than any cultivar in all three site years and sustained less than 5% damage in all field evaluations Measurements of the mean force required to penetrate the peanut hull suggest that GA-12Y's hull might be more difficult for the insect to penetrate than other cultivars. This finding will be reevaluated in future experiments. The results of this work provide some evidence that host plant resistance present in commercially available cultivars could play a role in managing peanut burrower bug.

Presentation Link:
https://youtu.be/l8DyK9CsdVQ

Modification of the Maturity Profile Board for Virginia Market Type Peanut

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Determining when to dig peanut and invert vines is one of the most important decisions a grower will make in their peanut production operation. Digging peanut one week prior to optimum pod and kernel maturity can prevent farmers from realizing substantial yield and economic returns. A peanut maturity profile board was developed for Virginia market type peanuts in 2005 based on original work reported by Williams and Drexler in 1982. Through use of a turbo nozzle and a standard pressure washer, peanut farmers and their advisors have the capacity to assess maturity on their own without input for Cooperative Extension agents. While many people outside of Cooperative Extension understand the relationship of pod mesocarp color and optimum digging dates, creating a profile board with key information was the goal to help indiviuals on their own make good decision about digging peanut. A series of red, yellow and green curves was present on the peanut profile board developed in 2005 with images of peanut pods representing examples of peanut with white, yellow, orange or rust, brown, and black pods exposed. In 2019 it became evident that the supply of peanut profile boards printed and laminated in 2005 had been exhausted. In spring 2020, the 2005 version of the peanut board was modified. In addition to the curves described above, the board provides images of biotic and abiotic stresses that would be observed while peanut samples are being collected for pod maturity determination. Information on the pace of development of severity of leaf spot disease and canopy defoliation are provided on the new profile board. The profile board will be available for use during harvest of the 2020 peanut crop.

Presentation Link:
https://youtu.be/IVt8eQzBIWQ

Nematode Suppression and Peanut Yield Response to Velum Total in Different Rotation Sequences in North Carolina

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Plant parasitic nematodes can have a negative impact on peanut (*Arachis hypogaea* L.) yield. Cropping sequence can have a major impact on nematode populations and is an important cultural practice to suppress populations. While fumigation can reduce populations, this approach is expensive and requires addition certification and training beyond application of most pesticides used in peanut. Velum Total (imidacloprid plus fluopyram) is currently registered for in-furrow application in peanut. Research is limited in North Carolina relative to efficacy of this insecticide-nematicide combination. In 2019, four rotation trials initiated from 1997-2000 with a wide range of crop rotation schemes were planted with peanut to determine if cropping sequence and in-furrow application of nematicide treatments interacted to impact peanut yield and nematode populations in soil. Depending on cropping sequence, root-knot nematode populations in soil collected in mid-September 2019 after peanut ranged from no detectable nematodes to approximately 2,800 nematodes/500 cm^3. Cropping sequence had a major impact on nematode populations in soil and peanut yield. However, nematicide treatment did not affect nematode populations in soil or peanut yield regardless of rotation sequence. These results were unexpected based on other research demonstrating suppression of nematodes by fluopyram. However, soil moisture was limited in these trials after planting in early May through early June and may have affected ability of fluopyram to move into soil solution and protect seedlings from infection by nematodes. Research will be conducted to compare these treatments in cotton (2020) and peanut (2021) in these experiments.

Presentation Link:
https://youtu.be/X2qOH2c47P0

Evaluation of Early- and Late-Season Herbicide Options for Control of Smell melon (*Cucumis melo*) and Citron Melon (*Citrullus lanatus*) in Peanut

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Smell melon (*Cucumis melo* var. *dudaim* Naud.) is a monoecious annual vine commonly found growing in disturbed areas and roadsides. In peanut it can be quite weedy in nature, resulting in significant yield reductions if left untreated. Citron melon (*Citrullus lanatus* (Thunb.) Mansf. var. *citroides* (Bailey) Mansf.), an annual low-growing vine, is the same species as cultivated watermelon, however the fruit is inedible in the raw state. Like smellmelon, citron melon can be a troublesome weed in peanut.

A field trial was conducted near Pleasanton, TX in 2019 to evaluate the efficacy of several preemergence and postemergence herbicides, alone or in combination, for early -season control of smell melon and citron melon in peanut. A total of nineteen herbicide treatments were included in this trial. Preemergence (PRE) applications were applied immediately after planting, while postemergence (POST) applications were applied 27 days later. A second field trial was conducted at the same location near Pleasanton, TX in 2019 to evaluate options for late-season POST or salvage control of large smell melon and pie melon in peanut. A total of fifteen herbicide treatments were evaluated in this trial.

At 27 days after the PRE applications, control of smellmelon was greater with pendimethalin 1.06 kg ai ha^{-1} + flumioxazin 0.07 kg ai ha^{-1} PRE, flumioxazin 0.11 kg ha^{-1} PRE, and imazethapyr 0.07 kg ae ha^{-1} PRE (97, 97, and 99% control, respectively) than with *s*-metolachlor 1.42 kg ai ha^{-1} PRE (55% control). Control of citron melon was variable and ranged from 65 to 100% control except for norflurazon at 0.89 kg ai ha^{-1} PRE (50%). The variable levels of weed control observed in this trial may be due to small seedlings of both species that were emerged at the time of PRE applications being made. When evaluated 27 days after the late-season POST applications were made, control of smell melon was greatest with lactofen 0.22 kg ai ha^{-1} + 2,4-DB 0.50 kg ae ha^{-1}, imazapic 0.07 kg ae ha^{-1}, and imazapic 0.07 kg ae ha^{-1} + 2,4-DB 00.50 kg ae ha^{-1} (87, 80, and 79% control, respectively). Glyphosate at 1.26 kg ae ha^{-1} provided similar levels of control (73%), however peanut injury would not be acceptable. Control of citron melon was variable and ranged from 66 to 99% and no differences among herbicide treatments were detected. The highly variable and often incomplete control of these species observed in this trial further reinforces the need for an integrated approach to management, including the use of soil-active herbicides before, at, or after planting.

Presentation Link:
https://youtu.be/Hdc-BYNuwg8

Screening of Groundnut Lines in Field and by AhTE Markers for *Sclerotium rolfsii* Resistance

D. CHETAN, Department of Biotechnology, UAS, Dharwad and **N.K. NAYIDU*,** ARS, Annigeri, UAS, Dharwad

Groundnut is one of the major economic seed oil crop and is affected by many diseases such as rust, late leaf spot, stem rot etc. Stem rot is caused by *Sclerotium rolfsii* which is becoming a major problem in recent years, causing yield losses up to 80 per cent. Groundnut being the major cultivated crop in northern Karnataka region and any progress made towards improving such a crop will definitely help farming community. In this regard present study was designed to investigate, 94 backcross lines (2 parents and 92 backcross lines) and 44 elite genotypes along with resistant check R9227 and susceptible check TMV-2. Field screening of stem rot resistance with artificial inoculation of mycelium culture having *sclerotial* bodies was carried out during *kharif 2018* at University of Agricultural Sciences (UAS), Dharwad, Karnataka, India. Mycelium was collected from the stems and collar regions of infected groundnut plants, collected from the fields of UAS, Dharwad. Dharwad isolate was confirmed by PCR sequencing of *S. rolfsii* DNA by using ITS (Internal Transcribed Spacer) *S. rolfsii* specific primers. Disease incidence was recorded after inoculation at 30 days interval till harvesting. In addition, productivity traits were also recorded. In field conditions, variability for disease incidence (DI) for all genotype was observed clearly and grouped into different classes like; 11 moderately resistance (10-20 % DI), 73 moderately susceptible (20-30 % DI) and 43 susceptible (>30 % DI) genotypes and only few of them showed partial resistance with 0.1-10 % DI (donor parent of backcross line {derivative of ISATGR 278-18}), 4 backcross lines (2552, 2584, 2854 and 2951) and 4 elite genotypes (ICGV 06420, Mutant III, R 9227 and TG 38). Further back cross lines and elite genotypes were genotyped with AhTE markers, to identify the single marker association (SAM) for the *Sclertoium* rot resistance/susceptibility. Among 150 markers studied 61 markers showed polymorphism among elite genotypes. Total of 59 Marker Trait Associations (MTA's) were established from backcross lines by 22 markers and 107 MTA's from 61 markers in elite genotypes. Based on PVE per cent (Phenotypic Variance Explained %) 32 markers showed <10 per cent PVE value, 22 markers had 10-20 per cent PVE value and 5 markers showed > 20 per cent PVE value in backcross population. Where as in elite genotypes, 26 markers showed <10 per cent, 68 markers were between 10-20 per cent PVE and 13 markers had > 20 per cent PVE values. P- value (Probability value) ranged between 0.0001 to 0.05 and 0.0001 to 0.07 for the backcross and elite genotypes respectively. Two markers *AhTE0491*and *AhTE0121* which were earlier reported with late leaf spot disease in groundnut were also found SMA with *Sclertoium* rot in the present study.

Abstract Accepted

Reference for markers Kamble, M. V., 2014, Association analysis for yield related traits and foliar disease resistance using transposon specific markers in a mutant population of groundnut. *M. Sc. Thesis,* Univ. Agric. Sci., Dharwad, Karnataka (India).

Cook County Peanut White Mold Fungicide Trial

T. PRICE*, Extension Agent, University of Georgia Extension, Cook County, Adel, Georgia 31620; R.C. KEMERAIT, Extension Plant Pathologist, Department of Plant Pathology, University of Georgia, Tifton, Georgia 31793

White Mold (WM), (*Sclerotium rolfsii*) is one of the most destructive diseases in peanut production in Georgia. The University of Georgia's latest annual publication "2016 Plant Disease Loss Estimates" determined that the disease reduced Georgia's peanut crop value by 7.5%, (the total value of the crop was $624.4 million according to 2016 Georgia Farm Gate Value report). Growers have many peanut fungicide options available, each with varying costs and WM efficacy ratings. In 2019, Cook County Extension collaborated with University of Georgia Peanut Specialists to install a 31 acre field trial in Cook County, Georgia to compare and evaluate nine common peanut WM fungicide programs with the objective to generate unbiased, research based data related to peanut WM fungicide programs to disseminate to peanut producers and agriculture industry via the County Delivery System from which to base peanut WM control strategies. WM fungicides used in protocol were Muscle ADV (*tebuconazole, chlorothalonil*), Priaxor Xemium (*fluxapyroxad, pyraclostrobin*), Provost Silver (*prothioconazole, tebuconazole*), Fontelis (*penthiopyrad*), Elatus (*azoxystrobin, benzovendiflupyr*), Umbra (*flutolanil, flutriafol*) and Convoy (*flutolanil*). All programs showed significantly less WM compared to the control.

Programs applying Excalia, Fontelis, Umbra and Elatus (2 block) treatments showed greatest control of the disease during field ratings. Those same programs (with the exception of the Fontelis program) in addition to the 2 block Convoy program also showed greatest yields compared to the control. Leafspot and tomato spotted wilt virus in this trial was insignificant.

Presentation Link:
https://youtu.be/1PifFF8csLc

Organic Seed Treatment For Control of Soil borne Pathogens in Valencia Peanut

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The objective of this study was to minimize the impact of soil borne pathogens on Valencia peanut by treating seeds with commercially available organic seed treatment products.

The experimental trial was planted on May 6, 2019 in 36-inch rows under center pivot irrigation. The study site was on an organic peanut grower's field in Lingo, New Mexico. Soil type is an Amarillo-Acuff-Olton and elevation is 3986 feet. Individual plots consisted of two rows, 36-inch rows with 20 feet long. There were four replications for each entry, planted in a randomized complete block. Individual plots were planted at a seed rate of five seeds/foot. Plots were planted with a John Deere Max Emerge planter fitted with cone metering units. Ten different seed treatments were used in this study. A.) untreated check (control) B.) Neem combo (3%) C.) Trilogy (3%) D.) Neem plus SP-1 (3%) E.) AKX-602 (2.4 kg/ha) F.) AKX-612 (1.2 kg/ha) G.) AKX-618 (2.4 kg/ha) H.) Cilus (1 g/kg of seed) I.) Mycostop (12 g/Kg seed) J.) Prestop (0.25 g/sq m). The list of treatments evaluated included a chemical (Dynasty) product for comparison. About 1800 kg/ha of compost along with chicken manure at the rate of 50 kg/ha was applied over the field in April 2019. Previous crop was a CRP grass.The average pod yield for the trial was 1406 kg/ha. The highest pod yield was recorded when the peanut seeds were treated with Cilus plus (1626 kg/ha). A preparation of Bacillus velezensis, commercial in Europe. Application of Cilus plus resulted in an increase of 363 kg/ha or 28.7% compared to the Untreated Check (1263 kg/ha). The chemical check Dynasty (1406 kg/ha) which was significantly not different from the organic seed treatments Trilogy (1478 kg/ha.), AKX 618 (1408 kg/ha), and Mycostop (1466 kg/ha). By treating the Valencia peanut seeds with organic products a grower can benefit anywhere from $ 236 with AKX-602 to $ 315 with Cilus.

Presentation Link:
https://youtu.be/hB-5pHDgUzs

Field Phenotyping of Biotic and Abiotic Stress in Peanut for Increased Genetic Gains in Ghana.

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Peanut is an essential crop in Ghana with subsistence and commercial value. However, production is limited by a myriad of abiotic and biotic factors. Current breeding methods such as genomic and marker assisted selection have tremendously contributed to overcoming these challenges, but the lack of accurate phenotypic data reduces their usefulness. Application of sensor technologies for phenotyping may overcome the flaws of conventional phenotyping through multi-trait evaluation and automatic measurements. As a first step of sensor technologies use in peanut breeding in Ghana, this work reports on the genetic variability for abiotic and biotic stress responses using sensors and conventional phenotyping. An experiment targeting abiotic stress phenotyping was conducted under irrigation using six contrasting genotypes for drought tolerance. A second experiment, targeting biotic stress phenotyping, included 60 genotypes selected from the African germplasm collection planted at Nyankpala and Fumesua. Data on plant density, seedling vigor, plant height, canopy width, days to 50% flowering, leaf area, disease severity, canopy temperature, chlorophyll content and fluorescence, and days to maturity, was taken using sensor and conventional phenotyping techniques. The data was analyzed using R statistical package. It is expected that, a high-throughput protocol for phenotyping will be developed for enhanced genetic gains in peanut breeding.

Presentation Link:
https://youtu.be/t8oMnTFOHD8

Evaluating Emergence of Spanish Peanut (*Arachis hypogaea* L.) for Organic Peanut Production

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Organic peanut production is centered in West Texas with some estimates indicating that as much as 98% of all organic peanuts in the U.S. are being produced in the region. Organic producers face limited options for control of several key production issues. A major area of concern is seedling emergence and seedling vigor issues. Many factors can play a role in stand establishment; however, this research was to specifically determine the extent that variety can play a role in seedling emergence and seedling vigor and stand establishment. The lack of the ability to use commercial seed treatments in organic production systems often results in poor germination and stand establishment. The Texas A&M AgriLife Research Peanut Breeding Program initiated a preliminary evaluation of current breeding lines in the 2019 season to see if differences could be observed between breeding lines based on stand count. Seven breeding lines and three commercially available checks were tested at Stephenville, Tx. under organic production practices with no pre-emergence herbicides being applied. Plots were planted on 7/28/19. Each entry was replicated 3 times and was tested with and without the commercially available seed treatment Trilex Star®. Plots were arranged in a randomized complete block and stand counts were taken at 7, 14, 21 and 28 days. Differences were observed based on date of stand counts, whether the breeding line was treated or not and between entries. The data will be presented. These results will be expanded on and used to establish the development of breeding lines specifically suited for the unique needs of organic peanut producers.

Presentation Link:
https://youtu.be/HJQMKDEbt-w

An Economic Analysis of Digging Yield Losses at Different Peanut Digger Ground Speeds and Conveyor Speeds

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Proper peanut digger setup and operation are important factors in maximizing profit for peanut production. A 2016 study conducted by Clemson University demonstrated significant peanut digging loss effects in Virginia type peanut as functions of ground speed and conveyor speed. Further studies were conducted 2017 and 2019 incorporating peanut yield monitor data and using similar tests on both runner and Virginia type peanuts. The tests were conducted with Amadas and KMC brand two-row peanut diggers. Ground speed treatments were set at 1.5 mph, 2.5 mph, 3.5 mph, and 4.5 mph with the conveyor speed set at 100% of ground speed for all ground speed tests. Conveyor speed treatments were set at 70%, 85%, 100%, 115%, and 130% of ground speed, which was held at 2.5 mph for all conveyor speed tests. Digging losses from above ground and below ground across types ranged from $83 to $270 per acre for Amadas digger and $42 to $163 per acre for KMC digger. The per acre digging loss for each mph above the optimal ground speed ranged between $19 and $25 per acre and increased at higher speeds. For both diggers in Virginia type peanuts, gross revenue was highest at conveyor speeds equal to 85% of ground speed. In runner type peanuts maximum gross revenue was observed at conveyor speeds equal to 70% and 115% of the ground speed for the Amadas and KMC diggers, respectively.

Abstract Accepted

Disease and Yield Response of Selected Peanut Cultivars to Low and High Input Fungicide Programs in Southwest Alabama

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The reaction of nine peanut cultivars to late leaf spot (LLS) caused by *Cercosporidium arachidicola*, rust caused by *Puccinia arachidis*, and white mold (WM) caused by *Sclerotium rolfsii* as influenced by fungicide program was assessed in southwest Alabama at the Gulf Coast Research and Extension Center (GCREC). The low input program included seven applications of chlorothalonil and the high input program included Mazinga, Miravis + Elatus, Muscle ADV, and chlorothalonil. LLS intensity was evaluated using the Florida leaf spot scoring system. Rust was evaluated using the ICRISAT scale. WM incidence was assessed immediately after plot inversion by counting the number of disease loci per row. Yields were reported at <10% moisture.

Due to late season drought, LLS defoliation, which significantly differed across cultivars and fungicide programs, was lower than that observed in prior years with defoliation exceeding 45% and 31% for the untreated Florunner 331 and Georgia-16HO respectively. All cultivars had similar defoliation levels in both the intensive and standard input fungicide programs. Rust intensity, however, differed across cultivars with Gerogia-18RU having a greater rust rating than all other cultivars. Both the standard and intensive input fungicide programs controlled rust compared to the no fungicide control. WM incidence was higher on TUFRunner 297 and Georgia-18RU than all other cultivars while Georgia-14N had the lowest incidence. Yield for both fungicide regimes were higher than that recorded for the nontreated control. The highest yields were recorded for AU-NPL 17, while lowest yields were noted for TUFrunner 297 and Georgia-06G. Overall, significant yield gains were recorded for AU-NPL 17, Georiga-09B, Georgia-16HO, and Georgia-18RU with the intensive compared with standard fungicide input programs.

Presentation Link:
https://youtu.be/S-tcQxD-I1c

Quantitative Trait Loci Mapping of Seed Dormancy in a Recombinant Inbred Line Population of Peanut (*Arachis Hypogaea* L.)

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Peanut sprouting/germination prior to harvest/digging results in significant loss of pod yield and possible preharvest aflatoxin contamination. We developed a recombinant inbred line (RIL) mapping population from Tifrunner (dormancy) and GT-C20 (no dormancy) for quantitative trait loci (QTLs) mapping for fresh seed dormancy and identification of markers and candidate genes. Fresh seed dormancy was carried out immediately after dug for two years, and the RIL population was genotyped using the peanut 58K SNP Array. A genetic map was constructed with 1147 SNP markers and used for QTL analysis. Total 47 QTLs were identified with phenotypic variance explained (PVE) from 10.77% to 51.60%. One QTL with 51.60% PVE was in linkage group A05, and another QTL with 43.15% PVE was in linkage group A04. The flanking sequence of the major QTLs were used for blasting to the reference genome, and a 98kb physical interval on Chr.15 was identified. According to the searches of the peanut genome database, a total of 11 genes were revealed in this genome region and one candidate gene was under-investigation for possibly response to the fresh seed dormancy. The identified QTLs associated markers and the potential candidate genes will be studied further for possible application in breeding for fresh seed dormancy in peanut.

Presentation Link:
https://youtu.be/Ol-NKxWgsNI

Joint Linkage Mapping and GWAS Study Identified Genomic Regions and Candidate Genes Associated with Late Leaf Spots rRsistance in Peanut

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Late leaf spot (LLS) is one of the major reasons for yield loss in peanut. Exploring the multiple alleles using the diverse parental lines widens the possibility to find the resistant genes/quantitative trait loci (QTL). In this study, two nested-association mapping (NAM) populations i.e. NAM_Tifrunner and NAM_Florida-07 comprising of 580 and 496 individuals, respectively, were used in joint linkage-based QTL mapping and genome-wide association study (GWAS). The 58K SNP array genotyping data and multi-season phenotyping for LLS in 2015, 2016 and 2017 was used in QTL and GWAS analysis. The joint linkage-based QTL mapping identified 30 QTLs in NAM_Tifrunner with 4.0 – 65.6 % phenotypic variance explained (PVE) and 32 QTLs in NAM_Florida-07 with 7.5 – 61.3 %PVE. Eight major QTLs A01 (2 QTLs), A03 (2 QTLs) and B03 (4 QTLs) were detected showing 10-36% PVE with alleles contributed from the interspecific parent. In parallel, GWAS analysis in NAM_Tifrunner and NAM_Florida-07 identified 221 significant single nucleotide polymorphism (SNPs) ($-\log_{10}(P) > 3.0$ - 21.1) and 293 significant SNPs ($-\log_{10}(P) > 3.0$ - 58.6), respectively associated with LLS resistance. Integration of QTLs and GWAS results across both populations narrowed down to 27 significant SNPs associated with 26 QTLs for late leaf spots. These significant SNPs upon validation can be used in genomics-assisted breeding programs for LLS resistance in peanut.

Presentation Link:
https://youtu.be/GZ685h1TERY

Oxidative Stability of Allergen Reduced Peanuts Treated by Alcalase

J. YU*, N. MIKIASHVILI, N. IDRIS, I.N. SMITH, Department of Family and Consumer Sciences; North Carolina Agricultural and Technical State University, Greensboro, NC 27411-0002

This study evaluated the impact of protease treatments on the oxidative stability of raw and dry-roasted peanuts. The Runner peanut kernels were treated with Alcalase in phosphate buffer, then dried in a dehydrator for 18 hours. The dry peanuts were packed in a set of amber glass jars (50g/jar), capped, and stored at 37 °C in an incubator for 0-8 weeks. Controls are untreated raw and dry-roasted peanuts packed and stored in the same way. Samples were taken weekly to determine peroxide value (PV) and concentration of thiobarbituric acid reactive substances (TBARS) as indicators of oxidation (n=3). The aroma/odor of each sample was recorded at the time of sampling. Alcalase treatment greatly reduced the contents of major allergens Ara h 1, Ara h 2 and Ara h 6. The initial PV of untreated-peanuts was higher than that of Alcalase-treated peanuts ($P<0.05$) and increased faster during storage, while the PV of Alcalase-treated peanuts only increased slightly during storage. The initial TBARS of Alcalase-treated raw peanuts was slightly higher than that of untreated, but the TBARS of Alcalase-treated dry-roasted peanuts were slightly but lower than that of untreated ($P<0.05$). For raw peanuts, the TBARS of the untreated increased gradually but the TBARS of the treated remained unchanged until week 7. For roasted peanuts, the TBARS of the treated increased gradually but were lower than that of untreated from week 0 to week 8 ($P<0.05$). Old peanut smell was detected at week 5 and 6 for untreated raw and roasted peanuts, at week 7 for treated roasted peanuts, but not detected in treated raw peanuts.

The study indicates that protease treatment of raw and dry-roasted peanuts may not accelerate oxidation of peanuts during storage. More study of oxidative stability of protease treated peanuts stored in the presence of sufficient air is needed.

