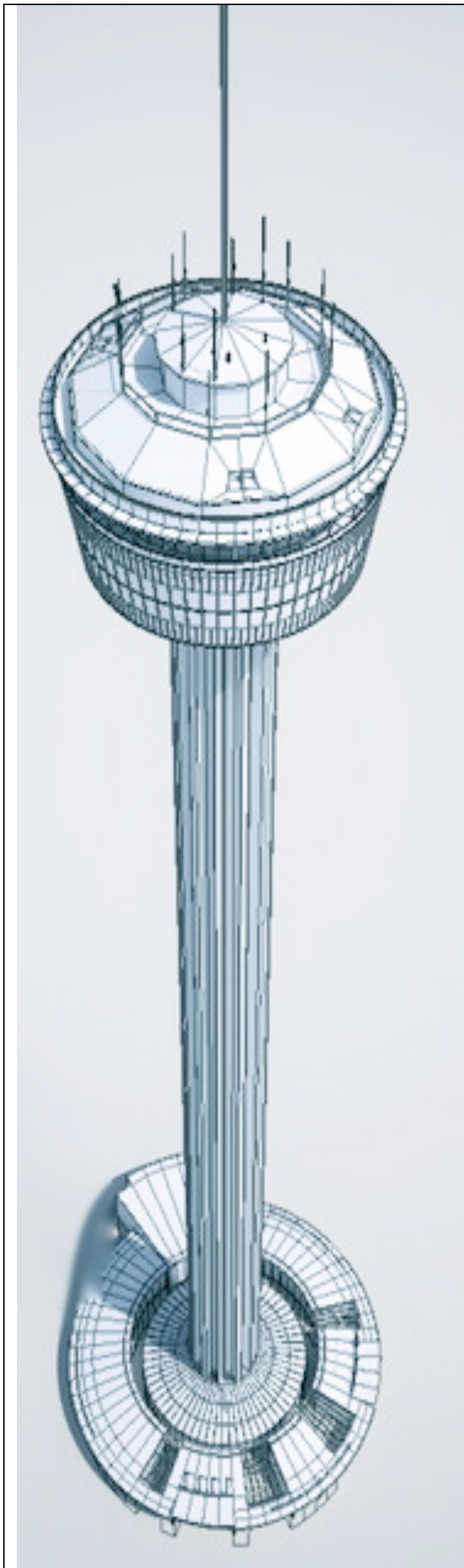

Tower of the Americas

AMERICAN PEANUT RESEARCH & EDUCATION SOCIETY, INC.

46th Annual Meeting

American Peanut Research and Education Society

July 8-10, 2014
Menger Hotel
San Antonio, TX

Proceedings

PROCEEDINGS

Of The

AMERICAN PEANUT RESEARCH AND EDUCATION SOCIETY, INC.

Meeting

July 8-10, 2014
San Antonio, TX

Publication Date
January 2015

Editors: Jason Woodward and Kimberly Cutchins

CONTRIBUTORS TO THE 2014 APRES ANNUAL MEETING

On behalf of APRES members and guests, the Program Committee says **"THANK YOU"** to the following organizations for their generous financial and product contributions:

SPECIAL ACTIVITIES

Texas Peanut Producers Board - Peanuts at the Park
Bayer CropScience & BASF – Wednesday Evening Meal
Dow AgroSciences – Thursday Evening Awards Reception
Texas Tech University – Fun Run
Texas Pest Management Association – Spouses' Program

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DOW AWARDS FOR RESEARCH & EDUCATION

Dow AgroSciences

EXCELLENCE IN EXTENSION

Bayer CropSciences

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BOARD OF DIRECTORS
2013 - 2014

President:	Timothy Brenneman (2014)
Past President:	Ames Herbert (2014)
President-elect	Naveen Puppala (2014)
Executive Officers:	Kim Cutchins (2014)
University Representatives:	
(VC Area)	David Jordan (2013)
(SE Area)	Barry Tillman (2013)
(SW Area)	Peter Dotray (2014)
USDA Representative:	Noelle Barkley
Industry Representatives:	
Production	Keith Rucker (2015)
Shelling, Marketing Storage	Darlene Cowart
Manufactured Products	Doug Smyth (2014)
National Peanut Board Representative:	Dan Ward (2013)
American Peanut Council Representative:	Howard Valentine (2013)

Past Presidents

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

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

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

APRES Committees
2014-15

Finance Committee
Jason Woodward, Chair (2014)
Naveen Puppala (2017)
Darlene Cowart (2015)
George Musson (2015)
Scott Tubbs (2017)

Nominating Committee
Timothy Brenneman (2015)
John Damicone (2015)
Barbara Shew (2015)
Noelle Barkley (2017)
Barry Tillman (2017)

Program Committee
Tim Brenneman, chair (2013)
John Beasley, Local Arrangements (2013)
Scott Tubbs, Technical Program (2013)
Julie Rucker, Spouses Program (2013)

Peanut Quality Committee
Mark Kline, Chair (2017)
Brent Besler (2015)
Dell Cotton (2015)
Darlene Cowart (2015)
Michael Franke (2015)
Tim Sanders (2015)
Barry Tillman (2016)
Chris Liebold (2017)

Publications and Editorial Committee
Nick Dufault, Chair (2016)
Calvin Trostle (2015)
Emily Cantowine (2016)
Shyam Tallury (2017)
Jiang Ping Wang (2017)
Chris Butts (2017)

Public Relations Committee
Jason Woodward, Chair (2017)
Kelly Chamberlin (2015)
Shelly Nutt (2015)
Julie Marshall (2016)
Bob Sutter (2016)

Site Selection Committee
Michael Baring, Chair (2017)
David Jordan (2015)
Thomas Stalker (2015)
Nick Dufault (2016)
Barry Tillman (2016)
Rebecca Bennett (2017)
Naveen Puppala (2017)

Bailey Award Committee
Charles Chen, Chair (2017)
Noelle Barkley (2015)
Kelly Chamberlin (2015)
Shyam Tallury (2015)
Scott Monfort (2016)

Dow AgroSciences Awards Committee
Kelly Chamberlain, Chair (2017)
Travis Faske (2015)
Scott Tubbs (2016)
Lisa Dean (2016)
Bill Branch (2017)
Victor Nwosu (2017)
John Rickburg (2017)

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

Coyt T. Wilson Distinguished Service Award Committee
Corley Holbrook, Chair (2016)
Nathan Smith (2015)
Austin Hagan (2016)
Emily Cantowine (2017)

Joe Sugg Graduate Student Award Committee
Robert Kemerait, Chair (2017)
Nicholas Dufault (2015)
Jason Woodward (2015)
Wilson Faircloth (2016)
Rebecca Bennett (2017)
Maria Balota (2017)

FELLOWS of the SOCIETY

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

BAILEY AWARD RECIPIENTS

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	1975S.R. Milla-Lewis and T.G. Isleib
2008	Y. Chu, L. Ramos, P. Ozias-Akins, and C.C. Holbrook
2007	D.E. Partridge, P.M. Phipps, D.L. Coker, and E.A. Grabau
2006	J.W. Chapin and J.S. Thomas
2005	J.W. Wilcut, A.J. Price, S.B. Clewis, and J.R. Cranmer
2004	R.W. Mozingo, S.F. O'Keefe, T.H. Sanders and K.W. Hendrix
2003	T.H. Sanders, K.W. Hendrix, T.D. Rausch, T.A. Katz and J.M. Drozd
2002	M. Gallo-Meagher, K. Chengalrayan, J.M. Davis and G.G. MacDonald
2001	J.W. Dorner and R.J. Cole
2000	G.T. Church, C.E. Simpson and J.L. Starr
1999	J.L. Starr, C.E. Simpson and T.A. Lee, Jr.
1998	J.W. Dorner, R.J. Cole and P.D. Blankenship
1997	H.T. Stalker, B.B. Shew, G.M. Garcia, M.K. Beute, K.R. Barker, C.C. Holbrook, J.P. Noe and G.A. Kochert
1996	J.S. Richburg and J.W. Wilcut
1995	T.B. Brenneman and A.K. Culbreath
1994	A.K. Culbreath, J.W. Todd and J.W. Demski
1993	T.B. Whitaker, F.E. Dowell, W.M. Hagler, F.G. Giesbrecht and J. Wu
1992	P.M. Phipps, D.A. Herbert, J.W. Wilcut, C.W. Swann, G.G. Gallimore and T.B. Taylor
1991	J.M. Bennett, P.J. Sexton and K.J. Boote
1990	D.L. Ketring and T.G. Wheless
1989	A.K. Culbreath and M.K. Beute
1988	J.H. Young and L.J. Rainey
1987	T.B. Brenneman, P.M. Phipps and R.J. Stipes
1986	K.V. Pixley, K.J. Boote, F.M. Shokes and D.W. Gorbet
1985	C.S. Kvien, R.J. Henning, J.E. Pallas and W.D. Branch
1984	C.S. Kvien, J.E. Pallas, D.W. Maxey and J. Evans
1983	E.J. Williams and J.S. Drexler
1982	N.A. deRivero and S.L. Poe
1981	J.S. Drexler and E.J. Williams
1980	D.A. Nickle and D.W. Hagstrum
1979	J.M. Troeger and J.L. Butler
1978	J.C. Wynne
1977	J.W. Dickens and T.B. Whitaker
1976	R.E. Pettit, F.M. Shokes and R.A. Taber

Joe Sugg Graduate Student Competition – Award Recipients

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

COYT T. WILSON DISTINGUISHED SERVICE AWARD

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

DOW AGROSCIENCES AWARD FOR EXCELLENCE IN RESEARCH

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

*1998 Changed to DowAgroSciences Award for Excellence in Research

DOW AGROSCIENCES AWARD FOR EXCELLENCE IN EDUCATION

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

1992-1996 DowElanco Award for Excellence in Extension

1997 Changed to DowElanco Award for Excellence in Education

1998 Changed to Dow AgroSciences Award for Excellence in Education

PEANUT RESEARCH AND EDUCATION AWARD RECIPIENTS

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

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

ABSTRACTS

Wednesday, July 9th

THE STATUS AND PROSPECTIVE OF PHENOTYPING

(1) Advances in Phenotyping of Functional Traits in the Field Crops. C.Y. CHEN*, Department of Crop, Soil and Environmental Sciences, Auburn University, 201 Funchess Hall, Auburn, AL 36849; C.L. Butts and P.M. DANG, USDA-ARS, National Peanut Research Lab, Dawson, GA 39842; M.L. WANG, USDA-ARS, Plant Genetic Resources Conservation Unit, Griffin, GA 30223

In plants, functional traits are morphological, biochemical, physiological, structural, phenological, or behavioral characteristics that are expressed in phenotypes of individual plants, that are relevant to the plant's role in the ecosystem or its agronomic performance. Plant phenotyping attempts to quantify functional traits that involve plant quality, photo-synthesis, development, architecture, growth and biomass productivity of single plants using different analysis procedures. Phenotyping provides a critical means to understand morphological, biochemical, physiological principles in the control of basic plant functions as well as for selecting superior genotypes in plant breeding. Besides well-known classical plant phenotyping procedures based on visual observations, measurements, or biochemical analyses, many recent developments are target-specific and highly automated analysis procedures. The technological developments for laboratory or greenhouse-based phenotyping have been dramatically improved, complemented by other techniques, and brought to a platform of high throughput. Automated phenotyping approaches are far more successful at the laboratory and greenhouse scale than in field conditions where many other variable factors complicate the retrieval of imaging data collected in the field. With respect to plant breeding, rapid measurement procedures, high throughput, a high degree of automation, and access to appropriate, well-conceived databases are required to depict the performance of certain genotypes in the field.

(2) Genetic Resources for Phenotyping C. C. HOLBROOK[1*], T. G. ISLEIB[2], P. OZIAS-AKINS[3], Y. CHU[3], S. J. KNAPP[4], B. TILLMAN[5], B. GUO[1], N. BARKLEY[6], C. CHEN[7], and M.D. BUROW[8]. [1]USDA-ARS, Tifton, GA 31793; [2]North Carolina State Univ., Raleigh, NC; [3]Univ. of Georgia, Tifton, GA; [4]Monsanto, Woodland, CA; [5]University of Florida, Marianna, FL; [6]USDA-ARS, Griffin, GA; [7]Auburn University, Auburn, AL; [8]Texas A&M, Lubbock, TX.

Phenotyping of structured populations, along with molecular genotyping, will be essential for marker development in peanut. This research is essential for making the peanut genome sequence and genomic tools useful to breeders because it makes the connection between genes, gene markers, genetic maps, and agronomic traits in peanut. Several structured populations are available, and phenotyping efforts are ongoing. Sixteen inbred mapping populations have been created using parents that maximize genetic diversity for practical breeding objectives. First, two modern runner cultivars (Tifrunner and Florida-07) were selected as common parents because runner cultivars account for about 80% of the production in the U.S. Second, eight unique parents were selected to supply diversity across market classes and botanical varieties and are donor of favorable alleles for enhancing drought tolerance and resistance to most important diseases of peanut in the US. Phenotyping of two additional RIL populations is ongoing since these are part of the genome sequencing effort. The T population

resulted from the cross of Tifrunner x GT-C20, and the S population resulted from the cross of SunOleic 97R and NC 94022. Genome sequencing is also planned for the USDA mini-core germplasm collection. Phenotypic data from these genetic resources should result in the identification of genetic markers for numerous economically important traits.

(3) Phenotyping for Foliar Diesease Resistance. A.K. CULBREATH*[1], C.C. HOLBROOK[2], B. GUO2, P. OZIAS-AKINS[3], Y. CHU[3], R. GILLI[3], J. CLEVENGER[3], T.B. BRENNEMAN[1], and T. G. ISLEIB[4]. [1]Dept. of Plant Pathology, University of Georgia, Tifton, GA 31793; [2]USDA-ARS, Coastal Plain Experiment Station, Tifton, GA, 31793; [3]Dept. of Horticulture and Institute of Plant Breeding, Genetics & Genomics, University of Georgia, Tifton, GA 31793; and [4]Dept. of Crop Science, N.C. State University, Raleigh, 27695.

Reactions to *Tomato spotted wilt tospovirus* (TSWV) and the fungi that cause early leaf spot (*Cercospora arachidicola*) and late leaf spot (*Cercosporidium personatum*) are traits of key interest in current work with several mapping populations of peanut (*Arachis hypogaea*). There are no consistent mechanical inoculation techniques for screening for resistance to TSWV, so determining reactions to that pathogen is dependent upon field evaluations with natural inoculum and resident vectors of *Frankliniella fusca* and/or *Frankliniella occidentalis*. Field evaluations, likewise, have been the predominant method for determining resistance to leaf spot pathogens. Because of the typical timing of occurrence of the different diseases, it has been possible to use a single trial to characterize response of the population lines to both TSWV and the leaf spot pathogens. Generally, if disease pressure of tomato spotted wilt is adequate, ratings can be made early- to mid-season. If the population is not treated with fungicides to control leaf spot, evaluation can be made for leaf spot diseases later in the season except in plots where tomato spotted wilt is so severe that leaf spot ratings are precluded. Rating plots for severity of tomato spotted wilt and leaf spot using severity scales for the respective diseases can be done quickly and consistently for field trials that include several hundred plots. Greenhouse and growth chamber trials utilizing standardized inoculum are being used for characterizing resistance to leaf spot pathogens. These may be useful for identifying specific components of resistance that may not be obvious in field evaluations. However, depending on the type evaluation being done they often require substantial time for each evaluation. Efforts are ongoing in which different methods are being compared for accuracy and precision for characterizing resistance responses among population lines and for efficiency of space, time and effort required to utilize them.

(4) Phenotyping Peanut Diseases caused by Soilborne Pathogens.
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Numerous efforts have been made over the years to phenotype peanut germplasm with regard to susceptibility to soilborne pathogens. Efforts in the Virginia-Carolina region have focused on Sclerotinia blight (*Sclerotinia minor*) and Cylindrocladium black rot or CBR (*Cylindrocladium parasiticum*), mainly on Virginia-type germplasm. In Georgia and Florida, stem rot (*Sclerotium rolfsii*), root knot nematode (*Meloidogyne arenaria*) and CBR have been the main targets in developing runner-type cultivars, with some work on Rhizoctonia limb rot (*Rhizoctonia solani* AG-4). In Texas and Oklahoma, runner types have been evaluated for all these except CBR.

Disease screens with excised tissues or plants in the greenhouse have provided useful data, but the ultimate test is field resistance, either in naturally-infested areas or inoculated plots. The improved resistance to these pathogens in available commercial cultivars reflects the success of these efforts, but greater efficiency is needed. This is currently limited by our lack of knowledge in several areas, but particularly regarding specific mechanisms of resistance.

(5) <u>Phenotyping for Abiotic Stress Tolerance.</u> M. D. BUROW[*], J. CHAGOYA, M. S. GOMEZ, Texas A&M AgriLife Research, Lubbock, TX 79403, and Texas Tech University, Department of Plant and Soil Science, Lubbock, TX 79409; P. PAYTON, G. BUROW, J. BURKE, USDA-ARS-CSRL, 3815 4th Street, Lubbock, TX 79415; K. KOTTAPALLI, Texas Tech University, Department of Plant and Soil Science, Lubbock, TX 79409; N. PUPPALA, Agricultural Science Center, New Mexico State University, Clovis, NM 88001; C. CHEN, Auburn University, Auburn, Alabama 36849; P. DANG, USDA-ARS, Dawson, GA, 39842; D. ROWLAND, University of Florida, Gainesville, FL; C. HOLBROOK, USDA-ARS, Tifton, GA 31793; S. LEAL-BERTIOLI, D. BERTIOLI, Empresa Brasileira de Pesquisa Agropecuaria, Recursos Geneticos e Biotecnologia, Brasilia 70770 DF, BRAZIL; H. D. UPADHYAYA, V. VADEZ, International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), Patancheru 502324, Andhra Pradesh, India.

Water deficit stress, at times in combination with heat and salinity stress, are major limitations to peanut production on multiple continents. Various measures have been used to estimate response to water deficit, including direct measures of T, TE, and HI. Other, indirect measures have been used, including delta ^{13}C or Carbon isotope discrimination, SPAD chlorophyll meter reading, SLA, photosynthetic measurements, paraheliotropism, flowering, canopy temperature, PSII fluorescence, and yield. Different methods have been used for experimental control of water deficit. Measures and methods for control of irrigation vary as to the number of samples that can be analyzed, and by the instrumentation and plot setup that are needed. Tolerance to heat stress has been measured by pollen viability, membrane stability, metabolite concentration, and yield. Salinity stress has been measured by SPAD chlorophyll content, stand survival, yield, visual observation, and chlorophyll fluorescence. For physiological studies of mechanism of resistance, labor-intensive methods are suitable, but for breeding populations, methods that allow for screening of large numbers of individuals are needed. Several of these methods have been tested on germplasm collections and wild species, and accessions with abiotic stress tolerance have been identified.

(6) <u>Potential Tools for Phenotyping for Physical Characteristics of Plants, Pods, and Seeds.</u> C.L. BUTTS*[1], C.C. HOLBROOK[2], M.C. LAMB[1], and C.Y. CHEN[3], [1]USDA, ARS, National Peanut Research Laboratory, Dawson, GA 39842; [2]USDA, ARS, Crop Genetics and Breeding Research, Tifton, GA 31793; [3]Crop, Soil & Environmental Sciences, Auburn University, Auburn, AL 36849.

Advances in phenotyping are a key factor for success in modern breeding as well as for basic plant research. Phenotyping provides a critical means to understand morphological, biochemical, physiological principles in the control of basic plant functions as well as for selecting superior genotypes in plant breeding. This presentation focuses on non-destructive techniques and analytical tools to assess the physical characteristics of plants, pods, and seed. X-ray imaging is one such technique that has been used to non-destructively determine the mass fraction of kernels and hulls, and kernel size distribution and will be discussed. The potential of other means of analysis will be explored.

(7) Phenotyping for Peanut Flavor. T.G. ISLEIB, H.E. PATTEE, and S.C. COPELAND, Dept. of Crop Science, N.C. State Univ., Raleigh, NC 27695-7629; and T.H. SANDERS, L.O. DEAN, and K.W. HENDRIX, USDA-ARS Market Quality and Handling Research Unit, Raleigh, NC 27695-7624.

Flavor has long been identified by US processors of virginia- and runner-type peanuts (*Arachis hypogaea* L.) as the pre-eminent trait of importance in marketing finished product. As new peanut cultivars are developed, it is important that the flavor profiles of new releases meet or exceed those of the cultivars they are intended to replace. The chemical basis of roasted peanut flavor has not been fully elucidated, so currently there is no chemical or physical test for flavor intensity. Measurement of flavor is achieved through use of sensory panels. Most elements of peanut flavor measured thusly have relatively low heritability, making flavor improvement a slow, expensive process. Identification of DNA markers associated with improved flavor would obviate the need to use sensory panels to assess flavor on large numbers of samples or perhaps enrich the samples tested via panels with lines possessing superior flavor. There have been numerous studies of peanut flavor, usually with limited numbers of different lines, and usually with limited representation of different environmental conditions. Different flavor lexicons have been used by different researchers to measure similar but perhaps somewhat different aspects of flavor. Flavor is very much confounded with maturity of the seeds being tasted, with overheating or too-rapid drying of in-shell peanuts, and with degree of roast, so crop management of this highly indeterminate species, post-harvest handling practices, and specific cooking protocols can have a large impact on panelists' perceptions of flavor. The cost of sensory panel work is fairly high, approximately US $50 per sample for the panelists' evaluation, exclusive of sample production and preparation which might have similar cost altogether. There are large environmental effects, particularly those of year and specific location of production. This may have to do with the average maturity of lines in the field trials. One can dig all plots earlier or later, thereby favoring one line over another. Ideally, each plot would be dug very close to its optimum maturity, but this is very difficult if not impossible to achieve and almost never the case. Drying of pod samples from different trials is also a factor. Cooking seeds for a specific time at a specific temperature is unsatisfactory: they must be cooked as nearly as possible to a common color. Roast color may be a used to good effect as a covariate for intensities of the roasted peanut, sweet, and bitter sensory attributes. Genotype-by-environment interactions also occur, so a line with superior flavor in one environment may not have it in another. The net result of these factors is that commercially important attributes like roasted peanut, sweet, sweet aromatic, and bitter have low heritabilities, making direct selection relatively ineffective. On the NCSU peanut breeding project with three test locations per year, we do not consider a flavor profile to be consistent before it is based on three years' worth of data, *i.e.*, a profile should be based on data from nine environments. A number of genetically stable recombinant inbred line (RIL) populations have been developed in peanut from a 2x8 factorial mating using two runner-type cultivars (Tifrunner and Florida-07) as "common" parents and an array of eight diverse lines as "uncommon" or "rare" parents. Approximately 400 RILs have been developed from each cross. Assuming that only 200 RILs from a single cross were evaluated, it would require 900 samples per line at US $50 to $100 per sample or $45,000 to $90,000 to achieve minimally acceptable phenotyping for flavor. This approximate cost of phenotyping must be weighed against the improvement in efficiency of selection for improved flavor that might be achieved subsequently.

(8) Phenotyping Peanut Seed Composition. L. L. DEAN*, K. W. HENDRIX, and T. H. SANDERS, Market Quality and Handling Research Unit, USDA, ARS, Raleigh, NC 27695- 7624; and C. M. KLEVORN, Department of Food, Bioprocessing, and Nutrition Sciences, North Carolina State University, Raleigh, NC 27695-7624.

Determination of the composition of peanut seed combines many aspects of conventional food analysis, but despite the need for accurate, yet low cost and rapid methods, most of this work is still labor intensive and relies on expensive, specialized equipment. The most successful rapid methods have been developed for proximate composition, especially total fat, protein and moisture. Chromatography, both liquid and gas, has been used with the most success for lipid composition, fat soluble vitamins, smaller carbohydrates such as sugars, small molecule phenolic compounds and to a lesser extent, water soluble vitamins. The addition of mass detectors has led to more metabolomic approaches, where multiple analytes can be determined at one time, however quantification remains a challenge. The peanut matrix has proven to be a challenge due to interference from both high protein and lipid levels with methods of analysis and enumeration. Accurate results for most methods still require skilled analysts for sample preparation, operation of high cost equipment and interpretation of data produced. To date, there have been approaches that have been successful, but some components remain problematical. Accurate phenotyping of seed components is always related to the particular seed subjected to analysis because of the effect of environment, maturity, handling, and seed size. In relating genotyping information, such as genomic markers, to phenotype of seed components requires careful sample selection as demonstrated in data on high oleic markers vs the high oleic trait in immature seed.

(9) Phenotyping Data Management. H. VALENTINE, The Peanut Foundation, Jasper, GA 30143

The Peanut Genome Initiative will generate a tremendous amount of data that will include Phenotyping, genotyping, and gene markers along with hundreds of sequenced peanut varieties. This data will be housed primarily at Iowa State and managed by Steven Cannon of USDA-ARS. A backup for the data will be housed at the NCGR server in Santa Fe, NM. All the data may be accessed by anyone at www.peanutbase.com. The peanut data will use the same software format developed for soybase by USDA and will make it easy for geneticist to compare the peanut genome with other legume genomes. The next step will be to extend the usefulness of the database for breeders by connecting it to another site developed by the Gates Foundation's Generation Challenge for African crops. This incorporates breeder tools such as gene markers for peanut diseases and quality traits as well as spreadsheets to aid in the set up and documentation of field trails to include Phenotyping.

(10) On-Farm Evaluation of a Seed Treatment and In-Furrow Granular Insecticide for Thrips and TSWV Management in Virginia and Runner-Type Peanuts

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Thrips species and the disease they transmit, Tomato Spotted Wilt Virus (TSWV), comprise one of the major economically important pest – pathogen complexes throughout the eastern peanut belt in the United States. With the loss of aldicarb for use in peanuts, there is a need to evaluate alternatives for both efficacy against thrips and the effects on incidence of TSWV. For the first time, an insecticide seed treatment, Cruiser Maxx Peanut (thiamethoxam, Syngenta Crop Protection, Inc.) is now commercially available to peanut growers. In cooperation with the State Peanut Specialist, county agents coordinated on-farm variety trials, in Darlington, Florence, and Orangeburg County, South Carolina with the objective of comparing Dynasty PD seed treatment + Thimet vs Cruiser Maxx Peanut seed treatment on three standard peanut varieties for management of thrips, TSWV incidence, and yield response. Plots in Florence and Darlington Counties compared Virginia type peanuts (Bailey, Champ, and Sugg). Plots in Orangeburg County compared Runner type varieties (Tuff Runner 727, Ga 07W, Ga 09B). Experiment treatments included: 1) Dynasty PD seed treatment + Thimet at 5.5 oz/1000 row feet, 2.) Cruiser Maxx Peanut at 0.318 mg ai/seed. Plots were established in a randomized complete block design. Data collection in Darlington and Florence County plots included TSWV incidence ratings and yield in pounds/acre. Data collection in Orangeburg County included seedling stand counts, visual ratings of plant injury caused by direct thrips feeding on a scale of 0=no injury to 10=dead plants, TSWV incidence ratings, and yield in pounds/acre. Results at the Darlington location showed; 1) Bailey numerically out-yielded Sugg and Champs, 2) Bailey numerically had less TSWV than Sugg and Sugg and Bailey had significantly less virus than Champs, 3) Relative to Cruizer Maxx, yield was numerically increased with Thimet in all varieties and more virus symptoms were present in Cruiser Maxx treated plots than Thimet Treated in all but Champs. Results from Florence showed; 1) In a very low yield environment, Bailey and Sugg yields were similar and both numerically out-yielded Champs and 2) Thimet treatment numerically increased yield relative to Cruizer Maxx in all but Champs where yields were similar. Excessive deer damage lead to no thrips injury or TWSV ratings being taken. Results from Orangeburg County showed; 1) no significant yield effects were observed across varieties; However, Ga 09B had the lowest yield compared to the other varieties, 2) Comparing Thimet to Cruizer Maxx, Thimet had numerically lower virus, lower thrips injury, and higher yield compared to Cruizer Maxx across all varieties.