Presentation Link:
https://youtu.be/q_XgO56VfM4

Angiotensin-Converting Enzyme-Inhibitory Activity of Allergen Reduced Peanut Protein Hydrolysate

J. YU* and N. MIKIASHVILI. Department of Family and Consumer Sciences; North Carolina Agricultural and Technical State University, Greensboro, NC 27411-0002

This study evaluated the *in vitro* allergenicity and angiotensin-converting enzyme (ACE)-inhibitory activity of peanut protein hydrolysates (PPH) produced by proteolytic hydrolysis of peanut flours. Partially defatted light- and dark-roasted peanut flours (12% fat) were hydrolyzed with Alcalase at the optimal pH and temperature of the enzyme. Samples were taken hourly to inactivate the enzyme. The peanut flour suspension incubated without Alcalase was used as control. After centrifugation, the soluble portions (PPH) were collected and total protein concentrations were determined. The degradation of major allergens Ara h 1, Ara h 2, Ara h 3 and Ara h 6 were monitored by SDS-PAGE. The IgE-binding of PPH was used as an indicator of *in vitro* allergenicity and was determined by Western Blot method using pooled plasma from 6 peanut allergic patients. The ACE-inhibitory activity of PPH was determined using ACE from rabbit lung. SDS-PAGE show that the major allergenic proteins Ara h 1, Ara h 2, Ara h 3 and Ara h 6 in peanut flour were greatly reduced by Alcalase treatment compared to the untreated, meanwhile, the smaller peptides (<10 kDa) were produced. Western blot shows that enzymatic hydrolysis eliminated or significantly reduced allergenicity of Ara h 1, Ara h 2 and Ara h 3 in the PPH, although some residual allergenicity of Ara h 6 and proteins/peptides 5-15 kDa remained. Alcalase hydrolysis resulted in PPH with 18-37% ACE-inhibitory activity at 1mg/ml depending on hydrolysis time, and the fraction with molecular weight smaller than 5kDa showed higher ACE-inhibitory activity than crude PPH. However, the ACE-inhibitory activity of light-roasted PPH was not significantly different from that of dark-roasted PPH at same concentration. Higher ACE-inhibitory activity indicates greater antihypertensive potential.

This study indicates that protease treatment of peanut flour could produce low allergenic PPH which can be a potential antihypertensive agent. However, more studies in food and animal models are needed.

Presentation Link:
https://youtu.be/Xc5ZxmGDI9s

2020 Graduate Student Poster Competition Pre-Recorded

The APRES YouTube link to each pre-recorded presentation can be found on their abstract.

Life Cycle and Fecundity of Peanut Burrower Bug, *Pangaeus bilineatus* Say (Hemiptera: Cydnidae), Under Laboratory Conditions

B. L. AIGNER* AND M. R. ABNEY, Entomology Department, University of Georgia, Tifton, 31793

Peanut burrower bug (PBB), *Pangaeus bilineatus* Say (Hemiptera: Cydnidae), is a serious pest of peanut, *Arachis hypogaea* L., in the Southeast US. Adults and nymphs feed directly on peanut seed with piercing sucking mouthparts reducing seed quality and value. There is limited information on the insect's biology including its life cycle; therefore, a study was conducted to determine PBB fecundity and development time from oviposition to adult eclosion. This information is critical for development of an integrated pest management strategy, as control tactics often exploit vulnerable life stages of the target pest. Observations of PBB in laboratory colonies at UGA indicate that development from egg to adult requires approximately 30 days under constant conditions of 29°C, 40%RH, and 14:10 L:D cycle, but empirical data were lacking. Fourth and fifth instar nymphs were allowed to mature to adulthood in isolation. Adult virgin males and females were paired (n=20 pairs) and placed in 266 mL resealable plastic containers (11×8×5cm) with screened lids and 1 cm of sandy loam soil wetted to approximately 15% VWC. Ten peanut seed were placed on the soil surface as a food source and were replaced each day. Containers were placed in a growth chamber on a 14:10 L:D cycle and a constant temperature of 29°C. Containers were checked daily for eggs, nymphs, and exuviae as evidence of development to successive life stages. Date, time, no. of eggs, no. of nymphs and life stage were recorded.

Presentation Link:
https://youtu.be/WIdnsW2zIOw

Drought Stress Tolerance of Peanut Using PGPR with Orange Peel Amendments

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Peanut provides over $4 billion per year to the United States economy along with many health benefits. Drought is an issue that reduces these benefits, as it lowers nutrition and yield and can lead to disease in peanut. Due to factors such as an increasing global population and climate change, something must be done to manage drought stress in peanut. *Bacillus velezensis* (*Bv*) and orange peel powder amendments, which have increased growth promotion in legume crops, will be used to determine their effect on peanut drought tolerance performance. Orange peel is a cheap source of pectin that can provide *Bv* with carbon to supplement its growth promotion properties. It has also been used to help triple vegetation in a forest as well as control pathogens.

A greenhouse experiment was conducted over 135 days to monitor the effects of the previously mentioned inoculants on five different peanut genotypes. Measurements taken to determine the effects of these inoculants and genotype-environment interactions include relative water content, pot weight, Soil Plant Analytical Development Chlorophyll Meter Readings, transpiration efficiency, mid-day photosynthesis, CO_2 curves, specific leaf area, biomass measurements, and N_2 fixation. These results will then be analysed and visualized using R. The first hypothesis for this experiment is that orange peel powder amendments may enhance *Bv* drought tolerance in peanut compared to using only *Bv*, and the second one is that genotype-environment interactions may occur between the genotypes and inoculation treatments. If these hypotheses are proven correct, these genotypes and inoculation treatments can be studied in later greenhouse and field trial experiments to help farmers grow peanuts more efficiently.

Presentation Link:
https://youtu.be/w3yKrNaHX8M

Phenotyping Peanut Resistance to *Nothopassalora personata* prior to Penetration

D.A. CASTELLANO*, E.G. CANTONWINE, Valdosta State University, Valdosta, GA 31698; J. CHU, P. OZIAS-AKINS, The University of Georgia, Tifton, GA 31793; and C.C. HOLBROOK, USDA-ARS, Tifton, GA 31793.

Nothopassalora personata is the fungal causative agent of late leaf spot in peanut. This disease can cause premature defoliation and yield loss if not controlled. Plant breeders have created several peanut cultivars with high levels of pathogen resistance using introgressive hybridization of cultivated peanut (*Arachis hypogaea*) and wild peanut species. The genotypes tested in this study are crosses between TifNV-High O/L and IAC322, each with different introgressions from *A. cardenasii*. This study assessed whether resistance associated with the introgressions A02 top, A02 bottom, A03 bottom, or A02 top + A03 bottom, begins before penetration. Using a detached leaf assay, leaves of each parent plant, a related susceptible genotype (Runner 866), and the lines with the selected introgressions, were inoculated with conidia of *N. personata* and maintained under optimal conditions for infections. The percentage of spores germinating and percentage of spores penetrating stoma will be measured over time, as will incubation period and lesion development. The results will be used to see if one or more introgressions affect the pathogens ability to penetrate the leaf surface.

Presentation Link:
https://youtu.be/TrzytbPvRUQ

High-Throughput Phenotyping for Disease and Drought Stress Selection in Groundnut (Arachis hypogea L.)

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The ability to accurately select for drought tolerance, disease resistance and variety performance is important across breeding environments. However, assessment traits of interest like plant biomass is resource intensive and often subjective, hence the quality of data is compromised. High-throughput phenotyping (HTP) using hand held tools was proposed to alleviate the phenotyping challenge in groundnut (*Arachis hypogaea* L.) breeding. The study was aimed at identifying 1) HTP tools for groundnut selection for tolerance to drought and diseases (groundnut rosette disease caused by satellite RNA, groundnut rosette virus, and groundnut rosette assistor virus and late leaf spot disease caused by *Phaeoisariopsis personata* (Berk & Curt) and yield performance and 2) plant physiological parameters that can predict pod yield to focus on during selection in breeding programs. Sixteen genotypes were grown under rainfed conditions in Serere (1°30'00.0"N, 33°33'00.0"E), Uganda, and evaluated over the 2019-2020 growing season. Data was collected using traditional phenotyping (visual scores and direct measurement) and HTP tools (red-blue-green, RGB camera; thermal camera; and GreenSeeker) on plant emergence and vigor, canopy height, leaf color, and disease severity on a weekly basis over a period of five weeks during plant growth. At harvest, measurements on plant biomass and pod weight were taken.

Results show that groundnut phenotyping can be successfully conducted with the less time consuming HTP tools to provide results that are still comparable with those obtained using the traditional phenotyping methods. In some cases, parameters derived with HTP tools were more accurate predictors of final whole plant dry weight and pod dry weight. The results generally indicate that there is potential to focus on measurement of a few plant traits and still accurately predict final groundnut yield using HTP tools. As already shown for other crops, the findings from this study highlight the potential of HTP tools in speeding up groundnut breeding programs that often have to work with numerous breeding lines.

Presentation Link:
https://youtu.be/jp_LdJD1HHQ

Comparing Strategies on Weed Management in Peanut Production: A Brazil's Overview

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The peanut crop has increasingly conquered an important space in Brazil's agriculture. According to the projection of the National Supply Company, a production of up to 537.6 thousand tons is expected for 2020, covering an area of up to 149.6 thousand hectares. One of the major obstacles in growing peanuts is the proper management of weeds. Because it is a crop planted in areas of sugar cane, mainly in the state of Sao Paulo, many of the weeds become common to both crops. Thus, the adoption of methods of control is necessary.

In terms of management, some studies have suggested a decrease in planting spacing. The adoption of smaller spacing than the conventionally used proved to be effective, mainly for low level cultivars. In this way, with the closure of the peanut canopy, the establishment of new weeds is reduced. In the biological control of weeds, an area that is still little explored, a preliminary research conducted by the Laboratory of Weeds at Sao Paulo State University, Jaboticabal, BR, tested the allelopathic effect of white lupine plants (*Lupinus albus* L.) and it was found that this was able to control the growth of wild radish (*Raphanus raphanistrum* L.) in peanut areas. Demonstrating that rotation in the peanut area with crops with allelopathic potential can be an interesting strategy.

Of the cited managements, the chemical is the most used. However, the number of registered products is still incipient. With the recent insertion of the peanut crop as a Crop with Insufficient Phytosanitary Support, by the Ministry of Agriculture of Brazil, it allowed companies and research institutes to carry out research in order to facilitate the registration of new active principles for the crop. In Brazil, the following active ingredients are currently registered for use in peanuts: trifluralin, alachlor, bentazon, imazamox, clethodim, quizalofop-p-ethyl and imazapic. Research with promising results has been conducted and indicating that s-metolachlor, 2-4D, mesotrione, sulfentrazone, lactofen, imazethapyr, chlorimuron, among others, may become active principles that can be used.

Presentation Link:
https://youtu.be/B0r9HGXXwQc

Marker Identification for Increased Folate in Peanuts

K. FRITZ*, R. ANDRES, Department of Crop and Soil Sciences, North Carolina State University, Raleigh, NC 27695; L. DEAN, Market Quality and Handling Research Unit, USDA, ARS, Raleigh, NC 27695-7624; C. NEWMAN, A. OAKLEY, J. DUNNE, Department of Crop and Soil Sciences, North Carolina State University, Raleigh, NC 27695

Tetrahydrofolate and its derivatives, known as folates, are essential vitamins used in the body as carbon acceptors and donors for various vital reactions. Folates are not produced in mammals *in vivo*, but legumes are excellent sources for folates with the most prevalent in peanut being 5-formyltetrahydrofolate. In order to implement a marker-assisted selection (MAS) approach to biofortify folates within cultivated peanut, a genome-wide association study (GWAS) was conducted to identify marker-trait associations to folate content in the peanut mini-core collection. To find the single nucleotide polymorphisms (SNPs) associated with folate content in the mini-core collection, we merged the original 58K-array genotypic data from PeanutBase with the locations from the 48K-array. The phenotypic data was downloaded from a study on nutrient content of the mini-core collection where folate content was collected through a bacterial and enzymatic digestion assay. Then, the genotypic and phenotypic data was uploaded into the Trait Analysis by association, Evolution and Linkage (TASSEL) software to conduct a GWAS. The results showed strong associations, but gave rise to concerns about the physical locations on the cv. ‘Tifrunner’ reference genome. Further work is needed to confirm the locations of these markers and then confirm the SNPs associations from the GWAS. To confirm the locations on the physical map, we will use the 48K probe set and our draft Virginia-type genome of Bailey II to identify differences in alignment and positioning. Three nested, recombinant inbred populations with Georgia Green as the common parent and three high folate peanut introductions from within the mini core as the other parents will be used to confirm the previously identified marker-trait associations for folate. The associated SNPs will be used to design PACE markers to be run on the three populations to create a representative subset to be phenotyped. With markers confirmed to be associated with increased folate content we will be able to more easily make selections in our breeding program for folate content. Cultivars with increased nutrient content will increase the dietary intake of folates for consumers and lead to reduced risks of deficiencies.

Presentation Link:
https://youtu.be/WbvQTX73Wt8

Tomato Spotted Wilt Epidemiology and Impacts on Peanut Yield

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Spotted wilt disease of peanut (SWP), caused by thrips-transmitted tomato spotted wilt orthotospovirus (TSWV), is a serious constrain in peanut production. SWP incidence in modern peanut cultivars, which possess field resistance to TSWV, has steadily increased since 2012 in Georgia. However, SWP loss estimates have been inferences based on limited field studies with anecdotal assessments of disease incidence, and the actual economic impact of SWP on peanut yield is unknown. Describing disease spread in time and space will aid in assessment of SWP's impacts on peanut. Field experiments were conducted in 2018 and 2019 in Tifton, GA. The amount of disease symptomatic plants and their field positions, disease severity, and thrips densities were assessed over time. Peanut yield was compared between TSWV infected and non-infected plants. Abundance of the major vector, tobacco thrips, was high in the early season and decreased by 80% after 48 days after planting (DAP). More new symptomatic plants were found at 60-90 DAP than earlier or later in the season. Temporal disease progressions indicated monocyclic epidemics in an overall lower incidence year (2018) and some polycyclic epidemics in an overall higher incidence year (2019). Spatial patterns of diseased plant clusters were not aggregated. Secondary spread was suggested by significant spatiotemporal disease distributions with increased disease incidence over time. Disease severity was significantly higher in plants showing symptoms before 62 DAP. Infected plants showing symptoms before 76 DAP had significantly lower biomass, pod production, and marketable kernel yield compared with non-infected plants. Disease severity was negatively correlated to peanut yield. Yield losses of individual plants to SWP ranged from 0-97%, depending on infection timings; on average, SWP reduced 45% peanut yield.

Presentation Link:
https://youtu.be/8VTiYqKZU2Y

Host Gene Expression and Epigenetic Regulation in Peanut (*Arachis hypogaea*) in Response to Rhizobial Early Infection

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Peanut (*Arachis hypogaea*) establishes symbiosis with rhizobia through an intercellular infection pathway called “crack entry”, which is relatively primitive compared to the well-studied “root hair” entry in model legume and many other legume crop species. Understanding the “crack entry” mechanism will facilitate nitrogen fixation efficiency improvement in peanut and the symbiosis engineering in cereal crops. In this study, we profiled the transcriptome of a pair of recombinant inbred lines, a nodulating line, E6 and non-nodulating line, E7 at 2 hour-post-inoculation (hpi) and 12 hpi. Differentially expressed genes, long noncoding RNAs (lncRNAs) and micro RNAs (miRNAs) related to early rhizobia infection were identified. The regulatory network between mRNA, lncRNA and miRNA provided an insight into the plant genetic response to symbiotic bacteria. We further profiled the epigenomes of E6 at 2 hpi and 12 hpi through whole genome bisulfite sequencing. Differentially methylated loci and regions near or on the differentially expressed genes were identified. The integrated analysis of transcriptome and methylation profiles allow us to understand the gene expression and epigenetic regulation controlling peanut response to symbiotic infection at early stage. Our study provided a set of crucial peanut genes involved in crack entry for further functional characterization.

Presentation Link:
https://youtu.be/s_C4rbcvBeQ

Performing an Internal Reference Genome Assembly, Whole-Genome Sequencing and *In Silico* Digestion for Improved Efficiencies in Marker Detection for Virginia-type Peanuts

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The steady decline in sequencing costs provides the opportunity for peanut breeding programs to utilize next-generation sequencing to identify single nucleotide polymorphisms (SNPs) across the genome for marker development. The resulting information helps guide the development of reduced representation (genotype-by-sequencing; GBS) sequencing protocols. GBS is a low-cost technique which can be used to rapidly genotype lines in a breeding program. Creating a modern genotyping approach involves: selecting or assembling a reference sequence most similar to the organism of interest; whole-genome sequencing (WGS) on a subset of diverse germplasm; aligning WGS data to the reference genome to identify SNPs; optimizing the selection of enzyme pairs to be used for GBS through *in silico* digestion of the reference genome and by maximizing SNP site quantity and sequencing read depth in vitro. To initiate this protocol development, an internal reference genome of cv. 'Bailey II' was assembled. Tissue from Bailey II was sequenced on the PacBio Sequel II system, yielding 253GB of raw data. The raw reads were then assembled, polished with Arrow and Pilon, and scaffolded with BioNano. Simultaneously, a subset of diverse lines from the North Carolina State University Peanut Breeding & Genetics program were submitted for WGS. The resulting data were cleaned and aligned to the reference genome to reveal novel SNPs and to validate extant SNP positions present on the current Affymetrix Arachis2 48k array. A novel Python script was written to digest the 'Tifrunner' genome using selected enzyme pairs and was then applied to the Bailey II internal reference genome. The fragments identified from the *in silico* digest of Bailey II will then be analyzed to maximize the recovery of SNPs using GBS. Validation of the optimal enzyme pairs for SNP recovery and read depth will be verified through the construction of GBS libraries based on enzyme pairs that 1. Maximize SNP recovery (potentially low depth), 2. Maximize depth (potentially low SNP count) 3. Intermediate SNP sites and depth. This high-throughput genotyping method would afford peanut breeding programs, based solely on phenotypic selection, the opportunity to develop genomic resources to implement marker-assisted or genomic selection for trait improvement.

Presentation Link:
https://youtu.be/xvjmwCnMjXw

Towards Reliable Greenhouse Methods for Phenotyping Peanut Susceptibility to Stem Rot (White Mold)

Y-C. TSAI*, Department of Plant Pathology, University of Georgia, Athens, GA 30605; C. C. HOLBROOK, USDA-ARS, Tifton, GA 31793; T. BRENNEMAN, Department of Plant Pathology, University of Georgia, Tifton, GA 31793; and S. LEAL-BERTIOLI**,** Department of Plant Pathology, University of Georgia, Athens, GA 30605.

Peanut stem rot (white mold), caused by the fungus *Sclerotium rolfsii*, is one of the most severe soil borne pathogens for U.S. peanut production. Only moderate to low levels of resistance are shown in cultivated peanuts, hence, it is essential to breed for white mold resistance. So far, field evaluation is the main approach for assessing plant resistance. Reliable methods for in-vitro or greenhouse evaluations are needed since field evaluation is costly and labor intensive. We devised a method to reliably assess resistance to stem rot on greenhouse cuttings. Sixty-day old stem cuttings treated with rooting gel were transplanted into a cup filled with potting mix. Cuttings were inoculated with active *S. rolfsii* mycelial plugs (0.7-cm-diameter) at the base with mycelium directly contacting the stem. Inoculated cuttings were put in a large storage box to keep humidity high. Each genotype had 4-7 replications. Length of lesion on stems was measured at 3, 5, 7, and 9 days after inoculation (DAI). Experiments were conducted twice in 2019 and 2020 in the greenhouse. Twelve recombinant inbred lines with different levels of field resistance and Georgia-12Y were evaluated using this method, and the results were compared with a 4-year field evaluation conducted in 2013-2015 and 2018. Results were subjected to analysis of correlation by using cor function in R, and Fisher z-transformation was used to test significance. Average lesion lengths in two experiments measured at 3, 5, 7 and 9 DAI were significantly correlated with 2 set of field evaluations at α=0.05. Correlation coefficients ranged from 0.63-0.88. Lesions measured at DAI7 were most highly correlated with field results. Overall, this greenhouse method is reliable and correlates well with field evaluation. It will greatly facilitate white mold resistance assessment among wild, induced allotetraploid, and cultivated peanuts.

Presentation Link:
https://youtu.be/_evzhSRVd3o

BOD & BUSINESS MINUTES

https://youtu.be/3EmxLyoSes4

MINUTES

BOARD OF DIRECTORS MEETING & BUSINESS MEETING COMBINED

June 22, 2020
Virtual Format - Zoom

Board Members Present:

President Barry Tillman	Yes
President-elect Gary Schwarzlose	Yes
Past President Rick Brandenburg	Yes
Steve Brown	No
Mark Burow	Yes
Lisa Dean	Yes
Bob Kemerait	Yes
Chris Liebold	Yes
Henry McLean	Yes
Chandler Levinson	Yes
Nathan Smith	Yes
Bob Sutter	Yes
Dan Ward	No
Executive Officer Kim Cutchins	Yes

President Barry Tillman called the meeting to order. Members present are noted above and constitute a quorum. Additional attendees are Maria Balota, Scott Monfort, John Cason, Emi Kimura, Peter Dotray, Josh Clevenger, William Pearce, Dylan Want, David Jordan, Dan Anco.

President Tillman stated this Board meeting serves as the traditional Board and Business meeting held at the Annual Meeting in July. He thanked the Board and Committee chairs for working to meet this early deadline so all reports and information can be loaded online prior to the start of the Virtual 52nd Annual Meeting, July 13-15, 2020.

Minutes of July 19, 2019 Board Meeting
Minutes of the October 3, 2019 Board Meeting
Minutes of the March 20, 2020 Board Meeting
Minutes of the April 29-30, 2020 Board Meeting and E-vote
President Tillman noted the the Board has met 4 times over the past year and neglected to call for approval of the previous minutes. The 4 sets of minutes state above were sent to the Board for review prior to the meeting and the Board was asked for comments, additions, edits. Chris Liebold moved that all sets be approved with one vote; the motion was seconded and

unanimously approved the 4 sets of minutes as presented:
Minutes of July 19, 2019 Board Meeting
Minutes of the October 3, 2019 Board Meeting
Minutes of the March 20, 2020 Board Meeting
Minutes of the April 29-30, 2020 Board Meeting and E-vote.

Executive Officer Report
President Tillman thanked Kim for her efforts to pull together this year's meeting, creating a whole new virtual format and schedule. EO Kim reported that memberships and registrations

are just starting to come in for this year and are currently on target to meet the goals set out in the revised Virtual Meeting budget. She responded to 2500+ emails; participated in 6+ Zoom meeting; 5+ Zoom webinars; 5 Board meetings; 3 industry events; visited hotels in Charlotte, Asheville, Greensboro, Raleigh, Wilmington, Savannah, & Atlanta in pursuit of a meeting site for 2021 & 2022 only to have the pandemic throw this in disarray; 15 marketing pieces; website updates to both APRES & Peanut Science; both websites will require updates this year; pandemic and new Accounting rep delayed budget preparation—all is on track now; members only area created for the website; member management son; Perrine Kemerait has been assisting as an intern this year courtesy of American Peanut Council.

NEW BUSINESS

Committee Reports follow this page. Any specific Committee actions are noted below.

FINANCE COMMITTEE:

Committee Chair Maria Balota stated a new Accounting rep at APRES' CPA firm and the pandemic delayed gathering of the financial information for the 2020 budget. Additionally, the change in Annual Meeting format changed fiscal projections for 2020. The FYE2019 financial status and the proposed FY 2020 budget were presented to the Board for their review and discussion.

The Committee is recommending approval of the 2020 Proposed budget of income $61,100; expense of $59,990; Income over Expense of $1,200. The motion was seconded by Chris Liebold. Questions were asked if EO Kim is feeling confident we will make budget. She replied that all indications is APRES will make budget this year.

The 2020 proposed budget was unanimously approved, as approved.

President Tillman thanked the Committee for their efforts and commented that APRES is in very good financial shape.

NOMINATING COMMITTEE

Chairman Rick Brandenburg (with assistance from Committee members Julie Marshall, Keith Rucker, Rebecca Bennett), presented the slate of 2020-21. He called on the Board and Committee Chairs to urge more members to participate on Committees in order to expand the pool of potential nominees. A nominee must be a APRES member for 5-years, be familiar with APRES and its members, and to have served on 3 different Committees. Each nominee has been contacted and has agreed to serve, if elected. Due to the pandemic, call for additional nominees and membership final vote will occur electronically. 15% of the membership must reply for the vote to stand. The Board recommended changing the deadlines for membership votes to ensure the votes are tallied before July 16th. In the event 15% of the membership does not respond, the emergency clause will be invoked allowing the Board to vote on behalf of the membership.

Incoming APRES President Gary Schwarzlose stated he has almost completed his Committee roster assignments for 2020-21.

To accept the report of the Nominating Committee and move the nominees forward to the membership for an electronic vote to be completed by July 16th.

PUBLICATIONS & EDITORIAL COMMITTE

Production Book

Chairman Dr. Chris Liebold shared an update on the progress of the book. Five chapters have been delivered; still waiting on seven chapters. Kira Bowen and Shyam Tallury are working as co-editors.

https://youtu.be/3EmxLyoSes4

Peanut Newsletter
Allison Floyd has done a great job reviving this communication project. They will be reaching out the APRES Graduate Student Organization and Peggy Ozias-Akins for their assistance gathering news.

Peanut Science
Tim Grey reported 47-1 has just been published; 47-2 is in the works; and, there will be a 47-3. He stated the pandemic research has been an opportunity for all to publish their research.

PEANUT QUALITY COMMITTEE

Chair William Pearce gave a brief summary of his complete report, which is focused on aflatoxin and seed quality. The full report is attached. No action needed from the Board.

PUBLIC RELATIONS COMMITTEE

The Public Relations Committee met and their complete report is attached. President Tillman advised the Board that by accepting the Committee's report they are endorsing the Committee to pursue the ideas and suggestions presented by Chair Dylan Wann.

BAILEY AWARD COMMITTEE

Chair Scott Monfort submitted their report, which is attached. The winner of the 2019 award will be announced during the virtual business meeting. Actual awards will be presented in person at the 2021.The Committee also agreed to suspend the Bailey Award nominations for 2020. It will be reinstated in 2021.

FELLOWS COMMITTEE

Chairman David Jordan announced Dr. Tim Grey is recommended to be elected to Fellow of the Society. Additional effort will be made to identify potential candidates for 2020. The motion was seconded by Bob Kemerait and Nathan Smith, and approved to:

Elect Dr. Tim Grey as Fellow of the Society.

SITE SELECTION COMMITTEE

Chairman Gary Schwarzlose's report is attached. President Tillman reminded the Committee to touch base with AAGB for the 2023 meeting per the Public Relations Committee report.

COYT T. WILSON DISTINGUISHED SERVICE COMMITTEE

Chair Dan Anco stated the Coyt T. Wilson Service Award Committee reached a unanimous recommendation for the 2020 award. A full report is attached.

JOE SUGG GRADUATE STUDENT ORAL PRESENTATION COMPETITION COMMITTEE

Chair Bob Kemerait stated from the grass roots effort by the Graduate Student Organization led by Chandler Levinson the Committee agreed to hold a live via Zoom Joe Sugg Graduate Student Competition. The competition has received the largest number of competitors in history. The Committee and students have been practicing and believe this will be a great addition to the program. A full report is attached.

https://youtu.be/3EmxLyoSes4

GRADUATE STUDENT POSTER COMPETITION

Chair Kemerait say the poster competition has attracted 10 competitors and will be done via pre-recorded narrated Power Point presentation and pdf poster.

CORTEVA AGRISCIENCE™, DIVISION OF DOWDUPONT™ AWARDS COMMITTEE

Chair Nick Dufault reported a recipient has been selected for both the research and education award. The Committee report is attached.

PROGRAM COMMITTEE

Program Chair Gary Schwarzlose announced this year's theme is Production, Challenges, Strategies. The live Virtual meeting will consist of a General Session, Aflatoxin Symposium, and the Joe Sugg Graduate Student Competition. All other presentations will be pre-recorded, narrated PowerPoint presentations to be viewed at your leisure. His complete report is attached. He gave kudos to Johnny Cason and Emi Kimura for their help in getting this virtual meeting planned.

OTHER BUSINESS

Graduate Student Organization

President Chandler Levinson is excited about the two graduate student competitions and has planned a seminar for the students during the meeting, too. Nick Hurdle is the incoming President of the organizations. Full report is attached.

Recognition of Outgoing Board Members

President Tillman announced outgoing Board members and thanked them for their APRES service:

Rick Brandenburg - Past President
Mark Burow
Chris Liebold
Steve Brown
Dan Ward
Chandler Levinson

President Tillman will recognize the outgoing Board members at the Business meeting in July and will somehow get their gift of appreciation to them during the year.

Virtual Meetings

President Tillman says the pandemic has allowed us to become more familiar with technologies like Zoom. The opportunity to record and post meetings could be very useful for expanding APRES' reach to its members, the industry and internationally. He called on David Jordan to use this format to help APRES grow.

Adjournment

Chris Liebold made a motion to accept all the Committee Reports, seconded by Gary Schwarzlose, and unanimously approved to:

accept all Committee reports, as presented.

There being no other business, the meeting was adjourned.

Finance Committee Report - 2020

The Finance Committee met electronically to review the 2019 Year-end Financials . The year-end numbers were instrumental in establishing a draft budget for 2020.

Due to a staff change at Herring CPA (APRES's accounting firm) and the subsequent pandemic, the Committee was delayed in finalzing the budget for Board approval. By the time the Committee and the Board were able to meet again, the Committee was asked to draw up a revised budget, incorporating the impact of changing the Annual Meeting format from a live, in-person meeting to a virtual format.

The Committee met electronically and adjusted the 2020 proposed budget and submitted its report to the Board of Directors at its April 29, 2020 meeting. The proposed budget assisted in the the Board's decision to move to a virtual format for the 2020 Annual Meeting.

The Board reviewed the following documents--2019 Year-End Financial Overview; 2020 Proposed Budget; and the 2020 Year-to-Date Financial Documents-- at its June 22, 2020.

The Board had no questions regarding the 2019 Financial Statements or the 2020 Financial Statements, commenting APRES is in a healthy place.

The Board discussed the proposed budget at its April 29, 2020 meeting and having no additional questions, Maria Bolata asked for approval of the 2020 budget. It was seconded by Chris Liebold, seconded, and **the Board unanimously approved the 2020 APRES Budget, as presented.**

Respectfully submitted,
Maria Balota, Chair
Finance Committee

2019 Year-End Financial Overview

Balance Sheet as of December 31, 2019

APRES financial statements are reported using the accrual system.

Current assets are $276,814 primarily in cash—checking, CD, Vanguard investments.

Liabilities are $760, which include a credit card bill and withholding taxes; Equity of $276,054. Total Liabilities and Equity are $276,814.

Profit & Loss Statement as of December 31, 2019

Income through December 31, 2019 is $118,300 and expense is $108,235. With the addition of $1,523 of dividend/interest income, Net income for the 2019 year-end is $11,589.

The numbers in this document have been used to create the 2019 Year-End Results and Proposed 2020 Budget Document.

American Peanut Research and Education Society
Balance Sheet
As of December 31, 2019

	Dec 31, 19	FYE 2018	
ASSETS			
Current Assets			
Checking/Savings			
Vanguard	34,989.78	32,879.98	
Paypal	5,345.68	9,648.53	
Cash - Checking - 2629	100,368.77	85,819.30	
Cash - MMA - 7397	122,245.20	121,940.00	
Cash - CD 4647	13,864.80	13,751.13	
Total Checking/Savings	276,814.23	264,038.94	
		5,792.00	AR
Total Current Assets	276,814.23	269,830.94	
TOTAL ASSETS	276,814.23	269,830.94	
LIABILITIES & EQUITY			
Liabilities			
Current Liabilities			
Credit Cards			
Security Bank Card	123.16	70.16	
Total Credit Cards	123.16	70.16	
Other Current Liabilities			
State W/H Tax	116.67	116.17	
FICA/FWH Payable	520.33	520.33	
Total Other Current Liabilities	637.00	637.00	
Total Current Liabilities	760.16	707.16	
Total Liabilities	760.16	707.16	
Equity			
31300 · Restricted Fund Balances	250.00	250.00	
32000 · Unrestricted Fund Balances	264,214.92	264,610.14	
Net Income	11,589.15	4,263.64	
Total Equity	276,054.07	269,123.78	
TOTAL LIABILITIES & EQUITY	276,814.23	269,830.94	

American Peanut Research and Education Society
Profit & Loss
January through December 2019

	Jan - Dec 19	FYE 2018
Ordinary Income/Expense		
Income		
Book Sales		
Shipping & Handling	101.60	
Peanut-Genetics, Processing & U	2,800.00	
Book Sales - Other	1,500.00	
Total Book Sales	4,201.60	978.90
Sponsorship-Annual Meeting		
Spouse Hospitality Suite & Prog	1,600.00	
Meeting Breaks	3,000.00	
Fun Run & T-Shirt Sales	40.00	
Contribution - Joe Sugg Award	750.00	
Awards	1,000.00	
Ice Cream Social	1,650.00	
Thursday Reception	4,000.00	
Wednesday Dinner	19,000.00	
Sponsorship-Annual Meeting - Other	2,750.00	
Total Sponsorship-Annual Meeting	33,790.00	44,628.25
Peanut Science		
Page Charges	17,059.00	
Total Peanut Science	17,059.00	15,849.00
Annual Dues		
Sustaining-Gold Level	800.00	
Sustaining-Silver Level	350.00	
Institutional	950.00	
Individual-Student	1,225.00	
Individual-Post Doc/Tech Supp	300.00	
Individual-Retired	225.00	
Individual-Regular	13,800.00	
Total Annual Dues	17,650.00	17,750..00
Meeting Registration		
Meeting Registration-Retired	375.00	
Meeting Registration-Platinum	1,500.00	
Meeting Registration-Regular	39,650.00	
Meeting Registration-Gold	125.00	
Meeting registration-Student	2,750.00	
Meeting Registration - Other	1,200.00	
Total Meeting Registration	45,600.00	53,405.45
Total Income	118,300.60	132,634.18
Gross Profit	118,300.60	**132,634.18**
Expense		
Administrative Expense		
66000 · Wages - Executive Officer	27,999.96	
Travel - Officer	1,623.77	
Taxes - Payroll	2,184.00	
Postage	131.51	
Office Expenses	120.90	
Bank Charges		
Paypal Fees	1,826.91	
Bank Charges - Other	35.00	
Total Bank Charges	1,861.91	
Webpage Maintenance	348.23	
Dues and Subscriptions	30.00	
Office Expense	50.00	
Insurance	100.00	

American Peanut Research and Education Society
Profit & Loss
January through December 2019

	Jan - Dec 19	FYE 2018
Outside Services	885.00	
Foreign Taxes	7.10	
Accounting	2,021.00	
Total Administrative Expense	37,343.38	35,334.83
Annual Meeting		
Travel	3,505.13	
Awards	5,159.52	
Meals	92.20	
Program Spouse	389.84	
Hotel Charges	40,677.53	
Supplies/Equip/AV	1,003.15	
Annual Meeting - Other	1,569.78	
Total Annual Meeting	52,397.15	71,228.47
Peanut Science Publishing		
Composition Charges	5,349.85	
Online Journal Hosting	9,208.44	
Peer Trac	454.58	
Peanut Science Editor Stipend	3,000.00	
Peanut Science Publishing - Other	481.48	
Total Peanut Science Publishing	18,494.35	22,291.71
Total Expense	108,234.88	128,855.01
Net Ordinary Income	10,065.72	3,779.17
Other Income/Expense		
Other Income		
Dividend Income	983.76	
Interest Income	539.67	
Total Other Income	1,523.43	484.47
Net Other Income	1,523.43	484.47
Net Income	**11,589.15**	**4,263.64**

Proposed 2020 Budget Document

The 2020 Proposed Budget is almost identical to the 2019 budget, with the exception of the Annual Meeting and supporting sponsorships. The move to a virtual format reduces meeting expenses as well as sponsorship support. For budget year 2020, the Finance Committee is proposing Income of $61,100; and Expenses of $59,990 for a net income of $1,200.

A line-by-line explanation of each income and expense category is given in the color-coded 2019 approved budget vs. 2019 actual year-end (Columns D&E) and proposed 2020 budget (Column F) document, along with comparisons with previous year-end results (Columns B&C) for comparative purposes.

The explanations in **Green** ink provide a description comparing the differences between the amounts budgeted for 2019 and the actual income/expense amounts for all of 2019.

The comments in **Black** ink are details on the proposed numbers for the 2020 budget.

Approval of the budget is needed.

Potential Growth Ideas Needed

APRES relies solely upon membership dues and annual meeting registrations/ sponsorships. For APRES to grow, it needs to grow membership, increase registrations, increase sponsorships and find other growth opportunities.

Committee Approved
May 28, 2020

APRES

2019 Year-End vs Budget Document and 2020 APRES Proposed Budget

BOD Approved 6-22-2020

	A	B	C	D	E	F	G
1	**INCOME**	**Actual 2017**	**Actual 2018**	**Approved Budget 2019**	**Actual 2019**	**Proposed 2020 Budget**	**2019 Budget vs. Actual Comments - Column D vs. Column E** **2020 Proposed Budget Rationale - Column F**
2	**Annual Dues**	**$22,850**	**$17,750**	**$25,000**	**17,650**	**$20,000**	Under budget; Sponsorships include membership as benefit Feel confident will reach goal;Will work to expand membership base and sponsorships; Better tracking and management via new software (Wild Apricot)
3	**AnMeeting Registrations**	**(SW) $43,620**	**(VC) $53,405**	**(SE) $40,000**	**(SE) $45,600**	**5,625**	Over Budget; Better than anticipated attendance; Lot of at the door registrations in 2019 Virtual Meeting: 100@$50; 25@$25; 118 accepted abstracts will meet goal; Anticipate more
4	**Sponsorships –**	**$39,750**	**$44,628**	**$40,000**	**$33,790**	**$14,250**	Under budget; Need more local support to boost sponsorships New Sponsorship request $1,000/video; Anticipate 10 companies will agree
5	Ice Cream Social	$0	$5,400	$5,000	$2,150	$0	Non-specificied donations gointo the Ice Cream Social category No Ice Cream Social for 2020
6	Wednesday Dinner	$19,000	$19,000	$19,000	$19,000	$0	On budget No Wednesday dinner for 2020
7	Thursday Reception	$3,250	$4,500	$4,500	$4,000	$0	Under budget; No Thursday reception for 2020
8	Meeting Breaks	$6,500	$6,000	$6,000	$4,500	$0	Under budget No meeting breaks for 2020
9	Spouse Suite/Program		$4,048	$2,500	$1,600	$0	Under budget; Category is supported by Sustaining Member sponsors, etc No spouse program for 2020
10	Awards	$4,000	$4,250	$4,250	$2,500	$4,250	Under budget; No Corteva Ed award Same as 2019 budget
11	Fun Run	$0	$630	$500	$40	$0	Under budget; Sponsor paid for shirts directly; Sales of excess shirts Fun run prizes to be donated
12	Other	$7,000	$800	$500	$0	$10,000	Under budget; Need more local support to boost sponsorships New Sponsorship request $1,000/video; Anticipate 10 companies will agree
13	**Peanut Science**	**$13,050**	**$15,849**	**$25,000**	**$17,059**	**$20,000**	Under budget; Negotiated a $3K per issue online hosting charge Anticipate billing 2 issues @ $10k per issue based on history
14	**Book Sales**	**$3,300**	**$960**	**$1,000**	**$4,100**	**$300**	Over budget; Books were purchased as gifts at AAGB conference Anticipate selling 3 copies @ $100/copy; No Point of Sale Opportunities
15	**Book Shipping**	**$27**	**$19**	**$50**	**$102**	**$25**	Reimbursed shipping by buyer Anticipate few sales; Still waiting on new Production book to be finalized
16	**Miscellaneous Income**	**$78+**	**$23**	**$800**	**$984**	**$500**	Over budget; Vanguard investment up Dividends and capital gains from Vanguard investment fund; anticipate downturn in market
17	**TOTAL**	**$123,387**	**$132,634**	**$131,850**	**$119,285**	**$60,700**	
18	Interest	$387	$484	$450	$540	$400	Over budget;Interest from CDs; Rates increase Budget less as money moved to Vanguard investment funds
19	**Total + Interest**	**$123,774**	**$133,118**	**$132,300**	**$119,825**	**$61,100**	Under budget; Sponsorship decrease and missed membership target Working toward a breakeven budget for 2020
20							
21							
22							

Committee Approved
May 28, 2020

APRES

2019 Year-End vs Budget Document and 2020 APRES Proposed Budget

BOD Approved 6-22-2020

	A	B	C	D	E	F	G
23	**EXPENSES**	**Actual 2017**	**Actual 2018**	**Approved Budget 2019**	**Actual 2019**	**Proposed 2020 Budget**	**2019 Budget vs. Actual Comments- Column D vs. Column E** **2020 Budget Rationale - Column F**
24	**Annual Meeting**	**(SW) $62,451**	**(VC-50th) $71,228**	**(SE) $56,250**	**$52,397**	**11, 250**	Under Budget; Hotel at Auburn gave APRES great discounts and incentives Virtual Meeting Expenses; Zoom Technology, etc.; Awards
25	Awards	$4,897	$6,284	$6,250	$5,160	$6,250	Under budget; Plaque printing error in 2018 give credit for 2020 Budgeting same as 2019 budget
26	Hotel Charges	$50,000	$45,328	$40,000	$40,678	$0	Over budget; Good sponsorships and great hotel f&b prices Virutual Meeting; No expenses for 2020; 2021 Deposit goes onn next year's budget as APRES is on accrual system
27	Speaker Expenses	$0	$2,795	$3,000	$92	$0	Under budget; Most speakers were members who paid their own way; Paid for one speaker meal No speaker expenses expected for virtual meeting
28	Spouse Suite/Program		$2,750	$3,000	$390	$0	Under budget, Not properly expensed No spouse program for virtual meeting
29	Supplies/Equip/AV	$0	$8,621	$2,500	$1,003	$5,000	Under budget; Left over supplies for 2018 Virtual Meeting Expenses; Zoom Technology, etc.; Cloud storage; Anticipate less than budget
30	Travel - Ext. Agents	$7,554	$1,612	$0	$0	$0	Sponsored program discontinued Sponsored program discontinued
31	Other Expenses	$3,000	$2,725	$1,500	$5,075	$0	Over budget. Coding issue; Bus charges should have been expenses to Spouse etc. None expected.
32							
33	**Peanut Science**	**$13,729**	**$22,292**	**$25,000**	**$18,495**	**$20,000**	Billed for 46-1&2&3; Negotiated reduction in online hosting charges Anticipating 2 issues billed in 2020 at $10K each
34	Publishing	$1,530	$6,588	$6,900	$5,350	$6,000	Under Budget Negotiating Contract for 2020; Anticipate increase for new platform
35	Editor Stipend	$3,000	$3,000	$3,000	$3,000	$3,000	On budget Same as 2019
36	Website Hosting	$8,152	$11,649	$14,000	$9,208	$10,000	Under Budget; Negotiated reduction in online hosting charges; Anticipate increase; Allen Press moving to new platform
37	Peer Review	$772	$779	$800	$455	$500	Under budget; Lots of manuscripts in pipline; fewer new submissions Manuscript Review fees
38	Other-CrossREf/DOIs	$275	$275	$300	$482	$500	Over Budget; CrossRef billing for DOIs instead of Allen Press CrossRef Fees for DOIs
39							
40	**Book Purchase - AOCS**	**$4,681**	**$0**	$0	$0	$0	No book purchases in 2019 No book purchases anticipated in 2020
41	**Book Shipping**		**$19**	**$50**	**$0**	**$25**	Included in Income;Majority of Books sold at Annual Meeting, no shipping fees or reimbursed by buyer Minimal shipping anticipated; Reimbursed by buyer

Committee Approved
May 28, 2020

APRES

2019 Year-End vs Budget Document and 2020 APRES Proposed Budget

BOD Approved 6-22-2020

	A	B	C	D	E	F	G
42	**EXPENSES,** Continued	**Actual 2017**	**Actual 2018**	**Approved Budget 2019**	**Actual 2019**	**Proposed 2020 Budget**	**2019 Budget vs. Actual Comments- Column D vs. Column E** **2020 Budget Rationale - Column F**
43	**Administrative Expenses**	**$27,997**	**$35,335**	**$41,130**	**$37,343**	**$39,965**	Under Budget Legal Expenses account for increase in budget
44	Executive Officer	$21,083	$27,583	$28,000	$28,000	$28,000	On budget Same as 2019
45	Taxes: Payroll	$2,072	$2,152	$2,500	$2,184	$2,200	Under budget Taxes @ 7.75%
46	Administrative Assistant	$0	$0	$0	$0	$0	APRES historical reference; Hired when EO is volunteer
47	Travel - Officers	$0	$0	$1,200	$1,624	$1,200	Over Budget; Travel to OKC/Dallas to secure 2020 venue Travel to industry meeting or 2021-2022-2023 site selection inspection
48	Corp. Registration Fees	$30	$30	$30	$30	$30	On budget Renewed January 2019; APRES Registered in state of Georgia
49	Legal Fees	$474	$0	$500	$0	$1,500	Under budget; Contingency funds Review 2020 Contract re. pandemic implications
50	Insurance	$100	$100	$100	$100	$100	On budget Same as 2019; BOD & Officer malfeasance insurance
51	Web Page Maintenance	$0	$0	$1,500	$348	$1,500	Under budget; security specialist not needed in 2019; GoDaddy Renewals Hiring network security specialist on as need basis for assistance
52	Accounting Services – Herring CPA	$1,915	$1,952	$2,175	$2,021	$2,100	Under budget; Herring did not increase their monthly fee for 2019 Monthly Billing $100/month; Taxes $675; Financial Statements $225
53	Outside Services	$455	$979	$1,700	$865	$1,000	Under budget; Email Marketing--Wild Apricot not fully implemented Email Marketing; Constant Contact; Membership Database software (Wild Apricot)
54	Postage	$47	$7	$50	$131	$150	Over budget Stamps/Mailing - Mailing BOD gifts
55	Office Expenses	$128	$0	$100	$171	$150	Over budget; Most expenses charged under Annual Meeting; New checks for New bank Office supplies
56	Bank Charges & Foreign Taxes	$38	$0	$25	$42	$35	Over budget; Stop Payment check 3500 (temporarily misplaced) & foreign transaction fees for wild apricot (canadian company) Amount of 1 cancelled check
57	PayPal/Credit Card Fees	$1,649	$2,532	$3,000	$1,827	$2,000	Under budget; Not as many transactions as projected Estimating to be similar to 2019; Likely to be less due to virtual meeting fee is less than live annual meeting fee
58	Miscellaneous	$0	$0	$250	$0	$0	Contingency fund
59	Depreciation	$0	$0	$0		$0	
60							
61	**Total Expenses**	**$108,858**	**$128,855**	**$122,430**	**$108,235**	**$59,990**	Expenses will be reduced due to move to a virtual Annual Meeting
62							
63							
64							

APRES

2019 Year-End vs Budget Document and 2020 APRES Proposed Budget

	A	B	C	D	E	F	G
65	**Income Over Expense**	**Actual 2017**	**Actual 2018**	**Approved Budget 2019**	**Actual 2019**	**Proposed 2020 Budget**	**2019 Budget vs. Actual Comments- Column D vs. Column E** **2020 Budget Rationale - Column F**
66	Total Income + Interest	**$123,774**	**$133,118**	**$132,300**	**$119,825**	**$61,100**	
67	Total Expenses	**$108,858**	**$128,855**	**$122,430**	**$108,235**	**$59,990**	
68	**Net Income**	**(SW) $14,916**	**(VC) $4,263**	**(SE) $9,870**	**(SE) $11,590**	**(Virtual) $1,200**	*2019 Income over Expense of $11,590; a positive result of $1,720 above budget* *2020 Anticipated Income over Expense of $1,200 projected; Sponsorships key to this outcome*

APRES
Finance Committee Report

2020 Year-to-Date Financial Overview

Balance Sheet as of May 31, 2020

APRES financial statements are reported using the accrual system.

Current assets are $253,931 primarily in cash—checking, CD, Vanguard investments. Accounts receivables of $17,338 consists of invoices which have been sen out but not been paid yet. They are Peanut Science page charges and sponsorships. We anticipate all will be received.

Liabilities are (-$28,876), which include a credit card bill; withholding taxes; pre-paid expenses for the 2021 Annual Meeting ($31,200) and credits for overpayments due to the change in Annual Meeting Registration fee ($1,050) add up to Total Equity of $282,428. Total Liabilities and Equity are $253,931. *(Technically, the PrePaid 2021 Annual Meeting liability should have been reported on the asset side of the balance sheet.)*

Profit & Loss Statement as of May 31, 2020

Income through May 31, 2020 is $27,833, consisting of Peanut Science paid page charges, membership dues, and registration fees.

Expenses are $21,712, which includes Executive Officer salary, taxes, Peanut Science publishing charges, and Annual Meeting expenses. With the addition of $252 in interest income, Net income for the first 5-months of the fiscal year is a positive $6,373.

As the 2020 budget has not yet been approved, a budget comparison is not included in the statement.