(11) Multi-Year (2009-2012) Research of In-Furrow and Topical Prothioconazole Treatments on Severity of Cylindrocladium Black Rot and White Mold Diseases of Peanut.

W. G. TYSON*, University of Georgia Cooperative Extension, Effingham County, Springfield, GA 31329 and R. C. KEMERAIT, University of Georgia, Department of Plant Pathology, 4604 Research Way, Tifton, GA 31794.

The impact of soilborne diseases on peanut production in Effingham County has been a problem that needs to be addressed with additional on-farm research. Peanut acreage has increased in the county over the past several years and the problems associated with peanut production have become more widespread, due in part to shorter rotations between peanut crops. The producers' current best line of defense to combat these problems involves selection of more-resistant varieties, judicious use of fungicides, and soil fumigation with metam sodium to reduce severity of Cylindrocladium black rot (CBR). In on-farm research demonstrations, the effectiveness of prothioconazole (Proline) applied in-furrow at planting and over-the-top after emergence was evaluated for the management of peanut diseases. Provost (prothioconazole + tebuconazole) and Artisan (flutolanil + propiconazole)/chlorothalonil were evaluated with Proline (prothioconazole) to assess the best program for overall disease protection. Data collected in this study included severity of leaf spot diseases, White mold, and Cylindrocladium black rot. As an in-furrow fungicide with known activity against Cylindrocladium black rot and over-the-top activity against white mold may also improve seedling health as well, it was hoped that this practice would not only improve control of CBR and White mold, but possibly seedling disease and TSWV as well. Because use of prothioconazole is a relatively new practice for our peanut growers, there is a serious lack of data on this type of application in the southeast that has been collected in large-plot, on-farm trials. The data will exhibit the effectiveness of prothioconazole on improving control of CBR and White mold soilborne diseases that negatively impact yield and quality. This data played an important role in recommendations for the use of prothioconazole in Effingham County and the Southeast.

(12) Experiences and Results from Regional Peanut Field Days in Southeastern North Carolina. R. HARRELSON*, D.L. JORDAN, P.D. JOHNSON, R.L. BRANDENBURG, and B.B. SHEW, North Carolina Cooperative Extension Service, Raleigh, NC 27695; B. SUTTER, North Carolina Peanut Growers Association, Nashville, NC 27856; and L. RANSOM, North Carolina Department of Agriculture and Consumer Services, Whiteville, NC 28427.

Field days were held in southeastern North Carolina during mid-September 2012 and 2013 to discuss production and pest management issues and peanut maturation in that region of the state. Trials established at the location included evaluation of 1) thrips control programs; 2) Virginia and runner marker type varieties; 3) the plant growth regulator prohexadione calcium (Apogee); 4) commercial inoculants; 5) in-furrow and early-season applications of fungicides; 6) interactions of inoculants, imidacloprid (Admire Pro), and prothioconazole (Proline); and 7) gypsum enhancement products. A pod maturity clinic was included in conjunction with the field day. Approximately 50 people attended the field day during 2012 with 75 attending during 2013. Similar events are scheduled in the future, serving as a platform to address the needs of growers in the southeastern region of North Carolina.

(13) Pest and Management Considerations for Peanut Production in West Texas. K. T. SIDERS*, Texas A&M AgriLife Extension Service, Levelland, TX 79336; and J.E. WOODWARD, Texas A&M AgriLife Extension and Texas Tech University, Lubbock, TX 79403.

Peanut production in Texas is unique as all four peanut market-types can be grown throughout the states four major growing regions. Over the past 12 years, peanut acreage has decreased and the composition of market-types has shifted and increased proportion of acres being planted to Spanish and Virginia cultivars, rather than Runners. Currently, production is concentrated in the Southern High Plains, where peanut is often rotated with cotton to help alleviate pest issues such as root-knot nematodes (*Meloidogyne incognita*). While peanut is a good rotational crop for cotton, several diseases can limit production and must be considered prior to planting. Foliar diseases such as early and late leaf spot, as well as web blotch and pepper spot or leaf scorch have been reported in the region. Recent drought conditions have led to a decrease in the incidence of foliar diseases, whereas, soilborne diseases such as Pythium and Rhizoctonia pod rot, and Verticillium wilt have increased. Losses from pod rot are greatest when kernels become infected, resulting in severe reductions for the value of the crop. Pythium and Rhizoctonia pod rot are of great concern, as management options are limited and disease development within a field can be sporadic. Furthermore, information regarding Verticillium wilt in peanut is limited. As a result, research efforts have focused on characterizing the response of different market-types and cultivars to the aforementioned diseases. Overall, Virginia and Runner cultivars appear to be inherently more susceptible to pod rot than Spanish cultivars. Recent studies have found differences exist among cultivars in the reaction to pod rot; however, the mechanism of resistance is not understood. In contrast, Runner and Virginia cultivars appear to be less susceptible to Verticillium wilt. Other issues, such as irrigation capacity and water quality are impacting peanut production in the region. Additional research is needed investigating newly released cultivars and advanced breeding lines, in order to maintain profitable peanut production in west Texas.

(14) 2013 Evaluation of In-Furrow and Foliar Fungicides for Disease Control of Peanut in Jay, Florida. J.D. ATKINS*; D. E. P TELENKO and L. JOHNSON, University of Florida, Jay, FL, 32565

Soilborne diseases are a devastating problem for peanut producers in Santa Rosa County. Peanut producers need both economical and sustainable options to reduced disease impacts and increase peanut yields. Fungicide programs used for disease management are the largest expense associated with peanut production. Resistant varieties and both foliar and in-furrow fungicides are used to combat soilborne disease. This research trial evaluated the efficacy of foliar and in-furrow fungicides against white mold (*Sclerotium rolfsii*). In-furrow use of fungicides is a new practice for our peanut growers in Santa Rosa County and there is interest and a need for local data on this practice compared to our traditional foliar applied fungicide programs. The plots were randomized complete block experimental design with four replications. They were managed following University of Florida recommended practices. The results of this trial will be reported in terms of disease control visual evaluations, final yields, cost of the fungicide programs and net returns.

(15) Survey of Key Production and Pest Management Practices in Peanut in North Carolina and Virginia during 2013. J. MORGAN*, M. CARROLL, P. SMITH, R. RHODES, A. COCHRAN, A. BRADLEY, W. DRAKE, C. ELLISON, A. WHITEHEAD, C. TYSON, M. SMITH, T. BRITTON, N. HARRELL, C. FOUNTAIN, R. THAGARD, M. MALLOY, L. GRIMES, M. SHAW, R. HARRELSON, D.L. JORDAN, P.D. JOHNSON, R.L. BRANDENBURG, and B.B. SHEW, North Carolina Cooperative Extension Service, Raleigh, NC 27695; and K. WELLS, M. PARRISH, G. SLADE, J. SPENCER, J. REITER, B. COUNCIL, and W. MARCUS, M. BALOTA, A. HERBERT, and H. MEHL, Virginia Cooperative Extension Service, Suffolk, VA 23437.

A written survey was conducted during winter 2014 at county and state production meetings in North Carolina and Virginia, respectively, to determine practices associated with tillage, use of the plant growth regulator prohexadione calcium (Apogee), and application of in-furrow and postemergence insecticides to control thrips. Approximately 34,000 acres of peanut were represented in the survey (16 farmers in Virginia and 139 farmers in North Carolina). Twenty percent of acreage was in some form of reduced tillage. Twelve and 5% of acreage was either chisel plowed or moldboard plowed, respectively. Field cultivation was performed on 44% of acreage. Fifty-five percent of acreage was in-row sub-soiled with only 25% of acreage bedded without sub-soiling. Thirty percent of growers applied prohexadione calcium. Only 15% of growers fumigated with metam sodium while 30% applied prothioconazole in the seed furrow to manage *Cylindrocladium* black rot (CBR). Crop rotation and variety selection were used on approximately 84% of acreage to manage CBR. The insecticides acephate, aldicarb, imidacloprid, and phorate were applied in the seed furrow at planting on 54, 1, 21, and 35% of acreage, respectively. The seed treatment (combination of thiamethoxam, mefenoxam, fludioxonil, and azoxystrobin) was applied on 18% of acreage. Sixty-six percent of acreage was treated with Orthene after peanut emergence to control thrips.

(16) <u>Irrigated Evaluation of Six Peanut Varieties in Jenkins County, Georgia</u>.

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Peanut cultivar selection is an on-going production issue in Jenkins County and the entire state. Research was conducted to evaluate six peanut cultivars. The field selected for this trial was planted using strip-till management and was irrigated. Cultivars assessed included: Georgia Greener, Florida-07, Georgia-09B, FloRun™ 107, Georgia-06G, and Georgia-07W. The planting date was June 8, 2013, with the digging date determined based on maturity sampling. The experimental design was a randomized complete block with three replications. Yield and grade (total sound mature kernels {TSMK}) were determined, and each plot was rated for tomato spotted wilt virus (TSWV). Yield was determined on each plot. Each variety was graded. The only difference in yield observed was Georgia-09B (4181 lb/ac) produced more peanuts than Georgia Greener (3436 lb/ac) while all other paired comparisons were not significant. For TSMK, all Georgia cultivars (78-79%) had better grade than FloRun 107 (74%). Incidence of TSWV did not significantly impact yield or grade. This data would suggest that the cultivars most suitable for production in Jenkins County, GA during a wet growing season are Georgia-06G, Georgia-07W, and Georgia-09B when taking yield, grade, and TSWV into account.

(17) <u>Extension Focuses on Peanut Education in Irwin County, Georgia</u>.

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Educational efforts continue year long and are focused on production issues facing Irwin County and area peanut farmers. Meetings, on-farm trials, demonstrations, newsletters and other methods are used to bring information to the farmer. Each year Extension meetings focus on production, crop budgets, weed control and disease control. Over the last several years on-farm trials were focused on such topics as fungicide comparisons, seed spacing, and many others. Collaboration with county agents, specialists and researchers is a key component in many educational efforts. As harvest approaches peanut maturity clinics become a major segment of the educational focus. Peanut yields have been increasing in recent years and many factors contribute to that increase especially the use of peanut maturity clinics conducted by Extension. Irwin County, Georgia has a long history of high yields and quality peanuts. Farmers continuously seek out the help of Extension on numerous subjects like variety selection, production issues, fungicide programs, maturity determination, crop budgeting, pesticide usage, sprayer calibration, and irrigation scheduling among others. The educational focus is to meet farmer needs through many various methods with an end result to increasing profitability and quality. Many of the day to day educational efforts are achieved through one on one contact either by phone, office or farm visits. Information is also presented to farmers through a weekly newspaper column. An emailed newsletter reaches 350 farmers and agribusinesses with an average of over 30 newsletters per year with many receiving news on their smartphones. The newsletter is now in a blog format. Other media, like television, radio and video, are also utilized on a less frequent basis. Extension is 100 years old this year and as program methods have changed over time the effectiveness of traditional meetings, farm visits and on-farm demonstrations has remained.

(18) <u>Classroom Instruction of Peanut Production in Elementary Children in Jeff Davis County, Georgia</u>. T. VARNEDORE*, Extension Coordinator, UGA Cooperative Extension, Jeff Davis County, Hazlehurst, GA. 31539; and S. MARCHANT, 4-H Agent, UGA Cooperative Extension, Jeff Davis County Hazlehurst, GA. 31539

Where in the world do peanuts come from, or any food for that matter? If you ask this question to youth across the country, many would answer, “the grocery store”. Jeff Davis County Georgia is no different. A vast majority of today’s youth have little knowledge of where their food comes from and the steps that are involved in producing it. Food does not “just appear” in the grocery store; being aware of this is the key to understanding. It is widely accepted that most understanding occurs through education and it is our responsibility to educate people on the process by which they are fed.

Georgia Congressman Jack Kingston once stated, “Citizens of the United States do not fully understand how our food is produced and the importance of agriculture to the survival of this country”. One of the best avenues for educating families is through education of our youth. Jeff Davis County Extension staff took on this mission with a product near and dear to our hearts; Peanut Butter!

Our awareness program was implemented to educate youth about the importance of peanuts to Jeff Davis County and Georgia. Since the Peanut Quota Program ended in 2001, peanut acreage in Jeff Davis County increased from 1,100 acres to a high of 17,000 acres. Since Jeff Davis County depends heavily on agriculture for economic stability, peanut production became a vital component of this county’s state economic stability and growth.

As a need for awareness became apparent, county agents began to implement a strategy to achieve certain goals for the program.

(19) Effect of Plant Population and Replant Method on Peanut Production. J.M. SARVER*, R.S. TUBBS, A.K. CULBREATH, N.B. SMITH, University of Georgia, Tifton, GA 31793; J.P. BEASLEY JR., Auburn University, Auburn, AL 36849; D.L. ROWLAND, University of Florida, Gainesville, FL 32611

The University of Georgia Extension recommendation for optimum plant stand in peanut (*Arachis hypogaea* L.) is 13.1 plants m^{-1}, although previous work has shown that yield potential can be maintained at lower plant stands. The unpredictable and often extreme weather and the ubiquity of pathogens in the region often contribute to poor emergence and poor plant stands. When plant stand is adversely affected, a point may be reached where replanting the field becomes a desirable option. The objectives of this study were to determine i) the effect of plant stand on yield, grade and disease incidence, ii) at what plant stand peanut gains an advantage from replanting and iii) the best method for replanting peanut when an adequate stand is not achieved. Field trials took place in Plains, GA in 2011, 2012, and 2013; and Tifton, GA in 2012 and 2013 to evaluate peanut production at six plant stands (3.3, 4.9, 6.6, 8.2, 9.8, and 11.5 plants m^{-1}) in combination with three replant practices (no replant, destroy the original stand and replant at a full seeding rate, and add a reduced rate of seed to supplement the original stand) in a randomized complete block design. A positive linear trend for yield and a negative linear trend for tomato spotted wilt virus incidence were discovered as plant stand increased. The only yield advantage from replanting occurred via supplemental seed addition to an initial stand of 3.3 plants m^{-1}. Completely replanting always resulted in lower yield than the other two replant practices.

(20) Economic Assessment of the Peanut Replant Decision. C.J. RUIZ*, N. B. SMITH*, College of Agricultural and Applied Economics, University of Georgia, Athens, GA, 30602.

Georgia peanut producers often face climatic stresses that can negatively affect crop performance. One of the more difficult decisions producers encounter is deciding whether or not to replant a sparse stand. This study evaluates the economic feasibility of replanting and supplemental planting options for regional producers using partial budgeting analysis. The general objective of this study is to identify which treatment maximizes producer net benefit under differing production practices. Treatments included differing seeding rate combinations, planting dates, and replanting time intervals across single and twin row patterns and conventional and strip tillage. Preliminary results suggest that regardless of treatment or production method, additional seeds (supplemental or replant scenario) and chemical treatment (replant scenario) account on average for more than 80% of the total additional costs incurred. Under the replant scenario, on average, the chemical used to destroy the initial stand lies between 10% and 20% of the additional costs. A significant difference in productivity levels was not observed among different methods. However, it is worth noting that for replant scenario, revenues received are on average slightly lower compared to supplemental and no-replant scenarios.

Despite of above, both replant and supplemental seeding scenarios are excellent options for farmers who aim to achieve a predetermined plant stand. A discussion comparing performance of each method-treatment will be discussed in detail.

(21) <u>Rate and Timing of Ammonium Sulfate Application on Peanut After an Inoculant Failure</u>. R.S. TUBBS*, and G.H. HARRIS, Crop and Soil Sciences Dept., University of Georgia, Tifton, GA 31793.

Peanut (*Arachis hypogaea* L.) is a legume and will fix N when nodules are present and active. However, when biological N-fixation is not occurring, the best method for supplying N to the plant is through surface applications of fertilizer. Ammonium sulfate is widely considered the best N fertilizer source for peanut for in-season N supplementation. To test the most optimum rate and timing of N-fertilization, experiments were conducted in Tifton, GA in 2010 (one location), 2011 (two locations), and 2013 (one location). The field sites had low native Bradyrhizobia populations (minimum of 15 years since last peanut planting), which simulated an inoculant failure. A commercial liquid inoculant was used as a control, and the other treatments did not include an inoculant but had soil applications of 0, 67, 135, or 202 kg N/ha at first bloom, or split applications of either 67 kg N/ha at first bloom followed by an additional 67 kg N/ha at early pod fill, or 135 kg N/ha at first bloom followed by an additional 67 kg N/ha at early pod fill. There were few statistical differences in yield, but inclusion of inoculant provided positive net revenue over the untreated in several site-year locations. Also, there were no instances where N fertilizer provided an economic advantage compared to the untreated plots. Based on these results, rescuing an inoculant failure with N fertilizer is not cost-effective, although more research is needed to evaluate additional management conditions.

(22) <u>Variable Depth Peanut Digger.</u> James S. THOMAS*, Kendall R. Kirk; W. Scott MONFORT, A. C. WARNER, Y. J. HAN, H.F. MASSEY, Clemson University, Edsito REC, Blackville, SC.

A variable depth peanut digger was developed as an automated system to control the three point hitch top link position on a 2-row KMC peanut digger, aimed at reducing peanut digging losses across a variety of soil conditions. Top link position, and therefore digger blade angle was controlled using a computer program. One year's data support that more digger losses occur with an improper shallow rather than an improper deep setting across three soil textural zones defined by soil electroconductivity (EC). Tests conducted at the Clemson University Edisto Research and Education Center demonstrated that there was an optimum top link setting within each soil texture zone with increased losses at both shallower and deeper depths. Average digging losses ranged from 3 to 11% of potential yield in the coarse soil texture, 6 to 16% in the medium texture, and 12 to 22% in the fine soil texture. Although more research needs to be done on how soil moisture may affect the inversion process, this test indicated that a variable depth digger has the potential to reduce digging loss. This initial computer guided, map-based system is currently designed to vary the digging depth to one position for each defined EC management zone. Data collected during testing from mounted sensors demonstrated positive correlations with soil texture and top link position indicating that sensors may ultimately be used to provide infinitely variable on-the-go adjustment across EC management zones.

(23) <u>Peanut Response to Tillage and Rotation in North Carolina.</u> D.L. JORDAN* and P.D. JOHNSON, Department of Crop Science, North Carolina State University, Raleigh, NC 27695; B.B. SHEW, Department of Plant Pathology, North Carolina State University, Raleigh, NC 27695; R.L. BRANDENBURG, Department of Entomology, North Carolina State University, Raleigh, NC 27695; and T. CORBETT and C. BOGLE, North Carolina Department of Agriculture and Consumer Services, Raleigh, NC 27699.

Rotation and tillage are important cultural practices that can impact peanut yield. Research was initiated in 1999 (Lewiston-Woodville) and 2000 (Rocky Mount) to determine interactions of rotation and tillage. During 2013 when peanut was planted in all plots, peanut yield differed based on previous rotation and tillage. However, response to tillage and rotation was independent. As expected, including peanut in the rotation more often resulted in lower peanut yields compared with including peanut during fewer years. Populations of soil parasitic nematodes were higher with shorter rotations but were not affected by tillage at either location. When pooled over 6 comparisons at each location over the duration of the experiment (1999 or 2000 through 2013), yield was 16% higher in conventional tillage compared with strip tillage at Rocky Mount (Goldsboro/Lynchburg soil series) while peanut yield was 5% lower at Lewiston-Woodville (Norfolk/Goldsboro soil series) in conventional tillage compared with strip tillage. Results from these experiments underscore the value of adequate crop rotation in optimizing peanut yield and the challenges of broad-scale adoption of reduced tillage practices for Virginia market type peanut in North Carolina.

SEED TECHNOLOGY AND PHYSIOLOGY

(24) Four Year Performance of CruiserMaxx Peanuts®; An Insecticide Seed Treatment from Syngenta. W. FAIRCLOTH*, H. MCLEAN, and S. MARTIN, Syngenta, 410 Swing Rd., Greensboro, NC 27409.

CruiserMaxx Peanuts® is a novel seed care product from Syngenta that includes both a fungicide and insecticide component as opposed to fungicide-only products that have been the industry standard to date. CruiserMaxx Peanuts® incorporates the neonicotinoid insecticide thiamethoxam, which has activity on a broad range of sucking and chewing pests and is rapidly systemic in seedling plants as they germinate from treated seed. Thiamethoxam is active on several species of thrips including tobacco thrips [*Frankliniella fusca* (Hinds)] and western flower thrips [*Frankliniella occidentalis* (Pergande)], both of which can stunt early peanut growth and could play a role in development of Tomato Spotted Wilt (tospovirus) later in the season. Professionally treated seed allow very low use rates (0.25 mg a.i./seed for thiamethoxam) meaning CruiserMaxx Peanuts® is part of an integrated pest management solution and provides a safer alternative to handling hopperbox insecticides. A summary of 4-years of research data and customer experiences from 2013 will be discussed.

(25) Effect of Planting Date on Growth and Production of Virginia-type Cultivars and Breeding Lines. M. BALOTA*, Tidewater Agric. Res. & Ext. Center, Virginia Tech, Suffolk, VA 23437-7099; T.G. ISLEIB, Department of Crop Sciences, North Carolina State University, Raleigh, NC 27695-7629; and S.P. TALLURY, Pee Dee Res. & Educ. Center, Clemson University, Florence, SC 29505.

Improved resistance to the tomato spotted wilt virus (TSWV) (Bunyaviridae, *Tospovirus*) of the new peanut cultivars allows early plantings and better management scheduling over the growing season. In this experiment, we examined the effect of planting date, late April, beginning May, and mid to late May, on plant development, disease incidence, pod yield, pod brightness, grade factors, and gross value at the Tidewater Agric. Res & Ext. Center, Suffolk, VA, and Taylor Slade Farm near Williamston, NC. Thirty genotypes in 2009 and 36 in 2010 were grown at both locations under a maximum input approach. Even though years were different, 2009 was cool and humid and 2010 was hot and dry, planting date had similar effects on plant development; April plantings delayed beginning lower by 15 days each year and beginning maturity by 23 days in 2009 and 8 days in 2010. The time from flower to beginning seed was approximately 31 days each year, but the time from beginning seed to beginning maturity was 50 days in the cool 2009 and 20 days in the hot and dry record year 2010, consistent across the planting dates. TSWV ratings indicated that even for the partial-resistant cultivars, disease was more severe in early plantings. For example, Bailey had a rating of 3 for the TSWV symptomatic plants in April planting, 1.3 in early May planting, and 0.7 in late May planting. Similarly, Sclerotinia blight (*Sclerotinia Minor*) symptomatic plants were double in number in April *vs*. late May planting. In 2009, yield and crop gross value were significantly higher for the later plantings at both locations; both locations received approximately 388 mm precipitation from June to Aug. In 2010, yield was significantly greater for the April compared to late May planting at Suffolk, where June to Aug precipitation was 13 mm, and similar for both plantings at Williamston (2800 kg ha-1), where June to Aug precipitation was 236 mm. Damaged kernel content was significantly higher and the extra-large kernel and total sound mature kernel content were significantly lower in the dry 2010 *vs*. 2009 at both locations but similar across the planting dates. Interestingly, the jumbo and fancy pods were brighter for the April *vs*. late May plantings at both locations in 2009 and at Suffolk in 2010. Our data seem to suggest that early planting of peanut could result in a yield benefit in very dry years but not in regular years; therefore we do not recommend early plantings even for disease resistant cultivars.

(26) Maturity and Development of the High Oleic Trait in Different Peanut Market Types. L. L. DEAN*, K. W. HENDRIX, and T. H. SANDERS, Market Quality and Handling Research Unit, USDA, ARS, Raleigh, NC 27695-7624; and C. M. KLEVORN, Department of Food, Bioprocessing, and Nutrition Sciences, North Carolina State University, Raleigh, NC 27695-7624; and C.C. Holbrook, Crop Breeding and Genetics Research Unit, Tifton, GA 31793.

The need to segregate high- and normal-oleic peanut seeds has lead to investigations into potential sources of mixing. Previous work in our lab examined the development of in two lines of virginia type seeds, Bailey (normal-oleic) and Spain (high-oleic) for changes in the oleic to linoleic ratios (O/L) due to the indeterminate nature of peanut flowering. An additional study was conducted with runner types seeds from two sister lines, Tifguard (normal-oleic) and 68-17 (high-oleic). Changes in the fatty acid profiles (FAP) and pod and seed moisture content were determined from representative plants from the period of initial pod development at 62 days after planting (DAP) until harvest at 148 DAP. At each sampling, all seeds were removed from 5 plants, pods and seeds (>0.1g) were weighed, and moisture content and FAP determined. At final harvest, a separate 4500 kg sample was maturity sorted by pod color prior to seed sizing and single seed FAP analyzed. Although growth patterns were similar in that each time sampling produced a range of pod sizes, the largest range was found in the high-oleic virginia seed. It was found that the FAP of an individual peanut seed was highly correlated with seed size, but not pod size or pod maturity. Pods can be of marketable size but still be developing small seeds with low O/L at the end of the growing season on high-oleic plants of both market types, but this was more evident in the virginia type. The range of seed sizes was smaller and more consistent across maturities for the runner sister lines and for Bailey. At maturity, there was still a range of seed sizes and maturation stages for both market types, but moisture content was higher in the more immature and usually smaller seeds. When sorting by pod color, the most mature seeds had the highest O/L ratios in the high-oleic lines of both market types. Sizing seeds could reduce the number of low O/L seeds found in Spain, a very large seeded virginia type, but this would not be as effective with the runner type. Without some type of sorting mechanism that can detect lipid character, it will be impossible to guarantee lots will be 100 % segregated regardless of handling strategies. A preliminary, small scale genotypic evaluation of the two virginia lines showed that not all the Spain seed were homozygous for both mutant alleles responsible for the high-oleic genotype and were normal-oleic even at maturity. Thus, impure or segregating lines, as well as normal high-oleic development may lead to low O/L contamination in high O/L lots.

(27) Effect of elevated growth temperature on acclimation capacity to water deficit stress. P. PAYTON*, J. MAHAN, USDA-ARS Cropping Systems Research Laboratory, Lubbock, TX 79415; K.R. KOTTAPALLI, Center of Genomics and Biotechnology, Texas Tech University, Lubbock, TX 79409; G. WRIGHT, Peanut Company of Australia, Kingaroy, QLD 610 R.C.N. RACHAPUTI, Center for Plant Science, Univ. of Queensland, Brisbane St Lucia, QLD 4072; D. Rowland, Agronomy Dept., Univ. of Florida, Gainesville, FL 32611; J. MOSEL, D. TISSUE, Hawkesbury Institute for the Environment, Univ. of Western Australia, Richmond, NSW 2753

We have observed acclimation responses to elevated temperature and to water-deficit stress in diverse peanut genotypes. The acclimation response has been observed under field conditions of scheduled water-deficit stress as a means of early season savings on irrigation and the induction of late-season tolerance to water deficit stress. This acclimation in the field was correlated with an increase in root mass and rooting depth and could be measured on a physiological level as maintenance of photosynthesis under progressive soil drying that occurred during the irrigation interval. Subsequently, we showed genotypic differences in acclimation to short-term, acute, high temperature stress in genotypes from the U.S. peanut mini-core collection.