American Peanut Research and Education Society
Balance Sheet
As of May 31, 2020

	May 31, 20
ASSETS	
Current Assets	
Checking/Savings	
Vanguard	34,989.78
Paypal	13,611.73
Cash - Checking - 2629	51,666.15
Cash - MMA - 7397	122,408.30
Cash - CD 4647	13,916.73
Total Checking/Savings	236,592.69
Other Current Assets	
Account Recievable	17,338.00
Total Other Current Assets	17,338.00
Total Current Assets	253,930.69
TOTAL ASSETS	**253,930.69**
LIABILITIES & EQUITY	
Liabilities	
Current Liabilities	
Credit Cards	
Security Bank Card	379.14
Total Credit Cards	379.14
Other Current Liabilities	
Prepaid Expense Annual Meeting.	-31,200.00
Prepaid Annual Meeting Reg.	300.00
Prepaid Membership Dues	750.00
State W/H Tax	233.34
FICA/FWH Payable	1,040.66
Total Other Current Liabilities	-28,876.00
Total Current Liabilities	-28,496.86
Total Liabilities	-28,496.86
Equity	
31300 · Restricted Fund Balances	250.00
32000 · Unrestricted Fund Balances	275,804.07
Net Income	6,373.48
Total Equity	282,427.55
TOTAL LIABILITIES & EQUITY	**253,930.69**

American Peanut Research and Education Society
Profit & Loss
May 2020

	May 20	Jan - May 20
Ordinary Income/Expense		
Income		
Sponsorship-Annual Meeting	10,000.00	10,000.00
Peanut Science		
Page Charges	9,258.00	10,008.00
Total Peanut Science	9,258.00	10,008.00
Annual Dues		
Sustaining-Platinum Level	0.00	1,000.00
Sustaining-Silver Level	0.00	350.00
Institutional	0.00	100.00
Individual-Student	600.00	1,000.00
Individual-Post Doc/Tech Supp	75.00	75.00
Individual-Retired	25.00	150.00
Individual-Regular	1,650.00	3,500.00
Annual Dues - Other	100.00	100.00
Total Annual Dues	2,450.00	6,275.00
Meeting Registration		
Meeting Registration-Retired	25.00	25.00
Meeting Registration-Regular	-275.00	1,175.00
Meeting registration-Student	300.00	350.00
Total Meeting Registration	50.00	1,550.00
Total Income	21,758.00	27,833.00
Gross Profit	21,758.00	27,833.00
Expense		
Administrative Expense		
66000 · Wages - Executive Officer	2,333.33	13,999.98
Taxes - Payroll	178.50	1,113.00
Bank Charges		
Paypal Fees	102.34	47.30
Bank Charges - Other	25.00	25.00
Total Bank Charges	127.34	72.30
Webpage Maintenance	242.74	442.61
Dues and Subscriptions	0.00	30.00
Office Expense	0.00	100.00
Outside Services	96.40	379.20
Accounting	0.00	400.00
Administrative Expense - Other	4.75	4.75
Total Administrative Expense	2,983.06	16,541.84
Annual Meeting		
Supplies/Equip/AV	40.00	298.13
Total Annual Meeting	40.00	298.13
Peanut Science Publishing		
Composition Charges	0.00	1,113.35
Peer Trac	0.00	454.58

American Peanut Research and Education Society
Profit & Loss
May 2020

	May 20	Jan - May 20
Peanut Science Editor Stipend	0.00	3,000.00
Peanut Science Publishing - Other	0.00	304.00
Total Peanut Science Publishing	0.00	4,871.93
Total Expense	3,023.06	21,711.90
Net Ordinary Income	18,734.94	6,121.10
Other Income/Expense		
Other Income		
Interest Income	54.38	252.38
Total Other Income	54.38	252.38
Net Other Income	54.38	252.38
Net Income	**18,789.32**	**6,373.48**

June 2020

NOMINATING COMMITTEE REPORT

Rick Brandenburg, Chair

The Nominating Committee met electronically and submitted the slate of officers and directors for consideration to the 2020-21 APRES Board of Directors. (See page 2)

The Board of Directors reviewed the slate and validated each nominee is eligible to serve, if elected.

The Executive Committee endorsed the Committee's recommendation to conduct the election by electronic vote using a timetable outlined in the attached draft flyer. (See page 3) This flyer will be sent to the entire membership. A majority response of approval by 15% of the membership responding will secure approval.

Discussion on the timetable resulted in a change to the following:

Step 1: Call for Additional Nominees - Due June 30, 2020
Step 2: E-Official Slate of Nominees Distributed for E-Vote: July 1, 2020
Step 3: Submit E-Vote by Deadline: July 15, 2020
Step 4: New Board Announced July 16, 2020

Election results will be announce at the conclusion of Day 2 of the Jugg Sugg Competition on July 16, 2020.

2020-21 Committee Assignments

President-elect Grary Schwarzlose stated he is working through the list of 18 Committee appointments needed for the 2020-21 membership year. David Jordan, the Nominee for President-elect will be responsible for putting together his team for the Program Committee he will chair.

Respectfully submitted,

David Jordan
Chair

AMERICAN PEANUT RESEARCH & EDUCATION SOCIETY
BOARD OF DIRECTORS
Outgoing Board Members and Nominees for 2020-21

President…… Barry Tillman (2021)
Gary Schwarzlose (2022

Past President…… Rick Brandenburg (2020)
Barry Tillman (2021)

President-Elect…… Gary Schwarzlose (2022)
David Jordan (2023)

Executive Officer…… Kimberly Cutchins (2020)

University Representatives:
Virginia-Carolina…… Nathan Smith (2022)
Southeast……Bob Kemerait (2021)
Southwest……Mark Burow (2020)
Mark Burow (2023)
USDA Representative…… Lisa Dean (2022)

Industry Representatives:
Production…… Henry McLean (2021)
Grower Association…… Bob Sutter (2022)
Manufactured Products……Chris Liebold (2020)
Victor Nwosu (2023)
Director of Science and Technology of the
American Peanut Council…… Steve Brown (2020)
Steve Brown (2023)

National Peanut Board …… Dan Ward (2020)
Dan Ward (2023)

APRES Graduate Student Organization President……Chandler Levinson (2020)
Nick Hurdle (2021)

Call for Additional Nominees
APRES Board of Directors

Members of APRES,

It is the role of the Society's Membership to elect the Directors of the American Peanut Research and Education Society' Board of Directors from a list of nominees submitted by the Nominating Committee and verified eligible to serve by the APRES Board.

This year the activities of the Annual Meeting will be held virtually with the exception of the Annual Business Meeting, where the Directors election is held. In lieu of a formal vote of all members present at the Annual Business Meeting, this year's vote will be conducted electronically. A majority response of at least 15% of the APRES membership will determine the new members to the 2020-21 APRES Board of Directors. The List of Nominees is below along with a voting schedule.

Membership E-Vote

Election of new members to the Board of Directors will be conducted by e-vote. It will be conducted in two parts:

Step 1: Call for Additional Nominees - Due June 30, 2020
Step 2: E-Official Slate of Nominees Distributed for E-Vote: July 1, 2020
Step 3: E-Vote Deadline: July 15, 2020

This is Step 1. Please email Nominating Committee Chair, Rick Brandenburg, with any additional nominations by **June 30, 2020.** If you agree with the 2020-21 nominees submitted by the Nominating Committee, no action is needed until Step 2.

Report of the Nominating Committee

Rick Brandenburg, Committee Chair

The Nominating Committee submits the following nominees to fill the Board seats expiring July 16, 2020.

Board Member Terms Ending	Outgoing Board Member	Board Nominees
President	Barry Tillman	Gary Schwarzlose, Bayer
President-elect	Gary Schwarzlose	David Jordan, NC State University
Past President	Rick Brandenburg	Barry Tillman, University of Florida
SW University Rep	Mark Burow	Mark Burow, Texas A&M
Industry Rep Manufactured Product	Chris Liebold	Victor Nwosu, Mars Wrigley
American Peanut Council Rep	Steve Brown	Steve Brown, APC
National Peanut Board Rep	Dan Ward	Dan Ward, National Peanut Board
APRES Graduate Student Organization Rep	Chandler Levinson	Nick Hurdle, University of Georgia

The APRES Board of Directors met on June 22, 2020 and validated each nominee is eligible to serve.

AMERICAN PEANUT RESEARCH & EDUCATION SOCIETY
BOARD OF DIRECTORS
2020-21

President
Gary Schwarzlose (2022)

President-Elect
David Jordan (2023)

Past President
Barry Tillman (2021)

University Representatives:
- Virginia-Carolina..... Nathan Smith (2022)
- Southeast..... Bob Kemerait (2021)
- Southwest..... Mark Burow (2023)

USDA Representative..... Lisa Dean (2022)

Industry Representatives:
- Production..... Henry McLean (2021)
- Grower Association..... Bob Sutter (2022)
- Manufactured Products..... Victor Nwosu (2023)

Director of Science and Technology of the
- American Peanut Council..... Steve Brown (2023)

National Peanut Board ..... Dan Ward (2023)

APRES Graduate Student Organization President..... Nick Hurdle (2021)

Peanut Quality Committee Report

Date: May 29, 2020 Via Microsoft Teams

Members: Ken Barton, Lyndsay Bashore, Lisa Dean, Ricky Hartley, Chris Liebold, William Pearce, Naveen Puppala, Jason Woodward

Topics of Discussion:

Aflatoxin in the 2019 Crop-

The 2019 southeastern U.S. peanut crop is one of worst quality crops that the industry has ever seen. Late season heat and drought stressed the crop and resulted in reduced yield, increased damage, and high amounts of aflatoxin. These quality challenges have been tough for peanut growers, shellers, and manufacturing companies. Growers lost revenue due to yield loss and quality degradation penalties. Shellers are challenged to clean up a poorer quality crop and meet aflatoxin restrictions for edibles. Manufacturers are working with shellers where they can to be amendable on their normal raw peanut quality size and spec limits. Fortunately, most are managing well and getting the peanuts they need to run plants and meet the customer demands.

The cost/benefit of irrigation investment was discussed. New irrigation is going in where it can and makes economic sense. Some areas are not issuing any new irrigation well permits, so this is restricting the ability to add irrigation that is not surface water.

The industry needs a good 2020 crop for all segments to increase profitability and return the supply and quality to a healthier place.

Seed Quality/2020 Planting Increase-

Peanut acres intended for seed production in 2019 endured the same environmental stressors that caused quality problems with our edibles. Therefore, the industry has encountered seed quality challenges as we plant the 2020 crop. Aflatoxin has been tested for and discovered in some seed lots. A great deal of seed came in field-dried with very low moisture last fall. This lead to an increase in split kernels during shelling and less viable seed. The industry has seen some low seed germination rates that negatively impact plant stands.

Seed shelling and kernel sizing was brought up for discussion. Research tells us that peanut maturity level has an impact on the progeny that may come from that seed. Thus, less mature seed can equal less mature quality coming with the next crop. Some shelling companies size their seed uniformly and screen off the largest jumbo kernels and the smaller, less mature kernels that fall through a +18/64 slotted screen. Others choose to include everything riding a +16/64 slotted screen with no upper limit either. This is an individual company decision with no laws governing the sizes eligible for sale. The question was posed if the industry should seek a standard on seed sizing? Would this help with seed quality and consistency?

The industry anticipates a 15-20% increase in peanut planted acres for this year. Most planting has occurred on time. Valencias are behind in the Southwest, but catching up.

Demand Increase/Any Concerns with Quality of the Supply-

Peanut consumption is up and that is great for the industry. Peanut butter and snacks are doing particularly well. What happens if we have a bad 2020 crop to short supply and quality? With the 2019 challenges, companies are using different sizes, and maybe some peanut types, that they normally would not. Aflatoxin problems and shortages of a particular origin, size, or spec are causing this. A bad 2020 crop could cause us problems meeting demand should that scenario play out. However, the large increase in plantings and at least a normal weather year should yield a good supply of quality peanuts and meet our needs.

Freeze Damage in SW Peanuts-

Kraft-Heinz noted some consumer complaints attributable to freeze damage in Southwest Virginia type peanuts. The complaints referenced kernel texture hardness and a burnt appearance in roasted snack nuts. Hardness can be a trait of higher sugar content. “Freeze” is a type of damage that FSIS graders inspect for when grading farmerstock peanuts. If any is detected, a sheller would segregate those peanuts separately. The inspection is all visual and there is no test for freeze damage. Growers and shellers can work together to proactively manage the risk of freeze damage when digging peanuts and having them cure in the field. Watching the weather and being mindful of freeze risk and potential impact on peanut grade and quality is very important.

UPPT-

UPPT samples were sent in to USDA-ARS Raleigh just as businesses began to close for the pandemic. The chemistry work will have to be completed and reported at a later time.

Quality on Properties beyond Maturity and Fatty Acid Composition-

Plant based protein is a big topic in food these days and we need to be mindful of protein percentages in current varieties and potential new releases. We certainly do not want to lose any protein. Fiber and Folate get brought up in conversation of what else to test for in peanut and what benefits they bring. Both can be costly or difficult to test for and funding is always an issue. Collaborating with the Peanut Institute on their work with any micronutrients and compounds would be a good idea.

Peanut Research Foundation Update-

Mission is to support and fund research that keeps the U.S. peanut industry competitive and resilient. We are currently in year one of Phase II of the Peanut Genomic Initiative. Our goal is to build on the successes and tools developed in Phase I, while focusing our research on four primary areas. These areas are Disease Resistance (Leafspot Initially), Drought Tolerance, Aflatoxin Mitigation, and Flavor Conservation/Enhancement. We had some great research proposals submitted during this last cycle and have funded several good projects. It's anticipated that we may have some delays due to the pandemic, yet we expect to move forward with all projects. Any and all of them could have a significant impact on maintaining and improving peanut quality.

Program Committee Report

Gary Schwarzlose, Chair

June 2020

The Committee met in February 2020 at the Omni Mandalay Resort in Dallas, TX for a site inspection of the property in anticipation of the 2020 Annual Meeting. Shortly thereafter, the nation was shut down due to the pandemic and the Committee began discussing the possibility of having a virtual meeting format.

With the Board of Directors endorsement in early March, the Committee organized an ad hoc subcommittee to create a Plan B option. The Board voted to move to a virtual meeting on April 30, 2020 and asked the Committee to go to Plan B. The meeting will consist of 5 webinars and on-line program content, which are highlighted in the next few pages.

The General Session theme is Production, Challenges, Strategies and this year's symposium is Aflatoxin: Impacts and Challenges for the U.S. and Beyond. Speakers have been invited and accepted. Johnny Cason (Technical Program Chair) and Emi Kimura (Local Arrangements Chair) were complimented on their superior organizational skills.

The Call for Papers was announced in January and 116 abstracts received. Registration is underway. The meeting will be an APRES members-only event. Fees are $50 for Individuals and $25 for all others. Membership must be paid in advance of the meeting to enter the event. Sponsorships are being solicited at $1,000 per member with a new perc of a sponsor video to be included in the online Program content to accompany one complimentary registration and membership.

A virtual Fun Run event is being planned with 8 gift certificate awards. A virtual Ice Cream Social is under consideration.

Respectfully submitted,

Gary Schwarzlose
Chair

Welcome

Sid Miller
Commissioner of Agriculture
State of Texas

Dr. Patrick Stover
Vice Chancellor and Dean
College of Agriculture and Life Sciences
Texas A&M University

General Session

Production, Challenges & Strategies

July 14, 2020 * 10:00 AM - 12:00 PM EST
Live Webinar

Trends
Patrick Archer
American Peanut Council

Markets & Trade
Dr. Luis Ribero
Texas A&M University

Nutrition
Dr. Samara Sterling
The Peanut Institute

Farming Challenges & Strategies
Texas Peanut Producers Panel

Symposium

Aflatoxin: Impacts and Challenges for the U.S. and Beyond

July 14, 2020 * 2:00 - 4:00 PM EST
Live Webinar

Economic Impacts and Overview of the Issue
Dr. Marshall Lamb
USDA-ARS-NPRL

Improved System Assessment of Aflatoxin Risk Utilizing Novel Data & Sensing Approaches at Points of Vulnerability
Dr. Diane Rowland
University of Florida

Dealing with Aspergillus in Peanut Seed-- An Old Enemy Learns Some New Tricks
Dr. Tim Brenneman
University of Georgia

Breeding for PreHarvest Aflatoxin Resistance
Dr. Corley Holbrook
USDA-ARS-CGCR

Advances in RNA Technology for the Control of Aflatoxin in Peanuts
Dr. Renee Arias
USDA-ARS-NPRL

Aflatoxin: An Industry Perspective
Dr. Darlene Cowart
Birdsong Peanuts

52nd APRES Annual Meeting

July 14-16, 2020

An APRES Members-only Event

Page 2

Pre-Recorded Online Program & Sponsor Videos

View at Your Leisure Online beginning July 14th

APRES Board & Committee Meeting
Breakout Sessions
Poster Session
Graduate Student Poster Competition
Sponsor Videos
Industry Reports
Awards Winners

Graduate Student Programs

Joe Sugg Award Graduate Student Competition

July 15 & 16, 2020
8:00 AM - 12:30 PM EST
Live Webinar

Graduate Student Seminar

July 15, 2020 * 1:30 PM EST

Interviews

Dr. Sherry Harsch-Porter
Board Certified Coach
PorterBay Insight Group on Leadership
Live Zoom Meeting

On-line Program Content Overview

What will be in the Members-only area of the 2020 APRES Virtual Annual Meeting On-line Program? The traditional parts of the live meeting, re-formatted for the new digital era. When you login to the members-only area you will find:

List of Presentations

This year APRES received 116 papers will be presented through live webinars; audio/video-recorded PowerPoint presentation; and PDFs. Every paper can be found in this master list of presentations.

Sort the alphabetical list by author name, topic, or session to find your special interest. Click on the Title to read the abstract; Click on the YouTube video to watch a presentation or sponsor video; Click on the PDF for an in-depth view of the Posters.

All items can be viewed at your leisure beginning July 14th and will become a part of the APRES historical digital database accessible to all APRES members.

Research Abstracts

The author of each research/education paper accepted for presentation at the 2020 APRES Virtual Annual Meeting posted an abstract to the APRES website. Click on each title in the list of presentations to read a short summary of each project, which will help you prioritize your viewing list.

Concurrent Breakout Sessions

Abstract authors narrated and video-recorded their 15-minute research presentations with PowerPoint; replacing the traditional four (4) concurrent breakout session at our live meeting.

The pre-recorded files have been uploaded to the APRES YouTube channel and links connected to the complete list of presentations. Click on the video link to view the presentation.

Poster Session

Gone for this year are the 30"x40" Posters on stands, superseded by a digital Poster image and narrated overview of each project. A PDF of each poster is also available for an in-depth look. Click on both the presentation and the PDF to listen to the presentation while getting a closer look at the Poster. Poster Narrations up to 15-minutes.

National Peanut Board Graduate Student Poster Competition

Graduate students were given up to 5 minutes to discuss their project in this year's digital contest. The 30"x40" or 36"x36" poster image is paired with a narrated overview. Click on both the presentation and the PDF to listen to the presentation while getting a closer look at the Poster. Winners receive $350+APRES book for First Place; $150+APRES book for 2nd Place.

Sponsor Videos

We asked APRES's 2020 Sustaining Members to submit a video of their choice, up to 15-minutes in length to share. Take a moment to view their innovative and inspiring messages.

Board & Committee Reports

APRES' Committees and Board of Directors met in June to carry out the Society's business normally conducted at the Annual Meeting. Minutes of the each 2019-2020 Board meeting and reports from each Committee can be accessed. The APRES Business meeting has been cancelled for this year and APRES members are asked to read these reports to get a

complete picture of the Society's activities this year. A membership e-vote initiated July 1st is in the process of determining new members to the Board of Directors. Voting closes July 15th. Please vote today!

Webinar Recordings

Missed the live webinars? You get a second chance to hear our great group of speakers from the General Session; Aflatoxin Symposium; and Joe Sugg Award Graduate Student Competition webinars. Zoom records all webinars and provides a recording that we will upload to the APRES digital database.

Industry Reports

Industry reports from the Crop Germplasm Committee and the Seed Summit will be posted.

Awards Winners

Annual recognition awards recipients will be announced at the end of the General Session live webinar on July 14th. All awards recipients and winner's of this year's competitions will be contacted directly and a short summary posted online. The formal presentation of the awards will occur at the 2021 Annual Meeting in Dallas.

How To View the Members-Only On-line Content

All content will be available for viewing at your leisure **beginning July 14th**.

Your APRES membership must be up-to-date (2020-21 Member) to access the 2020 APRES Virtual Annual Meeting On-line Program Content. All 2020 program content is on the APRES website www.apresinc.com.

First time users to the Members-only area will be asked to enter the email they used to register for the meeting and to select "Forgot Password" to create a password. Respond to the email to set your password and login.

Need help? Contact Executive Officer Kim Cutchins at kim.cutchins@apresinc.com or 229-329-2949.

Barry Tillman	and	Gary Schwarzlose
President		2020 Program Chair
APRES		APRES

Public Relations Committee Meeting

Dylan Wann, Chair

June 18, 2020

AGENDA

1) Updates on current necrology report
   a. Richard Rudolph, Bayer
   b. Tom Beaty, Universal Blancers
   c. Mary Webb, Texas Peanut Producers Board
   d. Gregory Sayer
   e. Jasper B. Sanfilippo, Sr., Sanfilippo Peanuts
   f. Ernest Harvey, Golden Peanut
   g. Mert Felts, Virginia Peanut Growers

2) Notable retirements in past year
   a. None of record yet – any updates?
   b. Patrick Archer, American Peanut Council retiring in 1.5 years

3) Updates on cross-promotion with NPB and Peanut Institute at 2020 APRES meetings
   a. General Session program -- Gary Schwarzlose
   b. Discuss cross-promotion options for 2021 meetings (TPPB, NPB, Peanut Institute, etc.)

   Ideas for 2020 have been postponed to 2021
   1. Community Fun Run
   2. Press and/or dietician lunch during 2021 meeting with TPPB & NPB & PI
   3. Ask the Experts session

4) Updates on potential collaboration with AAGB and IPGI for international meetings
   a. Dylan Wann

   The AAGB meeting is due to come back to the United Sates in 2023; discussion ongoing about having a joint meeting. EO asked to include additional space for 2023 in anticipation of a joint event.

5) Other business/updates

1. Virtual Ice Cream Social for 2020 Annual Meeting
2. World Peanut Meeting in Argentina - Virtual Format
3. APRES should consider doing more webinars in the future on a variety of topic, such as world peanut production research.
4. Consider changing current Annual Meeting structure to hold Committee meetings in advance all the time to free up more program time for more research discussion

Publications and Editorial Committee Meeting

Josh Clevenger, Chair

June 18th, 2018 3:30pm – 4:30pm

ZOOM

- The Publications and Editorial Committee held a zoom meeting with all in attendance plus Dr. Chris Liebold
- The production book was discussed. Currently 5 chapters have been received from authors with Maria Balota delivering a chapter on physiological development and abiotic stress tolerance. Two chapters will be combined into one; Marshall Lamb's economics of production and Chriss Butts' irrigation and water use. It will be completed by Dr. Butts.
- We discussed for the chapter on Historical developments of peanut that Howard Valentine would be a god choice to ask. Dr. John Beasley conceded he could not deliver the chapter. Dr. Tallury and Dr. Clevenger will reach out to Mr. Valentine.
- For Disease Management and Insect Management the committee discussed an update instead of new chapters. The chapters from the previous book could be used with an update. This would relieve authors from writing an entire chapter. For insect management we would ask Dr. Mark Abney and for disease management Dr. Tim and Brenneman and Dr. Albert Culbreath.
- The committee also discussed the quarterly newsletter, went over the email list for updates, and suggested to engage the graduate student representatives for news. Dr. Clevenger suggested adding Peggy Ozias-Akins to the list as the Director of the Institute of Plant Breeding at UGA.
- The Peanut Science website will be updated by Allen Press this Fall. EO Kim has been negotiating with Allen Press for the last several years for a more individualized look and improvements in SEO to increase citations for impact factor certification.

SITE SELECTION COMMITTEE

Gary Schwarzlose, Chair

June 2020 Report

The Committee submitted site recommendations for 2021 (VC) and 2022 (SE). EO Kim Cutchins visited sites in Charlotte, Ashville, Greensboro, Raleigh, and Wilmington, NC for 2021. And, Savannah, Jekyll Island, and Atlanta for 2022. Negotiations for 2021 fell through for Charlotte and negotiations were underway for Wilmington when the pandemic struck.

APRES was able to negotiate a "lift and shift" change to its 2020 contract with the Omni Mandalay Hotel at Las Colinas in Dallas, which means APRES will hold its 2021 meeting in Dallas. The 2020 meeting will be a virtual meeting.

A tentative agreement has been reach with the Hotel Ballast in Wilmington, NC for 2022.