Here, we tested whether growth under elevated temperature affects the acclimation to water deficit stress in two selected genotypes for short- and long-season production. We hypothesize that growth under moderately elevated temperatures, similar to those predicted for near future environments, will dampen the acclimation response, but that genotypic diversity for this response may be present in the germplasm. We will present our findings on the physiological and growth responses to elevated temperature and its effect on acclimation capacity in these two genotypes.

(28) Soluble Leaf Carbohydrates as Indicators of Drought-Stress Response in Runner Peanuts. M. ROY, Crop, Soil and Environmental Science Department, Auburn University, Auburn AL 36849; P. DANG, USDA-ARS National Peanut Research Lab, Dawson, GA 39842; C. CHEN and J. HOWE*, Crop, Soil, and Environmental Science Department, Auburn University, Auburn, AL 36849.

Increasingly warmer and drier conditions in the southeastern United States pose problems for peanut production, especially where irrigation is not available. Peanut has a natural tolerance to short-term drought; however, development of peanut cultivars with improved tolerance to drought could alleviate concerns regarding increasingly warmer and drier conditions and the effect on water usage in peanut production. In response to drought stress, plants accumulate soluble sugars (e.g., glucose, fructose, and sucrose) in their leaves in order to enhance osmotic potential and water uptake in the plant. Evaluation of leaf sugars can be used as an indicator of drought stress response. Soluble sugars in the leaf and phenotypic expression were evaluated in an F2 population of 249 runner peanut breeding lines under rain-out shelter plots with mid-season stress. Results indicate that fructose accumulations were significantly different among genotypes ranging from 2.7 to 664 µg/g, while no differences were identified for glucose and sucrose accumulations. Interestingly, fructose accumulations correspond to measured phenotypic expression characteristics.

PLANT PATHOLOGY AND NEMATOLOGY - 1

(29) Characterization of a New Interspecific Hybrid Population Derived from the Tomato Spotted Wilt Virus (TSWV) Resistant Diploid, Wild Species, *Arachis diogoi* (PI 276235; GK 10602).

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Spotted wilt disease caused by *tomato spotted wilt virus* (TSWV) has been a persistent problem in the peanut production regions of the US, particularly in the southeast. The virus is transmitted by thrips vectors, and chemical control measures to suppress thrips populations are not sufficient to stop the spread of the disease. No stable sources of resistance are available within *Arachis hypogaea* germplasm, although cultivars like Georgia Green,GA 06-G and Tifguard exhibit field tolerance. However, a diploid wild species, *A. diogoi* accession GK 10602 (PI 276235) has been found to be highly resistant to spotted wilt in greenhouse and laboratory studies, also to both early- and late leaf spots and rust. An interspecific hybrid population derived from *A. hypogaea* cv. Gregory as the female parent and *A. diogoi* (GK 10602) as the male parent is available in the peanut breeding program at Clemson University, SC. This population was produced via the triploid-hexaploid pathway involving doubling of chromosomes in the original sterile triploid F_1 hybrid. The early generation interspecific hybrid progenies displayed wild species type prostrate growth habit with small, irregular shaped pods clearly suggesting introgression of *A. diogoi* in the hybrids. The interspecific hybrid population has been selfed for 12 generations by 2013, without any selection. At this stage, the plants resembled *A. hypogaea* in morphology and contained large, 2-seeded pods. Preliminary evaluation of hybrid plants in field tests in 2013, with no chemical control for TSWV, indicated few symptomatic plants at harvest with most plants having dark green, healthy foliage. Efforts are underway to characterize the progenies for ploidy level determination, challenge them in greenhouses with virus to understand the mechanism of virus-vector-host interactions and underlying genetic mechanisms for TSWV infection. Additionally, plants will be evaluated for resistance to leaf spots in field tests in Florence.

(30) Stem Rot (White Mold) and Tomato Spotted Wilt Disease Resistance among Peanut Genotypes.

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Stem rot (white mold) caused by *Sclerotium rolfsii* Sacc. and tomato spotted wilt caused by *Tomato spotted wilt virus* (TSWV) are two major disease problems in Georgia peanut (*Arachis hypogaea* L.) production. Current fungicides are very effective but expensive for stem rot control, and insecticides usually have little effect on TSWV, which is transmitted by thrips. Consequently, the objective of this study was to evaluate different peanut genotypes for resistance to both of these pathogens. Field test evaluations were conducted for four consecutive years (2010-13) at a site on the agronomy research farm near the Coastal Plain Experiment Station which has a long history of continuous peanut production and a high incidence of stem rot and TSWV. Results from these field tests showed significant differences among the peanut genotypes evaluated for combined resistance to both diseases. Several genotypes showed low TSWV incidence at midseason and mid to late season. However by late season and after digging, the best combination of stem rot and TSWV disease resistance and highest consistent yield over years was found in recently released runner-type peanut cultivars

‘Georgia-12Y’, ‘York’, ‘Georgia-07W’, and ‘Georgia-10T’.

(31) Greenhouse-Based Inoculation Methods for Sclerotinia Blight Resistance in Peanut.

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Greenhouse-based assays for screening germplasm for resistance to Sclerotinia blight in peanuts can be conducted year-round, and thus may accelerate progress in breeding for resistant plants. Several techniques for assaying Sclerotinia blight resistance in the greenhouse have been proposed including methods using intact plants and detached plant parts. We compared three inoculation methods: cut petiole on intact plants, cut petiole on detached main stems partially submersed in Hoagland's solution, and detached leaflets. Six cultivars previously demonstrated to represent a range of resistance to *Sclerotinia minor* or *S. sclerotiorum* in the field or in the laboratory were used: highly resistant, Georgia 03L, ARSOK-R35; moderately resistant, Red River Runner, Tamrun 96; and susceptible, Tamrun OL02, and Okrun. Preliminary results indicate that the petiole inoculations, whether using whole plants or detached stems, were more consistent with previous field and laboratory results than the leaflet inoculations. Results will help determine the most consistent and efficient method for assaying physiological resistance to Sclerotinia blight in peanut.

(32) Assessment of Peanut Seedlings for Resistance *Rhizoctonia solani*.

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Differences in stand establishment, resulting from seedling disease, have been observed in recent field studies in Texas. The soilborne fungus *Rhizoctonia solani* is one of many causal agents involved in the seedling disease complex. This fungus is widely distributed throughout areas where peanuts are grown and can especially be a problem in cotton-based rotations. Planting when optimum soil temperatures are experienced can reduce the risk of seedling disease; however, chemical seed treatments are the primary means of management. Host resistance is an integral component of any disease management strategy. Currently, no commercial cultivars exhibiting resistance to seedling disease caused by *R. solani* have been released. The objective of this study was to screen seedlings of advanced breeding lines for resistance to *R. solani*. A total of 70 entries, including 63 breeding lines from the Texas A&M AgriLife Research Breeding Program and the cultivars Flavorrunner 458, Florida 07, Georgia 09B, McCloud, Tanrun OL07, Tamrun OL11 and Webb, were planted into soil inoculated with a virulent isolate of *R. solani* AG-4 obtained from peanut. Inoculum densities ranged from 1-10 colony forming units per 100 grams of soil. Plants were assessed for seed decay, as well as pre- and post-emergence damping off symptoms. On plants that emerged, hypocotyls lesions were enumerated and severity was scored on a scale of 1-5. Results from these studies will be presented and the potential benefit to peanut breeding programs will be discussed.

(33) <u>Effect of application pressure and water volume on azoxystrobin concentration on peanut foliage and soil</u>. T. A. WHEELER*, Texas A&M AgriLife Research, Lubbock, TX 79403; M. G. ANDERSON, Texas A&M AgriLife Extension Service, Seminole, TX 79360; S. RUSSELL, Texas A&M AgriLife Extension Service, Brownfield, TX 79316; and J. E. Woodward, Texas A&M AgriLife Extension Service, Lubbock, TX 79403.

Applications of azoxystrobin (Abound FL at 24.6 oz/acre, banded) were made to a Spanish peanut cultivar with pressure set at 20, 40, 60, or 80 PSI at a water volume of approximately 30 gal/acre; and at a pressure of 20 PSI and water volumes ranging from 30 to 111 gal/acre using a teejet 8010 flat fan nozzle tip. Applications were made on 24 July, 7 August, and 16 August. After two irrigation events, foliage from several plants in the center of the plot were sampled from top to bottom in a 6-inch diameter from the stem, and the soil to a depth of 4-inches and centered under the stem were mixed together and combined in a sample. Sample were frozen and sent to Omic USA Inc. (Portland, OR) for analysis of azoxystrobin concentration. The concentration of azoxystrobin in the soil to a 4-inch depth did not change as application pressure increased. However, as water volume increased to $\geq$54 gal/acre, there was a lower concentration of azoxystrobin in the soil relative to application at 30 gal/acre. Increasing the volume of water to $\geq$ 54 gal/acre also resulted in a lower concentration on the foliage, compared to 30 gal/acre, whereas increasing application pressure had little impact on azoxystrobin concentration on foliage. Increasing water volume to $\geq$54 gal/acre may have resulted in the fungicide being leached out below the pod zone.

(34) Cross Compatibility Studies in *Arachis* Wild Species to Identify New Species.
C.E. SIMPSON*[1/], J.F.M. VALLS[2/], J.M. CASON[1/], and B.D. BENNETT[1/]. [1/] Texas A&M AgriLife Research, Texas A&M AgriLife Research and Extension Center. Stephenville, TX 76401. [2/]Curator of *Arachis* wild species, EMBRAPA/CENARGEN. Brasilia, DF, Brazil.

It is useful to know the relationships of the various species of *Arachis* for developing introgression pathways to utilize useful traits in the wild species to improve cultivars. Describing new species of *Arachis* and studying the relationship of these species can be accomplished in different ways. For many years studies of morphological characters and later, associated cross compatibility studies were the only ways to define new species and determine relationships of species. Modern technology has brought about molecular studies that can be beneficial in determining which wild species of *Arachis* are closely related and which are not. When crossing and morphology studies are combined with molecular data a clearer understanding of species relationships often is the result. The studies reported here do not include molecular studies, only crossing and morphology. Molecular studies will be topic of a future publication.

The accession VSGr-6340 (PI 476105) was collected near Caceres, Brazil in 1981, and it contains some valuable traits for developing introgression pathways. In the Monograph, 6340 was included within the species, *A. matiensis*, even though the plant morphology of the two groups is quite different. Pertinent crossing data were not available at the time the Monograph was printed. Access to the site where we collected 6340 has been taken away so we cannot re-visit that location to confirm the peanut still grows there. At a later date we collected the same material from a nearby location several times (e.g., VKSSv 8910 = GRIF 7663). The 6340 was found east of the Rio Paraguay. Most *A. matiensis* populations are west of Rio Paraguay. Early crossing studies with the original accession resulted in pegs and fruits when crossed with *A. hypogaea*, but the fruits were empty. This is a typical result when we attempt to cross a section *Procumbentes* species with the cultigen. Crossing 6340 with several members of three sections, including section *Arachis*, gave the following results for pollen stains of hybrids: Species of section *Arachis*, *A. hypogaea* var. Florunner 0.20%; section *Caulorrhizae*, *A. pintoi*, 12787, 17.2%; section *Procumbentes*, *A. appressipila* , 9990 42.8%, 9993 20.2%, 10002 18.5%, *A. rigonii* 10034 72.5 & 83.8%, *A. subcoriacea*, 30037 85.6-96.8%. In summary we can say that 6340 approaches *A. subcoriacea* and *A. rigonii* in crossability and pollen count; by plant morphology 6340 is very different from other members of the *Procumbentes.*

(35) Recovery and Purification of Spanish High Oleate Peanut ‘AT-9899’. Z.B. CHEN, Dept. of Crop Sciences, the University of Georgia, Griffin, GA 30223; M.L. WANG, USDA-ARS, Plant Genetic Resources Conservation Unit, Griffin, GA 30223; M.C. LAMB and P.M. DANG, USDA-ARS, National Peanut Research Lab, Dawson, GA 39842; J. BOSTICK, Alabama Crop Improvement Association, Headland, AL 36345; and C.Y. CHEN*, Department of Crop, Soil and Environmental Sciences, Auburn University, 201 Funchess Hall, Auburn, AL 36849.

“AT-9899”, a Spanish market type peanut, was developed in Golden Peanut Company in 2002. It has spreading growth habit and mid maturity. Due to high level of oleate and small seed size, it is grown specifically for confectionery market in the USA and Mexico. However from the time of development and release to 2010, the high oleic trait had diminished, either due to impurity at release or contamination after release to the point that the variety was not meeting industry requirements to be classified as high oleic. In order to recover and purify 'AT-9899', 1,600 individual plants were initially selected based on phenotype in field in 2010. After shelling, 600 plants were further evaluated by GC analysis and SNP marker-assisted evaluation. 300 plants were identified as the most similar to original 'AT-9899'. The 300-plant seeds were planted as breeder seeds for seed increase and 3,200 pounds of the seeds were harvested in 2011. In 2013, about 90 tons of foundation seeds have been successfully achieved. In the meantime, through AFLP profile, potential mixers were identified. The result indicated that marker-assisted selection not only can improve the efficiency of breeding program but also can be used in seed industry for recovery and security of seed purity.

(36) Development and Utilization of InDel Markers to Identify Peanut (*Arachis hypogaea* L.) Disease Resistance. P.M. DANG*, USDA-ARS, National Peanut Research Laboratory, Dawson, GA 39842; L. LIU, Department of Agronomy, Agricultural University of Hebei, Baoding 071001, China; C.Y. CHEN, Department of Agronomy and Soils, Auburn University, 201 Funchess Hall, Auburn, AL 36849.

Peanut diseases, such as leaf spot and spotted wilt caused by Tomato Spotted Wilt Virus, can significantly reduce yield and quality. Application of marker assisted plant breeding requires the development and validation of different types of DNA molecular markers. Nearly 10,000 SSR-based molecular markers have been identified by various research groups around the world, but less than 14.5% showed polymorphism in peanut and only 6.4% have been mapped. Low levels of polymorphism limit the application of marker assisted selection (MAS) in peanut breeding programs. Insertion/deletion (InDel) markers have been reported to be more polymorphic than SSRs in some crops. The goals of this study were to identify novel InDel markers and to evaluate the potential use in peanut breeding. Forty-eight InDel markers were developed from conserved sequences of functional genes and tested in a diverse panel of 118 accessions covering six botanical types of cultivated peanut, of which 104 were from the U.S. mini-core. Results showed that 16 InDel markers were polymorphic with polymorphic information content (PIC) among InDels ranged from 0.017 to 0.660. With respect to botanical types, PICs varied from 0.176 for *fastigiata* var., 0.181 for *hypogaea* var., 0.306 for *vulgaris* var., 0.534 for *aequatoriana* var., 0.556 for *peruviana* var., to 0.660 for *hirsuta* var., implying that *aequatoriana* var., *peruviana* var., and *hirsuta* var. have higher genetic diversity than the other types and provide a basis for gene functional studies. Single marker analysis was conducted to associate specific marker to disease resistant traits. Five InDels from functional genes were identified to be significantly correlated to tomato spotted wilt virus (TSWV) infection and leaf spot, and these novel markers will be utilized to identify disease resistant genotype in breeding populations.

(37) Effects of Cool and Warm Locations on Fatty Acid Profiles in the Uniform Peanut Performance Test. S.C. COPELAND, and T.G. ISLEIB, Dept. of Crop Science, N.C. State Univ., Raleigh, NC 27695-7629; and T.H. SANDERS, L.O. DEAN, and K.W. HENDRIX, USDA-ARS Market Quality and Handling Research Unit, Raleigh, NC 27695-.

New peanut (*Arachis hypogaea* L.) cultivars with elevated oleic (18:1) fatty acid in the seed oil are released. It is important that any seeds that do not meet the criterion for being high oleic do

so because they are genetically not high oleic, not because of environmental influence on the high oleic trait. It has been demonstrated that immature seeds or seeds harvested from plants subjected to drought stress may fail to meet the criterion of a minimum ratio of oleic to linoleic (18:2) fatty acid (O/L ratio) of 9.0. It has long been asserted in the peanut research community that O/L ratio is elevated in peanuts grown under warmer environmental conditions and reduced in peanuts grown in cooler environments (year-by-location combinations). Although it is not clear how much of this perceived effect is due to differential maturation under different environmental circumstances, the existence of the difference is testable.

Each year in the Uniform Peanut Performance Test (UPPT), a common set of cultivars and breeding lines is grown at a group of locations chosen to represent the three major U.S. production areas. Increasingly, entries in the test have the high oleic trait although not all do. Fatty acid profiles have been determined by the USDA-ARS Market Quality and Handling Research Unit in Raleigh, NC, on composited, sized seed samples from each UPPT entry and test site since 2001. Annually, genotype-by-location means are computed and used to augment a database maintained at N.C. State Univ. Data from 12 cultivars with genetically "normal oleic" fatty acid profiles (Bailey, CHAMPS, Florunner, Georgia Green, Georgia Greener, Georgia-06G, Georgia-07W, NC-V 11, Phillips, Sugg, Tamrun 96, and Tifguard) and 10 with genetically "high oleic" profiles (Flavor Runner 458, Florida-07, Georgia-09B, OLin, Red River Runner, TUFRunner™ 756, Tamrun OL01, Tamrun OL02, Tamrun OL07, and Wynne) were employed. Some locations were classified as being typically "warm" (Tifton, GA, Marianna, FL, Headland, AL, Pearsall, TX, and Fort Cobb, OK) and some as "cool" (Suffolk, VA, Lewiston, NC, Blackville, SC, and Brownfield and La Mesa, TX). The mixed models procedure (PROC MIXED) of the SAS statistical software package was used to extract and compare means of normal- and high-oleic cultivars from warm and cool environments. Mean oleic acid content for cool environments was not different from that in warm environments (64.73 vs. 65.28%, $P=0.3940$) although the high- and normal-oleic lines were very different (78.46 vs. 51.55%, $P<.0001$). Elevation of oleic acid content going from cool to warm environments was not detected in either the high-oleic (78.62 vs. 78.30%, $P=0.7206$) or normal-oleic lines (50.85 vs. 52.26%, $P=0.0625$). Linoleic acid exhibited much the same pattern (17.29% in cool vs. 16.60% in warm environments, $P=0.2700$), 4.95% for high- vs. 28.94% for normal-oleic lines ($P<.0001$), and no detectable change in cool vs. warm environments for high-oleic lines (4.92 vs. 4.99%, $P=0.9319$). There was a slight but significant ($P<0.05$) depression of linoleic acid in normal-oleic lines in warmer environments (29.66 vs. 28.22%, $P=0.0453$). The O/L ratio behaved differently. The mean ratio increased going from cool to warm environments (10.36 vs. 11.70, $P=0.0357$). High- and normal-oleic lines were very different (19.90 vs. 2.16, $P<.0001$). There was a very significant rise in O/L ratio among high-oleic lines when grown in warmer environments (18.74 vs. 21.07%, $P=0.0073$), but no corresponding effect in the normal-oleic lines (1.98 vs. 2.34, $P=0.6323$). Among the 10 high-oleic lines tested, cool environment caused a significant reduction in O/L ratio on four of them (Flavor Runner 458, Florida-07, Tamrun OL01, and Wynne), but only one (Flavor Runner 458) failed to reach the critical O/L/ ratio of 9.0 in cool environments.

(38) Characterization of the thermal acclimation response in peanut: Physiology, transcript, and metabolic profiling of two contrasting U.S. mini-core accessions at reproductive growth stage. P. PAYTON*, J. MAHAN, J. BURKE, USDA-ARS Cropping Systems Research Laboratory, Lubbock, TX 79415; K.R. KOTTAPALLI, Center of Genomics and Biotechnology, Texas Tech University, Lubbock, State University Ag. Science Center, Clovis, NM 88101

To gain insights into the molecular mechanisms of tolerance to heat stress, we conducted a transcript profiling experiment to identify heat-responsive genes in peanut leaf tissue. Two genotypes (stress-sensitive COC166 and stress-tolerant COC041) showing contrasting response to thermal and drought stress were selected for gene expression profiling studies. Plants at reproductive growth stage were exposed to short-term, acute heat stress followed by a recovery period under optimal growth conditions. Net photosynthesis was used as a measure of stress and recovery and leaf samples were collected for expression profiling studies during the stress and recovery periods. Transcript profiling identified a number of stress responsive, differentially expressed transcripts unique to the tolerant genotype. Metabolite analysis confirmed increases in metabolites of selected pathways under heat stress that appeared to be unique to the tolerant genotype.

Based on these results, we tested whether exposure of peanut plants to a short-term, acute, high temperature would enhance tolerance to subsequent exposure to thermal stress and whether genotypic differences existed for the acclimation response. For the acclimation treatment, plants were grown under optimal conditions, subjected to an acute heat stress for 1 day, returned to optimal conditions for 1 week, and subsequently exposed to a heat stress period of two weeks followed by a 36 hour recovery period at optimal conditions. The acclimated, heat-sensitive accession (COC166) showed a short-term maintenance of photosynthesis (A) under heat stress conditions that was similar to the tolerant plant (COC041) response. However, after 48 h of heat stress, both acclimated and non-acclimated COC166 plants showed a significant decrease in A. Interestingly, these plants also showed a slow acclimation to thermal stress after 1 week exposure to the elevated growth temperature conditions. The acclimation treatment had little effect on Anet in the COC041, although these plants showed a statistically significant elevation in Anet following the 36 h recovery period compared to their non-acclimated cohort. Gene expression profiling revealed a number of genes that are both genotype specific and putatively specific to acclimation. These findings demonstrate that mechanisms of acclimation (both short and long-term) are significantly different in these two genotypes suggesting a possible wide-range of responses to abiotic stress.

JOE SUGG GRADUATE STUDENT COMPETITION

(39) Influence of Planting Date on Peanut Response to Selected Pest Management Practices.

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Planting date can affect pest reaction and yield of peanut. Research with the new Virginia market type cultivar Bailey is limited with respect the interaction of planting date with thrips management practices, seedling disease, and injury from soil-applied herbicides. Research was conducted in North Carolina during 2013 to address these treatment factors when Bailey was planted May 4, 16, or 28. In one experiment, treatment combinations included 2 levels of phorate (0 vs. 5.0 lbs product/acre), 2 levels of acephate applied postemergence (0 vs. 10 oz product/acre), and 2 digging dates (digging at optimum maturity vs. delaying digging 1 week past optimum maturity). In a second experiment, treatments consisted of 2 levels of phorate (0 vs. 5.0 lbs/ace) and 2 levels of seed treatment (no commercial fungicide seed treatment vs. commercial seed treatment). In a final experiment, treatments consisted of phorate treatments described previously and 4 levels of herbicide (Valor SX at 3 and 6 oz product/acre and Fierce at 3 and 6 oz product/acre). The combination of phorate and acephate controlled thrips more effectively and increased yield more than either insecticide alone irrespective of planting date. Peanut stand and yield were higher when seed was treated with commercial fungicide regardless of planting date, and less thrips damage was noted when peanut received a fungicide seed treatment compared with other seed treatment/phorate combinations. Visible Injury and peanut yield from Valor SX and Fierce was not affected by phorate treatment but was affected by planting date. Herbicide injury reflected timing of rainfall after planting relative to peanut emergence more than temperature associated with planting date. Peanut response to Valor SX and Fierce was similar.

(40) Row Pattern, Row Spacing, and Seeding Rate Effects in Peanut.

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The need for ongoing research for basic agronomic concepts such as row pattern, spacing and seeding rate is essential to any cropping system. By carefully selecting row pattern, spacing, and seeding rate, profits and yield can be maximized for growers. In Georgia, common crop rotations include Peanut (*Arachis hypogaea* L.). Due to Tomato Spotted Wilt Virus incidence in peanut, many producers have adopted the use of twin row planters to reduce disease and increase yields. Twin row patterns space plants more evenly within the row than single row patterns do, allowing less competition for water and nutrients. The objectives of this experiment are to plant peanut in 76-cm and 91-cm single rows and 91-cm twin rows at three seeding rates low, medium, and high to determine any effects that row pattern, row spacing, and seeding rate have on crop yield and production economics. Peanut plots will be planted in Tifton, Ga. Variables that will be measured are yield (kg/ha) and production costs.

(41) Maturity Effects on Contamination of High-Oleic Peanut Lots with Normal-Oleic Seeds of a Large Seeded Virginia Type Peanut Variety. C.M. KLEVORN*, K.W. HENDRIX, T.H. SANDERS, L.L. DEAN, Market Quality and Handling Unit, USDA-ARS, Raleigh, NC and N.A. Barkley, Plant Genetic Resources Conservation Unit, USDA-ARS, Griffin, GA.

To address increasing problems with mixing of high oleic peanut seed lots with normal oleic seed, the development of the lipid fraction of a range of immature to mature seed in two Virginia type peanut cultivars was examined. A very large seeded high-oleic cultivar (Spain) and a normal-oleic cultivar (Bailey) were harvested 148 days after planting (DAP) and analyzed without curing. High-oleic seeds were determined as those which had an oleic-to-linoleic (O/L) ratio greater than 9. Individual pods from each cultivar were evaluated for pod and seed weight, pod maturity, moisture content, and fatty acid profile. Pod maturity was determined based on mesocarp color. Pods with black, brown, and orange B mesocarp colors were considered to be mature pods. At 148 DAP, 31.6% of Bailey pods were immature compared to 23.0% for Spain. Of the immature Bailey pods, 19.2% were classified as white compared to 10.9% of Spain pods. Seeds from these pods were sorted based on their size classification. Size classifications utilized were others, number 1, medium, and extra large kernel (ELK). Within each size class, a range of maturities was present for both cultivars however for Spain, mature seeds were not present until they were large enough to be classified as ELK. Fatty acid profiling of these seeds indicated that for Spain, 100% of the ELK seeds that came from white colored pods had fatty acid profiles characteristic of normal-oleic seeds. The percentage of high-oleic seeds with normal-oleic O/L ratios was seen to decrease as the seeds moved up in maturity classes. Yellow high-oleic seeds classified as ELK had only 58.3% normal-oleic seed and orange A had 21.7% normal-oleic. The prevalence of high-oleic seed with normal-oleic O/L ratios was much less for more mature seeds. Only 5.0% of orange B, 5.0% of brown and 5.1% of black high-oleic seeds had normal-oleic O/L ratios. These results indicated that maturity plays a significant role in dictating the compositional characteristics of peanuts. Although maturity was essential for the accomplishment of maximum O/L ratios within high-oleic seed, genotypic analysis of a subset of selected seeds from this study showed that if a seed was not homozygous for both mutant alleles responsible for the high-oleic genotype then the high-oleic phenotype was not observed. A combination of strong genetic control and maturity were required to obtain high-oleic seed. This work explored the theory that large seeded, high-oleic Virginia type peanut cultivars need to mature and become commercially large enough because the immature seeds are still expressing normal-oleic acid levels, thus contaminating a high-oleic seed lot.

(42) Influence of Peg Strength and Maturity on Tifguard Yield and Digging Loss. B.COLVIN*, D.ROWLAND, J. FERRELL, A. CULBREATH, and J. ERICKSON Agronomy Department, The University of Florida, Gainesville, FL 32611 and Department of Plant Pathology, The University of Georgia, Tifton, GA 31793.

Determining the optimum harvest time for peanut is challenging due to the underground growth habit and indeterminate nature of the crop. It is critical to determine optimum maturity correctly and to dig at the proper time because maturity directly impacts yield and grade, two factors that ultimately determine the economic return to the grower. There are tools available that are useful in determining crop maturity, but there are currently no methods that take into account peg strength and potential pod loss during the digging process. Additionally, there have been anecdotal claims that certain varieties, such as Tifguard, are more susceptible to digging loss due to weaker pegs. Quantifying the peg strength of Tifguard and understanding how the interactions between peg strength and maturity impact yield and grade would benefit peanut growers when making important digging decisions. The objectives of this study were to: 1) quantify peg strength in commonly grown varieties and 2) examine the interactions between peanut maturity, peg strength, and yield/grade and how these factors impact digging decisions. Research plots were established in Citra, FL in 2013. The project included two peanut varieties (Georgia-06G and Tifguard) and three digging dates. The three digging dates were based off of the adjusted growing degree day (aGDD) model, which takes into account the ambient maximum and minimum temperatures as well as the water applied to track the growth and development of the crop. The peanuts were dug at 2300, 2500, and 2700 aGDD's. These three values correspond to an early, optimum, and late digging date. Pods were blasted and placed on the peanut profile board prior to inversion to assess maturity. Plants were also carefully uprooted prior to digging for additional measurements of peg strength. Peg strength was measured by using a digital force gauge mounted on a stand with a moveable gauge mount. The pods were placed in a clamp that was attached to a digital force gauge and the stem attached to the peg was secured on the stand platform. When the gauge moved up the stand, tension was placed on the peg until the breaking point was reached. The gauge recorded the peak force (breaking point) of the peg. Just after the plants were inverted, digging loss was measured. This was obtained by collecting all of the pods in the top four inches of soil in a two and a half foot by five foot area and weighing the collected pods. After harvest, yield and grade were measured. In 2013, Tifguard peg strength was consistently lower than Georgia-06G peg strength in all three digging dates. At the early digging date Tifguard peg strength was 27 percent lower than Georgia-06G, at the optimum digging date it was 19 percent lower, and at the late digging date it was 22 percent lower than Georgia-06G. There was a relationship between the mesocarp color of the pod and the peg strength in Georgia-06G peanuts. As the pod mesocarp color darkened the peg strength decreased. The pegs with black pods were 20% lower in peg strength compared to the pegs associated with yellow 1 pods. However, peg strength in Tifguard plants stayed relatively constant regardless of pod mesocarp color. Digging losses increased over the three digging dates reaching 218 kg/ha in Georgia-06G and 480 kg/ha in Tifguard by the third digging date. Despite these increases in digging losses over the three digging dates, yield and grade continued to increase over the three digging dates in both varieties. These data suggest that weaker pegs do indeed translate to higher digging losses. It also suggests that the plant is compensating for the pods left in the field, which is why yield doesn't decrease with increased digging losses. The second year of this study will be completed in 2014.

(43) **Fungicide sensitivity of *Sclerotium rolfsii* isolates from Florida peanut fields.**

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Fungicides are a critical component of peanut disease management systems in the Southeastern U.S. Typical spray programs will vary between peanut producing regions exposing populations to different seasonal doses of fungicides. The objective of this study was to compare the sensitivity *Sclerotium rolfsii* isolates from different Florida peanut production regions to five separate fungicide products. A total of 15 isolates were collected from 6 counties in Florida during the 2012 growing season. A mycelia growth assay for each isolate was conducted using potato dextrose agar amended with 5, 1, 0.5, 0.1, 0.05, 0.01, 0.005, 0.001, 0.0005, and 0.0001 µg of fungicide per µl of media. An actively growing mycelial plug of *S. rolfsii* was inoculated on the amended media plates and incubated at 26°C for 48 hours in complete darkness. After incubation, digital images of the plates were collected and colony areas were measured using the software KLONK. Preliminary results indicate that the 15 isolates varied in their sensitivity to the Proline (prothioconazole). Further analysis is being conducted on the 4 other fungicide products, but initial observations indicate that their results will be similar to Proline. These results indicate the importance of better understanding *S. rolfsii*'s diversity in order to develop integrated management systems specific to the region's population.

(44) <u>Leaf Drop in the Phyllosphere: Comparing the Contribution of Early and Late Leaf Spot.</u> A. FULMER*, A. CULBREATH and R. KEMERAIT, JR., Department of Plant Pathology, The University of Georgia, Tifton, GA 31793

Early (ELS) and late leaf spot (LLS), caused by *Cercospora arachidicola* and *Cercosporidium personatum*, respectively, are capable of completely defoliating the peanut plant. ELS has been predominant in GA since the early 90's, but LLS resurgence has been observed in recent years. The relative contribution ELS and LLS to defoliation and subsequent yield loss are unknown. Field trials were conducted at multiple research stations in GA and FL during 2011, 2012 and 2013 to assess the relative effects of each leaf spot on defoliation. Each year, plots were planted to runner 'Georgia06G'. Five stems were destructively sampled from untreated plots on a bi-weekly basis and the number of missing leaflets and sporulating ELS and LLS lesions were counted. From these results fields were described as predominantly ELS or LLS. Preliminary results suggest that the rate of defoliation is similar for both leaf spots over the course of the season. However, the estimated time predicted to reach 40% defoliation was much higher for LLS than ELS. These results suggest that LLS may cause less defoliation prior to 140 DAP on Georgia06G.

(45) <u>Chemical Properties and Sensory Analysis of Equivalently Roasted Peanuts using an Industrial Relevant Roaster</u>. X. SHI*, Department of Food, Bioprocessing and Nutrition Sciences, North Carolina State University, Raleigh, NC 27695; L.O. Dean, T.H.SANDERS, J.P.DAVIS, USDA ARS, Market Quality and Handling Research Unit, Raleigh, NC 27695.

In industry, peanuts are roasted to a specific surface color for quality control; however, different temperature/time combinations can be used to achieve equivalent surface colors but different chemical and sensory properties related to product quality. In a previously published paper, our lab examined the chemical/sensory properties of peanuts roasted by a lab scale oven with single layer peanut loaded and no forced air flow. Such work can be extended to a simulated industrial roasting using a pilot plant scale roaster that introduces the control of air flow direction, air flow rate, and bed depth. To investigate this potential, jumbo-size runner peanuts were systematically roasted under 5 temperatures (149, 163, 177, 191, and 204 °C) to Hunter L-values of 53 ± 1, 48.5 ± 1, and 43 ± 1, corresponding to light, medium, and dark roasting, respectively. The temperature profiles suggested low temperature/long time roasting featured in an isothermal phase, while high temperature/short time characterized by an outstanding come-up phase throughout the roasting. Moisture contents (MC) decreased from initial 7.97% to 1.60-0.74% after roasting. At equivalent temperatures, MC decreased as roasting intensity increased. Total tocopherol contents of expressed oil depended on both temperature and roasting levels, and were linearly associated with moisture content (R^2=0.78). Peanuts roasted at lower temperatures and darker colors had higher tocopherol contents. The highest glucose and fructose contents were observed from medium roasted peanuts, while there was no effect of roasting level on the contents of inositol, sucrose, raffinose, and stachyose. Yield stress, as a measure to assess the spreadability of peanut paste, was conducted to evaluate the food quality and consumer acceptance. Results showed that dark roasted peanut paste possessed a higher yield stress than light and medium roasted samples, while there was no significant difference between the light and medium. Sensory analysis suggested the medium roasted peanuts were significant higher in roasted peanutty (RP) than the light ($p=0.0075$) and dark ($p<0.0001$) roasted peanuts, and the light was higher in RP than the dark ($p=0.0257$). Within the medium group, the higher temperature/shorter time roasting schedule was more likely to obtain higher RP and sweet aromatic with less bitter, astringency, and flavor off notes.

(46) Development of Molecular Markers for Blanchability in the US Minicore.
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Blanchability, propensity of the testa to be removed from the kernel following rapid heat treatment, is a key breeding trait for the Australian Peanut Genetic Improvement Program (APGIP). Currently, phenotyping for this trait cannot be performed until potential breeding lines are well advanced in the program, due to the amount of seed required for accurate testing. Consequently, many undesirable lines are well progressed in the breeding program, only to be discarded after exhibiting poor blanchability at the F5 or F6 generation.

A key aim for this project is to discover molecular markers, using the US minicore, for good blanchability, that will be validated using Australian breeding lines. Blanchability is an ideal candidate for molecular markers as it is highly heritable, has a low GxE interaction, has significant genetic variability and is relatively difficult to phenotype.

An improved phenotyping technique has significantly reduced sample size and enabled 83 accessions of the US minicore to be phenotyped. There was a large variation in blanchability recorded, with results ranging from 51% to 96%. Around 30 of the 83 accessions tested were below 80%, with 12 lines being very poor, recording below 70% blanchability.

(47) Screening for Drought Tolerance, Nematode Resistance and the High Oleic Trait by Marker-Assisted Breeding.
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The objective of this research is to utilize marker-assisted breeding to accelerate the development of a high-oleic, drought tolerant, nematode resistant cultivar. An F_2 population of 84 single plants from a cross between a U.S. minicore accession identified as drought tolerant and a high-oleic, nematode resistant advanced runner breeding line was grown in the field in 2013 with limited water early in the season. Several SSR markers have been identified previously as associated with field measurements of plant response to drought stress by association mapping of the U.S. minicore collection. DNA was extracted and two SSR markers identified by association mapping were amplified. Allele scores were compared to yield, and both markers were found to be associated with large differences in pod yield. Previously published markers are being used for selection for nematode resistance. Inexpensive KASP SNP-based markers for FAD2A and FAD2B are being tested for selection for the high oleic trait. It is anticipated that as markers become available for more traits, the efficiency of marker-assisted breeding will continue to increase.

(48) <u>Genotypic Response of Peanut to Optimum and Limited Irrigation</u>. J. HAWKINS*, C. DENBOW, and G. PILOT, Plant Pathology, Physiology and Weed Science Department, Virginia Polytechnic Institute and State University, VA 24061; H. FRAME, Crop, Soil, and Environmental Science Department, Virginia Polytechnic Institute and State University, VA 24061; and M. BALOTA, Pathology, Physiology and Weed Science Department, Virginia Polytechnic Institute and State University, Tidewater Agricultural Research and Extension Center, VA 23437

We have examined the effect of drought stress on twelve peanut (*Arachis hypogaea* L.) genotypes, Bailey, Sugg, Phillips, SPT06-07, N04074FCT, N05006, HTS02-05, Georgia 06, Wynne, N08082ol, and Florida 07, grown under three rain exclusion shelters designated as well watered, moderate drought stress, and severe drought stress water regimes at the Tidewater Agricultural Research and Extension Center, Suffolk, VA. Each genotype was planted on 5/17 in a 1.7 m long and 0.9 m wide plot replicated three times in a randomized complete block design within each water regime. The well watered plots received a total of 170 mm and the moderate stress 90 mm of water equally divided in five irrigations from 7/16 through 9/05. This time interval coincided with beginning pod through beginning maturity peanut growth stages. The drought stress plots received a total of 36 mm on 8/08. No rainfall was allowed to fall on the plots during this time interval, but plentiful precipitation was received before 7/16 and after 9/05. Drought stress negatively affected yield of all genotypes. On average, the well watered regime produced 6621 kg ha^{-1}, the moderate stress 4523 kg ha^{-1}, and the drought stress regime 2557 kg ha^{-1}. For every inch of water not received by peanut between 7/16 and 9/05, yield was reduced by 726 kg ha^{-1}. Wynne exhibited drought susceptibility and its yield was 1000 kg ha^{-1} under the severe water regime; Phillips showed moderate tolerance and produced 2000 kg ha^{-1} under the severe water regime; and N05006 and HTS06-07 exhibited great drought tolerance with yield of 3700 kg ha^{-1} and 3000 kg ha^{-1}, respectively under the severe water regime. On average, the oleic to linoleic fatty acid (O/L) ratio of the peanut kernels decreased with the severity of water stress. A possible reason for decreased yield and quality was reduced photosynthetic activity under drought stress. For example, the average CO_2 assimilation of well watered plants was 25.6 µmol m^{-2} s^{-1}, moderately stressed plants 21.4 µmol m^{-2} s^{-1}, and severe stressed plants 19.8 µmol m^{-2} s^{-1}. SPT 06-07 and N05006 had significantly higher CO_2 assimilation in well watered and severe drought water regimes than Wynne. Phillips assimilated more CO_2 than Wynne and HTS02-05 under intermediate drought stress. This study indicated that SPT 06-07, N05006, and Phillips are candidate parental lines for breeding of peanut cultivars with improved yield and photosynthetic assimilation under drought stress.

(49) <u>Identifing SSR Markers Linked to TSWV Resistance in Peanut Cultivar, Florida-EP^{TM}'113'</u>. Y-C. TSENG*, B. L. TILLMAN, North Florida REC, Agronomy Department, University of Florida, Marianna, FL32446 and J. WANG, Agronomy Department, University of Florida, Gainesville, FL32610

Spotted wilt caused by tomato spotted wilt virus (TSWV) is one of the major diseases affecting peanut (*Arachis hypogaea* L.) production in the Southeastern USA. Occurrence, severity, and

symptoms of spotted wilt disease are highly variable from season to season making it difficult to efficiently evaluate breeding populations for resistant line selection. Molecular markers linked to spotted wilt resistance could overcome this problem and allow selection of resistant lines regardless of seasonal conditions. The objective of this study is to identify the simple sequence repeat (SSR) markers linked to TSWV resistance in peanut through genetic mapping using a bi-parental segregating population.

A total of 199 F_2 progeny derived from the cross between Florida-EP^{TM}'113', a TSWV resistant variety and Georgia Valencia, a highly susceptible cultivar were evaluated by ELISA (enzyme-linked immunosorbent assay) for the presence of TSWV. The $F_{2:3}$ and $F_{2:4}$ populations were further phenotyped by two different methods: visual evaluation and immunostrip test. The Immunostrip results confirmed that most of the symptomatic plants were infected by TSWV with some exceptions, which didn't display visual symptoms but exhibited positive immunostrip reaction. This result indicates that immunostrip test is a more sensitive method for TSWV phenotyping. For genotyping, a total of 60 SSR markers flanking known QTLs for TSWV resistance were screened against the two parental lines of the F_2 segregating population. In total, 18 markers are polymorphic. These polymorphic marker were used to genotype the whole F_2 population to test whether Florida-EP^{TM}'113' has any of the known QTLs. Fine mapping will be conducted to identify flanking markers closely linked to spotted wilt resistance conferred by Florida-EP^{TM}'113'.

(50) <u>Validation of Illumina-generated Inter-specific SNPs in Peanut</u>. R. CHOPRA*, Dept. of Plant and Soil Sciences, Texas Tech University, Lubbock, TX 79409; G. BUROW, USDA-ARS-CSRL, Lubbock, TX 79415; A. FARMER, National Center for Genome Resources, Santa Fe, NM 87505; J.A. MUDGE, National Center for Genome Resources, Santa Fe, NM 87505; C.E. SIMPSON Texas A&M AgriLife Research, Stephenville, TX 76401; and M.D. BUROW Texas A&M AgriLife Research, Lubbock, TX 79403, and Dept. of Plant and Soil Sciences, Texas Tech University, Lubbock, TX 79409

Advances in sequencing technologies have provided ample opportunities to study complex transcriptomes at lower cost, and can help determine genetic variability. In this study, we used a diverse panel of 22 *Arachis* accessions representing seven *Arachis hypogaea* market classes, A-, B-, and K- genome diploids, a synthetic amphidiploid and a tetraploid wild species to sequence the transcriptome for polymorphism detection and genotyping. Transcriptomes of 22 peanut genotypes, including elite breeding genotypes, parents of mapping populations, and unimproved wild genotypes, were sequenced. The realignment of individual reads to the OLin contigs enabled the detection of ~292,000 bi-allelic SNPs across all 22 genotypes. Diversity analysis based on these variants indicated grouping of diploids according to genome classifications and the tetraploid subspecies of *Arachis*. Cluster analysis of variants indicated that sequences of B genome species were more similar to the tetraploids, and the next closer parental species belonged to the A genome species. Twenty allele-specific SNPs and 28 regions ranging from 200-500bp covering 30 SNPs were selected from the above dataset to validate in 8 accessions using KASP technology and sequencing PCR based methods. KASP based validation had 90% success, whereas only 40% of the region in the sequencing based method produced single bands of the expected size, suggesting the presence of variants of genes or intronic regions. SNP data will serve as a valuable resource for creating a catalog of allelic variants of peanut genes and will also aid in future studies of marker-assisted breeding, and gene identification aimed at developing better varieties.

(51) Peanut Injury and Yield as Affected by Exposure to 2,4-D and Dicamba.

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Cotton and soybean cultivars with tolerance to 2,4-D and dicamba are being developed. As growers adopt these new technologies in the southeastern US, the risk of unintended exposure of peanut to these herbicides from drift or application errors will increase. When such incidents occur, growers will need to determine whether the injured peanut crop has the potential to produce an economic yield or should be terminated and the area replanted. In order to make this decision growers must be able to estimate the potential yield reduction caused by exposure to 2,4-D or dicamba. Dose response studies were conducted under field conditions in Citra and Jay, FL during 2012 and 2013 to determine the level of peanut injury and yield reduction after exposure to 70, 140, 280, 560, and 1120 g ae/ha of 2,4-D or to 35, 70, 140, 280, and 560 g ae/ha of dicamba at 21 and 42 days after planting (DAP). Peanut age did not affect response to dicamba or 2,4-D. Dicamba caused 2 to 5 times greater peanut foliar injury and 0.5 to 2 times higher yield loss than 2,4-D. Foliar injury ranged from 0 to 35% when peanuts were treated with 2,4-D and from 20 to 78% with dicamba. The maximum yield reduction from 2,4-D treatment was 41% and from dicamba exposure was 65%. Linear regression indicated that the intercept for yield reduction was 12% for 2,4-D and 23% for dicamba, and there was a 2.5% and 7.7% increase in yield reduction per additional 100 g/ha of 2,4-D or dicamba, respectively. Although high variability was observed, there was a positive correlation between foliar injury and peanut yield reduction ($P<0.0001$) suggesting that growers can use foliar injury data to estimate yield reduction and decide whether to continue or terminate the crop.

(52) New Peanut Cultivar Response to Paraquat Applications.

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Paraquat was first registered for use in peanut in 1988. Since that time, there have been significant changes in the peanut cultivars planted. In Georgia, the most popular cultivar currently grown is Georgia-06G. Newer, high-oleic peanut cultivars, such as Georgia-09B, are preferred by certain manufacturers. Limited field trials have evaluated the tolerance of Georgia-06G and Georgia-09B to herbicides registered for use prior to 2006. In 2013, four, replicated, weed-free, irrigated, small-plot field trials were conducted in southern Georgia to evaluate the response of Georgia-06G and Georgia-09B to various postemergence (POST) treatments of paraquat (0.06 lb ai/A) + NIS (0.25% v/v), paraquat (0.19 lb ai/A) + acifluorfen (0.17 lb ai/A) + bentazon (0.33 lb ai/A) + NIS (0.25% v/v), paraquat (0.19 lb ai/A) + acifluorfen (0.17 lb ai/A) + bentazon (0.33 lb ai/A) + s-metolachlor (0.95 lb ai/A), paraquat (0.19 lb ai/A) + acifluorfen (0.17 lb ai/A) + bentazon (0.33 lb ai/A) + s-metolachlor (0.95 lb ai/A) followed by imazapic (0.06 lb ai/A) + s-metolachlor (0.95 lb ai/A), and imazapic (0.06 lb ai/A) + s-metolachlor (0.95 lb ai/A). All POST treatments were applied with a CO_2-powered backpack sprayer calibrated to deliver 15 GPA between 13 and 39 days after planting. All data were subjected to ANOVA ($P=0.10$). Peanut leaf burn and plant stunting were frequently observed, especially with any paraquat treatment. However, peanut yields were not significantly reduced by any herbicide treatment.

(53) Characterizing Variability in Postemergence Herbicide Tolerance in Peanut Breeding Lines. R.G. LEON*, West Florida Research and Education Center, University of Florida, Jay, FL 32565; and B. TILLMAN, North Florida Research and Education Center, University of Florida, Marianna, FL 32446.

Postemergence (POST) herbicide tolerance is a critical component for grower adoption of new peanut varieties. However, POST herbicide tolerance is generally evaluated when the new variety is in the last phases of the breeding program or close to commercial release. This approach has the inconvenience that lines with desirable characteristics such as disease tolerance or oil content might be discarded during the selection process because of low yields caused by high susceptibility to the herbicides used in the breeding program. Also, a variety could be kept in the breeding program until release, but it might be susceptible to herbicides that were not used during the selection phases. These problems can be avoided if the herbicide tolerance of the breeding lines is known since the early stages of selection or even before crosses are made. In this way, specific evaluation and selection strategies that take into consideration herbicide tolerance can be implemented enabling the development of peanut varieties that have a more robust tolerance to key herbicides.

We randomly selected 35 breeding lines from the University of Florida Peanut Mini-Core Collection and evaluated their tolerance to 11 POST herbicides under greenhouse conditions. 'Florida-07' and 'Georgia-06G' were included in the experiment as standards for comparisons. Plants were treated at the 3 to 5-leaf stage and injury and dry-weight reduction were evaluated at 14 and 40 days after treatment (DAT), respectively. For all evaluated herbicides, there were significant differences in dry-weight reduction after treatment among breeding lines. Injury did not correlate with growth reductions for all herbicides. POST herbicides with limited translocation and systemic action such as metribuzin, paraquat, and flumioxazin showed a positive relationship between injury and growth reduction. Conversely, systemic POST herbicides such as 2,4-D, 2,4-DB, dicamba, chlorimuron, and diclosulam showed no relationship between injury and growth reduction. In most cases, Florida-07 and Georgia-06G were in the middle or the upper level of POST herbicide tolerance among the evaluated breeding lines. These results suggest that significant differences in POST herbicide tolerance exist among breeding lines, and that these differences could be used to increased POST herbicide tolerance of new peanut varieties. Also, this information can be used when designing new crosses to reduce the risk of developing varieties with low POST herbicide tolerance.

(54) Peanut Tolerance to ET Applied Postemergence. R.M. MERCHANT*, P.A. DOTRAY, Plant and Soil Science, Texas Tech University, Lubbock, TX, 79409; and J.GRICHAR, Soil and Crop Sciences, Texas A&M University, College Station, TX, 77843.

Pyraflufen (ET) was labeled for use postemergence in peanut in 2013. This herbicide will effectively control a number of troublesome weeds including Palmer amaranth (*Amaranthus palmeri*), kochia (*Bassia scoparia*), and Russian thistle (*Salsola tragus*) when applied to weeds up to 4-inches in height. There is concern that peanut response to ET applied postemergence could cause significant peanut injury and there is limited information available on peanut response to ET following applications applied postemergence-topical. The objective of this study was to determine peanut response to postemergence applications of ET when applied according to the new label modification. ET applications were made to peanut at the 6-leaf, 30 days after (DA) 6-leaf, 60 DA 6-leaf, and 90 DA 6-leaf in single and in all possible 2-application sequential treatments. Trials were conducted at Halfway, TX and Yoakum, TX. All applications were made at 10 GPA and included a non-ionic surfactant (0.25% v/v). Visual injury was recorded during the growing season with yield and grade determined at the end of the season. At the Halfway, TX location, peanut exhibited 23-25% injury, characterized as leaf burn and stunting, two weeks after the 6-leaf treatment. Peanut injury four weeks after treatment at 6-leaf was 28%. Peanut injury when treated with a second application 30 DA 6-leaf was 35%. Peanut injury when treated with ET 60 DA 6-leaf was no more than 17%. When treated with a second application 30 days later, peanut injury was 45%. Two weeks after treatment with ET 90 DA 6-leaf peanut injury was at least 28%. No differences in yield were noted, although a trend was apparent that suggested peanut yield was most susceptible to ET when applied at 60 DA 6-leaf application. At the Yoakum, TX location, two weeks after treatment at 6-leaf, peanut injury was at least 25%. When treated with a second application 30, 60, and 90 DA 6-leaf, injury was 25%, 23%, and 25%, respectively. Peanut injury when treated 30 DA 6-leaf was at least 23%. When treated with a second application 60 and 90 DA 6-leaf, peanut injury was 25% and 27%, respectively. Peanut injury, when treated 60 DA 6-leaf was at least 25%. When a second application was made 90 DA 6-leaf, peanut injury was 25%. Peanut that were treated with ET 60 DA 6-leaf, regardless of previous or later applications, yielded less than other treatments (2100-2400 lbs/A). The use of ET in peanut may provide postemergence control of troublesome broadleaf weeds, but visible peanut injury (leaf burn and stunt) is likely and yield loss may occur.

(55) Performance of Besiege™ Insecticide on key Lepidopteran Pests of Peanuts.
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Besiege, the premix of chlorantraniliprole and lambda cyhalothrin, recently was granted EPA registration on peanuts. Prior to commercial availability of this insecticide, small plot efficacy trials have been conducted over the last several years in cooperation with University Entomologists in the Southeastern US. Good Lepidopteran pressure in both 2012 and 2013 allowed for quantitative efficacy assessment across the Southeast, where Besiege performed as well as, and often superior to, many of the commercial standards providing good knockdown and residual efficacy on various difficult to control insect pests.

(56) The Role of Winter Weed Flora on Tomato Spotted Wilt Virus Epidemics in Georgia with Emphasis on Peanut.
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Thrips-transmitted *Tomato spotted wilt virus* (TSWV) infects over 1000 plant species including crops and weeds. TSWV is known to consistently affect peanut production in Georgia. Typically peanut is grown only from March through November. In the crop-free period weeds are presumed to serve as a green bridge for thrips and TSWV. Previous studies have documented numerous winter weeds as TSWV and thrips hosts. However, their ability to influence TSWV transmission in peanut or other crops is not completely understood. To further understand these interactions, population dynamics of two prevalent vectors viz., *Frankliniella fusca* Hinds and *Frankliniella occidentalis* Pergande on selected winter weeds was monitored from October through April in four counties from 2004 to 2008. Peak populations were typically recorded in March and April. *F. fusca* and *F. occidentalis* adults were found on winter weeds, their percentages ranged from 0 to 68 in comparison with other adults. Immatures outnumbered all adults. Microcosm experiments indicated that the selected winter weeds differentially supported *F. fusca* reproduction and development. The time required to complete one generation (adult to adult) ranged from 11 to 16 days. Adult recovery ranged from 9.7 to 22 per 10 females released. Furthermore, transmission assays revealed that thrips transmitted TSWV efficiently from peanut to weeds, the incidence of infection ranged from 10 to 55%. Back transmission assays with thrips from TSWV-infected weeds resulted in up to 75% TSWV infection in peanut. These whole plant transmission and back transmission assays provide basis for TSWV persistence in farmscapes year round.