EO Kim Cutchins has been asked to re-visit properties in Savannah

Respectfully submitted,
Gary Schwarzlose, Chair
Site Selection Committee

2020: July 14-16
VIRTUAL MEETING

2021: JULY 13-15
OMNI MANDALAY RESORT AT LAS COLINAS
DALLAS, TEXAS

2022: JULY 12-14
HOTEL BALLAST *(Tentative Agreement)*
WILMINGTON, NC

2023: JULY 11-13
SOUTHEAST REGION (GEORGIA)
JEKYLL ISLAND
SAVANNAH
ATLANTA

2024: JULY 9-11
SOUTHWEST REGION

FELLOW OF THE SOCIETY COMMITTEE

June 2020 Report

Fellow of the Society is the highest Honor a Member of the Society can receive.

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. Fellows of the Society are 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.

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.

The Committee received one nomination and the Committee is in agreement that **Dr. Tim Grey, University of Georgia**, should be honored as Fellow of the Society for 2020.

Chair David Jordan brought the nomination to the Board on June 22, 2020 for review and approval. It was moved by David Jordan, seconded by Bob Kemerait and **unanimously approved by the APRES Board of Directors to bestow the honor of Fellow of the Society to Dr. Tim Grey, University of Georgia.**

Respectfully submitted,

David Jordan
Chair

Dr. Tim Grey
Fellow of the Society

Dr. Tim Grey is a professor of Crop and Soil Sciences at the University of Georgia. He has been very active in APRES for over 25 years, serving as Editor of Peanut Science since 2012, and Associate Editor from 2005 - 2012. In 2019, Tim received the Coyt T. Wilson Award, in 2016 the Dow Agriscience Award for Excellence in Teaching in 2016, and for Excellence in Research in 2011.

Tim is a world recognized leader in weed science and plant physiology, and herbicide chemistry, dissipation and resistance. His research program has focused on herbicide use and dissipation in peanut, vegetables and other row crops, herbicide resistant weeds, agronomic and alternative crop production systems, as well as, fruit and nut production. Dr. Grey works in collaboration with UGA, USDA/ARS, other university's scientists, graduate students, research technicians and staff, as well as state clientele, and industry representatives. His contributions on peanut seed germination, seedling vigor and physiology are also especially noteworthy, resulting in changes in the recommendations on when to plant seed based on soil temperature. His innovative use of his thermogradient table has also been important for evaluation of seed quality in breeding lines for the plant breeding programs. He has published 135 journal articles, and 10 book chapters, made over 200 contributed and invited presentations at various professional meetings. Recognition of his research accomplishments has come as awards from University of Georgia, University of Kentucky, USDA, American Society of Agronomy, APRES Bailey Award nominations, APRES 2011 Dow Agriscience Award for Excellence in Research.

Tim has served on many APRES committees and has an exemplary record of APRES volunteer service. Of particular note, his 15 years of leadership and dedication to the publication of Peanut Science, APRES' peer-reviewed scientific journal. Peanut Science published 34 issues containing 333 peer-reviewed articles during his outstanding leadership as an Associate Editor and since 2012, as its Editor. Addtionally, the challenging transition from a printed only journal to a digital journal was all due to his expertise, dedication and guidance. The hours of service to publishing during his tenure is unprecedented and was recognized in 2019 with his receiving the APRES Coyt T. Wilson Distinguished Service Award.

Dr. Grey has an excellent record in education, both in direction of graduate student programs and formal classroom teaching. He has been a leader in establishing and sustaining teaching programs at the University of Georgia, Tifton Campus, and has been invited as a guest teacher for courses abroad. He has served as chair for 10 graduate students, served on committees for 30 others (13 as major professor) and supervised three postdoctoral associates. Dr. Grey has always emphasized that his students attend the APRES annual meeting and compete in the Joe Sugg competition. Since 2005, he has been associated with 38 APRES abstracts (23 presentations with fellow scientists, and 15 student presentations and posters). Recognition of his accomplishments in education has come as awards from the University of Georgia, as well as the APRES DowAgrisciences Excellence in Education Award.

Dr. Grey does so much in so many different areas and excels in all. The combination of his outstanding research accomplishments, excellent educational activities, and his admirable service to The University of Georgia, the peanut industry, and APRES, makes Dr. Timothy Grey most deserving of being named an APRES Fellow of the Society.

2020 COYT T. WILSON DISTINGUISHED SERVICE AWARD

Report

The Coyt T. Wilson Distinguished Service 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.

All business for this Committee was conducted electronically. Two nominations were received and reviewed by all Committee members. The Committee's votes have been received. Both candidates were undoubtedly highly deserving.

There was a unanimous consensus to advance **Dr. Kelly Chamberlin, USDA-ARS** for recognition of the **2020 Coyt T. Wilson Distinguished Service Award**.

Respectfully submitted,
Dan Anco, Chairman

Dr. Kelly Chenault Chamberlin

2020 Coyt T. Wilson Distinguished Service Award Recipient

Dr. Kelly Chamberlin has been an active APRES member since 1997 and has been contributing distinguished service to APRES since 1999. Over her 23-year APRES membership, Dr. Chenault has held virtually every leadership position highlighted by her Presidency in 2009, concurrent Board of Directors service, and elected Fellow of the Society in 2012. Since joining the Society in 1997, she has received 41 APRES membership service recognitions, having served on the majority of APRES committees including: Nominating Committee (Chair); Finance Committee (Chair & Member); Bailey Award Committee (Chair & Member); Joe Sugg Graduate Student Award Committee (Member); Dow Agrochemicals Award for Excellence in Research and Education Committee (Chair & Member); Annual Meeting Program Committee (Chair); Annual Meeting Technical Program Committee, (Chair); Fellow of the Society Award Committee (Chair & Member); Public Relations Committee (Member); and Site Selection Committee (Member).

In addition to her APRES committee service, Kelly has served since 1999 as an Associate Editor on the Editorial Board for APRES' peer reviewed scientific journal Peanut Science.

Dr Chamberlain's gathered these APRES kudos while excelling in her professional career. She has progressed from Research Biologist to USDA ARS Research Leader and Lead Scientist while simultaneously holding the rank of Adjunct Professor in the Departments of Plant and Soil Sciences/Entomology and Plant Pathology at Oklahoma State University.

Her professional record of accomplishments and contributions to the peanut industry are matched by few others. The value of her influence on modern peanut breeding cannot be overstated and her partnership are highly valued at state, regional and national levels. From her research program, she has released six high yielding and disease resistant peanut cultivars which are directly and positively impacting the peanut industry. On a national level, she has been recognized with the USDA Under Secretary's Award of Merit as the Team Lead, Legume and Oilseed Breeding, for developing high performing, disease and weather tolerant legume and oilseed crops with increased value and health benefits. She was a valued partner in the international Peanut Genome Initiative. And, last but not least, she is leading the USDA/ARS effort in identifying and developing resistance to peanut smut in cooperation with peanut scientists in Argentina.

In every case, Dr. Chamberlain has provided both outstanding leadership and "roll up your sleeves and get the work done effort". She is highly respected among her peers in both the Society and the peanut industry. Hers is a voice that is heard and her message is valued and will always be part of a collective solution to Society and industry issues.

Kelly's dedication to and passion for APRES and the peanut industry are an enduring source of inspiration for others to similarly share their talents. It is with great honor that Dr. Kelly C. Chamberlain is awarded APRES' 2020 Coyt T. Wilson Distinguished Service award.

CORTEVA™ AGRISCIENCE
EXCELLENCE IN RESEARCH AND EDUCATION AWARDS

2020 COMMITTEE REPORT

Nominations have been received. The Committee voted electronically and approved the 2020 recipients are:

2020 Corteva™ Agriscience Award for Excellence in Education

Dr. Corely Holbrook

USDA-ARS

2020 Corteva™ Agriscience Award for Excellence in Research

Dr. Ye Chu

University of Georgia

Dr. Holbrook and Dr. Chu will each receive a plaque commemorating the occasion and a $1,000 check from awards sponsor Corteva™ Agriscience.

Respectfully submitted,

Nick Dufault

Chair

Bailey Award Committee Report

June 2020

Good Afternoon,

The Bailey Award Committee received 12 nominations from the 2019 APRES Meeting in Auburn, AL. After the 12 nominations were received, the committee contacted each nominee and asked them provided a manuscript to the committee for consideration for Bailey Award. There were 6 manuscripts submitted to the committee for consideration. All manuscripts were assessed based on 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; and 4) Contribution to peanut scientific knowledge. Each area was assessed on a 1 to 10 (10 being the highest and 1 being the lowest). The winner of the bailey award had the overall highest score from all of the members of the bailey award committee.

The 6 manuscripts submitted to the Bailey Award Committee were:

"A Major Seed Size QTL on Chromosome A05 of a Peanut Cultivar is Conserved in the U.S. Mini Core Germplasm Collection" --- Juliet Chu

"Timing of Termination for Supplemental Replanted Peanut to Maximize Yield and Grade" --- Scott Tubbs

"Nitrogen Credits after Peanut" --- Michael Mulvaney

"Relative importance of Variability Sources in Smut Resistance Assessment in Field Tests" --- J. Baldessari

"Cotton and Peanut Sustainability Education" --- Anna Hartley

"'Walton', a New Virginia-Type Peanut Suitable for Virginia" --- Maria Balota

The Bailey Award Recipient for for the best paper at the 2019 APRES Annual Meeting is:

Dr. Scott Tubbs, University of Georgia
"Timing of Termination for Supplemental Replanted Peanut to Maximize Yield and Grade"
Co-author: Dr. Scot Monfort, University of Georgia.

Bailey Award Nominations 2020 – Upon the decision to go to a virtual format for the 2020 APRES Annual Meeting, the Committee was asked to determine if the new format would lend itself to meet the judging criteria for nominations for the 2020 Bailey Award. *(The presentation format for all breakout sessions will be a recorded, narrated PowerPoint presentation.)* **It was the majority opinion that the Bailey Award be suspended for 2020 and reinstated for the 2021 Annual Meeting, if it returns to a live meeting.**

Respectfully submitted,

Scott Monfort
Bailey Award Committee Chair

JOE SUGG GRADUATE STUDENT COMPETITION COMMITTEE

June 2020 Report

Years of Competition:	31 Years, began in 1989
2020 Competitors:	28 (Largest in History)
# of Universities:	9 Universities (Matching record set in 2017) UGA, Iowa State, KNUST, Clemson, Auburn, TTU, UFL, CSIR, VT
# of Countries:	2 – U.S. & Ghana
Sponsor:	North Carolina Peanut Growers Associatiion Increased prize money to $1,000
Virtual Format:	Expanded to 2-days due to large number of Participants July 15 & 16 8:00AM – 12:30 PM with one 15 minute break Rule Changes Format Changes: Live Webinar with PowerPoint Presentation Video Instructions Created Do's and Don'ts Created Winner Announcements by Email Blast

Graduate Student Poster Competition

Years of Competition:	3 Years, began in 2018
2020 # of Competitors:	10
# of Universities:	6 Universities UGA, Auburn, Valdosta State, VT, NCSU, UFL
# of Countries:	1
Sponsor:	National Peanut Board
Virtual Format:	Poster with Recorded Narrative Poster Dimension Size Change to 40" Wide x 30" Tall Video Instruction Created Winner Announcements Made Via Email Blast

Assistance of Emi Kimura, Chandler Levinson and Perrine Kemerait

Joe Sugg Award Graduate Student Competition

Oral Presentation Format

First Place: Chandler Levinson, University of Georgia

"Anatomical Characteristics Correlated to Peg Strength in Arachis Species"

Second Place: Kayla Eason, University of Georgia

Third Place: Nick Hurdle, University of Georgia

Sponsored By: North Carolina Peanut Growers Association

National Peanut Board
Graduate Student Poster Competition

First Place: **Pin Chu Lai, University of Georgia**
"Tomato Spotted Wilt Epidemiology and Its Impacts on Peanut Yield"

Second Place: Ben Aigner, University of Georgia

Honorable Mention: Y-C Tsai, University of Georgia

GRADUATE STUDENT ORGANIZATION

2019-20 ACTIVITIES

1. Group Zoom Meetings to Practice Masters Theses and Doctoral Dissertations

2. Joe Sugg Graduate Student Competition - Largest number of competitors ever

3. NPB Graduate Student Poster Competition

4. Graduate Student Seminar
    a. July 15, 2020 @ 1:30 PM EST
    b. Speaker: Dr. Sherry Harsch-Porter
        1. Board Certified Coach
        2. Porter-Bay Insight Group
    c. Student will break out into Zoom Rooms to practice Interviewing Skills

5. Incoming President: Nick Hurdle, University of Georgia

APRES Board Member Recognition
2020

Rick Brandenburg	2016-17	VC University Rep
	2017-18	President-elect
	2018-19	President
	2019-20	Past President
Mark Burow	November 2018-2019 (Jason Woodward changed jobs; not in SW or University)	
	2019-20	
	Nominated to Return for a Full Term 2020-21 thru 2022-23	
Chris Liebold	2017-18	
	2018-19	
	2019-20	
Steve Brown	2017-18	
	2018-19	
	2019-20	
	Nominated to Return to Represent APC	
Dan Ward	2013-14	
	2014-15	
	2015-16	
	2016-17	
	2017-18	
	2018-19	
	2019-20	
	Nominated to Return to Represent NPB	
Chandler Levinson	2019-20	

Overview
2020 APRES Virtual Annual Meeting
July 14-16, 2020
52nd Celebration
Virtual Format

(The virtual format of the meeting did not allow APRES to conduct its traditional Business Meeting. All business matters were conducted prior to the 2020 Virtual Annual Meeting via a Zoom Board of Directors meeting on June 22, 2020 and electronic mail to the APRES membership. Membership actions, Committee reports and Awards Winners announcements were posted to the APRES website, recorded in the APRES Board minutes, and archived in the 2020 Proceedings.)

The 52nd Annual Meeting of the American Peanut Research and Education Society (APRES) was held virtually July 14-16, 2020 due to COVID-19 federal, state and local meeting restrictions. APRES President Barry Tillman (UFL) presided over the meeting and the Program Committee, led by Gary Schwarzlose, created an entire new way to meet via Zoom technology.

The APRES Board and Program Committee began meeting every two weeks in March to discuss the emerging Covid-19 pandemic. As each week brought new business closures and travel restrictions, the group discussed how to plan for the 2020 Annual Meeting. A Plan B virtual format was created where the General Session, Technical Symposium and the Joe Sugg Competition would be held live via Zoom technology. And, the Technical Program breakout sessions and the Poster session were re-structured as pre-recorded audio, slide presentations and poster images with recordings posted on the APRES website and its newly created APRES YouTube channel. A decision was made May 1st to go virtual when the hotel (Omni Las Colinas Hotel, Dallas, TX) agreed to shift APRES' contractual obligation to 2020 without penalty. *(Huge thanks to Technical Chair, John Cason; Local Arrangements Chair, Emi Kimura; APRES Grad Student Organization President, Chandler Levinson, and APRES Intern Perrine Kemerait, who made a virtual meeting possible with their technical knowledge of Zoom, Facebook, Powerpoint recording features, YouTube, etc...)*

President Barry Tillman kicked off the virtual meeting of 250 attendees from every peanut producing state and 9 countries at 10:00 AM EST on July 14th by thanking all the APRES members/attendees and, especially, the **sponsors of this year's meeting—Amvac, Bayer, BASF, Birdsong Peanuts, Corteva Agriscience, Fine Americas, National Peanut Board, National Peanut Buying Points Association, North Carolina Peanut Growers Association, Olam Edible Nuts, The J.M. Smucker Company, Syngenta, Texas Peanut Producers Board, Texas Tech University, Valent, Virginia Peanut Growers Association, and Visjon Biologics whose support keep APRES strong.**

Highlights of the program included opening General Session addresses by:
Sid Miller, Texas Commissioner of Agriculture and Dr. Patrick Stover, Vice Chancellor and Dean for Agriculture and Life Sciences at Texas A&M University, welcomed the attendees virtually to the state of Texas, providing attendees with an overview of agriculture in Texas. A panel session on **"Production, Challenges & Strategies"** expanded the topic to a

global level. Leading off was **Patrick Archer, American Peanut Council,** with ***"A Look at the Global Peanut Market"***. Exports make up 25+% of the farmers stock market with China is becoming a dominant player in the market, from the traditional European, Canadian, Mexican markets. The reason for this change is China's peanut consumption has increased 26%, while production has increased only 18% since 2000. Canada is the U.S. largest export market with Mexico close on their heels. Challenges affecting world marketing are differences in rules regarding aflatoxin, pesticide monitoring, port inspection procedures, CODEX, trade agreements (tariff & non-tarrif issues). Consumer marketing worldwide focus on quality peanuts, nutritional benefits, and peanut allergy education. Patrick emphasized the work of peanut research and extension are critical to expansion of world markets. **Dr. Luis Ribera, Professor and Extension Economist in the Department of Agriculture Economics, Texas A&M**, followed with ***"Trade Issues and Opportunities for the Peanut Industry"***. Interestingly Dr. Ribera's world ag market trends showed a close alignment with peanut industry market. The U.S. is the world leader in ag exports at $132 billion. Mexico, Japan, China, Canada and the EU are the largest markets. Currently, trade exports are balanced with imports of $131 billion. He stressed the importance of trade agreements such as USMCA (some call it NAFTA+), U.S. Japan Trade Agreement, and the recent U.S.-China Phase I agreement in keeping the U.S. as the world leader of exports. Looking at challenges and opportunities, COVID 19 rises as the foremost challenge with exports down 2-10% in most markets. Longer term, the availability of ag land to grow crops for a growing world population. Opportunities abound with more people to feed, lower food prices and rising disposable income. A focus on nutrition, healthy eating, and research on beneficial properties of plant-based foods is an area that needs more exploration.; **Dr. Samara Sterling, Research Director for The Peanut Institute** covered healthy-eating trends in her presentation, ***"Nutrition for the Peanut Industry: Challenges and Opportunities"***. Peanuts are affordable, sustainable, and a powerfully nutritious plant, perfectly poised to play an important role filling the needs of the world's growing population. An added 10 billion people by 2050, will require a shift to a more plant-based diet with a 50% increase in fruits, vegetables, nuts and legumes according to a study they recently supported at Harvard University. Nutritional breeding as a component of peanut variety development and product innovation are critical to overcoming world nutritional crises, such as malnutrition (lack of proper food and lack of proper nutrients) and obesity. In closing, Dr. Sterling asked the industry to unite to find these solutions. The last presentation of the General Session, attendees heard from **Texas growers—Otis Lee Johnson**, Gaines County; **Michael Newhouse**, Conley County; **Jeff Roper,** Yoakum County; **Ryan Warnken**, Atascosa & Fri Counties & **Larry Don Womack**, Comanche County-- sharing their personal challenges and strategies. Executive Officer Shelly led the discussion ***"Production, Challenges and Strategies—A Grower Perspective***. There are five distinct growing areas across the large state of Texas, yet the challenges they are facing are similar—year on year drought, water/rain, wind, equipment, rent/land prices, COVID-19 and a hydraulic hose that will last more than a couple of years. This group of Texas growers spoke about faith, irrigation, crop diversity, resource management, spraying at night, good business relationships, time management, time management, minimizing risks, good health insurance, patience, and being open to new ideas are just a few strategies to be a successful farmer today. **Watch these presentations at the links below.**

General Session Speakers – Speaker Presentations

Opening Remarks: https://youtu.be/sqKaoCOSmcI
Commissioner Sid Miller: https://youtu.be/OiqTi3dh9Xg
Dr. Patrick Stover: https://youtu.be/t0YXvmnPJnU
Patrick Archer: https://youtu.be/ahaXYV_vQ0g

Dr. Luis Ribera: https://youtu.be/IrN6Fh-_2FA
Dr. Samara Sterling: https://youtu.be/BDw2gJ__BDI
Texas Peanut Growers: https://youtu.be/HmrHq0m9zaU
Closing Remarks: https://youtu.be/jMOjh6nZXHs

The last two years have brought challenges from Aspergillus flavus for the U.S. peanut crop. At the request of the American Peanut Council's Task Force on Aflatoxin, APRES agreed to put together the symposium, **"Aflatoxin: Impacts and Challenges for the U.S. and Beyond".** The title of each presentation will give you a glimpse of their presentation and you may hear their entire presentations at the links at the end of this summary: **Dr. Marshall Lamb**, USDA/ARS, ***Economic Impacts and Overview of the Issue;*** **Dr. Diane Rowland**, University of Florida, ***Improved System Assessment of Aflatoxin Risk Utilizing Novel Data and Sensing Approaches at Points of Vulnerability;*** **Dr. Timothy Brenneman**, University of Georgia, ***Dealing with Aspergillus in Peanut Seed—An Old Enemy Learns Some New Tricks;*** **Dr. Corley Holbrook**, USDA/ARS, ***Breeding for PreHarvest Aflatoxin Resistance;*** **Dr. Renee Arias**, USDA/ARS, ***Advances in RNA Interference Technology for the Control of Aflatoxins in Peanut;*** and, **Dr. Darlene Cowart**, Birdsong Peanuts, ***Aflatoxin: An Industry Perspective.***

Technical Symposium on Aflatoxin - Speaker Presentations:
John Cason Intro: https://youtu.be/sH7zMHEvfog
Dr. Marshall Lamb: https://youtu.be/DNMUp4P83Ww
Dr. Diane Rowland: https://youtu.be/l_yvJaNSh18
Dr. Timothy Brenneman: https://youtu.be/31wi2yA7uqo
Dr. Corley Holbrook: https://youtu.be/KINxOHmArWQ
Dr. Renee Arias: Presentation Locked until Published
Dr. Darlene Cowart: https://youtu.be/tyfX3B1z8O4

Technical Program Chairman John Cason (Texas A&M) and Local Arrangements Chair Emi Kimura organized the traditional **breakout sessions into an online smorgasboard of presentations** 117 pre-recorded audio presentation/posters, presented via the APRES YouTube channel for members to view at their leisure now and open access in 2021. Presentation topics covered: Peanut Breeding, Biotechnology & Genomics; Production Technology; Excellence in Extension; Plant Pathology; Physiology, Seed Technology; Food Sciences; Entomology; Weed Science; and Economics & Marketing. Judging for the 2021 Bailey Award was suspended, given that the criteria call for a live, in-person oral presentation.

Sponsor Videos, Pre-Recorded Breakout Session, Joe Sugg Live Presentations and Posters:
https://www.youtube.com/@apres9070/videos
Or you can find the link to each presentation on the presenting author's abstract contained in the 2020 Proceedings.

During the 2020 Virtual Annual Meeting, APRES recognized several individuals for their achievements and/or service to APRES:

- **Dr. Tim Grey** (University of Georgia) was inducted as **Fellow of the Society** this year for serving as Editor or Associate Editor of Peanut Science for over 10 years.
- The **Coyt T. Wilson Award for Distinguished Service** to APRES went to **Dr. Kelly Chamberlin,** USDA-ARS, for her over 25 years of service to APRES as serving on every Committee, Board member, and leading APRES as its President in 2009.

- **Dr. Ye "Juliet" Chu**, University of Georgia was selected as this year's recipient of the **Corteva™ Agriscience Award for Excellence in Research**.
- **Dr. C. Corley Holbrook**, USDA-ARS was selected as this year's **Corteva™ Agriscience Award for Excellence in Education.**
- The **Bailey Award** for the **best paper** from the **2019 Annual Meeting** went to **Dr. Scott Tubbs,** University of Georgia (Presenting Author) and co-authors S. MONFORT, Crop and Soils Sciences Department, University of Georgia, Tifton Campus, Tifton, GA 31793 for their paper ***"Timing of Termination for Supplemental Replanted Peanut to Maximize Yield and Grade"***.

The 33rd Annual **Joe Sugg Graduate Student Competition,** sponsored by the North Carolina Peanut Growers Association drew 28 competitors *(largest ever)* from 9 universities *(most ever)* and 3 countries. The live competition was carried out over two days (July 15&16) via Zoom. Committee members agreed virtual meetings are here to stay and it is important to excel in both formats—live and virtual. Rules were added and modified to address the significance of using this new technology now and in the future.

- The **winner** ($500) of this year's competition was **Chandler Levinson (**University of Georgia) who presented her research, *"Anatomical Characteristics Correlated to Peg Strength in Arachis Species"*.
- Second Place ($300) went to **Kayla Eason** (The University of Georgia) and her research, *"Determining Flumioxazin Dissipation and Effects on Peanut Using a Thermal Gradient Table"*. The North Carolina Peanut Growers Association increased their prize money this year to offer a permanent third prize for the competition, which recognizes the growth in the number of competitors.
- **Nick Hurdle** (University of Georgia) was awarded third place prize ($200) for his research, *"Evaluation of High-Oleic Peanut Germination on Thermogradient Table"*.

Fifty-one (51) scientific posters were digitized and uploaded to the APRES YouTube channel for members to view at their leisure now and open access in 2021. The **3rd Annual Graduate Student Poster Competition**, sponsored by the National Peanut Board, attracted 10 participants from 6 universities.

- The 2020 graduate student poster competition winner was **Pin Chu Lai** (The University of Georgia) for *"Tomato Spotted Wilt Epidemiology and Its Impacts on Peanut Yield"*.
- Second place was awarded to **Ben Aigner** (The University of Georgia) for *"Life Cycle and Fecundity of Peanut Burrower Bug, Pangaeus bilineatus Say (Hemiptera: Cydnidae), Under Laboratory Conditions"*.
- Third place (Honorable Mention) was awarded to **Y-C Tsai** (The University of Georgia) for *"Towards Reliable Greenhouse Methods for Phenotyping Peanut Susceptibility to Stem Rot (White Mold)"*.

The virtual format did not prevent APRES from two of its traditional **Social functions** – the **Ice Cream Social and Fun Run**. Invitations were sent to all attendees to try their hand at a homemade waffle ice cream sandwich and asked to send family photos eating their creation. Fun Run Chair Peter Dotray had great success with his virtual fun run. Runners were asked to conduct their run any time during the meeting and post photos and times. All runners submitting a photo were entered for a chance to win one of eight (8) $25 gift cards.

At the conclusion of the meeting, **new officers and directors** for the Society were inducted based on the outcome of an electronic membership vote. Outgoing President, Barry Tillman (University of Florida) presented the gavel to incoming President, Gary Schwarzlose (Bayer). President-Elect for 2020-21 is David Jordan of North Carolina State University. Past President for 2020-21 is Barry Tillman (University of Florida). Newly elected to the APRES Board of Directors Mark Burow (Texas A&M University); Victor Nwosu (Mars Wrigley); Steve Brown (American Peanut Council); Dan Ward (National Peanut Board); Nick Hurdle (APRES GSO Representative). Outgoing Board members Past President Rick Brandenburg (North Carolina State University); Chris Liebold (The J.M. Smucker Company); Mark Burow (Texas A&M University); Steve Brown (American Peanut Council); Dan Ward (National Peanut Board) and Chandler Levinson (University of Georgia) were recognized for their support and service with a gift of a canvas print, entitled "Erdnuss".

The first action of President Schwarzlose's term was to recognize Dr. Barry Tillman for his service to the Society. (A Past President's Award for Barry Tillman will be formally presented next year in Dallas.) He continued by thanking again the attendees, sponsors, speakers, Program Committee and Board of Directors for creating and supporting this new method of meeting, allowing APRES to continue bringing its 52 years of peanut research and education to all. President Schwarzlose closed by asking all to mark their calendars for the **53rd Annual Meeting, July 13-15, 2021 at the Omni Las Colinas Hotel in Dallas, TX.**

APPENDIX

BY-LAWS

of the

AMERICAN PEANUT RESESEARCH 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.

4. *Diamond Level,* four persons designated by the sustaining member would be entitled to an individual membership and 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, will serve a three-year term.

h. The Executive Officer - non-voting member of the Board of Directors who may be compensated for his/her 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.

j. The APRES Graduate Student Organization (GSO) President – The APRES GSO President is a non-voting member of the APRES Board of Directors. The GSO President will give an update to the Board on events and issues relative to the APRES GSO.

Section 2. Terms of office for the directors' positions set forth in Section 1, paragraphs d, e, and f 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 six 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
APRES Annual Meeting
11 July 2019, Auburn, AL

GUIDELINES for AMERICAN PEANUT RESEARCH AND EDUCATION SOCIETY

FELLOW of the SOCIETY ELECTIONS

Fellows

Fellows are active members of the Society who have been nominated to receive the honor of fellowship by APRES active members. Fellows of the Society are 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 June 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 with a placque. 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).

Administrative Note:
Fellow of the Society nominees must be approved by the Board of Directors at its June BOD meeting. The nomination package of each nominees should be sent to the Board to assist in their review. A congratulatory letter is sent to newly elected Fellow(s) prior to the meeting so that they may have family members present at the Award Ceremony.

Amended July 2015

Format for

AMERICAN PEANUT RESEARCH AND EDUCATION SOCIETY FELLOW NOMINATIONS

TITLE:
"Nomination of _____ for Election to Fellowship by the American Peanut Research and Education Society."

NOMINEE:
Name, mailing address, and telephone number.

NOMINATOR:
Name, signature, mailing address, and telephone number.

BASIS OF NOMINATION:
Primary area: designate Research, Extension, Service to Industry, or Administration.
Secondary areas: designate contributions in areas other than the nominee's primary area of activity.

QUALIFICATIONS OF NOMINEE:
Complete parts I and III for all candidates and as many of II-A, -B, -C, and -D as are applicable.

I. Personal Achievements And Recognition (10 points)

A. Degrees received: give field, date, and institution for each degree.
B. Membership in professional and honorary academic societies.
C. Honors and awards received since the baccalaureate degree.
D. Employment: years, organizations and locations.

II. ACHIEVEMENT IN PRIMARY (50 POINTS) AND SECONDARY (10 POINTS) FIELDS OF ACTIVITY

A. Research

Significance and originality of basic and applied research contributions; scientific contribution to the peanut industry; evidence of excellence and creative reasoning and skill; number and quality of publications; quality and magnitude of editorial contributions. Attach a chronological list of publications.

B. Extension

Ability to (a) communicate ideas clearly, (b) influence client attitudes, and (c) motivate change in client action. Evaluate the quality, number and effectiveness of publications for the audience intended. Attach a chronological list of publications.

C. Service to Industry

Development or improvement of programs, practices, and products.
Evaluate the significance, originality and acceptance by the public.

D. Administration or Business

Evidence of creativeness, relevance, and effectiveness of administration of activities or business within or outside the USA.

III. SERVICE TO THE PROFESSION (30 Points)

A. Service to APRES including length, quality, and significance of service

1. List appointed positions.
2. List elected positions.
3. Briefly describe other service to the Society.

B. Service to the profession outside the Society including various administrative skills and public relations actions reflecting favorably upon the profession

1. Describe advancement in the science, practice and status of peanut research, education or extension, resulting from administrative skill and effort.
2. Describe initiation and execution of public relations activities promoting understanding and use of peanuts, peanut science and technology by various individuals and organized groups within and outside the USA.

EVALUATION:
Identify in this section, by brief reference to the appropriate materials in sections II and III, the combination of the contributions on which the nomination is based. Briefly note the relevance of key items explaining why the nominee is especially well qualified for fellowship.

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 is listed in the Call for Nominations on the APRES website (www.apresinc.com).

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. Electronic copy or Six (6) hard copies of the nomination packet, plus a headshot photograph of the nominee should be sent to the committee chair.

Format.

TITLE:
Entitle the document "Nomination of *(Enter Nominee Name)* for the Coyt T. Wilson Distinguished Service Award presented by the American Peanut Research and Education Society".

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 letters 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.

Administrative Note:

The BOD votes on the nomination of the award recipient prior to the July Board meeting. The recipient is notified by letter prior to the meeting in order to give them time to bring family to the meeting.

Amended July 2015

GUIDELINES for AMERICAN PEANUT RESEARCH & EDUCATION SOCIETY

BAILEY AWARD

The Bailey Award is given to the author(s) of the best paper presented at the APRES Annual Meeting. The Bailey Award was established in honor of Wallace K. Bailey, an eminent peanut scientist.

The award is determined through a two-step process whereby nominations are selected from the oral paper presentations at the APRES Annual Meeting. One nominee is selected from each session category. Nominees are asked to submit a manuscript based on the information presented during the respective meeting. The winner is decided after critiquing the submitted manuscripts.

Initial Selection – Oral Presentation:

Each session moderator 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 moderator in consultation with the Bailey Award chairman, the three judges may agree to 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. Joe Sugg Graduate Student Competitors, oral presentation and poster presentation, are **not** eligible for the Bailey Award.
3. Symposia and Poster presentations are **not** eligible for the Bailey Award.

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

- Well organized.
- Clearly stated.
- Scientifically sound.
- Original research or new concepts in extension or education.
- Presented within the time allowed.

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

Final Evaluation – Submitted Manuscript:

Final evaluation for the Award and determination of the winner will be made from manuscripts submitted to the Bailey 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 APRES Annual Meeting Proceedings.

The following should be considered for eligibility:

1. Authorship of the manuscript should be the same (both in name and order) as the original abstract.
2. Papers with added author(s) will be ruled ineligible.
3. Submission of a manuscript for Bailey Award consideration is an agreement to publish the manuscript or a "Spotlight" Research article in Peanut Science, if the manuscript is the winning paper. (Winning paper is published free of charge.)

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.

Chairman Responsibilities:

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

- In collaboration with the session moderator, identify judges for each session at the APRES Annual Meeting.
- Notify session moderators for the upcoming meeting of their responsibilities in relation to judging oral presentations as set in the Bailey Award guidelines, which are published in the APRES Annual Meeting Proceedings.
- Meet with committee at APRES meeting.
- Collect names of nominees from session moderators by Friday a.m. of Annual Meeting.
- Provide Executive Officer and Bailey Award committee members the name of Bailey Award nominees.

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

- Notify nominees within two months of meeting.
- Set deadline for receipt of manuscripts by Bailey Award chair.
- Distribute manuscripts to committee members for judging.
- Provide Executive Officer with Bailey Award winner and paper title by the date provided in the Call for Nominations.
- Notify session moderators for the upcoming meeting of their responsibilities in relation to judging oral presentations as set in the Bailey Award guidelines, which are published in the APRES Annual Meeting Proceedings
- Meet with committee at APRES meeting.
- Collect names of nominees from session moderators by Friday a.m. of Annual Meeting.
- Provide Executive Officer and Bailey Award committee members the name(s) of Bailey Award nominees.
- Bailey Award chair's responsibilities are completed when the Executive Officer receives Bailey Award nominees name and paper title.

Award

The presentation of peanut bookends will be made to the speaker and other authors appropriately recognized. Publication of winning manuscript will be published free of charge in Peanut Science.

Amended 7-8-2019

Administrative Note:

The Bailey Award winner(s) is announced during the Business Meeting at the APRES Annual Meeting. The winner is **not** notified in advance of the announcement. The BOD does not vote on or endorse the recipient at its June meeting.

GUIDELINES

Corteva Agriscience™ AWARDS FOR EXCELLENCE IN RESEARCH AND EDUCATION

I. Corteva Agriscience™ 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 Research 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 Corteva Agriscience™ Awards Committee are ineligible for the award while serving on the committee.

II. Corteva Agriscience™ 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 Education 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 Corteva Agriscience™ Awards Committee are not eligible for the award while serving on the committee. Eligibility of nominators, nomination procedures, and the Corteva Agriscience™ Awards Committee are identical for the two awards and are described below:

III. Eligibility of Nominators

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

IV. Nomination Procedures

Nominations will be made on the Nomination Form for Corteva Agriscience™ Awards. Forms are available on the APRES website (www.apresinc.com). A nominator's submittal letter summarizing the significant professional achievements and their impact on the peanut industry must be submitted with the nomination, along with a photograph (headshot) of the nominee. Three supporting letters must also 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.

V. Corteva Agriscience™ 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.

Administrative Note:

Recipients of the Corteva Agriscience™ Awards are not notified in advance of receiving the award. Only the President, President-Elect, and Past President are notified of the recipients in advance of the meeting.

Amended 7-10-2019

NOMINATION FORM FOR CORTEVA AGRISCIENCE™ AWARDS

General Instructions: Listed below is the information to be included in the nomination for individual or teams for the Corteva Agriscience™ Award. Ensure that all information is included. Complete Section VI. Professional Achievements, on the back of this form.

Indicate the award for which this nomination is being submitted. Date nomination submitted.

	Award for Excellence in Education
	Award for Excellence in Research

I. Nominee(s): For a team nomination, list the requested information on all team members on a separate sheet.

DATE:

Nominee(s): _____

Address _____

Title _____ Tel No. _____

Nominee has been an APRES Member for 5 Years?	Yes	No
Nominee Photograph Included with Nomination?	Yes	No

II. Nominator:

Name _____ Signature _____

Address _____

Title _____ Tel No. _____

III. Education: (include schools, college, universities, date, attended and degrees granted).

IV. Career: (state the positions held by listing present position first, titles, places of employment and dates of employment).

V. Honors and Awards: (received during professional career).

VI. Professional Achievements: (Describe achievement in which the nominee has made significant contributions to the peanut industry).

VII. Significance: (A "tight" summary and evaluation of the nominee's most significant contributions and their impact on the peanut industry). The material should be suitable for a news release.

JOE SUGG GRADUATE STUDENT ORAL PRESENTATION COMPETITION

RULES

A. ELIGIBILITY

1. Any student who is a APRES member and has registered to attend the current APRES Annual Meeting is eligible to compete in the poster or oral presentation contest.

2. Students are eligible for participation in the Student Poster Contest and to make an oral presentation in the Joe Sugg Graduate Student Oral Presentation Competition multiple times during a M.S. program and a Ph.D. program; however, a student cannot participate in the oral presentation contest and poster presentation contest during the same year.

B. RULES AND PROCEDURES

1. A contestant may enter the Joe Sugg Graduate Student Oral Presentation multiple years. Persons who have graduated from a degree program (M.S. or Ph.D.) may enter during the first annual meeting following graduation and present the work completed during the respective degree program.

2. Contestants will indicate a preference to enter either the Student Poster Contest or Joe Sugg Graduate Student Oral Presentation Competition when submitting their abstract. Abstracts must be turned in by the deadline posted on the APRES website for abstract submissions.

3. M.S. and Ph. D. students will compete together within the Joe Sugg Graduate Student Oral Presentation Competition.

C. AWARDS

Awards will be presented to 1st, 2nd, and 3rd place winners in the Joe Sugg Graduate Student Oral Presentation Competition. The winner will receive a check in the amount of $500; the second-place finisher will receive a check for $300; and the third-place finisher will receive for $200.

D. CRITERIA FOR THE JOE SUGG GRADUATE STUDENT ORAL PRESENTATION COMPETITION

Competitors for the Joe Sugg Graduate Student Oral Presentation Competition will be judged based on the criteria outlined in the Score Sheet for the Joe Sugg Graduate Student Oral Presentation Competition.

Updated June 2020

APRES 2020

Score Sheet for Joe Sugg Graduate Student Competition – Virtual Format

STUDENT NAME/PAPER: _____

I. **Organization of Presentation: 50 points** **TOTAL POINTS (organization): _____**

a. Introduction: 15 points

i. ___ Hypothesis clearly stated.
ii. ___ Research objectives stated clearly.
iii. ___ Introduction material stated succinctly, but in enough detail to allow audience to understand importance of problem.
iv. ___ Important related studies noted.

b. Materials and Methods: 10 points

i. _____ Materials and methods succinctly presented, yet in enough detail that allows the audience to follow procedures.
ii. _____ Appropriate method of data analysis noted.

c. Results and Discussion: 20 points

i. _____ Results summarized with appropriate use of statistics or other techniques for data analysis.
ii. _____ Importance of results discussed in relation to objectives.
iii. _____ Plans for future direction of research discussed.

d. Questions: 5 points

i. _____ Questions answered fully and effectively.

II. **Presentation Techniques: 50 points** **TOTAL POINTS (Presentation techniques): ____**

a. _____ Speaker presents paper at volume clearly audible to the entire audience.
b. _____ Student speaks at appropriate speed and clarity so as to be understood by the audience. Students for whom English is a second language should take extra care to speak clearly.
c. _____ Student uses appropriate inflection in voice, hand gestures, and looks at his/her camera during presentation.
d. _____ Student times presentation to allow enough time for questions (approximately 13 minutes for a 15-minute presentation [including questions]).
e. _____ Student repeats each question from the audience.
f. _____ Color of font and text of sufficient contrast for maximum clarity.
g. _____ Bullet points succinctly stated for clarity. Text on each slide restricted to most important points.
h. _____ Font size large enough to be read clearly by the audience.
i. _____ Text slides supported with sufficient illustrations to add understanding and interest to the presentation.
j. _____ Graphs and tables easy to read and understand by the audience.
k. _____ Speaker is in front of a plain/non-distracting background to ensure that they are the focus of their presentation, rather than their surroundings.
l. _____ Presentation is free of background distractions/disruptions.

STUDENT NAME/PAPER: _____
(Continued)

III. **Research: 50 points** **TOTAL POINTS (research): ____**

a. _____ Uniqueness and creativity of research objectives.
b. _____ Creativity of research approach as presented in "Materials and Methods".
c. _____ Complexity of research efforts.
d. _____ Use of innovative techniques for evaluation and assessment of results.
e. _____ Completeness of results and discussion in achieving research objectives.

IV. **TOTAL POINTS (out of 150): _____**

General Comments:

GRADUATE STUDENT POSTER CONTEST

Rules

A. ELIGIBILITY

1. Any student who is a APRES member and has registered to attend the current APRES annual meeting is eligible to compete in the poster or oral presentation contest.

2. Students are eligible for participation in the Student Poster Contest and to make an oral presentation in the Joe Sugg Graduate Student Award Contest multiple times during a M.S. program and a Ph.D. program; however, a student cannot participate in the oral presentation contest and poster presentation contest during the same year.

B. RULES AND PROCEDURES

1. A contestant may enter the Student Poster Contest multiple years. Persons who have graduated from a degree program (M.S. or Ph.D.) may enter during the first annual meeting following graduation and present the work completed during the respective degree program.

2. Contestants will indicate a preference to enter either the Student Poster Contest or Joe Sugg Graduate Student Award Contest when submitting their abstract. Abstracts must be turned in by the deadline posted on the APRES website for abstract submissions.

3. M.S. and Ph. D. students will compete together within the Student Poster Contest.

C. AWARDS

Awards will be presented to 1st and, 2nd place winners in the Student Poster Contest. When there is a tie for 1st place in either contest, there will be no 2nd place winner and the prizes will be equally shared by the two 1st place winners of the respective contest.

D. CRITERIA FOR THE STUDENT POSTER COMPETITION

1. The **abstract** should provide all pertinent information with respect to the research project. Abstract formatting should be judged according to the APRES submission guidelines and standard format. A score of 0 is to be awarded if no abstract is submitted.

2. **Appearance and flow** refers to the physical development of the poster. This includes the organization and pattern of the poster and effective use of text, figures, and pictures to convey information in an easily understandable manner. The use of creative “art work”, illustrations, color balance, and general organizational layout of the poster should be a consideration in the category. Proper grammar, sentence structure, spelling, and use of terminology should be considered.

3. The **Introduction** section of the poster should provide an adequate introduction to the problem as well as provide a thorough, yet concise review of relevant previous research. Contestants should clearly justify reasons for conducting the research and then state objectives. Material should be presented in a clear and interesting manner that will make the audience want to learn more. Originality includes scientific merit and the contribution of the research to peanut science.

4. **Materials and Methods** should clearly describe how the research was conducted. All pertinent information with respect to how experiments were conducted should be included. A description of the experimental design utilized should be included as well as statistical analysis of the data. Materials and Methods should be brief but descriptive enough for the audience to understand and evaluate the overall approach used to address the stated objective(s).

5. **Results and Discussion** are an essential part of any research paper. It is important that the Results and Discussion be supported by the data and interpretation of the data is logical. Findings should be related to other work if available. References should be made to graphs, tables, figures etc. as necessary in the Results and Discussion section.

6. **Conclusions** should be clear, concise, and easy to follow. In addition, Conclusions must be supported by results. Conclusions should address stated objectives and/or hypothesis.

7. **Future Research** needs should be included that provide ideas that may result in a greater understanding of the subject. Future Research should address areas of study that are currently lacking data and/or require a greater understanding of the subject matter to determine scientifically sound solutions to the problem at hand.

8. **Student Interaction** is a vital portion of the presentation process. Students should be able to intelligently discuss all aspects of the material they are presenting. In addition, students should present themselves appropriately given that APRES is a professional scientific society. If judges are unable to interact with all students in the contest, no points should be awarded to any student that a judge is assigned to in order to not give one student an advantage over another in terms of scoring.

9. **Poster dimensions** should be no larger than 36 inches high and 36 inches wide. For 2020, students were given the option to create 30"x40" posters to accomodate better online viewing. Students should not be penalized for choosing either size.

10. Students are strongly encouraged to provide 8” x 11” color copies of their poster presentations to interested parties. Copies should be made available by displaying them at the poster board.

As of June 2020

American Peanut Research and Education Society

Graduate Student Organization

Manual of Operating Procedures

June 2018

Constitution - as revised through June 2018

Preamble

The Graduate Student Organization (GSO) is established to bring together students actively pursuing advanced degrees in disciplines related to peanut. The primary purpose of the GSO is to exchange ideas, experiences, opinions, and information in all areas of peanut research and education and to have a representative on the American Peanut Research and Education Society (APRES) Board of Directors.

Article 1-Name

The name of this organization shall be the
American Peanut Research and Education Society Graduate Student Organization

Article II - Officers of the GSO Executive Board

Section 1. The officers of the GSO shall be President and President-Elect.

Section 2. The GSO President-Elect shall be elected by a closed ballot at the annual GSO meeting and shall hold office for 1 year beginning with the close of the regular annual business meeting after his/her election and ending with the close of the next annual business meeting at which time he/she assumes the duties of the President.

Section 3. All graduate students who are members of the American Peanut Research and Education (APRES) Society are eligible to hold office.

Section 4. Except for President, unexpired terms of members of the GSO Executive Board shall be filled by a majority vote of the APRES Executive Board. Those individuals elected to a vacant office shall serve the remainder of the unexpired term or until the next annual business meeting, at which time a new member will be elected. If a vacancy occurs in the office of President, the President-Elect shall ascend to the office of President. The Executive Board at this time will elect a new President-Elect.

Section 5. At the beginning of the annual business meeting, each participating university will select one individual to serve as the university representative. The university representative will be responsible for voting and will serve as communications liaison between the GSO Executive Board and the students of that university.

Section 6. Each university present at the annual business meeting will be allowed only one vote for each GSO Executive Board position. This vote will be cast by each university representative at the annual

business meeting under a closed balloting procedure. In the event that a university representative is also nominated for an Executive Board position, another student from the university will be selected to place the university vote for that position. In the event of a tie vote for any Executive Board position in the GSO, the tie will be voted on again by each university representative. In the case that a tie vote results after the revote, the GSO positions of President and President-Elect will vote on the nominees to break the tie under a closed balloting procedure. This vote will take place at the current annual business meeting with the results disclosed at this meeting.

Article III - Nominations for Office

Section 1. Each university may nominate only one representative to each of the elected positions set forth in Article II.

Section 2. Any graduate student attending the APRES GSO annual business meeting is eligible to be nominated. Students can nominate themselves or be nominated by another graduate student.

Section 3. Students nominated for a position should provide a brief introduction of themselves after nominations have closed and prior to voting. Then all nominees will be required to exit the room during the voting procedure.

Article IV - Meetings

Section 1. The Graduate Student Organization shall meet annually to carry out its objectives.

Section 2. The business matters of the GSO shall be handled during one of the following meetings: 1) a meeting of the GSO Executive Board prior to the beginning of the GSO annual business meeting; 2) a meeting of the members during the GSO annual business meeting; 3) a meeting of the Executive Board at the close of the annual meeting; or 4) a meeting during the calendar year through electronic means as deemed necessary by the GSO or APRES President.

Section 3. At the first meeting of the GSO Executive Board prior to the annual GSO business meeting, the GSO Executive Board will consider all committee reports and accept, modify, or reject such reports.

Section 4. At the GSO annual business meeting, the members will act on all committee reports submitted by the GSO Executive Board. No matter shall be voted on at this meeting that has not first been considered by the GSO Executive Board.

Section 5. After the close of the annual GSO business meeting both outgoing and newly-elected members and University representatives will meet. These constituents will act on any old business not completed at the previous GSO meetings.

Section 6. An GSO Executive Board meeting may be called by the GSO or APRES President throughout the business year if needed to conduct business that is relevant to the Graduate Student Organization. This meeting will be held via electronic mail, conference calling, and or by video conferencing at a designated time proposed by the GSO or APRES President. All subject matter will be presented to each GSO Executive Board member and University Representative 5 days prior to such meeting time.

BY-LAWS

DUTIES

Section 1. The APRES Graduate Student Organization Executive Board President Shall:

1) Serve as Chairperson of the GSO Executive Board.

2) Attend regular American Peanut Research and Education Society Executive Board meetings as a student representative and report to the Graduate Student Organization Executive Board.