(57) <u>Evaluating Thrips Management Strategies in North Carolina and Virginia</u>.

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The recent loss of the at plant, in furrow insecticide, Temik (aldicarb) resulted in grower uncertainty concerning the most cost effective approaches for early season thrips management and tomato spotted wilt virus suppression in the North Carolina-Virginia peanut production areas. Replicated test plots were established in 2012, 2013, and 2014 in both states at numerous locations in a variety of soil types. Treatments included Thimet (phorate), Orthene (acephate), Admire Pro (imidacloprid), Temik (aldicarb) and CruiserMaxx (thiamethoxam). Products were applied either as post emergence foliar sprays, directed into the seed furrow at planting, or as a seed treatment. Plots were evaluated for thrips damage to plant leaflets, tomato spitted wilt virus incidence, and pod yield. Results across both states provide consistent and reliable data that permit the development of cost effective thrips management options in response to the loss of Temik (aldicarb) as an at plant thrips control product.

(58) <u>Multi-State Evaluation of a Seed Treatment and In-Furrow Granular Insecticide for Thrips and TSWV Management in Virginia and Runner-Type Peanut.</u>

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Thrips transmitted *Tomato spotted wilt virus* (TSWV), comprise one of the major economically important pest–pathogen complexes throughout the eastern peanut belt in the United States. With the loss of aldicarb for use in peanut, there is a need to evaluate alternatives for both efficacy against thrips and the effects on incidence of TSWV. For the first time, an insecticide seed treatment, CruiserMaxx Peanut (thiamethoxam, Syngenta Crop Protection, Inc.) is now commercially available to peanut growers. Previous field studies by the co-authors have demonstrated that although CruiserMaxx Peanut does provide control of thrips, results are often variable. A multi-state project was initiated that includes cooperators in some of the major peanut growing states in the eastern US (VA, NC, SC, GA) with the objective of evaluating the efficacy of CruiserMaxx Peanut seed treatment on select Virginia and runner-type peanut cultivars for management of thrips and TSWV. Experiment treatments included: 1.) Untreated check; 2.) Thimet 20G at 5.5 oz/1000 row feet; 3.) CruiserMaxx Peanut at 0.318 mg ai/seed; 4.) CruiserMaxx Peanut at 0.318 mg ai/seed + Orthene 97 at 10 oz/ acre. All insecticide treatments were evaluated on three Virginia and three runner-type cultivars with varying levels of TSWV resistance. Experimental design was a randomized complete block with 4 replications. Data collected included seedling stand counts, visual ratings of plant injury caused by direct thrips feeding on a scale of 0=no injury to 10=dead plants, numbers of thrips adults and immatures per 10 terminal leaflets per plot, number of TSWV hits per plot, and pod yields at harvest (TBD). Initial results showed that both CruiserMaxx Peanut and Thimet provided good levels of thrips control compared with the untreated check with lower thrips numbers and plant injury ratings. CruiserMaxx Peanut generally resulted in more plant injury compared with Thimet. Incidence of spotted wilt was reduced by both insecticides compared with the untreated check, and Thimet tended to have lower levels of spotted wilt compared with CruiserMaxx Peanut treatments. Thimet and CruiserMaxx plus Orthene insecticide treatments had significantly higher yields compared to the untreated check across most varieties and locations.

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(59) <u>Evaluating Peanut Genotypes for Drought Tolerance and Aflatoxin Contamination</u>. J.M. LUIS*, Department of Plant Pathology, The University of Georgia Tifton Campus; P. OZIAS-AKINS, Department of Horticulture, The University of Georgia Tifton Campus; C.C. HOLBROOK, Crop Genetics and Breeding Research Unit, USDA-ARS Tifton; and, R.C. KEMERAIT, JR., Department of Plant Pathology, The University of Georgia Tifton Campus, GA 31793.

Drought and heat stress enhance aflatoxin contamination of peanuts especially when such occur during the last three to six weeks of the growing season. Identifying drought-tolerant genotypes may aide in development of aflatoxin resistance in peanuts. This study was conducted to phenotype seven peanut genotypes (Tifguard, Tifrunner, Florida-07, 554CC, NC3033, C76-16, and A72) based on their response to drought stress. The phenotyping methods included visual ratings, chlorophyll fluorescence (PI_{ABS}, Fv/Fm, and PHI_{EO}), soil and plant analysis development (SPAD) chlorophyll meter reading (SCMR), canopy temperature (CT), canopy temperature depression (CTD), and normalized difference vegetation index (NDVI). Based on these traits, Tifguard and Tifrunner showed better drought-coping mechanisms than the other genotypes. After the aflatoxin content of the different genotypes was measured, significant correlations were obtained among aflatoxin contamination, visual ratings, SCMR, CT, CTD and NDVI. The genetic relationships of the seven genotypes were also assessed using simple sequence repeat (SSR) markers that were previously identified to be polymorphic between Tifrunner and Florida-07.

(60) <u>Recent advances for management of Meloidogyne arenaria on peanut in Georgia</u>. R. C. KEMERAIT*, J.T. WALLS, and T.B. BRENNEMAN, Department of Plant Pathology, University of Georgia, Tifton, GA 31793.

Management of the peanut root-knot nematode, *Meloidogyne arenaria*, is of critical importance to peanut producers in the southeastern United States. Tactics to manage the peanut root-knot nematode have included crop rotation and use of nematicides such as 1,3-dicholorpropene and aldicarb. In recent years growers have planted the root-knot nematode resistant cultivar ‘Tifguard’ but have lost use of aldicarb. Aldicarb had been widely used both in-furrow and as an over-the-top application during “pegging time” in the peanut field. A new product from Bayer CropScience offers opportunity for effective management of root-knot nematode affecting peanut. In 2012 and 2013 fluopyram (either alone or formulated with prothioconazole or imidacloprid) was assessed for management of *M. arenaria* in a naturally infested field on the University of Georgia’s Coastal Plain Experiment Station in Tifton. The objective of this study was to assess the efficacy of fluopyram (65 and 130 g/100kg seed) + imidacloprid (Admire, 9 fl oz/A), fluopyram + prothioconazole (Propulse, 13.7 fl oz/A) and fluopyram + imidacloprid (Velum Total, 10 and 18 fl oz/A) as compared to aldicarb (Temik 15G, 10 lb/A) for management of the peanut root-knot nematode. Plots were planted to ‘Georgia-06G’. Fungicide treatments were applied either as seed treatments, in-furrow-at-plant, at pegging-time, or in a combination of timings. Thrips were managed using aldicarb, phorate or imidacloprid. Data collection included stand count (2013), plant vigor (2013), nematode counts from soil, root-gall ratings, above-ground symptoms of

stunting and necrosis, and yield. Numerical increases in stand counts were observed with in-furrow applications of Velum Total as compared to Temik 15G and fluopyram applied as a seed treatment. Greatest stand counts were observed where Velum Total was applied at 18 fl oz/A. Numeric increases in vigor ratings were greatest where Velum Total was applied in-furrow; however such differences were not significant among treatments. In-furrow applications of fluopyram were associated with reductions in root damage (significant in 2012, numeric in 2013), a numeric reduction in above-ground stunting (2012), and increased yield (numeric) as compared to applications of aldicarb, seed-treatment use of fluopyram, or pegging-time applications of Propulse. Research will continue to further elucidate how fluopyram, marketed with imidacloprid, as Velum Total, can be of greatest benefit to peanut producers.

(61) <u>Comparison of Georgia-06G and Georgia-12Y with seven levels of fungicide inputs</u>. T. B. BRENNEMAN[1]*, W. D. BRANCH[2], and A. K. CULBREATH[1], Department of Plant Pathology[1] and Department of Crop and Soil Science[2], University of Georgia, Tifton, GA 31794.

A study conducted in 2013 in Tifton, GA compared the disease susceptibility and yield of Georgia-06G (GA-06G) and Georgia-12Y (GA-12Y) peanut under irrigated conditions with seven levels of fungicide inputs. Fungicide programs ranged from a low of seven Bravo sprays (1.5 pt/A) to a high of three applications of Fontelis (16.0 fl oz) plus Orius (7.2 fl oz), with Proline (5.7 fl oz) in a 6-inch band at 30 DAP, and two Bravo sprays afterward. The other treatments had each of these components individually with Bravo sprays filling any voids where stem rot treatments were not used. Stem rot (*Sclerotium rolfsii*) incidence in the Bravo-only plots was 27% and 8% for GA-06G and GA-12Y, respectively. The high input treatment had only 7% stem rot on GA-06G, and 4% on GA-12Y. Pod yield with GA-06G ranged from 3674 to 4828 lb/A in the low and high input treatments, respectively, and from 5256 to 5539 lb/A with GA-12Y. Leaf spot (primarily *Cercospora arachidicola*) was similar in both cultivars, but tomato spotted wilt (*Tomato spotted wilt virus*) in GA-12Y was less than half the incidence recorded for GA-06G. The new cultivar GA-12Y demonstrated excellent yield potential compared to the current standard cultivar, GA-06G, and superior disease resistance, especially for stem rot. These results indicate GA-12Y has great potential for production with reduced fungicide inputs.

(62) <u>Evaluation of fungicide programs for control of early leaf spot and stem rot of peanut in Oklahoma</u>. J. P. DAMICONE* and T.J. PIERSON, Department of Entomology and Plant Pathology, Oklahoma State University, Stillwater, OK, 74078.

Fungicides were applied to the spanish cultivar ‘Tamnut OL06’ in a full-season calendar schedule (6 applications), a reduced calendar schedule (3 applications on a 14-day schedule beginning 1 Aug.), or according to a weather-based advisory program (3 applications; www.mesonet.org) for control of early leaf spot. Leaf spot control with advisory programs was similar to the full-season programs, and better than the reduced calendar programs (P=0.05) for all of the fungicides evaluated. Tebuconazole provided good leaf spot control (<15% defoliation) and the highest yields when applied in full-season block program or in an advisory program tank mixed with chlorothalonil. Yield responses (P=0.05) to fungicide programs averaged over 900 lb/A, demonstrating the importance of foliar disease management where weather is favorable for early-season disease development. Full-season fungicide programs were evaluated in adjacent trials on 'Tamnut OL06' inoculated at mid-season with *Sclerotium rolfsii*. Both stem rot and early leaf spot reached severe levels in these trials. Stem rot levels were greatest (P=0.05) for the full-season programs with chlorothalonil (22 to 28%) compared to the untreated check (4 to 11%). The low level of stem rot in the untreated checks was attributed to severe defoliation by early leaf spot (70 to 80%) which created a less favorable microclimate for stem rot development. As a result, control of leaf spot with chlorothalonil did not increase yield where stem rot was severe. All of the programs with fungicides registered for stem rot control provided excellent control of early leaf spot (0 to 10% defoliation) and increased yields (P=0.05) compared to both the untreated check and full-season chlorothalonil program. Yield responses ranged from 944 to 1881 lb/A above the untreated check. Fungicide programs that included tebuconazole, penthiopyrad, tebuconazole + prothioconazole, tebuconazole + azoxystrobin, flutolanil, propiconazole + flutolanil; but not azoxystrobin or pyraclostrobin + fluxapyroxad, reduced levels of stem rot compared to the full-season chlorothalonil program. Fungicide programs that included tebuconazole, azoxystrobin + tebuconazole, penthiopyrad, and flutolanil provided the best control of stem rot (>50% reductions in disease incidence).

(63) Effect of Phorate Insecticide on Tomato Spotted Wilt in New Field Resistant Peanut Cultivars. A.K. CULBREATH*[1], R. SRINIVASAN[2], M.R. ABNEY[2], W.D. BRANCH[3], C.C. HOLBROOK[4]. and B. TILLMAN[5]; [1]Dept. of Plant Pathology, University of Georgia, Tifton, GA 31793-5766; [2]Dept. of Entomology, University of Georgia, Tifton, GA 31793-5766; [3]Dept. of Crop and Soil Science, University of Georgia, Tifton, 31793-5766; [4]USDA-ARS, Coastal Plain Experiment Station, Tifton, GA, 31793-5766; and [5]North Florida Research and Education Center, University of Florida, Marianna, FL 32446.

Use of resistant cultivars is the most important component of an integrated disease management program for tomato spotted wilt (TSW) of peanut (*Arachis hypogaea*), caused by *Tomato spotted wilt virus* (TSWV). In-furrow application of phorate (Thimet 20G) insecticide also provides suppression of TSW and reduces injury of peanut foliage by tobacco thrips (*Frankliniella fusca*) larvae. In recent years, several peanut cultivars and breeding lines have been developed with improved levels of field resistance to TSWV. The objective of this study was to determine the effects of in-furrow applications of phorate insecticide on severity of TSW in several of these new cultivars. Field trials were conducted at the UGA-CPES Lang-Rigdon Farm, Tifton, GA in 2011-2013. Experimental design was a split-plot with four replications. Whole plot treatments consisted of in-furrow application of phorate (1.12 kg ai/ha, Thimet 20G) and no in-furrow insecticide. Sub-plot treatments consisted of 10 genotypes in 2011 and 2012 and 8 cultivars in 2013. All plots were cover-sprayed with acephate at early emergence to minimize thrips feeding injury. There were no significant phorate X genotype interaction effects for final incidence of TSW in any year. Across genotypes, incidences of TSW for respective nontreated control and phorate treatments were 9.7 and 6.4% (LSD = 2.5) in 2011; 9.9 and 6.2% (LSD = 1.7) in 2012; and 15.0 and 10.7% (LSD = 2.7) in 2013. In 2011 and 2012, across insecticide treatments, final incidence in Georgia-10T and Georganic was less than that in Georgia-06G. Final incidence in Florun 107 was higher than that of Georgia-06G in 2011, but incidence was similar for those two cultivars in 2012. In 2013, across insecticide treatments, Georgia-10T, Georgia-11J, and Georgia-12Y had final spotted wilt incidence that was lower than that of Georgia-06G. There was no indication of consistent yield benefits with the application of phorate in these experiments. Across insecticide treatments, several entries had pod yields similar to those of Georgia-06G in one or more of the years. In 2013, Georgia-12Y had yields higher than any other entry. Trends of lower incidence of TSW with in-furrow application of phorate in these experiments are consistent with previous observations.

(64) Seeding Rate impact on Diseases and Yield of Selected Runner Peanut Cultivars in a Rainfed Production System in Southwest Alabama. A.K. HAGAN*, H. L. CAMPBELL, K.L. BOWEN. Auburn University, AL 36849; L. WELLS. Wiregrass Research and Extension Center, Headland, AL 36849.

Impact of seeding rate on yield of selected runner peanut cultivars as well as the occurrence of tomato spotted wilt (TSW), leaf spot diseases, and stem rot were evaluated in 2012 and 2013 in a rainfed field cropped to peanut once every three years at the Gulf Coast Research and Extension Center. A split-split plot design was used with year as the whole plot, peanut cultivar as the split plot, and seeding rate as the split-split plot. Florida-07, Georgia-06G, Georgia-09, Georgia-10T, and Tifguard peanut varieties were evaluated in each year at seeding rates were 3, 4, 6, and 8 seed/row ft. Planting dates were in mid-May. Whole plots were randomized in four complete blocks with 4 replications. Each plot consisted of four 30-ft rows on 38-inch centers. Plots were not irrigated. Leaf spot control was obtained with seven applications of 1.5 pt/A of Bravo Weather Stik 6F made at 2-wk intervals starting approximately 40 DAP. Stand counts were made from one of two harvest rows of each plot at 14 days after planting. TSW incidence and leaf spot severity was assessed just prior to plot inversion, and stem rot incidence was determined immediately after plot inversion. Stand density differed across study years with denser stands noted in 2013 than in 2012 for the 3 and 4 but not the 6 and 8 seed/ft seeding rates. Stand density also differed by seeding rate and peanut variety. At the 8 seed/ft but not lower seeding rates, stand density was lower for Florida-07 than for Georgia-09B but not Georgia-06G, Georgia-10T, and Tifguard. While overall disease pressure was low, TSW incidence, which was higher in 2012 than 2013, declined with increasing seeding rates with equally low disease indices observed at the two highest seeding rates. TSW incidence was similar for all peanut cultivars. Leaf spot intensity, stem rot incidence, and yield differed by year and peanut variety. In 2012, similar leaf spot intensity ratings were recorded for all peanut varieties but not in 2013 when Florida-07 suffered the highest and Georgia-10T the least leaf spot damage. Seeding rate did not impact leaf spot intensity. For all peanut varieties, stem rot incidence, which was lower in 2012 compared with 2013, was not impacted by seeding rate. For 2012, stem rot incidence was higher in Georgia-06G than Florida-07, Georgia-10T, and Tifguard, which had low disease, but not Georgia-09B. In the following year, Florida-07 suffered higher stem rot damage than all other peanut varieties with Georgia-10T and Tifguard again having the lowest disease ratings. Yields were higher in 2012 than 2013 for all varieties except for Georgia-10T, which had similar yields in both study years. In 2012 highest yields were recorded for Florida-07, Georgia-06G, and Georgia-09B, while Georgia-10T produced the highest yields in 2013. Yields rose with each successive increase in seeding rate with the 8 seed/ft seeding rate producing the highest pod yield.

(65) Initial Evaluation of a Weather Based Decision Support System for Early Season Fungicide Sprays of *Sclerotium rolfsii* in Peanuts. N.S. DUFAULT,* The Dept. of Plant Pathology, University of Florida, Gainesville, FL 32611; R. L. BAROCCO, The Doctor of Plant Medicine Program, University of Florida, Gainesville, FL 32611

It has been indicated that early season fungicide sprays can help manage stem rot or white mold, caused by *Sclerotium rolfsii* Sacc., a devastating disease of peanuts in the Southeastern

U.S. These early sprays are typically applied between 20 and 40 days after planting (DAP), but their effectiveness varies from season to season when compared to the standard 60 DAP application. The objective of this study was to evaluate the accuracy of an environmental model used to assess early season peak growth periods of *S. rolfsii*. During the 2013 growing season, it was observed that the model accurately predicted 9 of 12 possible non-spray events at 4 sites across Florida. However, there were no instances where management of *S. rolfsii* benefited from an early season spray, and thus the models accuracy for these events is still unknown. Further work is being conducted in 2014 to examine the utility of this model given different Peanut Rx risk situations and as a support tool on the PeanutFARM website.

(66) Initial Evaluations of Solatenol™ Fungicide – A New SDHI Fungicide for Peanut. H. MCLEAN*, V. MASCARENHAS, K. BUXTON, and A. H. TALLY. Syngenta Crop Protection, LLC, Greensboro, NC.

Solatenol™ fungicide is a new broad spectrum foliar fungicide discovered and developed by Syngenta. It is the third Syngenta succinate dehydrogenase inhibitor (SDHI) carboxamide to be introduced. Syngenta currently has two registered products in the SDHI class – sedaxane (Vibrance™) used in Seed Care, and isopyrazam (Seguris™) used on wheat and bananas in several countries. In the US, Solatenol™ fungicide (ISO name benzovindiflupyr) has been submitted for registration to the US EPA. Solatenol™ is not systemic but is translaminar. Solatenol™ is classified as a pyrazole carboxamide (FRAC 7). The very high affinity for succinate dehydrogenase results in its high intrinsic activity. Solatenol's™ high intrinsic activity combined with strong binding to the plant's wax layer from where it slowly penetrates into the plant tissue, results in long lasting disease control. Solatenol™ is safe to the crop when applied alone or when mixed with DMI or QoI fungicides. Key strengths of Solatenol™ fungicide include activity on Asian soybean rust (*Phakopsora pachyrhizi*), *Septoria tritici* on wheat, and apple scab (*Venturia inaequalis*). Use rates as low as 30 g ai/ha are extremely efficacious on soybean rust. It also has excellent activity on many leafspots, rusts, powdery mildews, *Rhizoctonia* spp., and *Sclerotium rolfsii*. It does not control oomycete diseases. In peanut, Solatenol™ Fungicide has shown excellent residual activity of early leafspot (*Cercospora arachidicola*), late leafspot (*Cercosporidium personatum*), peanut rust (*Puccinia arachidis*), and Southern Blight (*Sclerotium rolfsii*) at use rates of 75 to 100 g ai/ha. Peanut fungicide programs including Solatenol™ Fungicide have shown excellent seasonal control of peanut diseases and resulted in improved yield compared to the best disease control programs currently available.
*[*Solatenol™ is a registered trademark for the active ingredient and not the tradename]*

(67) Single Nucleotide Polymorphism (SNP) Detection in Cultivated Peanut Using the Diploid Wild Progenitor Reference Genomes. J. CLEVENGER*, Y. GUO, and P. OZIAS-AKINS, Institute of Plant Breeding, Genetics & Genomics, The University of Georgia, Tifton, GA 31793.

High throughput next generation sequence-based genotyping and SNP detection opens the door for emerging genomics methods such as genome-wide association analysis and genomic selection-based breeding. High density SNP markers allow easy identification of tightly linked functional markers to important disease resistance QTL. In diploid crops, with an available reference genome, SNP detection is routine. In polyploids, SNP detection is confounded by highly similar homeologous sequence where a homeologous SNP looks like an allelic SNP. If reference genomic sequence is available, homeologous SNPs can be controlled for by high stringency mapping of sequence reads where the mismatch percentage allowed is less than the average difference between homeologous sequences. In peanut, the difference between subgenomes is too similar to apply high stringency as a reliable method to control for false-positive homeologous SNP detection. Here we introduce a method for identifying high-quality SNPs by using homeologous haplotypes to identify true allelic SNPs. Utilizing the newly released diploid progenitor genomes (*Arachis duranensis* and *Arachis ipaensis*), we use a sliding window approach that visits each called SNP and looks for a neighboring homeologous haplotype, using this haplotype as a guide to decide if the SNP is allelic. Using sequence from a pilot study of six cultivated peanut genotypes, we identified 339 A and B genome-specific high quality SNPs. A subset of these SNPs was validated using sequencing. Our method can be expanded to utilize sequence-based genotyping for high-throughput, high-resolution genotyping and facilitate the construction of subgenome-specific SNP arrays for cultivated peanut.

(68) Genetic Mapping of *FAD2* Genes and their Relative Contribution towards Oil Quality in Peanut (*Arachis hypogaea* L.). M.K. PANDEY, H. WANG, L. QIAO, S. FENG, P. KHERA*, A.K. CULBREATH, the University of Georgia, Department of Plant Pathology, Tifton, GA; M.L. WANG, N.A. BARKLEY, USDA-ARS, Plant Genetics Resources Conservation Unit, Griffin, GA; J. WANG, the University of Florida, Department of Agronomy, Gainesville, FL; C.C. HOLBROOK, USDA-ARS, Crop Genetics and Breeding Research Unit, Tifton, GA; M.K. PANDEY, P. KHERA, R.K. VARSHNEY, International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), Patancheru, India; B.Z. GUO, USDA-ARS, Crop Protection and Management Research Unit, Tifton, GA.

Improvement of oil quality in peanut has been the major breeding goal because of its high economic impact on growers/traders and the potential health benefits to consumers. Fatty acid desaturase (*FAD)* genes are known to control the oil quality in peanut, but their positions on the peanut genome and their relative contribution towards total phenotypic variance for oil qualities are still not well understood. In this context, two improved genetic maps using S-population (SunOleic 97R × NC94022) and T-population (Tifrunner × GT-C20) were developed with 206 (1780.6 cM) and 377 (2487.4 cM) marker loci with marker densities of 9.6 and 7.6 cM/marker loci, respectively. Quantitative trait loci (QTL) analysis for oleic acid, linoleic acid, oleic / linoleic acid ratio and total oil content detected a total of 41 and 49 main-effect QTLs (M-QTLs) explaining up to 45.63% and 39.50% phenotypic variance (PV) using QTL Cartographer for S-

and T-population, respectively. Similarly, QTLNetwork identified 11 M-QTLs each for S- and T-population with PV up to 25.42% and 29.13%, respectively. In case of epistatic QTLs (E-QTLs), QTLNetwork detected eight E-QTLs in S-population and two E-QTLs in T-population with PV up to 2.83 and 2.19%, respectively. Mutant allele in *FAD2A* contributed up to 9.11% and 38.41% of PV in S- and T-population, respectively while *FAD2B* mutant contributed 42.33% PV in S-population. The phenotypic effect of M-QTLs and E-QTLs detected through QTLNetwork showed lower PV as compared to M-QTLs detected from QTL Cartographer. Now, it is clear that the contribution of *FAD2B* is higher than the *FAD2A* gene in controlling quality traits. In summary, the present study lead to the development of two improved genetic maps and identification of 112 M-QTLs and 10 E-QTLs for oil quality traits. The information generated through the present study is very useful for marker-assisted improvement of peanut oil quality.

(69) Genotype-by-Irrigation Interaction in the Georgia State Peanut Trials.

T.G. ISLEIB and S.C. COPELAND, Dept. of Crop Science, N.C. State Univ., Raleigh, NC 27695-7629; J.GASSETT, Dept. of Crop and Soil Sci., Univ. of Georgia., 1109 Experiment St., Griffin, Georgia 30223-1797; and W.D. BRANCH and A.E. COY, Dept. of Crop and Soil Sci., Coastal Plain Exp. Sta., Univ. of Georgia, Tifton, GA 31793-5766.

The Univ. of Georgia conducts trials of peanut (*Arachis hypogaea* L.) cultivars at three sites in the main peanut producing area of the state: Tifton, Plains, and Midville, GA. At each site there is an irrigated and a non-irrigated trial. Each is replicated. In addition to released cultivars in the runner and virginia market types, the trials include advanced breeding lines from the Univ. of Georgia breeding program at Tifton, GA. Each year, the results of the trials are incorporated into a database maintained by the breeding program at N.C. State Univ. Because the data are extensive, they afford an opportunity to examine the interaction between genotypes and irrigation. Data were retained for analysis only if a line was tested in 2013 and had been tested for at least three years. The most tested line was Georgia Green (93 trials over 17 years, 1997-2013) while the least tested were three Georgia experimental lines (GA 082522, GA 082524, and GA 082546 tested in 17 trials over 3 years, 2011-2013). Irrigation increased pod yield (4619 vs. 3822 lb A^{-1}, P=0.0104) and support price (18.46 vs. 17.90 ¢ lb^{-1}, P=0.0452), resulting in increased dollar value per acre (855 vs. 692, P<0.0001). Large differences were found between runner- and virginia-market-type cultivars and breeding lines for all measured traits as was variation among lines within market types. Interaction between market type and irrigation was detected for total sound mature kernels, meat content, weight of 100 seeds, and support price, but not for pod yield or dollar value per acre. Interaction between lines within market types and irrigation was found only for support price. Lack of interaction of genotypes with irrigation level for yield and crop value suggests that breeders' evaluation of lines under irrigation should identify selections that will perform with the same relative standing even under non-irrigated conditions.

(70) Pedigree of Southeastern Runner Peanut Cultivars and the Potential for Yield Improvement.

B.L. TILLMAN*, North Florida REC, Agronomy Department, University of Florida, Marianna, FL 32446.