3) Actively solicit input from students at the American Peanut Research and Education Society meetings on issues affecting students in the American Peanut Research and Education Society so this information can be passed on to committees or the American Peanut Research and Education Society Board of Directors.

4) Organize a graduate student luncheon/symposium and make arrangements for guest speakers.

Section 2. The Graduate Student Organization President-Elect Shall:

1) Perform the duties of the GSO President if he/she cannot serve

2) Attend all Graduate Student Organization Executive Board meetings and general student meetings to record the minutes of each meeting...

3) Assist the GSO President in organizing the GSO Executive Board meeting, student meeting, or Graduate Student Luncheon whenever necessary.

4) Distribute pertinent information to the student representatives from each university for distribution within the institution.

5) Serve as GSO President the following year.

Section 3. The Student Representative from each University shall:

1) Report to the GSO President any questions or concerns that other graduate students from their university may have so that the GSO President can disclose these concerns to the American Peanut Research and Education Society Executive Board.

OPERATING PROCEDURES
OF THE
AMERICAN PEANUT RESEARCH AND EDUCATION SOCIETY
GRADUATE STUDENT ORGANIZATION

CHANGES IN OPERATING PROCEDURE

The constitution and by-laws may be amended only by a majority vote of the graduate student representatives of each university comprising the Graduate Student Organization. Changes or improvements proposed by a member should be brought forth to their University Representative who will suggest such recommendations to the Graduate Student Organization Executive Board at the GSO Executive Board meeting held prior to the GSO annual business meeting

EXECUTIVE BOARD

The Graduate Student Executive Board Shall:

1) Conduct an GSO Executive Board meeting prior to the student organization meeting.

2) Conduct a GSO meeting for all graduate students attending the annual American Peanut Research and Education Society. At this meeting, each university in attendance will have the opportunity to appoint student board representative to serve a one-year term on the student executive board as their university representative. A GSO President-Elect will be elected by the set forth voting procedures outlined in the By-Laws. Also, pertinent issues will be presented for discussion to the members by the Graduate Student Executive Board.

3) Conduct a GSOExecutive Board meeting immediately following the student organization meeting.

4) Actively solicit input from students at the American Peanut Research and Education Society meetings on issues affecting students in the American Peanut Research and Education Society so this information can be passed on to committees or the American Peanut Research and Education Society Executive Board of Directors.

5) Organize a graduate student luncheon with the local arrangements committee chairperson and arrange for entertainment such as a guest speaker.

6) Be responsible for changes in the Manual of Operating Procedures (other than the Constitution and By-Laws) after study and recommendations by the Graduate Student Executive Board.

PRESIDENT

The President Shall:

1) Serve as chairperson of the Graduate Student Organization Executive Board and prepare an agenda for meetings of the GSO Executive Board. The GSO President shall submit the proposed agenda to the members of the GSO Executive Board in advance of GSO meetings so that issues can be properly considered.

2) The GSO President shall be a Student Representative to the American Peanut Research and Education Society Executive Board and participate in American Peanut Research and Education Society Board meetings held prior to the American Peanut Research and Education Society annual meeting. The GSO President will give an update to the Executive Board on events and issues relative to the Graduate Student Organization. The GSO President will be an ex-officio (non-voting) member of the APRES Board of Directors

3) Be responsible for determining that the decisions of the Graduate Student Organization Executive Board are correctly enforced within the framework of the Constitution and By-Laws.

4) Maintain the Graduate Student webpage on the APRES website.

5) Work with the various APRES committee representatives to aid them in developing programs or rules beneficial to the Graduate Student Organization.

6) Write letters of thanks to all GSO event speakers and appropriate personnel.

PRESIDENT-ELECT

President-Elect shall:

1) Perform the duties of the GSO President if he/she cannot serve.

2) Take all minutes at all business meetings of the Graduate Student Organization, including the GSO Executive Board meeting, the GSO annual business meeting, and the GSO closing meeting after the APRES annual meeting, along with any other GSO meeting called to order by the GSO or APRES President. All minutes shall be supplied to the members of the GSO Executive Board and to members of the Graduate Student Organization upon request as deemed necessary by the GSO Executive Board.

3) Receive nominations for GSO office at the GSO annual business meeting. Collect and count votes and notify the Graduate Student Organization of the result at the GSO annual business meeting.

4) Present the GSO President-Elect's report at the GSO annual business meeting.

5) Aid the GSO President in arrangements necessary for the Graduate Student Luncheon

6) Assist the GSO President in maintaining the Graduate Student webpage on the APRES website.

7) Furnish an electronic copy of the GSO meeting minutes to the APRES Executive Officer for archiving and inclusion in the proceedings of the APRES annual meeting

8) Perform other duties delegated by the GSO President or the GSO Executive Board

9) Advance to the Office of President of the Graduate Student Organization at the end of his/her term as GSO President-Elect.

STUDENT REPRESENTATIVES FROM EACH UNIVERSITY

The GSO Student Representative Shall:

1) Report to the GSO President any questions/concerns that other graduate students at his/her University, so as the GSO President can disclose such concerns to the Executive Board of the Graduate Student Organization and or the Executive Board of the American Peanut Research and Education Society.

2) Actively communicate with the GSO Executive Board so as to keep his/her University aware of the activities of the Graduate Student Organization.

3) Perform other duties delegated by the GSO President or the GSO Executive Board.

Overview
2020 APRES Virtual Annual Meeting
July 14-16, 2020
52nd Celebration
Virtual Format

(The virtual format of the meeting did not allow APRES to conduct its traditional Business Meeting. All business matters were conducted prior to the 2020 Virtual Annual Meeting via a Zoom Board of Directors meeting on June 22, 2020 and electronic mail to the APRES membership. Membership actions, Committee reports and Awards Winners announcements were posted to the APRES website, recorded in the APRES Board minutes, and archived in the 2020 Proceedings.)

The 52nd Annual Meeting of the American Peanut Research and Education Society (APRES) was held virtually July 14-16, 2020 due to COVID-19 federal, state and local meeting restrictions. APRES President Barry Tillman (UFL) presided over the meeting and the Program Committee, led by Gary Schwarzlose, created an entire new way to meet via Zoom technology.

The APRES Board and Program Committee began meeting every two weeks in March to discuss the emerging Covid-19 pandemic. As each week brought new business closures and travel restrictions, the group discussed how to plan for the 2020 Annual Meeting. A Plan B virtual format was created where the General Session, Technical Symposium and the Joe Sugg Competition would be held live via Zoom technology. And, the Technical Program breakout sessions and the Poster session were re-structured as pre-recorded audio, slide presentations and poster images with recordings posted on the APRES website and its newly created APRES YouTube channel. A decision was made May 1st to go virtual when the hotel (Omni Las Colinas Hotel, Dallas, TX) agreed to shift APRES' contractual obligation to 2020 without penalty. *(Huge thanks to Technical Chair, John Cason; Local Arrangements Chair, Emi Kimura; APRES Grad Student Organization President, Chandler Levinson, and APRES Intern Perrine Kemerait, who made a virtual meeting possible with their technical knowledge of Zoom, Facebook, Powerpoint recording features, YouTube, etc...)*

President Barry Tillman kicked off the virtual meeting of 250 attendees from every peanut producing state and 9 countries at 10:00 AM EST on July 14th by thanking all the APRES members/attendees and, especially, the **sponsors of this year's meeting—Amvac, Bayer, BASF, Birdsong Peanuts, Corteva Agriscience, Fine Americas, National Peanut Board, National Peanut Buying Points Association, North Carolina Peanut Growers Association, Olam Edible Nuts, The J.M. Smucker Company, Syngenta, Texas Peanut Producers Board, Texas Tech University, Valent, Virginia Peanut Growers Association, and Visjon Biologics whose support keep APRES strong.**

Highlights of the program included opening General Session addresses by:
Sid Miller, Texas Commissioner of Agriculture and Dr. Patrick Stover, Vice Chancellor and Dean for Agriculture and Life Sciences at Texas A&M University, welcomed the attendees virtually to the state of Texas, providing attendees with an overview of agriculture in Texas. A panel session on **"Production, Challenges & Strategies"** expanded the topic to a

global level. Leading off was **Patrick Archer, American Peanut Council,** with ***"A Look at the Global Peanut Market"***. Exports make up 25+% of the farmers stock market with China is becoming a dominant player in the market, from the traditional European, Canadian, Mexican markets. The reason for this change is China's peanut consumption has increased 26%, while production has increased only 18% since 2000. Canada is the U.S. largest export market with Mexico close on their heels. Challenges affecting world marketing are differences in rules regarding aflatoxin, pesticide monitoring, port inspection procedures, CODEX, trade agreements (tariff & non-tarrif issues). Consumer marketing worldwide focus on quality peanuts, nutritional benefits, and peanut allergy education. Patrick emphasized the work of peanut research and extension are critical to expansion of world markets. **Dr. Luis Ribera, Professor and Extension Economist in the Department of Agriculture Economics, Texas A&M**, followed with ***"Trade Issues and Opportunities for the Peanut Industry"***. Interestingly Dr. Ribera's world ag market trends showed a close alignment with peanut industry market. The U.S. is the world leader in ag exports at $132 billion. Mexico, Japan, China, Canada and the EU are the largest markets. Currently, trade exports are balanced with imports of $131 billion. He stressed the importance of trade agreements such as USMCA (some call it NAFTA+), U.S. Japan Trade Agreement, and the recent U.S.-China Phase I agreement in keeping the U.S. as the world leader of exports. Looking at challenges and opportunities, COVID 19 rises as the foremost challenge with exports down 2-10% in most markets. Longer term, the availability of ag land to grow crops for a growing world population. Opportunities abound with more people to feed, lower food prices and rising disposable income. A focus on nutrition, healthy eating, and research on beneficial properties of plant-based foods is an area that needs more exploration.; **Dr. Samara Sterling, Research Director for The Peanut Institute** covered healthy-eating trends in her presentation, ***"Nutrition for the Peanut Industry: Challenges and Opportunities"***. Peanuts are affordable, sustainable, and a powerfully nutritious plant, perfectly poised to play an important role filling the needs of the world's growing population. An added 10 billion people by 2050, will require a shift to a more plant-based diet with a 50% increase in fruits, vegetables, nuts and legumes according to a study they recently supported at Harvard University. Nutritional breeding as a component of peanut variety development and product innovation are critical to overcoming world nutritional crises, such as malnutrition (lack of proper food and lack of proper nutrients) and obesity. In closing, Dr. Sterling asked the industry to unite to find these solutions. The last presentation of the General Session, attendees heard from **Texas growers—Otis Lee Johnson**, Gaines County; **Michael Newhouse**, Conley County; **Jeff Roper,** Yoakum County; **Ryan Warnken**, Atascosa & Fri Counties & **Larry Don Womack**, Comanche County-- sharing their personal challenges and strategies. Executive Officer Shelly led the discussion ***"Production, Challenges and Strategies—A Grower Perspective***. There are five distinct growing areas across the large state of Texas, yet the challenges they are facing are similar—year on year drought, water/rain, wind, equipment, rent/land prices, COVID-19 and a hydraulic hose that will last more than a couple of years. This group of Texas growers spoke about faith, irrigation, crop diversity, resource management, spraying at night, good business relationships, time management, time management, minimizing risks, good health insurance, patience, and being open to new ideas are just a few strategies to be a successful farmer today. **Watch these presentations at the links below.**

General Session Speakers – Speaker Presentations

Opening Remarks: https://youtu.be/sqKaoCOSmcI
Commissioner Sid Miller: https://youtu.be/OiqTi3dh9Xg
Dr. Patrick Stover: https://youtu.be/t0YXvmnPJnU
Patrick Archer: https://youtu.be/ahaXYV_vQ0g

Dr. Luis Ribera: https://youtu.be/IrN6Fh-_2FA
Dr. Samara Sterling: https://youtu.be/BDw2gJ__BDI
Texas Peanut Growers: https://youtu.be/HmrHq0m9zaU
Closing Remarks: https://youtu.be/jMOjh6nZXHs

The last two years have brought challenges from Aspergillus flavus for the U.S. peanut crop. At the request of the American Peanut Council's Task Force on Aflatoxin, APRES agreed to put together the symposium, **"Aflatoxin: Impacts and Challenges for the U.S. and Beyond".** The title of each presentation will give you a glimpse of their presentation and you may hear their entire presentations at the links at the end of this summary: **Dr. Marshall Lamb**, USDA/ARS, ***Economic Impacts and Overview of the Issue;*** **Dr. Diane Rowland**, University of Florida, ***Improved System Assessment of Aflatoxin Risk Utilizing Novel Data and Sensing Approaches at Points of Vulnerability;*** **Dr. Timothy Brenneman**, University of Georgia, ***Dealing with Aspergillus in Peanut Seed—An Old Enemy Learns Some New Tricks;*** **Dr. Corley Holbrook**, USDA/ARS, ***Breeding for PreHarvest Aflatoxin Resistance;*** **Dr. Renee Arias**, USDA/ARS, ***Advances in RNA Interference Technology for the Control of Aflatoxins in Peanut;*** and, **Dr. Darlene Cowart**, Birdsong Peanuts, ***Aflatoxin: An Industry Perspective.***

Technical Symposium on Aflatoxin - Speaker Presentations:
John Cason Intro: https://youtu.be/sH7zMHEvfog
Dr. Marshall Lamb: https://youtu.be/DNMUp4P83Ww
Dr. Diane Rowland: https://youtu.be/l_yvJaNSh18
Dr. Timothy Brenneman: https://youtu.be/31wi2yA7uqo
Dr. Corley Holbrook: https://youtu.be/KINxOHmArWQ
Dr. Renee Arias: Presentation Locked until Published
Dr. Darlene Cowart: https://youtu.be/tyfX3B1z8O4

Technical Program Chairman John Cason (Texas A&M) and Local Arrangements Chair Emi Kimura organized the traditional **breakout sessions into an online smorgasboard of presentations** 117 pre-recorded audio presentation/posters, presented via the APRES YouTube channel for members to view at their leisure now and open access in 2021. Presentation topics covered: Peanut Breeding, Biotechnology & Genomics; Production Technology; Excellence in Extension; Plant Pathology; Physiology, Seed Technology; Food Sciences; Entomology; Weed Science; and Economics & Marketing. Judging for the 2021 Bailey Award was suspended, given that the criteria call for a live, in-person oral presentation.

Sponsor Videos, Pre-Recorded Breakout Session, Joe Sugg Live Presentations and Posters:
https://www.youtube.com/@apres9070/videos
Or you can find the link to each presentation on the presenting author's abstract contained in the 2020 Proceedings.

During the 2020 Virtual Annual Meeting, APRES recognized several individuals for their achievements and/or service to APRES:

- **Dr. Tim Grey** (University of Georgia) was inducted as **Fellow of the Society** this year for serving as Editor or Associate Editor of Peanut Science for over 10 years.
- The **Coyt T. Wilson Award for Distinguished Service** to APRES went to **Dr. Kelly Chamberlin,** USDA-ARS, for her over 25 years of service to APRES as serving on every Committee, Board member, and leading APRES as its President in 2009.

- **Dr. Ye "Juliet" Chu**, University of Georgia was selected as this year's recipient of the **Corteva™ Agriscience Award for Excellence in Research**.
- **Dr. C. Corley Holbrook**, USDA-ARS was selected as this year's **Corteva™ Agriscience Award for Excellence in Education.**
- The **Bailey Award** for the **best paper** from the **2019 Annual Meeting** went to **Dr. Scott Tubbs,** University of Georgia (Presenting Author) and co-authors S. MONFORT, Crop and Soils Sciences Department, University of Georgia, Tifton Campus, Tifton, GA 31793 for their paper ***"Timing of Termination for Supplemental Replanted Peanut to Maximize Yield and Grade"***.

The 33rd Annual **Joe Sugg Graduate Student Competition,** sponsored by the North Carolina Peanut Growers Association drew 28 competitors *(largest ever)* from 9 universities *(most ever)* and 3 countries. The live competition was carried out over two days (July 15&16) via Zoom. Committee members agreed virtual meetings are here to stay and it is important to excel in both formats—live and virtual. Rules were added and modified to address the significance of using this new technology now and in the future.

- The **winner** ($500) of this year's competition was **Chandler Levinson (**University of Georgia) who presented her research, *"Anatomical Characteristics Correlated to Peg Strength in Arachis Species"*.
- Second Place ($300) went to **Kayla Eason** (The University of Georgia) and her research, *"Determining Flumioxazin Dissipation and Effects on Peanut Using a Thermal Gradient Table"*. The North Carolina Peanut Growers Association increased their prize money this year to offer a permanent third prize for the competition, which recognizes the growth in the number of competitors.
- **Nick Hurdle** (University of Georgia) was awarded third place prize ($200) for his research, *"Evaluation of High-Oleic Peanut Germination on Thermogradient Table"*.

Fifty-one (51) scientific posters were digitized and uploaded to the APRES YouTube channel for members to view at their leisure now and open access in 2021. The **3rd Annual Graduate Student Poster Competition**, sponsored by the National Peanut Board, attracted 10 participants from 6 universities.

- The 2020 graduate student poster competition winner was **Pin Chu Lai** (The University of Georgia) for *"Tomato Spotted Wilt Epidemiology and Its Impacts on Peanut Yield"*.
- Second place was awarded to **Ben Aigner** (The University of Georgia) for *"Life Cycle and Fecundity of Peanut Burrower Bug, Pangaeus bilineatus Say (Hemiptera: Cydnidae), Under Laboratory Conditions"*.
- Third place (Honorable Mention) was awarded to **Y-C Tsai** (The University of Georgia) for *"Towards Reliable Greenhouse Methods for Phenotyping Peanut Susceptibility to Stem Rot (White Mold)"*.

The virtual format did not prevent APRES from two of its traditional **Social functions** – the **Ice Cream Social and Fun Run**. Invitations were sent to all attendees to try their hand at a homemade waffle ice cream sandwich and asked to send family photos eating their creation. Fun Run Chair Peter Dotray had great success with his virtual fun run. Runners were asked to conduct their run any time during the meeting and post photos and times. All runners submitting a photo were entered for a chance to win one of eight (8) $25 gift cards.

At the conclusion of the meeting, **new officers and directors** for the Society were inducted based on the outcome of an electronic membership vote. Outgoing President, Barry Tillman (University of Florida) presented the gavel to incoming President, Gary Schwarzlose (Bayer). President-Elect for 2020-21 is David Jordan of North Carolina State University. Past President for 2020-21 is Barry Tillman (University of Florida). Newly elected to the APRES Board of Directors Mark Burow (Texas A&M University); Victor Nwosu (Mars Wrigley); Steve Brown (American Peanut Council); Dan Ward (National Peanut Board); Nick Hurdle (APRES GSO Representative). Outgoing Board members Past President Rick Brandenburg (North Carolina State University); Chris Liebold (The J.M. Smucker Company); Mark Burow (Texas A&M University); Steve Brown (American Peanut Council); Dan Ward (National Peanut Board) and Chandler Levinson (University of Georgia) were recognized for their support and service with a gift of a canvas print, entitled "Erdnuss".

The first action of President Schwarzlose's term was to recognize Dr. Barry Tillman for his service to the Society. (A Past President's Award for Barry Tillman will be formally presented next year in Dallas.) He continued by thanking again the attendees, sponsors, speakers, Program Committee and Board of Directors for creating and supporting this new method of meeting, allowing APRES to continue bringing its 52 years of peanut research and education to all. President Schwarzlose closed by asking all to mark their calendars for the **53rd Annual Meeting, July 13-15, 2021 at the Omni Las Colinas Hotel in Dallas, TX.**

Welcome

APRES

52nd Annual Meeting

July 14-16, 2020 - Virtual Format

GENERAL SESSION

July 14, 2020

9:00AM - 11:00AM CST

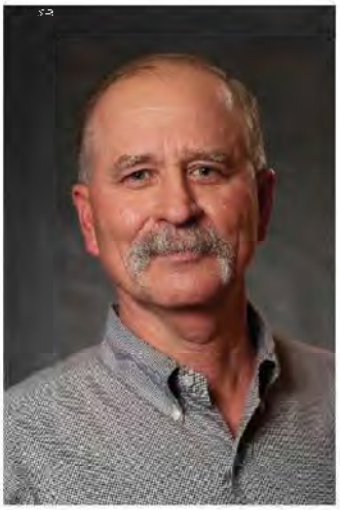
10:00AM - 12:00PM EST

Via Zoom Webinar

Production, Challenges & Strategies

The 52nd APRES General Session will focus on what influences the production of peanuts...it's challenges and strategies. Each segment of the industry looks at production differently whether its weather, world markets, diseases, consumer trends, peanut supply, prices, etc. etc. There are numerous factors and the challenge is to find the right strategy for your business. Our guest speakers will approach this topic individually, yet leave you with a complete picture of where the industry stands and insights on planning for the future.

Barry Tillman
President
APRES



Gary Schwarzlose
2020 Program Chair
APRES

APRES 52nd Annual Meeting
July 14-16, 2020 - Virtual Format

GENERAL SESSION

July 14, 2020

9:00AM - 11:00AM CST
10:00AM - 12:00PM EST
Via Zoom Webinar

Time	Presentation / Title	Speaker
9:00 am CST 10:00 am EST	Welcome and Call to Order	Dr. Barry Tillman President - APRES
9:05 am CST 10:05 am EST	Welcome to Texas	Sid Miller Texas Commissioner of Agriculture
9:10 am CST 10:10 am EST	Welcome to Texas	Dr. Patrick Stover Vice-Chancellor and Dean for Agriculture and Life Sciences Texas A&M AgriLife
9:15 am CST 10:15 am EST	A Look at the Global Peanut Market	Patrick Archer President American Peanut Council
9:35 am CST 10:35 am EST	Trade Issues and Opportunities for the Peanut Industry	Dr. Luis Ribera Professor and Extension Economist in the Department of Agricultural Economics Texas A&M University
9:55 am CST 10:55 am EST	Nutrition for The Peanut Industry: Challenges and Opportunities	Dr. Samara Sterling Research Director The Peanut Institute
10:15 am CST 11:15 am EST	Production, Challenges and Strategies; a Grower Perspective	Texas Peanut Producers Panel Discussion
10:45 am CST 11:45 am EST	Presidential Address	Dr. Barry Tillman President - APRES
11:00 am CST 12:00 pm EST	Session Close	

GENERAL SESSION

July 14, 2020

9:00AM - 11:00AM CST
10:00AM - 12:00PM EST
Via Zoom Webinar

GUEST SPEAKERS

SID MILLER
Texas Commissioner of Agriculture

An eighth generation farmer and rancher, Sid Miller is the 12th Commissioner of the Texas Department of Agriculture (TDA). He has devoted his life to promoting Texas agriculture, rural communities and the great state of Texas.

Born in De Leon, in Comanche County, in September 1955, Sid Miller graduated with honors from Tarleton State University in Stephenville with a Bachelor of Science degree in Vocational Ag Education.

A recognized community leader, Miller was first elected to the House of Representatives in 2000. He quickly earned a reputation as a staunch defender of Texas agriculture, constitutional freedoms and individual liberties for all Texans.

He was elected statewide as the 12th Texas Agriculture Commissioner in 2014, and re-elected to his second term in office in 2018.

Since taking office as Agriculture Commissioner, Commissioner Miller has brought real, common sense reform to TDA. Within six months in office, he eliminated a two-and-a-half year backlog in organic certifications. He reshaped field operations to maximize efficiency for Texas taxpayers. This included increasing the number of consumer protection inspections by as much as 183 percent while slashing the miles traveled by TDA inspectors by more than half a million miles a year.

Commissioner Miller also launched Operation Maverick, a consumer protection initiative to round up businesses which failed to register their commercial scales with TDA. Registrations have increased 35 percent, and more than 2,000 previously unregistered businesses are now monitored by TDA to ensure consumers are protected.

A former ag teacher and school board member, Commissioner Miller is committed to fighting childhood obesity and promoting healthy lifestyles for Texas schoolchildren. His creation of Farm Fresh Fridays and other farm-to-school initiatives resulted in a $14 million increase in the amount of Texas products purchased by schools. Commissioner Miller is also passionate about ensuring rural communities have the water and infrastructure they need to thrive. To that end, he created TDA's Office of Water to ensure all Texans have access to clean water for today and future generations. Additionally, under his guidance, TDA has directed hundreds of millions of dollars in federal funding through the Texas Community Development Block Grant program to local communities for infrastructure improvements and repairs.