Runner peanut cultivars developed and grown in the southeastern United States trace a large percentage of their parentage to one or two plant introductions or to other cultivars derived from one or both of those plant introductions. Simultaneously, record yields have been set and for the first time average yields exceeded 4000 pounds per acre in both 2012 and 2013. In 2012, seven runner cultivars occupied nearly 100% of the certified seed acreage in Alabama, Florida and Georgia as follows: Georgia-06G (77%), Tifguard (5%), Georgia-07W (5%), Florida-07 (5%), Georgia Greener (5%), Georgia-09B (2%), and FloRunTM '107' (1%). All of these cultivars except Georgia-09B share a common parent, C-99R, which is a descendant of PI203396 on its maternal side and PI259785 on its paternal side. On average, C-99R would be expected to share (coancestry) 25% of PI203396 and 25% of PI259785 genetics. Since each of these six cultivars would, on average, share 50% coancestry with C-99R, they then share 12.5% coancestry with PI203396 and 25% coancestry with PI259785 or about 25% total coancestry with plant introductions through their parent C-99R. This is a relatively startling level of genetic contribution to commercial cultivars given that most cultivated species such as maize, cotton, soybean, rice and wheat contain very low coancestry with plant introductions. Georgia-09B is a backcross derivative from Georgia Green and Georgia-02C with the former as the recurrent parent for 3 crossing cycles. Georgia Green is an ancestor of PI203396 through its maternal parent Southern Runner, a direct descendant of PI203396. Thus Georgia Green shares 25% coancestry with PI203396. Three of the cultivars developed at the University of Georgia (Georgia-06G, Georgia-07W, and Georgia Greener) have Georgia Green as a parent so that they have coansestry to PI203396 through both parents, 25% through C-99R and 12.5% through Georgia Green for a total of 37.5% coancestry with PI203396. Through an analysis of the elite lines being tested in the University of Florida peanut breeding program, this presentation will explore a possible link between improved yield potential and the continued use of plant introductions in runner cultivars breeding in the southeastern United States.

(71) <u>Phenotypic, Biochemical, and Genetic Characterization of the U.S. Peanut Core Collection.</u> N.A. BARKLEY*, USDA ARS PGRCU Griffin, GA 30223, G.E. MACDONALD, Agronomy Department University of Florida, Gainesville, FL 32611, B.L. TILLMAN, Agronomy Department, University of Florida Marianna, FL 32446, and C.C. HOLBROOK, USDA ARS Crop Genetics and Breeding, Tifton, GA 31793

The US peanut core collection is a valuable germplasm resource for the peanut community. The core collection was constructed in 1993 to minimize genetic redundancy, provide a smaller subset for peanut researchers to identify important agronomic traits for genetic improvement of cultivated peanut, and reveal other accessions across the entire germplasm collection that contains a trait of interest. This collection contains the major genetic diversity for each of the 4 peanut market types – Valencia, Spanish, Virginia, and Runner. Few studies have attempted to characterize the lines within the core; therefore, a more complete evaluation and characterization of this collection should be conducted. The aim of this on-going study was to evaluate critically important traits to breeders and growers such as yield, grade, standard peanut descriptors, morphological characterization including subspecies (*fastigiata* or *hypogaea*) classification, biochemical parameters such as protein, oil content, and fatty acid composition and carry out genetic profiling (SSR and SNP genotyping). Furthermore, it is necessary to periodically regenerate to ensure an adequate supply of highly viable seeds are available in the USDA collection for distribution especially due to the foreseeable demand on this germplasm in light of the current genomics effort. The entire collection was grown under field conditions in 2013 using an augmented design that integrated replicates of the mini core and commercials standards of each market type. We will report preliminary findings to date and plan to repeat the entire study in 2014.

(72) Identification of Additional FAD2 Genes plus DGAT Genes in Peanut, and Mapping of QTLs for Fatty Acid Composition in Peanut.

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Identification of genes for oil composition and concentration can be useful for generation of molecular markers for breeding for the high-oleic trait or potentially for altering the concentrations of other fatty acids, as well as for higher or lower oil concentration. Two FAD2 (fatty acid desaturase) genes have been identified previously, and have been associated with the high oleic trait. By PCR amplification, we have identified 4 additional FAD2 genes in peanut, two each from the A and B genomes. These have been mapped as CAPs and/or Kasp SNP-based markers. In addition, six DGAT (diacylglycerol aminotransferase) genes have been cloned and sequenced, two each for DGAT1, DGAT2, and DGAT3, with one member of each pair from the A and B genomes. QTL analysis of the oil composition of a RIL population derived from a cross between *A. hypogaea* cv. Runner IAC 886 × a synthetic amphidiploid *(A. ipaënsis* × A. *duranensis*)$^{4\times}$ was performed using SSR and SNP-based markers. Twenty-seven QTLs for concentrations of 8 different fatty acids or fatty acid ratios were mapped to 14 distinct loci on 12 linkage groups. Four of these mapped nearby one of the newly-discovered FAD2 genes. Markers are expected to accelerate progress in breeding for oil composition and content.

(73) Genetic Mapping and QTL Analysis for Oil Concentration in Peanut.

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The objectives of this study were construction of an SSR-based genetic linkage map and discovery of QTL in multiple environments using an advanced backcrossed population derived from the runner genotype ‘Florunner’ and a high-oil synthetic amphidiploid, TxAG-6. Oil concentrations for 87 genotypes comprising the mapping population ranged from 440 to 630 g kg^{-1}. The genetic map was consisted of 91 markers and 22 linkage groups with a genetic distance of 1322 cM. Seven genomic regions were linked to oil concentration in at least one environment using LOD 3.3 as a genome-wide 0.05 p-value corresponding to a p-value of 0.0001 for any given marker. In a combined data set across all environments, eleven genomic regions and one gene-based SNP were linked to oil concentration. Significant markers included a DGAT2-based SNP, which is involved in the Kennedy pathway leading to oil biosynthesis.The percentage of phenotypic variation accounted for by each significant marker ranged from 2 to 43%. In addition, 38 two-way epistatic interactions were identified at LOD 5.0. The markers and epistatic interactions identified could be utilized in marker-assisted selection and pyramiding of

oil genes in new peanut cultivars.

(74) Candidate SNP Markers for High Oleate Content in Peanut.

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As compared with its normal oleic counterpart, high oleic peanut has a longer shelf life and considered healthier for human and more suitable for biodiesel production. Hence, high oleic acid has become a major breeding objective of peanut. The role of *FAD2A* and *FAD2B* genes in conditioning oleate content in peanut has been well documented, however, there are some reports indicating the possibility that other genetic factors may also be involved. A Super-BSA strategy was therefore utilized to identify candidate SNP markers for high oleate content in the cross Huayu 31× FB4. Made up of 42 F_2 individuals each, high and low oleate bulks had 74.328%-81.442% (average: 77.02%) and 20.641%-39.496% (average: 35.22%) oleate, respectively. Totally 53,144 SLAF tags were obtained after sequencing the bulks and the parents. The overall average depth was 195×. Only 2,987 (5.62%) SLAF tags were polymorphic. 385 markers with clear parental origins were chosen for further association analysis using the SNP-index algorithm. 0.5302 was selected as the threshold value for Delta (SNP-index), as over 95% of the markers analyzed were found to have a lower value. Twenty SNPs with a Delta (SNP-index) value higher than 0.5302 were therefore identified as candidate markers for high oleate content in peanut. Hopefully, the A and B genome sequence information will be some help in elucidating the relationship between the SNPs and *FAD2A/FAD2B*, testing the candidate SNP markers in larger populations and isolating of the gene(s) of interest.

ECONOMICS, PROCESSING AND UTILIZATION

(75) 2014 Farm Bill: More Flexibility and More Complicated. N.B. SMITH, University of Georgia, Tifton, GA 31793

The Agricultural Adjustment Act of 2014 eliminates the Direct and Counter-cyclical Program (DCP) which had been in place since 2002 for peanuts. The DCP program is replaced with a choice between Price Loss Coverage (PLC) and Agricultural Risk Coverage (ARC). PLC is very similar to the old Counter-cyclical program which is a safety net based on price. ARC is somewhat similar to the old ACRE program but more like area-based crop insurance and is a revenue-based safety net. Producers will make a one-time election between these two programs for peanuts and other covered crops for the 2014 crop year and to remain for the life of the farm bill. Producers and landowners will have the opportunity to reallocate base acres and update payment yields if he/she chooses. A new crop insurance program is also established for 2015 crop year and beyond called Supplemental Coverage Option (SCO) that is referred to a “shallow loss” program. The SCO policy will cover part of the insurance deductible. Producers will be making these decisions later in the year and perhaps into the Spring of 2015 as rules and regulations come out. Possible implications of the new programs will be discussed as well as flexibility provided by the establishment of generic base from old cotton base.

(76) Consolidation and Concentration in the U.S. Peanut Industry. F.D. MILLS, JR.*, H.G. JACKSON ROE, K.E. WEBER, Department of Agricultural and Industrial Sciences, Sam Houston State University, Huntsville, TX 77341-2088.

U.S. agriculture experienced revolutionary changes in the 20th century. Many scholars refer to this transformation as the industrialization of agriculture. Innovation and the application of new technology propelled U.S. agriculture from a pastoral model to an industrial model. As a result, consolidation (the merger of two or more firms) and concentration (the number of firms in a market and their respective market shares) occurred. Though numerous articles reference measurable changes among various agriculture commodity sectors, little information exists about the U.S. peanut industry. The purpose of this study was to assess whether consolidation and concentration has occurred in the U.S. peanut industry and if so, what are the implications? Measurements were performed on the production, shelling, and manufacturing sectors of the U.S. peanut industry. Consolidation was measured by comparing the number of firms in each sector in 1982 and 2007. Concentration was calculated using the four firm concentration ratio (CR4) and the Herfindahl-Hirschman Index (HHI). Census data showed the number of farms producing peanuts declined from 23,011 to 6182, a 73% decrease from 1982 to 2007, with minimal change in acreage. Though consolidation has occurred, the number of producers remains large enough to limit concentration in the production sector. Consolidation and concentration has also occurred in the shelling sector with the emergence of a dominant core-fringe. Data analyzed from IBISWorld 2013 showed the CR4 (HHI) for candy, snack nuts, and peanut butter manufacturing to be 74.8% (1824), 47.4% (1291), and 83.3% (3052), respectively. These values indicate that with the exception of snack nuts, the manufacturing sector is very concentrated, especially peanut butter. Consequently, results point to varying levels of market power and price control among the various U.S. peanut industry sectors.

(77) An Economic Analysis of Alternatives Insecticides in the Management of Thrips and Tomato Spotted Wilt Virus in Peanut. A. WRIGHT*, University of Georgia, Athens, 30602, N.B. SMITH, R. SIRINIVASAN, A.K. CULBREATH, R.C. KEMERAIT, R.S. TUBBS, University of Georgia, Tifton, GA 31793, A.K. HAGAN, Auburn University, Auburn, AL 36849

The economic feasibility of using new alternative insecticides will be examined through cost-benefit analysis to validate utilization of new insecticides when compared to using phorate and aldicarb, as well as no insecticide. Aldicarb and phorate have been popular insecticides for thrips control and suppression of *tomato spotted wilt virus* (TSWV) in peanut. The withdrawal of aldicarb, and potentially phorate, as an option presents a management challenge for producers for economic control. Newer cultivars such as Georgia-06G possess a high level of TSWV resistance. Thus, insecticides are now more critical to manage thrips damage than to suppress spotted wilt incidence. Newer, softer insecticides such as Admire Pro, Assail, Cruiser Maxx, Karate and Radiant are compared with aldicarb and phorate using two cultivars, Georgia Green and Georgia-06G. Three years, 2011 thru 2013, of yield and cost data are examined to estimate variable costs and net returns. The results will provide better recommendations on possible alternatives to aldicarb and phorate if both are withdrawn.

(78) Simple Flotation Test for Raw Cotyledons Predicts Textural Attributes of Roasted Snack Peanuts. D.A. SMYTH*, Kraft Foods, Planters R&D, 200 Deforest Ave., East Hanover, NJ 07936; and M. FRANKE, Birdsong Peanut Company,1564 County Road, Brownfield, TX 79316.

The crunchiness of roasted *Arachis hypogaea* L. seeds used in snack peanuts is an important part of the eating experience. Crunchiness is a complex attribute which is measured in the roasted seed usually by descriptive sensory methods, or by measuring physical resistance to crushing or slicing with texture instruments. Consumers use the terms crunch and some resistance to chewing when describing optimal texture. A simple floatation test described here used raw cotyledons and a series of NaCl solutions in the 10-17 % (w/w) range to characterize seed density, which was then correlated to textural properties of these same seeds after roasting. Cultivars tested in the 2012 crop were ACI 149, Tifguard, Georgia 06G and Georgia 09B; and cultivars in the 2010 crop included ACI 149, Florida Fancy, Tamrun OL-07, Red River Runner, Georgia 06G, Georgia 09B, Florida 07, Champs, Phillips, and Perry. Certified seeds were harvested from the Georgia, Florida, Texas, Oklahoma, Virginia, and North Carolina growing regions to examine how environment growing conditions impacted density. Cotyledon density was greatest in cultivars Red River Runner and ACI 149 grown in the southwest U.S., whereas cultivar Georgia 06G had lower density. Growing region did appear to have impact on cotyledon density as both cultivars ACI 149 and Florida Fancy had less density when grown in Georgia or Florida versus Texas. Consumers rated the roasted seed from cultivar ACI 149 as harder than cultivar Georgia 06G in the 2012 crop. A screening sensory test on the 2010 cotyledons picked cultivars ACI 149 and Red River Runner from the southwest as the hardest texture and cultivar Georgia 06G as the softest. These results suggested that raw cotyledon density might be a good indicator for subsequent finished product hardness.

(79) Survey of Postharvest Quality Characteristics During Long-Term Farmers Stock Storage. C.L. BUTTS*, M.C. LAMB, USDA, ARS, National Peanut Research Laboratory, Dawson, GA 39842; and T.H. SANDERS, USDA, ARS, Market Quality and Handling Research Unit, Raleigh, NC 27695.

The length of time that peanuts remain in farmers stock storage is variable . With the record harvest of the 2012 peanut crop, some peanuts remained in farmers stock storage for up to 12 months before being shelled and placed in cold storage or shipped to the manufacturer. To investigate potential changes in peanut quality during storage in farmers stock warehouses, a survey was conducted at three farmers stock warehouses in the Southeastern U.S. All warehouses were located within 55 km of Dawson, Georgia. Two were 24-m wide conventional warehouses with 7.3-m eave heights and a 12:12 roof pitch. The third warehouse was approximately 61 m square with an eave height of approximately 4.3 m and a 2:12 roof pitch. Warehouses were filled to capacity by Nov 1, 2012 and had adequate headspace ventilation Data collection began 11 April 2013 in two of the warehouses and 23 April 2013 in the third warehouse, and continued until unloading began in each warehouse. Temperature and relative humidity of the head space between the roof and the peanuts was recorded using battery operated dataloggers equally spaced along the catwalk and parallel to the ridge line of the warehouse. Three 5-kg samples were collected at similar locations in each warehouse on a monthly basis. Each sample was cleaned and shelled to determine the seed l size distribution and a portion of the medium grade-sized seed were utilized for quality evaluations. The quality parameters determined were moisture content, peroxide value, raw skin color ,roasted seed, and paste color), and descriptive sensory analysis . Moisture and oil content were similar throughout the sampling period. The percentage of jumbo- and medium-grade- sized seed decreased slightly over time and the percentage of splits also increased. Moisture content was relatively consistent because sampling began in April, approximately 5 months into the storage period, when the moisture content should have equilibrated with warehouse environmental conditions. Over time, Hunter L values of skins of the raw peanuts decreased over time indicating a darkening of the skins. Intensity scores for Roasted Peanutty and Sweet Aromatic decreased slightly and off-flavors increased over time especially in the latter sampling dates.

(80) Structural and Anti-glycative Activities Characterization of the Phytochemicals Extracted from Different-colored Peanut Skins.
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Structural and bioactivities characterization of peanut kernel skins have attracted extensive interests in related value-added products development. In this study, fluorescence-based determination of BSA-fructose reactant after incubation at 50°C for 24 h was applied for detecting and screening the anti-glycative phytochemicals extracted from different-colored peanut skins. Twelve different colored skins, namely, black, red, pink and black-pink, were subjected to extractions with water, methanol and 70% acetone and followed by anti-glycative activity determination. The extracts of pink-colored skins exhibited higher yields and stronger anti-glycative activities than did extracts of other colored skins. From each colored peanut skin, 70% acetone was better than water and methanol in extraction of the anti-glycative phytochemicals. The 70% acetone skin extracts of one of pink-colored peanut cultivars (PNS-2) were sequentially isolated and purified by solvent partition, Diaion HP-20 column, Toyopearl HW-40F column and semi-preparative RP-18 HPLC fractionation. Two compounds were isolated and subjected to structural identification by ^{1}H and ^{13}C NMR spectroscopic analysis and

elucidated as procyanidin A1 (epicatechin-(2β→O→7, 4β→8)-catechin) and epicatechin-(2β→O→7, 4β→6)-catechin.

(81) <u>Germinated Peanut Kernels as a Potent Enzyme Source in Mediating Resveratrol Dimerization</u>. P.-C. CHIU*, Y.-J. Li, Department of Applied Chemistry, Chiayi 60004, National Chiayi University; and R. Y.-Y. CHIOU, Department of Food Science, National Chiayi University, Chiayi 60004, Taiwan, ROC.

Various stilbene dimers have attracted academic and industrial interests in investigations of their biological activities and related products development. The dimer contents are generally low in nature and discovery of a biochemical procedure to enhance dimerization is innovative. In this study, based on the fact that peanut kernel is a potent source of stilbenes including dimers, kernels were selected as the enzyme producer enabling to mediate resveratrol dimerization. Basically, the kernels were incubated, germinated and followed by separation of germs and cotyledons and then lyophilized and pulverized into powders as enzyme sources. Dimerization was achieved by enzyme-mediated coupling of resveratrol and followed by addition of H_2O_2 to activate oxidative formation of *δ*-viniferin confirmed by isolation and NMR spectroscopic elucidation. As based on HPLC analysis and the peak height ratio of resveratrol and *δ*-viniferin as a measure of dimerization-related enzyme activity, the activities increased significantly with an increase of time of germination. At each germination time, activities of germs were higher than those of cotyledons. The germ powders were successfully applied for *δ*-viniferin formation in a continuous system by simultaneous additions of resveratrol and H_2O_2 solutions. As generalized, it is of merit to demonstrate that the properly germinated peanut germs are a potent enzyme source bearing specific enzyme-dimerization of resveratrol.

(82) <u>Process Optimization of Blister Fried Peanuts</u>. E H. MCDOWELL, M. ADAMS, J. LILLEY, S. RENN, Y. THOR; North Carolina State University, Dept. of Food, Bioprocessing & Nutrition Sciences, Raleigh, NC, 27695. B.L. WHITE, J.P.DAVIS*, USDA ARS, Market Quality and Handling Research Unit, Raleigh, NC 27695

Blister fried peanuts are a specialty product with origins in Eastern North Carolina and Virginia that are characterized by a “blistered” surface and a distinct crispy and crunchy texture. Central to preparing this product is a wetting step, in which peanuts are intentionally soaked/boiled in water, drained, and subsequently oil roasted (fried). During frying, steam is released from the peanuts, which creates ‘blisters’ on the peanut surface resulting in a distinct appearance and texture. Although the peanut industry currently produces acceptable blister fried peanuts, there is no published research specific to this product. Accordingly, a robust and repeatable lab scale process for ‘blister frying’ peanuts was developed. Utilizing this process, the following parameters for the central wetting step were systematically varied for super XL blanched, Virginia peanuts to understand effects on product quality: soak temperature (23 or 100°C); soak time (10 or 30 min); and peanut to water ratio during soaking (1:5 or 4:3). After frying, peanuts were evaluated for color, blister counts using digital images and ImageJ software, and texture/flavor using a trained sensory panel. Increasing soak time from 10 to 30 min increased ($p<0.05$) the number of blisters after frying. Boiling versus a room temperature soak substantially increased ($p<0.05$) the numbers of blisters after frying, but there was a texture ‘penalty’ in that boiled treatments were typically less ($p<0.05$) crispy or crunchy after frying, although all blister fried peanuts were substantially more crispy and crunchy than either the oil roast control. The 1:5 soak ratio offered no meaningful improvements to product quality and

would not be recommended from a production perspective. Peanuts that blistered extensively had higher ($p<0.05$) moisture contents and were softer (as measured by a Kramer Shear Cell compression test) going into the fryer. However, these heavily blistered peanuts were lighter (increased Hunter L value) in color and tended to be less crispy, crunchy or hard as peanuts that blistered less extensively. While acceptable, roasted peanut flavor of blister fried peanuts was also less intense than dry roasted or oil roasted peanuts (prepared from same starting material), and this was attributed to protein/sugar being leached into the soak water as confirmed by chemical analyses. This work provides a scientific framework from which 'blister frying' of peanuts can be further investigated to improve commercial product quality and processing efficiency.

(83) Evaluation of Flavor in Roasted Virginia- and Runner-type Peanut Breeding Lines. H.E. PATTEE*, T.G. ISLEIB, and S.C. COPELAND, Dept. of Crop Science, N.C. State Univ., Raleigh, NC 27695-7629; and T.H. SANDERS, L.O. DEAN, and K.W. HENDRIX, USDA-ARS Market Quality and Handling Research Unit, Raleigh, NC 27695.

Flavor has long been identified by processors of virginia- and runner-type peanuts (*Arachis hypogaea* L.) as the pre-eminent trait of importance in marketing finished product. As new peanut cultivars are developed, it is important that the flavor profiles of new releases meet or exceed those of the cultivars they are intended to replace.

The breeding program at N.C. State Univ. (NCSU) utilizes roasted peanut flavor as a criterion in breeding line selection. Trials are conducted within the state each year. Sensory analyses generally are conducted on relatively few lines (approximately 36 over the past ten years) each year, generally advanced lines already found to have acceptable yield, grade, and disease resistance. Sound mature kernels from grading samples of an entry in a trial at a location in a year are bulked across reps then divided into 16 subsamples. Eight subsamples are roasted as nearly possible to a common color (58.3 CIELAB L* reading of cool paste), pooled, ground to paste and submitted to a trained descriptive sensory analysis panel in the Sensory Services Center in NCSU's Dept. of Food, Bioprocessing and Nutrition Sciences. Eight panelists evaluate the following attributes of each sample: roasted peanut, over-roast, under-roast, sweet, wood-hulls-skin, fruity, painty, stale/cardboard, moldy, petroleum/chemical, bitter, throat/tongue burn, astringent, nutty aftertaste and bitter aftertaste. Scores are averaged across panel sessions, trials and locations within years, and the data are added to a database maintained since 1985. Multiple year, multiple-location analyses are performed, producing line means adjusted to a common environmental effect. Roast color and fruity attribute intensity are used as covariates where appropriate. From the 2012 crop year 23 NCSU breeding lines, 5 virginia-type cultivars, and 2 runner-type flavor standards (Florunner and Georgia Green) were evaluated. There was variation among lines ($P<0.05$) for nearly all traits. New high-oleic release Sullivan represented an improvement in roast peanut flavor over existing cultivars Bailey and Sugg. Among lines still under test, N09042olF, N11028ol, and N11051olJ had superior flavor profiles.

The Uniform Peanut Performance Test (UPPT) includes soon-to be released breeding lines from public programs. All entries are grown at eight sites across all three U.S. production regions. Pods are pooled across reps before being shelled and graded at the USDA-ARS Natl. Peanut Res. Lab. in Dawson, GA. Medium runner, jumbo runner, or virginia extra large kernels are evaluated for quality characteristics as appropriate for the test entry. Flavor is assessed by the USDA-ARS Market Quality and Handling Res. Unit in Raleigh, NC. A database of sensory and composition data from the UPPT is maintained and summarized annually to determine if new releases have flavor profiles as good as or superior to existing cultivars. For the Virginia-Carolina (VC) area where virginia-type cultivars predominate, Sullivan and Wynne had better flavor profiles than the widely grown cultivars Bailey and Sugg. In the VC area, runner-type lines TUFRunner™ 756 and Georgia-12Y were superior runner-type releases with respect to flavor. In the Southeastern reps of the UPPT, TUFRunner™ 756 and Georgia-12Y were markedly superior in flavor to the very commonly grown cultivar Georgia-06G. In the Southwest, Georgia-09B represented a substantial improvement over common cultivars Flavor Runner 458 and TAMrun OL07. It is evident that there is improvement that can be made in the flavor of the U.S. peanut crop in any of the three major production regions simply by choice of which to use out of existing cultivars. It is further evident that there is progress to be made in flavor through breeding new cultivars if flavor is monitored.

POSTERS

(84) Undocumented Positive Traits Associated with Introgression of Rootknot Nematode Resistance from the Wild Species. M.R. BARING, Soil and Crop Sciences Dept., Texas A&M AgriLife Research, College Station, TX. 778443-2474, C.E. SIMPSON, J.M. CASON, Soil and Crop Sciences Dept., Texas A&M AgriLife Research, REC at Stephenville, TX. 76401, and M.D. BUROW, Soil and Crop Sciences Dept., Texas A&M AgriLife Research, REC at Lubbock, TX. 79403.

Resistance to root-knot nematodes [*Meloidogyne arenaria* (Neal) Chitwood and *M. javanica* (Treub) Chitwood] was transferred into the cultivated peanut from the wild species derived hybrid TxAG-6 by C.E. Simpson and J.L. Starr beginning in 1977 with the first cross between TxAG-6 and Florunner. The first commercial peanut cultivar released with resistance to root-knot nematodes was COAN in 1999 which was a result of a BC_5 cross derived from TxAG-6 X Florunner where Florunner was used as the recurrent parent. COAN was followed by the release of the higher yielding NemaTAM in 2002 both of which were released by the Texas Agricultural Experiment Station. Tifguard followed these two releases in 2007 by the USDA/ARS and the Georgia Coastal Experiment Station at Tifton, GA. Recently, the first high oleic nematode resistant peanut cultivar named Webb was released by Texas A&M AgriLife Research in 2012. The resistance to root-knot nematodes has been well-documented with these cultivar releases as well as the DNA markers associated with this trait and new markers are being discovered in current research. What has not been documented are the additional positive traits associated with the introgression from the wild species derived hybrid.

The multiple disease resistance peanut breeding program at Texas A&M AgriLife Research has transferred nematode resistance into almost 50% of its current breeding lines. During testing in 2013 new phenotypic associations were observed at one South Texas nursery in the lines that have resistance to root-knot nematodes. The first observation was that the entire field and all of the non-nematode resistant nursery plots were yellowing as were several south Texas fields in the area. However the nematode resistant breeding lines remained dark green in color. The yellowing was not typical of iron chlorosis and speculations are that the yellowing may have been caused by micro-nutrient deficiencies which have resulted from several years of over-irrigation due to recent Texas droughts. The second observation was a result of a late season infestation of army worms which covered the entire field. The surrounding field and again, all of the non-nematode resistant checks in the nursery, had armyworm damage up to 35% defoliation while the nematode resistant breeding lines ran in the 0-5% defoliation range. Further tests will need to be performed to determine whether or not preference was an issue in this case.

(85) Development of an Introgression Pathway for Resistance to *Sclerotium rolfsii* Sacc. J.M. CASON*[1], B.D. BENNETT[1], C.E. SIMPSON[1], M.R. BARING[2], M.D. BUROW[3,4]. [1]Texas AgriLife Research, Texas A&M System, Stephenville, TX 76401, [2]Department of Soil and Crop Science, Texas A&M University, College Station, TX 77843, [3]Texas AgriLife Research, Texas A&M System, Lubbock, TX, 79403, [4]Department of Plant and Soil Science, Texas Tech University, Lubbock, TX, 79409.

We have previously reported about an introgression program in which we are developing a pathway to introgress genes for resistance to *Sclerotium rolfsii* Sacc. from *Arachis stenosperma*

Krapov. and W.C. Gregory into the cultivated peanut. Resistance was reported in HLK 410 (PI 338280) by researchers at NC State University in Raleigh, NC. We attempted several crosses directly between *A. hypogaea* and A-genome *A. stenosperma* but were not successful in developing viable hybrids. Crosses with several different B genome parents were attempted without success but we were successful in crossing *A. linearifolia* Valls, Krapov. and C.E. Simpson (VPoBi 9401) with *A. magna* Krapov., W.C. Gregory and C.E. Simpson (KGSSc-30093). We had previously crossed *A. stenosperma* and *A. linearifolia* so we took the partially fertile hybrid between the two accessions (410 X 9401 = 53.9% pollen stain), and crossed that hybrid with 30093, producing a highly sterile three-way hybrid which was then chromosome doubled. The amphiploid was then crossed with Tamrun OL11 and the F_1 hybrid produced more than 1000 seeds. These F_2 embryos were space planted in a naturally infested field and at harvest plant selections were made for resistance to *S. rolfsii* disregarding agronomic traits. The selected progeny were grown in plant rows the following year in the infested field. From these plant rows two lines were selected as being somewhat resistant. Progeny from these two lines were backcrossed to Tamrun OL11 and the BC_1F_1 was grown for seed production. A total of 55 BC_1F_2 plants were grown in the greenhouse from December 2013 to May 2014, and the progeny planted as plant rows in the infested field again in summer of 2014. Selections will be made in October of 2014 which will be used for a second backcross to the productive *A. hypogaea* parent.

(86) **QTL mapping for bacterial wilt resistance in peanut (Arachis hypogaea).**

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Bacterial wilt (BW) caused by *Ralstonia solanacearum* is a serious disease of peanut on a global scale but it is especially destructive in China. There is a significant need to identify DNA markers linked to resistance to this disease to effectively develop resistant cultivars through molecular breeding due to the limitation of conventional strategies for controlling this soil-borne pathogen. A F_2 mapping population was used to detect quantitative trait loci (QTL) for resistance to bacterial wilt disease in the cultivated peanut (*Arachis hypogaea* L.). Genome-wide SNPs were identified from restriction-site associated DNA sequencing (RAD-seq). SNPs linked to disease resistance were determined using the bulk segregant analysis (BSA) approach. A moderately dense linkage map was constructed using SSR and SNP markers for performing the QTL analysis. Three QTLs detected for resistance to BW disease were closely linked in the linkage group (LG1) within 15 cM and account for 9 - 14% of the bacterial wilt phenotypic variance. Two of these QTLs were linked to peanut BAC clones containing disease resistance gene homologs (RGHs) suggesting that a cluster of disease resistance genes may locate in the LG1, and also indicating that resistance to BW disease was likely controlled by polygene. QTLs identified in this study would be useful to conduct marker-assisted selection and may permit cloning of resistance genes. Our study shows that bulk segregant analysis of genome-wide SNPs is useful approaches in the expedited identification of genetic markers linked to disease resistance in peanut.

(87) <u>An Efficient Cotyledonary Node-based Organogenesis System for Agrobacterium-mediated Transformation of Peanut (Arachis hypogaea L).</u>

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Published direct regeneration protocols for peanut transformation are highly genotype-dependent. The repetitive somatic embryogenesis system is suitable only for biolistic gene delivery and requires prolonged *in vitro* sub-culturing. We have optimized a facile and rapid method for direct shoot organogenesis from peanut cotyledonary node (CN) explants. In tested cultivar, New Mexican Valencia A (NMVA) CN showed higher sensitivity to cytokinin treatment in shoot induction responses compared with Florunner. Furthermore, 100% of rooting rate, higher number of long roots when 1-Naphthaleneacetic acid (NAA) were tested on NMVA. To maintain the photosynthesis performance and decrease the yield loss resulted from leaf spot disease, the optimized regeneration system combined with *Agrobacterium*-mediated transformation systems was applied to transfer a construct *PSag12::IPT* into a leaf spot susceptible peanut cultivar, NMVA. The embryo germination rate of NMVA was approximately 90%. The average shooting rate was 64% under 4 mg/L 6-Benzylaminopurine (BAP) treatment, and was 93% when applied 1 mg/L NAA. The selection pressure for putative transformed CN was 50 mg/L kanamycin in shoot induction medium. The regenerated putative *Psag12::IPT* transgenic plantlets were subjected to genomic PCR validation. The results showed that 15 out of 53 T0 putative transgenic plantlets were positive yielding a total transformation rate of 6.5%. Starting from mature seed, the described protocol yielded rooted plantlets within 12-15 weeks, in contrast to 15-18 months required for initiating and regenerating somatic embryogenic cultures. The results of this study implied that our regeneration and transformation systems can be successfully used in peanut germplasm improvement.

(88) <u>Seed Proteome Responses to Water-Deficit Stress: Merging Transcriptome and Proteome Data</u>. K.R. KOTTAPALLI, Center of Genomics and Biotechnology, Science Center, Clovis, NM 88101; P. HAYNES, Dept. of Chemistry and Biomolecular Sciences, Macquarie University, North Ryde, NSW, 2109; P. PAYTON, USDA-ARS Cropping Systems Research Laboratory, Lubbock, TX 79415.

In the present study we employed a label-free quantitative proteomics approach to study the functional proteins altered in the mid-mature (65-70 days post-anthesis) peanut seed grown under water-deficit stress conditions. We created a seed transcriptome by RNA-Seq using mRNA isolated from well-watered control and water-deficit stressed pod tissues. De novo assembly of the fastq files from each library generated 20,209 and 16,004 putative consensus sequences from control and stressed tissue, respectively. CAP3 assembly of all sequences generated 24,483 non-redundant consensus sequences. The consensus sequences were translated in all 6 frames to create a pod proteome database containing 146,898 amino acid sequences for protein identification. We identified 93 non-redundant, statistically significant and differentially expressed proteins between well-watered and drought-stressed seeds. Mapping of these differential proteins revealed three candidate biological pathways (glycolysis, sucrose and starch metabolism, and fatty acid metabolism) that were significantly altered due to water-deficit stress. Differential accumulation of proteins from these pathways provides insight into the

molecular mechanisms underlying the observed physiological changes which include reductions in pod yield and biomass, reduced germination, reduced vigor, decreased seed membrane integrity, increase in storage proteins, and decreased total fatty acid content. Some of the proteins encoding rate limiting enzymes of biosynthetic pathways could be utilized by breeders to improve peanut seed production during water-deficit conditions in the field.

(89) Identification of Quantitative Trait Loci (QTL) Controlling Important Fatty Acids in Peanut (*Arachis hypogaea* L.). M.L. WANG, N.A. BARKLEY, USDA-ARS, Plant Genetics Resources Conservation Unit, Griffin, GA; M.K. PANDEY, H. WANG*, L. QIAO, S. FENG, P. KHERA, A.K. CULBREATH, the University of Georgia, Department of Plant Pathology, Tifton, GA; J. WANG, the University of Florida, Department of Agronomy, Gainesville, FL; C.C. HOLBROOK, USDA-ARS, Crop Genetics and Breeding Research Unit, Tifton, GA; M.K. PANDEY, P. KHERA, R.K. VARSHNEY, International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), Patancheru, India; B.Z. GUO, USDA-ARS, Crop Protection and Management Research Unit, Tifton, GA.

Fatty acids play an important role in controlling oil quality of peanut. In addition to the major fatty acids, oleic acid (C18:1) and linoleic acid (C18:2) accounting for about 80% of total peanut oil, there are several minor fatty acids accounting for the rest 20% of total peanut oil, such as palmitic acid (PA, C16:0), stearic (SA, C18:0), arachidic (AA, C20:0), gadoleic (GA, C20:1), behenic (BA, C22:0), and lignoseric (LA, C24:0) acids. Relatively little effort has been made so far to study the genetic control of these important minor fatty acids. In this study, two improved genetic maps (SunOleic 97R × NC94022 and Tifrunner × GT-C20) with 206 and 377 marker loci and two-seasons of phenotyping data were used for identification of QTLs for PA, SA, AA, GA, BA, and LA. QTL analysis detected a total of 39 and 98 main-effect QTLs (M-QTLs) for S-population (SunOleic 97R × NC94022) and T-population (Tifrunner × GT-C20), respectively explaining up to 22.04% and 40.57% phenotypic variance (PV) using QTL Cartographer. Similarly, QTLNetwork identified six M-QTLs for S-population and 21 M-QTLs for T-population with PV up to 12.44% and 28.32%, respectively. Analysis with QTLNetwork detected nine epistatic QTLs (E-QTLs) in S-population and 18 E-QTLs in T-population with PV up to 5.53% and 8.12%, respectively. Mutant alleles in *FAD2A* and *FAD2B* contributed up to 4.25% and 22.34% PV in S-population while *FAD2A* contributed up to 28.93% PV in T-population for the third most predominant fatty acid, palmitic acid. Therefore, it is clear that *FAD2* genes control palmitic acid with very less control over other fatty acids (SA, AA, GA, BA, and LA). In summary, the present study reports 154 M-QTLs and 27 E-QTLs for different fatty acids for the first time in peanut and the information generated will be very useful for marker-assisted improvement of peanut oil quality.

(90) & (94) Identification of SNP Markers and Candidate Genes for Branching Habit in Peanut by a Combination of RNA-seq and Bulk Segregant Analysis. G. KAYAM, A. FAIGENBOIM AND R. HOVAV*, Department of Field Crops, Plant Sciences Institute, ARO, Bet-Dagan, Israel.

Branching habit is an important descriptive and agronomic character of peanut. However, both the inheritance and the genetic mechanism that controls branching habits in this crop are not clear. Here, by combining the usage of deep sequencing and well defined genetic system we studied this important aspect in peanut. Initially, segregating F2 populations derived from a reciprocal cross between closely related Virginia-type cultivars with respective Spreading and

Bunch growth habits were examined. The Spreading/Bunch trait was shown to be controlled by a single gene with no cytoplasmic effect. Subsequently, bulked segregant analysis was performed on 52 completely Bunch and 47 completely Spreading F3 families. Young leaves were sampled and bulked. RNA samples were converted into libraries suitable for Illumina sequencing and reads were aligned against peanut reference transcriptome. Inter-varietal SNPs were detected, scored and quality filtered accordingly. For each bulk, the frequency of the informative base was calculated at each SNP position and then the ratio between the bulks was determined for each SNP. Approximately 20 candidate SNPs were retrieved, among them 4 top hits were analyzed in segregating populations and were found to be linked to the trait. One SNP (M875) perfectly co-segregated with the trait in a relatively big F2 population. This marker was located on the AiPa2s scaffold of the recently released peanut B-genome. Candidate genes surrounding this marker were analyzed. One candidate gene, hypothetical gibberellin 20-oxidase, that previously was shown to be related to branching habit in peanut, is currently being studied as the leading candidate gene for the Spreading/Bunch trait in peanut.

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(91) Comparison of Germination and Freeze Damage for Lines of the Cultivar Bailey Expressing Differences in Fatty Acid Composition. A. DE LUCA-WESTRATE*, D.L. JORDAN, R.P. PATTERSON, T.G. ISLEIB, S.C. COPELAND, and L. SNYDER. Department of Crop Science, North Carolina State University, Raleigh, NC 27695.

Availability of peanut (*Arachis hypogaea* L.) cultivars expressing the high oleate trait is increasing in the U.S.A. Concern has been expressed about the impact of this trait on germination under low soil temperatures and impact on freeze damage following digging and vine inversion. Greenhouse experiments were conducted to compare germination and response to freezing temperature following harvest of two lines of the normal-oleate cultivar Bailey and the backcross-derived high-oleate line N12009olCLT). Seeds of both lines were planted in pots using a loamy sand soil, watered to initiate germination, and allowed to remain in the greenhouse under warm conditions for 2 d. After 2 d pots either remained in the greenhouse at 12 h at 95°F days and 12 h at 75°F nights or were placed in a growth chamber for 2 d at 12 h at 70°F days and 12 h at 40°F day and nights. Pots were then maintained in the greenhouse until completion of the experiment. The treatment regime was designed to simulate a cold front with a short duration several days after planting. Germination was affected by peanut line ($p = 0.0020$) and temperature ($p = 0.0088$) but not the interaction of these treatment factors ($p = 0.4155$). Results were inconclusive relative to the impact of oleate trait on germination. The rate of germination was delayed for both peanut lines following exposure to 2 d of cold temperature.

In the experiment comparing possible differences in freeze damage for the peanut lines, peanut seed was planted in mid-October or early November in the greenhouse with plants harvested in late February. Peanut pods remained on the plant after harvest (digging). Following 1 or 2 d of drying in the greenhouse, plants and pods were placed outside of the greenhouse at an approximate temperature of 25° F for one night. A group of plants including pods was also placed outside the greenhouse immediately after harvest with no time for drying. Following exposure to freezing temperature, plants and pods were placed in the greenhouse for additional drying. A control group remained in the greenhouse without exposure to freezing temperature. More visible symptoms of damage from freezing were observed as the moisture content of pods increased. There was no interaction of peanut line with harvest time and planting date for visible symptoms of freeze damage (p = 0.3885 to 0.9696). Additionally, the main effect of peanut line was not significant for freeze damage. While results from these experiments should be considered preliminary, these data suggest that peanut with the high oleate trait most likely will respond in a manner similar to the normal oleate trait of the same variety under extremes in temperature. This research was funded by the Everett W. Byrd Endowment at North Carolina State University through a proposal designed to support undergraduate student research in the Dept. of Crop Science.

(92) <u>Yield Combined Analysis of on Campus Four Years Evaluation of Peanuts Bred Lines in Southern Mexico</u>. S. SANCHEZ-DOMINGUEZ,* G. R. MORALES-ROMERO, C. SANCHEZ-ABARCA, Depto de Fitotecnia, Universidad Autónoma Chapingo, Chapingo Mex., 56230, and T. ISLEIB, North Carolina State University, Raleigh. N.C. USA.

From 2003 to 2006 a set of 23 peanuts bred lines (runners and bunch growth habit), and two commercial varieties, from the North Carolina Peanut Improvement Program, were planted at the locality of Cuauchichinola, State of Morelos, at Southern Mexico. Each one was sown in a small plot of 4 m long and 0.80 m coming apart. An unbalanced lattice 5X5 experimental design, with 3 replications, was used. The measured variables, in a 3.2 m^2 plot, were: mature pod number, mature pod weight, mature grain number, matured grain weight and 100 mature grains weight. All variables were subjected to an analysis per year. Further, a combined analysis of genotypes per year was performed. In statistical analysis per year, differences among 23 bred lines were found, in all measured characteristics. However in the combined analysis, statistical differences were not found for the bred lines per year interactions. Maybe the reason for these results is due to only three replications were used in the assays. X00-173 was the best bred line. It underlayed in mature pod weight, during the four years, being the most stable. In mature pod number underlayed the bred line X00-174. This line showed always the highest values in this trait. Chapingo 02-4 was the best line in mature grain number. It ranked in high values, in the four years of evaluations. In mature grain weight, the best bred line was X00-162. Due that in all years, it showed the highest values, in comparison to another one. Finally, Chapingo 02-5 was the best in 100 grains weight. It showed major seed size. Even though statistical differences were not found for genotype per year interactions, a graphic analysis demonstrates that they exit.

(93) <u>Release of OLé Spanish Peanut</u>. K.D. CHAMBERLIN*, R.S. BENNETT, H.A. MELOUK, USDA-ARS, Wheat, Peanut and Other Field Crops Research Unit, Stillwater, OK 74075-2714; J. P. DAMICONE, Department of Entomology and Plant Pathology, and C. B. GODSEY, Department of Plant and Soil Sciences, Oklahoma State University, Stillwater, OK 74078-1056.

OLé is a high oleic Spanish-type peanut that has excellent yield and enhanced Sclerotinia blight and pod rot resistance when compared to other high oleic Spanish cultivars. The purpose for releasing OLé is to provide peanut producers with a true Spanish peanut that is high oleic and has enhanced yield, grade and disease resistance compared to other high oleic Spanish varieties. OLé (tested as ARSOK-S140-1OL) is the product of a Tamspan 90 X F435 (original donor of the high O/L gene). F_1 seed were grown out in 2001 and F_2 generation seed were space planted in 2002 in plots at the OAES Experiment station at Ft. Cobb, OK. Single plant selections were made from F_3 plots to become individual F_4 breeding lines. $F_{4\text{-}5}$ breeding lines were evaluated for disease resistance and agronomic performance in 2006-2007. OLé was identified in 2007 as exceptional due to its low incidence of Sclerotinia blight and high yield.

Early bulk seed selection of OLé was made from healthy and Sclerotinia-free plants grown at Ft. Cobb, OK, in 2007. Seed increase of the selection as well as testing of agronomic performance was performed in 2008-2013 at several Oklahoma locations. Seed increases were also conducted at the Puerto Rico Winter Nursery. OLé was identified as exceptional due to its potential for low incidence of Sclerotinia blight and pod rot and excellent yield compared to available high oleic Spanish cultivars. In agronomic performance tests conducted from 2007-2013 in Oklahoma, OLé averaged 48% less incidence of Sclerotinia blight and 75% less pod rot than other Spanish cultivars tested. OLé averages a yield of 500 – 1000 lbs more per acre and a crop value of $83 – $175 more per acre than other Spanish cultivars. OLé is high oleic (O/L = 20:1) and has a nutritional and flavor profile similar to that of other Spanish cultivars. OLé is a true Spanish peanut cultivar with an erect growth habit. OLé seed typically matures at 120 days after planting under Oklahoma growing conditions. Seed size of OLé is typical of Spanish cultivars with seed weight/100 averaging 47.6 g. OLé seed typically grade similar to other Spanish cultivars but have averaged 1-3 points higher depending upon location and year. The release of OLé peanut will offer producers in the US Southern Plains a true Spanish peanut with an exceptional disease resistance and yield package. The production of OLé will increase their profit margin by an average of $130 per acre, potentially increasing the economy by $7 M annually.

(95) Relative Performance of Different Peanut Market-types in West Texas.

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Peanut production in the Southern High Plains is unique, as all four market-types (runner, spanish, valencia and virginia) are grown. Historically, runners have been the predominant market-type; however, acreage of virginia-types has increased over the last several years. In 2013, virginia-types accounted for approximately 35% of the total planted acres in Texas followed by runner, spanish and valencia-types at 27, 25 and 13%, respectively. Such changes have resulted in an increased interest in the performance of these market-types. Small-plot field trials were conducted throughout west Texas during the 2012 and/or 2013 growing seasons to compare the performance of commercially available cultivar(s) of each type. Yields were lowest for Valencia-C, which was only evaluated in 2013, ranging from (2581 to 3640 lb ac-1). Likewise, yields for the spanish-types where consistently lower than runner or virginia-types. When comparing the spanish cultivars evaluated, yields were highest for AT-9899 (4306 lb ac-1) followed by OLin (3855 lb ac-1) and Tamnut OL06 (3642 lb ac-1). Similar yields were achieved for the virginia-type cultivars AT-07V, AU-1101, Champs and Florida Fancy, averaging 5023 lb ac-1, and were equivalent to those of the runners Flavorrunner 458, Tamrun OL11 and Tamrun OL07. Results from a large-plot trial conducted in 2013 followed a similar trend, where yields were lowest for Valencia-C (3832 lb ac-1). Yields for the runner cultivars Flavorrunner 458, Tamrun OL11 and Tamrun OL07 were similar to those of the virginia cultivars AU-1101 and Bailey averaging 5428 and 5168 lb ac-1, respectively; whereas, yields for the spanish cultivar Tamunut OL06 were intermediate at 4739 lb ac-1. These results indicate that differences among peanut market-types are greater than those between cultivars within a market-type. Many of the virginia-type cultivars evaluated in these studies have the potential to yield as well as the standard runner cultivars. This in conjunction with premiums that are offered for virginia-type peanuts should lead to a continued interest in their production. Additional analyses which include different price scenarios for the aforementioned market-types would also be useful in making management decisions.

(96) <u>Determination of Optimum Soil Moisture for Growth of Aspergillus flavus</u>.

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Peanuts are a major cash crop in the southeastern United States. Hot, dry conditions are associated with *Aspergillus* spp. infection of pods and aflatoxin contamination. While the optimum soil temperatures for *Aspergillus* spp. growth have been repeatedly studied, soil moisture effects are less clear. An *in vitro* study was conducted using two soil textures (sandy loam and loamy sand) in which peanuts are commonly grown. Field capacity (FC) was determined using 5 oven-dry soil columns for each soil type. The columns were flooded with water and allowed to sit overnight to allow excess water to drain. Weight differences were recorded and averaged to determine the percent water content at FC. For initial studies, sterile soil was used as the growth medium. Approximately 300 cm^3 of each soil was put in propagation boxes (7.5x7.5x9.5 cm). Five moisture contents were used as treatments (0%, 33%, 50%, 66%, and 100% FC). Soil in containers was brought to appropriate moisture by adding a pre-determined volume of deionized water to the surface and allowing it to drain through. A single kernel of wheat inoculated with *Aspergillus flavus* (NRRL 21882) was used as inoculum for this study. Lateral growth was measured daily for 5 days by taking 1 g soil samples (composite of 3 subsamples of approximately 0.3 g) at 1.25 cm distance intervals from the inoculum. Soil samples were plated on M351B agar. Both the propagation boxes and the soil plates were incubated at 30 C. In sterile soil, fungal growth was found to differ by moisture content in the sandy loam but not loamy sand soil. In the sandy loam soil, fungal growth increased with increasing FC and ranged from 0.33 cm per day with 0% FC to 1.00 cm per day with 100% FC. In sterile loamy sand soil, moisture levels greater than or equal to 33% FC had fungal growth at approximately 0.9 cm per day. A study with non-sterile soil will be conducted and compared to results with sterile soil.

(97) <u>Recovery of Peanut Yield from Short Rotations after Six Years of Corn, Cotton, Soybean, and Wheat Cropping Systems</u>.

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Rotation can play a major role in disease and plant parasitic nematode development and peanut yield. Trials were established in 1997 and maintained through 2006 with rotations ranging from continuous peanut to only two years of peanut during that time period. Corn, cotton, and soybean were included in various combinations as rotational crops. As expected, nematode population in soil increased when fewer years separated peanut plantings or when soybean was included in the rotation. Peanut yield was affected by rotation, with higher peanut yields observed when more crops other than peanut separated peanut plantings. In 2007, a rotation sequence of corn (2007), wheat-soybean (2007-2008), corn (2009), wheat-soybean (2009-2010), corn (2011), and cotton (2012) were grown over the entire test area to determine the degree of peanut yield recovery from the rotations imposed from 1997-2006. Plant parasitic nematode population in soil was reduced dramatically from 2006 to 2013 to levels that most likely would not affect peanut yield. In contrast to the wide range of differences in peanut yield noted during 2006 when comparing rotations, peanut yield did not differ in 2013 regardless of previous rotation. These data suggest that adverse effects of short rotations can be minimized or eliminated using good rotation practices for 6 years with crops other than peanut.

(98) <u>Impact of Planting Date, Cultivar, and Insecticides on Thrips, Diseases, and Yield of Peanut in Alabama</u>. H.L. CAMPBELL*, A.K. HAGAN, K.L. BOWEN, Dept. of Entomology and Plant Pathology, Auburn University, AL 36849; L. WELLS, Wiregrass Research and and Extension Center, Fairhope, AL 36532.

In 2013, a study was conducted at the Wiregrass Research and Extension Center (WREC) in Headland, AL and the Gulf Coast Research and Extension Center (GCREC) in Fairhope, AL to compare the efficacy of the seed dressing CruiserMAXX with the in-furrow granular insecticides Thimet 20G and Temik 15G as influenced by planting date and peanut cultivar for the control of thrips nd associated damage as well as their effect on the incidence of tomato spotted wilt (TSW), foliar and soil-borne disease activity and yield. The peanut varieties Georgia 06G and Flavorunner 458 were planted in mid-April and mid-May. Whole plots were randomized with four replications and individual split-split plots were randomized within each whole plot. Each plot consisted of four 30-ft rows spaced 36-38 in apart, depending on study location. Stand counts and thrips damage ratings (TDR) were made for each plot along with disease ratings for leaf spot and stem in addition to yield. Stand counts were made at 14 days after planting for each planting date and TDR were made at weekly intervals beginning at 4 weeks after planting. Thrips counts were made by placing 10 juvenile leaves collected from seedlings in the two harvest rows of each plot in a kill solution at two week intervals beginning four weeks after emergence for a total of 3 samples per planting date. TSW counts were made three times during the season at sampling for each planting date and a final TSW count was made just prior to inversion. Leaf spot intensity was assessed just prior to inversion while stem rot incidence was determined immediately after inversion. At both sites, thrips counts were higher at the April than May planting date and similar thrips counts were recorded at the first sampling for each planting date. At GCREC, denser stands were found at the May compared with the April planting date across both varieties and stand density differed by peanut variety and insecticide treatment. At WREC, stand density was higher for Georgia-06 than for Flavorunner 458. Planting date and insecticide treatment impacted stand density. The level of thrips protection provided by insecticide treatments varied by planting date. At GCREC, all insecticide treatments reduced the level of thrips damage compared with the Dynasty PD control at the April planting date. At WREC, except for the Dynasty PD control, TDR for all insecticide treatments were higher at the May than April planting date when all insecticide treatments had lower TDR compared with the Dynasty PD control. At both locations, Flavorunner 458 had higher ratings for TSW. At GCREC, a significant reduction in TSW incidence when compared with the Dynasty PD control was observed for all insecticide treatments except Temik 15G. At both study sites, insecticide treatments did not significantly impact thrips counts, leaf spot intensity, or rust severity or stem rot incidence. At WREC, planting date influenced TSW incidence in Flavorunner 458 but not Georgia 06G with the former variety having higher disease indices at the April compared with the May planting date. When compared with the Dynasty PD control, CruiserMAXX + Thimet 20G and CruiserMAXX alone significantly reduced the incidence of TSW at WREC and GCREC. At both locations, leaf spot intensity and stem rot incidence differed by planting date and peanut cultivar. Disease severity and planting date had a greater impact on yield Flavorunner 458 compared with Georgia 06G at both sites. A significant planting date x peanut cultivar interaction for yield was observed. Cooler and wetter than normal weather conditions in April and May stalled seedling growth past the anticipated insecticide residual activity, thereby increasing peanut sensitivity to thrips feeding activity. As a result, thrips damage to peanuts was higher than anticipated and insecticide performance was poorer than expected.

(99) <u>Peanut Tolerance to Pyroxasulfone Preemergence</u>. T. A. BAUGHMAN and R. W. PETERSON, Oklahoma State University, Institute for Agricultural Biosciences, Ardmore. T. S. MORRIS, P. A. DOTRAY, and W. J. GRICHAR, Texas A&M AgriLife Research, Lubbock and Yoakum.