Commissioner Miller is the state's leading advocate around the world for Texas agriculture, Texas-grown products and Texas-owned businesses. He oversees TDA's world-renowned GO TEXAN program — a marketing effort to showcase the best products, companies and communities that call the Lone Star State home. Since taking office, Commissioner Miller's passion to increase market exposure for Texas agriculture has led him and his staff to mount trade missions to Cuba, Ecuador, Argentina, Israel, China and every continent on the globe, except Antartica.

DR. PATRICK STOVER
Vice Chancellor and Dean, College of Agriculture and Life Sciences, Texas A&M University

Patrick J. Stover, Ph.D., is the vice chancellor and dean for agriculture and life sciences at Texas A&M AgriLife and director of Texas A&M AgriLife Research. As vice chancellor, Stover oversees coordination and collaboration of the agriculture, academic and research programs across The Texas A&M University System, as well as four state agencies: Texas A&M AgriLife Research, Texas A&M AgriLife Extension Service, Texas A&M Veterinary Medical Diagnostic Laboratory and Texas A&M Forest Service. Stover is also director of AgriLife Research, where he oversees 13 research centers across the state with a research portfolio of more

than 500 projects and $214.2M in annual research funding. As dean of the College of Agriculture and Life Sciences, Stover leads more than 7,000 students and 330 faculty members in 15 academic departments.

Stover previously directed the Division of Nutritional Sciences at Cornell University. He received his bachelor's degree in chemistry from Saint Joseph's University, a doctorate in biochemistry and molecular biophysics from the Medical College of Virginia and completed his postdoctoral studies in nutritional sciences at the University of California, Berkeley.

An international leader in biochemistry and nutrition, Stover focuses his research on the biochemical, genetic and epigenetic mechanisms that underlie the relationships between folic acid and human pathologies such as developmental anomalies, neuropathies and cancer. He is an elected member of the National Academy of Sciences and a fellow of the American Association for the Advancement of Science. He is also former president of the American Society for Nutrition and has served two terms on the National Academies of Sciences, Engineering, and Medicine's Food and Nutrition Board.

PATRICK ARCHER
President, American Peanut Council

Patrick Archer is President of the American Peanut Council and previously served as its Vice President. He has been with the Council since 1987 in various positions in the area of export promotion. Mr. Archer has supervised marketing and PR programs in Canada, Mexico, Brazil, Europe, the Middle East, China and other Asian markets. Prior to joining the American Peanut Council, he worked in the United States House of Representative as a Legislative Assistant for former Alabama Congressman Bill Dickinson and also worked for the U.S. Treasury Department in Washington, D.C. He received his Bachelor of Arts degree from Troy University and M.B.A. from The University of Alabama. He also holds a certificate in language from The Sorbonne in Paris, France. Mr. Archer was appointed by the U.S. Secretary of Agriculture to serve on the Agricultural Technical Advisory Committe. He has also served on the Executive Committee of the U.S. Agricultural Export Development Council.

The American Peanut supports the long-term growth of the U.S. peanut industry by offering a forum and unified voice for everyone involved with peanuts. Whether you grow, buy, sell or manufacture, we're here for you. APC is the only association that represents the entire peanut industry.

Dr. Luis A. Ribera
Associate Professor and Extension Economist, Department of Agricultural Economics, Texas A&M University

Dr. Ribera is an Associate Professor and Extension Economist in the Department of Agricultural Economics. He also serves as the Program Director for International Projects for the Agricultural and Food Policy Center. Dr. Ribera received his B.S. and M.S. from the University of Arkansas and his Ph.D. from Texas A&M University, all in Agricultural Economics with emphases in Risk Analysis, Simulation and Econometric Modeling. His research expertise includes applying risk analysis and econometric tools on business management and economic analysis.His current work focuses on economic feasibility studies of biofuels using different technologies and feedstock, food safety, and horticulture production. Dr. Ribera has coordinated several workshops on food safety and horticulture production with emphasis on local/organic small acreage fruits and vegetable production. Since 2004, Dr. Ribera is a faculty member of the Master's Program in Applied Economics and Business Administration, a partnership program between Texas A&M University and Universidad del Valle de Guatemala.

Selected Publications:

Ribera, Luis A., Marco A. Palma, Mechel Paggi, Ronald Knutson, Joseph Masabni, and Juan Anciso. "Economic Analysis of Food Safety Compliance Costs and Foodborne Illness Outbreaks in the United States." *HortTechnology*. Forthcoming.Ribera, Luis A., and Henry Bryant. "Economic Issues for Sugarcane as a Feedstock for Fuel." In Eric Lam, Jorge da Silva and Helaine Carrer (eds.) *Compendium of Bioenergy Plants*: Sugarcane. Forthcoming.

Dr. Samara Sterling
Research Director, The Peanut Institute

Samara Sterling serves as the Research Director for The Peanut Institute and has expertise in the use of plant-based nutrition for the prevention and treatment of chronic diseases. In her role, she manages the research funded by The Peanut Institute and industry partners and develops research aims surrounding peanut nutrition research. She has worked as a researcher on a National Cancer Institute study where she studied the effects of nut consumption on health outcomes in a rural community. She has also served as a nutrition consultant for various community-based research projects.

The Peanut Institute is a non-profit organization supporting nutrition research and developing educational programs to encourage healthful lifestyles that include peanuts and peanut products.

Texas PEANUT PRODUCERS

Producer Discussion Panel

Shelly Nutt
Executive Director
Texas Peanut Producers Board

Larry Womack
Womack Farms
Comanche County
TPPB Board Member

Otis Lee Johnson
Producer
Gaines County
TPPB Board Member

Michael Newhouse
Producer
Conley County
TPPB Board Member

Jeff Roper
Producer
Yoakum County
TPPB Board Member

Ryan Warnken
Wilco Peanuts
Atascosa and Frio
Counties

Welcome

APRES **52nd Annual Meeting**

July 14-16, 2020 - Virtual Format

AFLATOXIN SYMPOSIUM

July 14, 2020

1:00PM - 3:00PM CST

2:00PM - 4:00PM EST

Via Zoom Webinar

Aflatoxin: Impacts and Challenges for the U.S. and Beyond

Last year, the industry struggled with its nemesis aflatoxin. Improvements in processing, production, research and education efforts keep the industry ahead of it. Yet, will we ever be rid of it? This year's symposium experts give you an industry-wide appreciation of the issue and what's on the horizon.

Economic Impacts and Overview of the Issue

Improved System Assessment of Aflatoxin Risk Utilizing Novel Data & Sensing Approaches at Points of Vulnerability

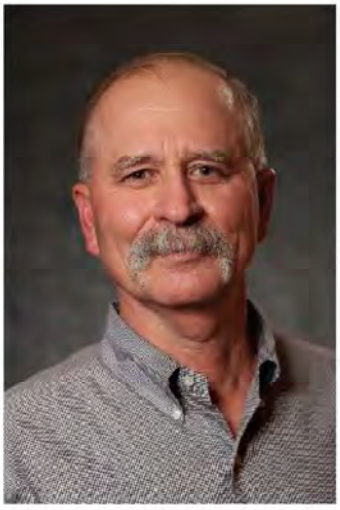
Dealing with Aspergillus in Peanut Seed--An Old Enemy Learns Some New Tricks

Breeding for PreHarvest Aflatoxin Resistance

Advances in RNA Technology for the Control of Aflatoxin in Peanuts

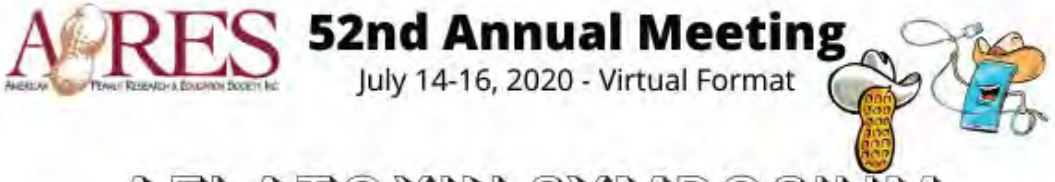
Aflatoxin: An Industry Perspective

Barry Tillman
President
APRES



Gary Schwarzlose
2020 Program Chair
APRES

Johnny Cason
Symposium Moderator
APRES



AFLATOXIN SYMPOSIUM

July 14, 2020

1:00PM - 3:00PM CST
2:00PM - 4:00PM EST
Via Zoom Webinar

Time	Presentation Title	Speaker
	Welcome	Moderator: Johnny Cason Texas A&M University
1:00 PM CST 2:00 PM EST	Economic Impacts and Overview of the Issue	Dr. Marshall Lamb USDA/ARS
1:20 PM CST 2:20 PM EST	Improved System Assessment of Aflatoxin Risk Utilizing Novel Data and Sensing Approaches at Points of Vulnerability	Dr. Diane Rowland University of Florida
1:40 PM CST 2:40 PM EST	Dealing with Aspergillus in Peanut Seed – An Old Enemy Learns Some New Tricks	Dr. Timothy Brenneman University of Georgia
2:00 PM CST 3:00 PM EST	Breeding for Preharvest Aflatoxin Resistance	Dr. Coley Holbrook USDA/ARS
2:20 PM CST 3:20 PM EST	Advances in RNA Interference Technology for the Control of Aflatoxins in Peanut	Dr. Renée Arias USDA/ARS
2:40 PM CST 3:40 PM EST	Aflatoxin: An Industry Perspective	Dr. Darlene Cowart Birdsong Peanut Co.

Aflatoxin: Impacts and Challenges for the U.S. and Beyond

APRES Symposium || July 14, 2020

Marshall Lamb, USDA/ARS

Economic Impacts and Overview of the Issue

Marshall Lamb serves as Research Leader and Location Coordinator at the USDA/ARS National Peanut Research Laboratory and Lead Scientist on USDA-ARS research project titled "Enhancing the Competitiveness of US Peanuts and Peanut-based Cropping Systems." He has authored or co-authored over 200 scientific publications and abstracts, 3 book chapters, and has given over 400 invited presentations at international, national, and regional professional and industry meetings and workshops and has written an estimated 200 popular press articles. Developed an expert system for farm management and marketing risk management (WholeFarm), co-developed an expert system for peanut irrigation (Irrigator Pro for Peanuts) and developed two other expert systems for corn (Irrigator Pro for Corn) and cotton irrigation (Irrigator Pro for Cotton). Marshall obtained B.S. and M.S. degrees from the University of Georgia and a Ph.D. from Auburn University.

Diane Rowland, University of Florida

Improved System Assessment of Aflatoxin Risk Utilizing Novel Data and Sensing Approaches at Points of Vulnerability

Diane Rowland is Chair of the Agronomy Department and Professor of Crop Physiology in the Institute of Food and Agricultural Sciences at the University of Florida in Gainesville, FL. She also directs the Center for Stress Resilient Agriculture that focuses on transdisciplinary approaches to researching, extending, and teaching about the complexity of challenges to maintaining sustainable food production worldwide. Diane specializes in the physiological mechanisms of crop stress, particularly related to water deficit and its impact on root structure and function. Diane pioneered the development of primed acclimation, a water management system that capitalizes on the nearly universal priming response in crop plants to enhance drought tolerance. The Agronomy Department is internationally recognized for the University of Florida's cross-departmental Agroecology graduate program focused on evaluating the sustainability and resilience of global agroecosystems.

Tim Brenneman, University of Georgia

Dealing with Aspergillus in Peanut Seed – An Old Enemy Learns Some New Tricks

Dr. Brenneman received his B.S. in Biology from Goshen College (Goshen, Indiana) and his Ph. D. in Plant Pathology from Virginia Tech. He joined the faculty of the University of Georgia in 1986 and currently serves as professor of plant pathology with responsibilities for research and extension programming on peanuts and pecans, two of the major crops in Georgia. He also teaches Introductory Plant Pathology at the UGA Tifton campus, and has mentored numerous graduate students and post-docs. His research program has been broad, including discovery of pecan truffles in Georgia, but his main focus has always been on developing improved, more cost-efficient methods of disease control. He has published over 150 refereed journal articles. He is a Fellow and past-president of APRES, and a Fellow of the American Phytopathological Society.

Corley Holbrook, USDA/ARS

Breeding for Preharvest Aflatoxin Resistance

Dr. Corley Holbrook is the Research Leader for the USDA-ARS Crop Genetics and Breeding Research Unit in Tifton, GA. He also has over 30 years of experience in peanut breeding and genetic research. Dr. Holbrook has published over 500 technical publications, and delivered numerous invited presentations at regional, national, and international conferences. He has served on the Board of Directors of the American Peanut Research and Education Society (APRES), and the Crop Science Society of American. He has also served as President of APRES. He developed 'Tifguard', the first peanut cultivar with resistance to both the peanut root-knot nematode and tomato spotted wilt virus. He recently released TifNV-High O/L which combines these resistances with the high oleic characteristic. Corley also served as a co-chair of the Research Steering Committee for the Peanut Genomic Initiative. He led the work to develop structured population and to phenotype these populations for economically important traits. This has resulted in the identification of numerous genetic markers that can be used to improve the efficiency and effectiveness of all U.S. Peanut Breeding Programs.

Renée Arias, USDA/ARS

Advances in RNA Interference Technology for the Control of Aflatoxins in Peanut

Dr. Renée Arias has been a member of the Graduate Faculty of Plant Pathology Department at UGA since June 2012, as well as a research pathologist at USDA-ARS-SAA since 2011. She received her B.S. in Agronomic Engineering from Universidad Nacional de Santiago del Estero, Argentina; her M.S. in Soil Microbiology from Universidad Nacional de Santiago del Estero, Argentina; and both her M.S. in Plant Pathology and Ph.D. in Plant Pathology from the University of Hawaii. She is currently engaged in eight international collaborations and has applied for two patents. Dr. Arias' professional service includes participating in the review panel for National Science Foundation and Small Business Innovative Research Grants, in addition to being a reviewer for over thirty scientific journals. Her awards and fellowships include the Presidential Early Career Scientist of the Year award for USDA (2014), the USDA-ARS Headquarters award (2013-2014), and the Early Career Scientist of

Darlene Cowart, Birdsong Peanuts

Aflatoxin: An Industry Perspective

Dr. Darlene Cowart is Corporate Director of Food Safety and Quality for Birdsong Peanuts headquartered in Suffolk, VA. Birdsong Peanuts operates shelling plants in all three major peanut producing regions in the U.S. Her primary responsibility at Birdsong is the implementation and management of the food safety and quality systems for all regions. Darlene has spent her entire professional career in the peanut industry focusing on food safety and quality at all levels of the business. She is currently serving as Chairman of APSA Safety and Sanitation Committee, Chairman of the Research Committee of the Peanut Institute, board member for the Peanut Research Foundation of the American Peanut Council, and as a board member of the Peanut Standards Board appointed by the U.S. Secretary of Agriculture. Darlene received a Bachelor's degree in Biology from Presbyterian College (1989), a Master's Degree in Horticulture from the University of Georgia (1991), and a Ph.D. in Food Science from the University of Georgia (1993).

Welcome

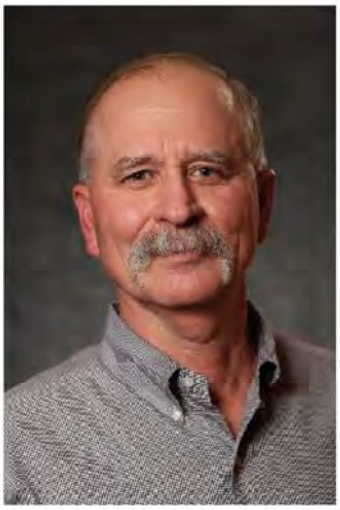
Joe Sugg Award Graduate Student Competition
Oral Presentation Format

Peanut Hall of Famer, Joe Sugg, was the first Executive Secretary of the North Carolina Peanut Growers Association (1953). In his nomination to APRES Fellow of the Society, Joe was described as "the pioneer that realized the need for sharing peanut research and education at the state and national level." He chaired and served as a board member of the National Peanut Council, was instrumental in the formation of APRES, and the establishment of the Bailey Award and the research journal, Peanut Science. The Joe Sugg Graduate Student Award for the best Graduate Student paper presented at Annual Meeting was created as a tribute to his service to the industry and his achievements. The North Carolina Peanut Growers Association supports this award with $1,000 going to the top 3 papers ($500-1st Place; $300-2nd Place; $200-3rd Place).

The Joe Sugg Award goal is to foster increased graduate student participation in presenting papers, which builds leadership skills. Winners of this award exemplify his great communications skills, passion for research and belief in higher education.

This year's competition draws the largest number of competitors in its 31-year history. Join us for two days of competition.

Barry Tillman
President
APRES



Gary Schwarzlose
2020 Program Chair
APRES

Bob Kemerait
Committee Chair
APRES

Joe Sugg Award Graduate Student Competition

Day 1: July 15, 2020

Time - EST	Last Name	First Name	Title of Presentation
8:00 AM	Kemerait Committee Chair	Bob	DAY 1 - OPENING REMARKS
8:15 AM	Abogoom	Jennifer	Evaluation of Perceptions, Preferences and Quality of Peanut Seed in Ghana
8:30 AM	Arthur	Stephen	Financial Returns for Weed and Disease Management Inputs in Peanuts in Southern Ghana
8:45 AM	Azevedo	Ana Julia	Effect of Winter Cover Crops on Peanut in Rotation with Cotton
9:00 AM	Becton	Hope	Image Analysis and Regression Modeling for Peanut Symptom Identification
9:15 AM	Bogati	Sujata	Strip Tillage versus Conventional Tillage: Fresh Insight on a Long-Standing Controversy
9:30 AM	Commey	Leslie	Seed Coat Biochemicals Mediate *Aspergillus Flavus* Resistance in Peanut
9:45 AM	Davis	S. Brad	Spatial Assessment of Tomato Spotted Wilt Virus to Varying Gap Lengths Within Uniform Peanut Stands
10:00 AM	(BREAK)	(BREAK)	(BREAK)
10:15 AM	Deraniyagala	S.R.A.S (Anushi)	Development of Diagnostic Tools Against Important Quarantine Viruses of Peanut
10:30 AM	Eason	Kayla	Determining Flumioxazin Dissipation and Effects on Peanut Using a Thermal Gradient Table
10:45 AM	Fogle	Benjamin	Yield Loss and Grade Effects of Peanut Combine Speed Settings
11:00 AM	Foster	Delaney	Peanut Response and Weed Control Following Norflurazon Applied Preemergence and At-Crack
11:15 AM	Godwin	Hayden	Peanut Response to Vegetative Injury Occurring at Different Intensities and Growth Stages
11:30 AM	Hurdle	Nick	Evaluation of High-Oleic Peanut Germination on Thermogradient Table
11:45 AM	Kulkarni	Roshan	Modeling for Ambiguous SNP Calls in Allotetraploid Peanut
12:00 PM	Kumar	Naveen	Understanding and Enhancing Drought Tolerance in Virginia Type Peanut
12:15 PM	Kemerait Committee Chair	Bob	DAY 1 - CLOSING REMARKS

As of 7-7-2020

Joe Sugg Award Graduate Student Competition

Day 2: July 16, 2020

Time - EST	Last Name	First Name	Title of Presentation
8:00 AM	Kemerait Committee Chair	Bob	DAY 2 - OPENING REMARKS
8:15 AM	Chen	Yi-Ju	Evaluation of Wild Peanut Genotypes for Resistance to Thrips and Thrips-transmitted TSWV
8:30 AM	Levinson	Chandler	Anatomical Characteristics Correlated to Peg Strength in *Arachis* Species
8:45 AM	Moreno	Leticia	Physiological Quality Gain in Peanut Seeds During Development
9:00 AM	Otyama	Paul I.	Genotypic Characterization of the U.S. Peanut Core Collection
9:15 AM	Peper	Alan	Can Calcite Dissolving Bacteria Promote Pod Growth?
9:30 AM	Rossi	Chiara	Assessing Photosynthetic Response of Peanut to Different Planting Dates Using UAV-based Multispectral Images
9:45 AM	Sarkar	Sayantan	High-Throughput Techniques to Estimate Leaf Wilting in Peanuts
10:00 AM	(BREAK)	(BREAK)	(BREAK)
10:15 AM	Studstill	Sara	The Evaluation of Vegetation Indices to Assess Yield and Crop Quality Parameters in Peanut
10:30 AM	Sung	Cheng-Jung	Effect of Irrigation Levels on Peanut Production and Profitability
10:45 AM	Virk	Simerjeet	Crop Emergence and Yield Response to Peanuts Planted at Different Seeding Depths and Planter Downforces in Loamy Sand Soils
11:00 AM	Wiggins	Raegan	Screening Peanut Recombinant Inbred Lines for Aflatoxin Contamination Using *in vitro* Seed Colonization of *Aspergillus flavus*
11:15 AM	Zhang	Qiong	Physiological Responses of Peanut Varieties to Drought Stress
11:30 AM	Zhao	Zifan	GFP-tagging of *Bradyrhizobium* strain Lb8 isolated from peanut *(Arachis hypogaea* L.) nodules
11:45 AM	Kemerait Committee Chair	Bob	DAY 2 - CLOSING REMARKS

As of 7-7-2020

On-line Program Content Overview

What will be in the Members-only area of the 2020 APRES Virtual Annual Meeting On-line Program? The traditional parts of the live meeting, re-formatted for the new digital era. When you login to the members-only area you will find:

List of Presentations
This year APRES received 116 papers will be presented through live webinars; audio/video-recorded PowerPoint presentation; and PDFs. Every paper can be found in this master list of presentations.

Sort the alphabetical list by author name, topic, or session to find your special interest. Click on the Title to read the abstract; Click on the YouTube video to watch a presentation or sponsor video; Click on the PDF for an in-depth view of the Posters.

All items can be viewed at your leisure beginning July 14th and will become a part of the APRES historical digital database accessible to all APRES members.

Research Abstracts
The author of each research/education paper accepted for presentation at the 2020 APRES Virtual Annual Meeting posted an abstract to the APRES website. Click on each title in the list of presentations to read a short summary of each project, which will help you prioritize your viewing list.

Concurrent Breakout Sessions
Abstract authors narrated and video-recorded their 15-minute research presentations with PowerPoint; replacing the traditional four (4) concurrent breakout session at our live meeting.

The pre-recorded files have been uploaded to the APRES YouTube channel and links connected to the complete list of presentations. Click on the video link to view the presentation.

Poster Session
Gone for this year are the 30"x40" Posters on stands, superseded by a digital Poster image and narrated overview of each project. A PDF of each poster is also available for an in-depth look. Click on both the presentation and the PDF to listen to the presentation while getting a closer look at the Poster. Poster Narrations up to 15-minutes.

National Peanut Board Graduate Student Poster Competition
Graduate students were given up to 5 minutes to discuss their project in this year's digital contest. The 30"x40" or 36"x36" poster image is paired with a narrated overview. Click on both the presentation and the PDF to listen to the presentation while getting a closer look at the Poster. Winners receive $350+APRES book for First Place; $150+APRES book for 2nd Place.

Sponsor Videos
We asked APRES's 2020 Sustaining Members to submit a video of their choice, up to 15-minutes in length to share. Take a moment to view their innovative and inspiring messages.

Board & Committee Reports
APRES' Committees and Board of Directors met in June to carry out the Society's business normally conducted at the Annual Meeting. Minutes of the each 2019-2020 Board meeting and reports from each Committee can be accessed. The APRES Business meeting has been cancelled for this year and APRES members are asked to read these reports to get a

complete picture of the Society's activities this year. A membership e-vote initiated July 1st is in the process of determining new members to the Board of Directors. Voting closes July 15th. Please vote today!

Webinar Recordings

Missed the live webinars? You get a second chance to hear our great group of speakers from the General Session; Aflatoxin Symposium; and Joe Sugg Award Graduate Student Competition webinars. Zoom records all webinars and provides a recording that we will upload to the APRES digital database.

Industry Reports

Industry reports from the Crop Germplasm Committee and the Seed Summit will be posted.

Awards Winners

Annual recognition awards recipients will be announced at the end of the General Session live webinar on July 14th. All awards recipients and winner's of this year's competitions will be contacted directly and a short summary posted online. The formal presentation of the awards will occur at the 2021 Annual Meeting in Dallas.

How To View the Members-Only On-line Content

All content will be available for viewing at your leisure **beginning July 14th**.

Your APRES membership must be up-to-date (2020-21 Member) to access the 2020 APRES Virtual Annual Meeting On-line Program Content. All 2020 program content is on the APRES website www.apresinc.com.

First time users to the Members-only area will be asked to enter the email they used to register for the meeting and to select "Forgot Password" to create a password. Respond to the email to set your password and login.

Need help? Contact Executive Officer Kim Cutchins at kim.cutchins@apresinc.com or 229-329-2949.

Barry Tillman	and	Gary Schwarzlose
President		2020 Program Chair
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