Peanut is both a slow and low growing crop making early season weed control essential to producing a high yielding and quality crop. One of the most effective ways to ensure this is through the use of preemergence herbicides as part of an overall weed management system. As weed resistance continues to be an increasing problem in crop production this also often allows the use of different modes of action, which assist in reducing potential resistance issues. Herbicide studies were conducted to evaluate the tolerance of the various market types to pyroxasulfone herbicide applied alone and in combination preemergence. Trials were conducted during the 2013 and 2014 growing season in Oklahoma and Texas. Peanuts were planted at the Caddo Research Station near Ft. Cobb, OK, and the Texas A&M AgriLife Experiment Stations near Halfway and Yoakum, TX. All peanut were planted in April or May, irrigated, and typical production practices were used. Typical small plot research techniques were employed in all trials. Pyroxasulfone was applied preemergence at both a 1X (Fierce at 3 oz/A and Zidua = 1.5 oz/A) and a 2X application rate. Fierce is a prepackaged combination of two active ingredients: flumioxazin (33.5%) and pyroxasulfone (42.5%). Zidua contains only the single active ingredient: pyroxasulfone (85%). All four market-types grown in the Southwest peanut-growing region were evaluated: Runner, Spanish, Valencia, and Virginia. Visual evaluations of crop response were recorded at all locations throughout the growing season. Trials conducted in 2013 were harvested using a 2-row commercial combine retrofitted with a sacking attachment to determine herbicide effects on yield. Samples from each plot were taken and grades were determined at the Texas locations. There were no injury from pyroxasulfone treatments to runner peanut at Halfway in 2013 or Yoakum in 2013 or 2014. Injury greater than 10% did occur with the 2X rate of both Fierce and Zidua at Halfway in 2014. However, no injury was observed at Halfway on runner peanut with the 1X rate of either herbicide. Runner peanut injury was 15% (Fierce) and 9% (Zidua) with the 2X rate at Ft. Cobb in 2014. Spanish peanut injury was 5% or less in 2013 at Ft. Cobb and Halfway. Spanish peanut injury was 2% with 1X rate of both Fierce and Zidua at Halfway in 2014. This injury increased to 15% with Fierce and 8% with Zidua at the 2X rate at Halfway in 2014. Spanish peanut injury was at least 9% with all treatments except Fierce applied at the1X Rate at Ft. Cobb in 2014. Virginia peanut injury was greater than 5% with all treatments except Fierce at the 1X Rate at Ft. Cobb in 2014. No herbicide injury was evaluated on Virginia or Valencia peanut in 2013 at Halfway. Injury to Virginia peanut was less than 5% with the 1X application rates at Halfway in 2014. However, injury with the 2X application rates was 18% with Fierce and 25% with Zidua at this location. Conditions after planting were much different at both Ft. Cobb and Halfway between 2013 and 2014. Heavy rains and cool temperatures occurred after planting in 2014 that resulted in the increased injury observed in 2014. All trials were harvested in 2013. No yield differences were observed with any of the herbicide treatments at either the 1 or 2X rate applied. Grades were recorded in Texas and no grade differences were observed with any of the market types. Trials will be maintained to yield to determine if early season injury during 2014 will result in yield differences at harvest.

(100) Weed response to postemergence herbicides when using different surfactants. W. J. GRICHAR, Texas A&M AgriLife Research, Corpus Christi, TX 78406; P. A. DOTRAY, Texas A&M AgriLife Research, Lubbock, TX 79403; and M. A. MATOCHA, Texas A&M AgriLife Extension Service, College Station,TX 77843.

Field studies were conducted for two years in south Texas and the High Plains of Texas to evaluate weed control when using different surfactants with commonly used peanut herbicides. In south Texas, Select Max® (clethodim), Fusilade DX® (fluizafop-P-butyl), Cadre ® (imazapic), and Cobra® (lactofen) at 1/2 and 1X labeled rates were applied with either no surfactant, Agridex® (99% heavy range paraffinic oil, polyol fatty acid esters, and polyethoxylated derivatives) at 1.0% volume by volume (v/v), Induce® (90% alkyl aryl polyoxylkane ether and free fatty acid) at 0.25% v/v, Cide-Kick II® (100% d'limonene and related isomers plus selected emulsifiers) at 1.0% v/v, and 90-10® (alkyl, polyethoxy ethers, ethoxylated and soybean derivatives and antifome 90-10) at 1.0% v/v. In the High Plains 1/2 and 1X rates of either Ultra Blazer® (aciflurofen), imazapic, Pursuit® (imazethapyr), lactofen, or Butyrac® (2,4-DB) were applied with no surfactant, Agridex or Induce.

In 2012 in south Texas, when rated 30 days after application (DAA), Palmer amaranth (*Amaranthus palmeri* L.) control with imazapic at the 1/2X rate was 66% when no surfactant was used and at least 82% with Agridex while at the 1X rate control was <73% with/without a surfactant. In 2013, the use of no surfactant with the 1/2X rate of imazapic resulted in 70% control while all surfactants improved control (> 75%) with the exception of 90-10. With the 1X rate of imazapic, control was 64% without a surfactant and Cide-Kick II resulted in 83% control. The use of a surfactant did not improve Palmer amaranth control with lactofen at either rate in either year. Also, the use of a surfactant did not improve smellmelon (*Cucumis melo* L.) control with either imazapic or lacofen at either rate or in either year.

When rated 14 DAA, Texas millet [*Urochloa texana* (Buckl.)] control with clethodim at the 1/2X rate was not improved with a surfactant in 2012; however, in 2013 clethodim at the 1/2X rate without a surfactant provided 74% control while the addition of Agridex resulted in 92% control. Clethodim control at the 1X rate was not improved by the addition of a surfactant in either year with the exception of one year where clethodim alone provided 90% control and the addition of Induce resulted in 64% control. Texas millet control 14 DAA with fluizafop at the 1/2X rate was not improved by the use of a surfactant in 2012 but in 2013 fluizafop without a surfactant provided 81% control and the addition of 90-10 resulted in 95% control. Texas millet control was not improved when using the 1X rate of fluizafop with any surfactant. When rated 30 DAA, Texas millet control with fluizafop was not improved by the use of a surfactant at either rate or either year.

In the High Plains, when rated 30 days after herbicide application (DAA), Palmer amaranth control with both rates of aciflurofen and 2,4-DB was improved with the use of a surfactant over no surfactant. Palmer amaranth control with imazapic and lacofen at the 1/2X rate was not improved with the use of a surfactant; however, Palmer amaranth control with the 1X rate of both herbicides was improved with the addition of a surfactant. Palmer amaranth control with imazethapyr was similar to that seen with imazapic and lactofen with the exception of the 1/2X rate of imazethapyr which showed improved control with Agridex over the use of no surfactant or Induce in one year while Induce was better than no surfactant or Agridex in the other year.
Results from these trials suggest that not all surfactants perform the same for individual herbicides. It is critical that a quality surfactant be used when the label suggests that one is needed for maximum herbicidal activity. Since surfactants may also increase herbicidal toxicity to crops, it is also critical to omit the surfactant if the label suggests to do so for individual

herbicides.

(101) Peanut Response to Fluridone in North Carolina. D.L. JORDAN, M.D. INMAN*, and P.D. JOHNSON. Department of Crop Science, North Carolina State University, Raleigh, NC 27695.

Fluridone is currently being evaluated for possible use in peanut to control broadleaf weeds including Palmer amaranth. Three experiments were conducted during 2013 in North Carolina to determine peanut response to preemergence applications to fluridone (formulated as Brake) at rates ranging from 0.15 lbs ai/acre to 0.50 lbs/acre. In a second group of experiments conducted at three locations, weed control with fluridone was compared with commercial standards. Visible injury was minor in 2 of 3 experiments but was no more than 10% at the projected use rate of 0.15 lbs/acre. Palmer amaranth control by fluridone alone was comparable to commercial standards when applied at 0.2 lbs/acre.

(102) Zidua Weed Management Systems in Peanut. M. R. MANUCHEHRI*, P. A. DOTRAY, Plant and Soil Science Department, Texas Tech University, Lubbock, TX 79409; W. J. GRICHAR, Texas A&M AgriLife Research, Corpus Christi, TX 78406; T. A. BAUGHMAN, Institute for Agricultural Biosciences, Oklahoma State University, Ardmore, OK 73401, T. S. MORRIS, R. M. MERCHANT, Plant and Soil Science Department, Texas Tech University, Lubbock, TX 79409; and J. D. REED, BASF, Wolfforth, TX 79382.

Zidua (pyroxasulfone) is a broad-spectrum herbicide that controls several small-seeded broadleaf and grass weeds in corn (*Zea mays* L.), wheat (*Triticum aestivum* L.), and soybean (*Glycine max* L.) and may be available for use in peanut in the near future. The use of Zidua in peanut would be a valuable weed management tool for growers due to its effective broadleaf weed control and low risk of crop injury. In 2013, five field trials were conducted in Oklahoma and Texas to evaluate the control of ivyleaf morningglory (*Ipomoea hederacea* Jacq.), Palmer amaranth (*Amaranthus palmeri* S. Wats.), smellmelon (*Cucumis melo* L.), and Texas millet (*Urochloa texana* Buckl.) in Zidua-based weed management systems. Treatments for these systems trials included Zidua (0.05 and 0.08 lb ai A^{-1}) applied preplant incorporated (PPI), preemergence (PRE), at-crack (AC), and/or early-postemergence (EPOST) alone or in tank-mixture. Preemergence tank-mix partners included Dual II Magnum (0.96 lb ai A^{-1}), Gramoxone Inteon (0.19 lb ai A^{-1}), Outlook (0.75 lb ai A^{-1}), Prowl H_20 (0.75 and 0.95 lb ai A^{-1}), and Valor (1.0 lb ai A^{-1}). At-crack tank-mix partners included Dual II Magnum (0.96 lb ai A^{-1}), Gramoxone Inteon (0.19 lb ai A^{-1}), Outlook (0.75 lb ai A^{-1}), Storm (0.74 lb ai A^{-1}), and Valor (1.0 lb ai A^{-1}) and EPOST partners included Cadre (0.03 and 0.06 lb ai A^{-1}), Outlook (0.75 lb ai A^{-1}), and Pursuit (0.06 lb ai A^{-1}). Treatments excluding Zidua were included so that comparisons could be made to existing herbicide programs. The most effective treatments for ivyleaf morningglory and Texas millet control (38-73%) four weeks after EPOST in Oklahoma were Dual II Magnum (PRE) fb Gramoxone Inteon+Storm (AC) fb Cadre (EPOST); Zidua (PRE) fb Gramoxone Inteon+Outlook (AC) fb Zidua (EPOST); and Prowl (PPI) fb Valor (PRE) fb Gramoxone Inteon (AC) fb Pursuit (EPOST). In west Texas, Palmer amaranth was controlled at least 85% seven weeks after EPOST for all treatments with the exception of PRE only treatments that did not include Zidua [Outlook+Gramoxone Inteon (PRE) and Dual II Magnum+Gramoxone Inteon (PRE)]. In a second study in west Texas, Palmer amaranth control seven weeks after EPOST was similar for all treatments; however, control increased by approximately 9% when treatments included an EPOST application of Cadre and/or Zidua. Smellmelon and Texas millet control six weeks after EPOST in south Texas was at least 95% and 96%, respectively, for all treatments that included a PRE, AC, and EPOST timing. When treatments did not include an EPOST application of Zidua and/or Cadre, control decreased for smellmelon and Texas millet by approximately 21% and 10%, respectively. Overall, Zidua was effective in managing Palmer amaranth, smellmelon, and Texas millet in Texas peanut while control of ivyleaf morningglory and Texas millet in Oklahoma was challenging regardless of herbicide program.

(103) Economics of an Inoculant Rescue Trial in Georgia. A.R. SMITH*, N.B. SMITH, Department of Agricultural and Applied Economics, R.S. TUBBS, Department of Crop and Soil Sciences, The University of Georgia, Tifton, GA 31793.

Peanut growers in Georgia generally use an inoculant to aid in the fixation of nitrogen. However, if an inoculant is not used or if it is ineffective for any reason, a supplemental nitrogen application may prove beneficial to the peanut crop. Inoculants and supplemental nitrogen applications add costs to a peanut production system and influence revenues by means of yield impacts. As a result, it is necessary to determine the profitability of this decision. Economic analysis was conducted on data from a three-year study conducted in Tifton, GA during 2010, 2011 and 2013. Treatments consisted of an untreated control, an inoculant treatment, three no inoculant treatments with supplemental nitrogen applications at 60, 120 and 180 pounds of nitrogen at flowering, and two no inoculant treatments with supplemental nitrogen applications at 60 pounds at flowering + 60 pounds at lapping and 120 pounds of nitrogen at flowering + 60 pounds at lapping. Economic analysis was conducted using a partial budget approach. Revenue data were collected on yield and grade. Systems costs were collected on the treatments and their application costs.

(104) In-furrow and Emergence Applications of Prothioconazole Fungicides for Control of Soilborne Diseases in Peanut. H. L. MEHL* and P. M. PHIPPS. Tidewater Agr. Res. & Ext. Ctr., Virginia Tech, Suffolk, VA 23437.

The response of Virginia-type peanut cultivars to control of Cylindrocladium black rot (CBR) and other soilborne diseases with in-furrow Proline 480SC 5.7 fl oz (prothioconazole) and in-furrow or emergence sprays of Propulse 400SC 13.69 fl oz (prothioconazole + fluopyram) was evaluated from 2011 through 2013. Champs was included in trials in all three years. In 2013, multiple cultivars were evaluated in a split plot design with treatments of in-furrow and emergence fungicides in six-row, main plots and varieties in two-row, subplots. Varieties included Bailey, Sugg and CHAMPS. In-furrow (F) fungicide treatments were applied in a volume of 5 gal/A through a microtube to the seed furrow while planting 3.5 seed/ft of row. Emergence spray (E) treatments were applied in an 8-in. band over rows. All treatments with the exception of the check were sprayed with foliar fungicides for leaf spot. The initial application was at beginning pod (R_3) and thereafter applied according to weather-based advisories as recommended by the Virginia Leaf Spot Advisory Program. Standard practices for production of Virginia-type peanuts were followed throughout the growing season. In 2011, low incidences of soilborne diseases were observed (CBR, Sclerotinia, and stem rot), and yield did not differ among fungicide treatments. In two trials in 2012, Sclerotinia and CBR were present, and in-furrow Propulse provided the best control of Sclerotinia and the highest yields; CBR incidence did not differ among treaments in 2012. In the trial using Champs in 2013, Sclerotinia, CBR, and stem rot were present. Sclerotinia and stem rot did not differ among treatments, but Propulse in-furrow provided the best control of stem rot and the numerically highest yield in the trial. In the 2013 variety trial, overall CBR incidence was high but stem rot and Sclerotinia blight incidence were low. Neither variety nor fungicide treatment influenced incidence of Sclerotinia blight. Fungicide treatments did not influence incidence of stem rot or CBR, but both diseases were significantly higher in CHAMPS compared to the other two varieties. Bailey and Sugg had significantly higher yields than CHAMPS, but fungicide treatments improved yield of all varieties. In-furrow and emergence sprays increased yield compared to the four-spray foliar fungicide program alone, with the Propulse emergence spray resulting in the highest yield for all varieties. Results demonstrate the efficacy of Propulse and Proline fungicides in suppression of soilborne diseases but suggest that yield responses are dependent on the disease pressure and specific pathogens present in the field.

MINUTES

BOARD OF DIRECTORS MEETING
46th
Annual Meeting
San Antonio, TX
9 July 2014

Board Members Present:

President Tim Brenneman	Yes
President-elect Naveen Puppala	Yes
Past President Ames Herbert	Yes
Noelle Barkley	Yes
Darlene Cowart	No
Peter Dotray	Yes
David Jordan	Yes
Keith Rucker	Yes
Doug Smyth	Yes
Barry Tillman	Yes
Howard Valentine	Yes
Dan Ward	Yes
Executive Officer Kim Cutchins	Yes

President Tim Brenneman called the meeting to order at 3 p.m. Members present are noted above and constitute a quorum.

Minutes of June 16, 2014 meeting
Minutes of the June 16, 2014 Board meeting were distributed to the Board for review prior to the meeting. President Brenneman asked for any changes and/or additions. There being none, President Brenneman called for approval.

The minutes of the June 16, 2014 Board meeting were unanimously approved.

Executive Officer Report
Kim Cutchins reported that her first full year at APRES has been a learning curve, from APRES operating procedures and finances to membership to publishing to the Annual Meeting. Working closely with President Tim Brenneman, she shared that a new accounting firm had been hired to handle day-to-day operations of APRES. The Georgia firm of Herring & Associates have put together a new format for presenting financial information which Finance Chairman Todd Baughman will report shortly. She also stated that she has been taking an in-depth look at the Peanut Science publication contract with Allen Press, getting a handle on how Peanut Science is being produced. She thanked Tim Grey and Chris Butts for sharing their knowledge and bringing her up to speed. She stated that working with Naveen Puppala, Jason Woodward and Gary Schwarzlose on this year's Annual Meeting has been amazing. She shared that the Board would be hearing more in-depthly from the various committees on their findings and thanked all the Committee chairman for working with her to get her up to speed on the organization's operations. She stated that with this greater understanding of the organization, she will work with the incoming leadership to grow the organization's membership and move its activities forward.

NEW BUSINESS:
The following Committee reports were presented to and approved by the Board. Action taken by the Board is in italics. Unless otherwise noted, the Board voted to accept each report as presented. Full reports from each committee are to be presented at the July 10th Business Meeting and Awards Ceremony in the Ballroom at 5:00 p.m.

Finance Committee:
Financial Statements as of June 30, 2014 - Chairman Todd Baughman reviewed the budget approved at the June Board meeting compared to expenses through the end of June. Income received is $64,615 vs. budgeted $92,350. He noted that additional income is expected to be received for Annual Meeting sponsorships that should keep the budget on track. Expenses through June are $32,937 vs. budget of $88,175. Again, Todd noted that the majority of expenses are related to the Annual Meeting and will show up in the next couple of months. He highlighted that Peanut Science income and expenses will be over budget due to the fact that the July-December 2013 issue were not billed until January of this year and the 2014 fiscal year will reflect expenses for three (3) issues instead of the budgeted two (2) issues. The APRES Balance Sheet (cash basis) as of June 30, 2014 consists of: Total assets = $255,389, consisting of cash and CDs; Liabilities and equity are employment taxes $518, retained earnings of $222,524, net income of $32,346 totaling $255,389.

2013 Taxes – Herring CPA Group prepared and filed the 2013 APRES tax forms. Total revenue of $90,415; total expenses of $84,497 were indicated. Cash and investments on hand at the beginning of the year was $217,231 and $223,041 at the end of the year. Total assets at the beginning of the year was $217,231 and $223,041 at the end of the year. Total liabilities at the beginning of the year were $626 and $581 at the end of the year. Net assets or fund balances were $216,605 at the beginning of the year and $222,523 at the end of the year.

Credit Card Payment System – The Finance Committee met and discussed APRES's current credit card payment system through Sterling Payment Systems. Over the past year, Todd stated the Executive Officer has been fielding numerous member complaints about the Sterling system. Upon investigation, it was learned that the Sterling system does not integrate well with the web and is not able to supply members with the payment information needed to file their paperwork. Additionally, the Sterling system does not easily supply the data needed for our accountants to properly record membership fees, specifically who is the member vs. who paid the bill, requiring an inordinate amount of staff time to manage. The APRES web designer recommended we compare the PayPal credit card payment system vs. Sterling. It was found that PayPal (which was designed for web use) should integrate easily with the APRES website as well as provide easy to share transaction receipts and reports. The PayPal system accepts all the major credits cards as well as gift cards and PayPal dollars. A user does not have to register with PayPal to pay by credit card. In a comparison of fees, PayPal charges 2.2% on the amount of the transaction, plus $.30 per transaction vs. Sterling's average of 5.7%. The Committee is seeking the Board's endorsement to end the APRES contract with Sterling Payment Systems and to move the PayPal Payment System. It was moved by Todd Baughman, seconded by Howard Valentine, and unanimously approved to:

Not renew the Sterling Payment Systems contract and
to change the APRES credit card payment system to PayPal.

APRES Investment Policy – Todd reported that the Committee has discussed over the last couple of years about expanding APRES' investment policy from bank CDs and bank money market accounts to include other avenues which might result in additional income for the organization. At its meeting yesterday, the Committee reviewed several options proposed by Fidelity and Vanguard for potential investment of the $115,000 APRES currently has in CDs. The Committee chose to look at Fidelity and Vanguard because of their excellent financial rankings and low management fees. Todd related that currently APRES CDs are earning between .3%-2.18% and upcoming CD rates at Stillwater National Bank (APRES' bank) range from .2% for 6 months to 1.25% for 60 months.

The mutual funds recommend by Fidelity and Vanguard have a 3-year return average of 4.36%-9.65% and a 10-year return average of 4.63%-6.16%. All of the recommended funds are a mixture of stocks and bonds with varying degrees of each. The Committee is recommending that the funds from CDs maturing this fall be moved into the Vanguard LifeStrategy Income Fund (VASIX), which is made up of 20% stocks and 80% bonds.

The Board discussed the pros and cons of expanding the APRES investment policy as well as whether to move a portion or all of the CD funds into a new investment area. David Jordan made the motion, seconded by Howard Valentine, and the Board unanimously approved:

To move all funds ($115,000) currently in CDs at Stillwater National Bank into the Vanguard LifeStrategy Income Fund (VASIX) account.

Peanut Science - Todd asked Peanut Science Editor Tim Grey to share the financial outlook for Peanut Science which currently operates on a break-even basis. Tim stated he has been reviewing the Allen Press contract for publishing Peanut Science with the Executive Officer for potential cost savings. The 3-year contract ends December 2015 and APRES is locked into the Allen Press pricing schedule until that time. They have been in contact with Allen Press and have notified them that they will be looking at additional avenues to potentially publish Peanut Science as it is felt there are substantial cost savings to be had given the advances in technology. Tim reported that a subcommittee had looked at reducing author publishing charges, but given our current contract with Allen Press, found that it is not viable at this point without additional financial resources (grants, new members, sponsorships, etc.) to offset the expenses. All of these potential revenue sources are being explored. The goal of the Subcommittee is to be able to charge a minimal flat fee ($250-$500) per article, and ultimately, move to no cost to publish for APRES members with a flat fee for non-members.

Dan Ward made the motion, seconded by Naveen Puppala, and the Board unanimously approved:

the report of the Finance Committee.

<u>Nominating Committee Report</u>

Chairman Ames Herbert stated the Nominating Committee met June 10th via conference call to discuss positions on the APRES Board of Directors which will be coming open at the July Board meeting. All members of the Committee were present. Committee members discussed requirements for being a Board member, which are 5-year member of APRES, served on 3 different Committees, and familiar with APRES and its members. Using the stated criteria, the Committee recommends the following slate of nominees for the APRES 2014-15 Board of Directors:

President-Elect: ***Tom Stalker, NC State University***
Southwest University Representative: ***Peter Dotray, Texas Tech University***
Industry Rep – Manufactured Product: ***Jim Elder, The J.M. Smucker Company***
American Peanut Council Representative: ***Howard Valentine***

Each nominee has been contacted and has agreed to serve, if elected. In concluding his report, Ames requested that the criteria to serve on the Board and to move into the officer rotation be announced at the Board meeting and Business Meeting to encourage more participation and to expand the pool of eligible candidates. President Brenneman recommended the Nominating Committee move forward with election proceedings at the Business Meeting tomorrow afternoon.

Additionally, incoming APRES President Naveen Puppala presented the Committee rosters for 2014-15.

Dan Ward made the motion, seconded by Naveen Puppala, and unanimously approved:

to accept the report of the Nominating Committee.

Publications & Editorial Committee:
Book Update – Based on the recommendation of the Board last year, the P&E committee formed an ad hoc committee to formulate an outline for a production focused update of the APRES book volumes. That was completed and several publishers have been contacted including the ASA Trisocieties publishers, Springer, and UGA Press. Currently, the UGA Press quote is approximately 10 K. The board suggested that AOCS (the current publishers of the Genomics volume that is in development) be contacted to determine if they would be willing to publish and provide a quote for cost.
Update: this has been completed with a total cost of $15,485 (see attached quote). Therefore, the plan is for the P&E committee to submit a request to the Board to move forward with the UGA quote.

APRES and Peanut Science Survey - At the request of the Board, the Publications & Editorial Committee Chairman Diane Rowland put together a membership survey to gather information on how to expand the circulation of Peanut Science and improve APRES membership programs and activities. The survey is currently being circulated and 90 responses have been received-to-date. The survey will remain open until after the Annual Meeting and the results will assist APRES in planning for the future.

Digitized Proceedings - Jason Woodward who volunteered to create digitized copies of APRES Proceedings announced that every APRES Proceedings from the first Annual Meeting in 1969 to 2013 can now be found online on the APRES website, www.apresinc.com. Additionally, the Proceedings of the five National Peanut Research Conferences (1957, 1962, 1964, 1966, 1968) which led to the formation of APRES can also be found on the website.

Peanut Quality Committee:
High Peanut Fat Content: A consensus was drawn last year to reassess high fat issue this year once another crop year was in production. We are seeing approximately 1% to 2% lower fats than the previous year and are still at the higher end of normal but acceptable to manufacturers.

High Oleic Purity: A discussion of the issue of High Oleic purity was also continued from the previous year. The consensus is that the cause is multi-faceted and the only effective way to address is when all US varieties are High Oleic. Some thought that the level of HO purity in US varieties is better than Argentinian varieties.

Farmer Stock Storage: Since the peanut crops yield better with larger carryover, the question was raised should Farmer Stock storage conditions be upgraded to improve shelf life? The 2012 crop was so large that Farmer Stock peanuts were moved very rapidly to make room and were stored under various conditions and places. Some flavor problems occurred due to higher moistures and quick drying conditions and then meal/brittleness became a problem at the end of the storage period. H. Valentine commented that the GMP's for Farmer Stock peanut storage are defined and published. Warehouses that have ventilation fans have humidity control incorporated. The industry knows what to do and just needs to implement correctly.

High Oleic Conversion: The consensus is that the peanut industry does not have the ability to segregate and the only way to effectively implement is to convert all US varieties to HO. This was easier to do in the SW due to geography and the quota system at the time. It was brought up that the three University of Florida patents will expire in 2017. HO peanuts from the SE will be more economical to export via shipping out of Savannah. S. Fletcher stated that it will take a "super" variety with step change agronomics for the growers to switch from their historical plantings. It would probably take at least 3 – 5 years to totally convert the industry.

Certified Seed Acreage: T. Isleib presented a compilation of 2013 Certified Seed production acreage. This is a good summary of what will be planted for 2014. Georgia-06G comprises 85% of the SE Runner varieties. Georgia 09B is the largest Runner variety in the SW @ 28%. Bailey is the largest Virginia variety in the VC region. High Oleic cultivars comprise only 20% of the total US cultivars.

Peanut Parentage Map: T. Isleib also presented a work in progress of a peanut parentage map that shows linkages of Runner and Virginia market types.

2015 Quality Committee Membership: J. Elder's membership term is expiring. M. Kline from Hershey's has agreed to serve a three year term and serve as chairperson beginning next year.

Public Relations Committee

The Committee met in February to discuss strategies for improving communication with the APRES membership, including attending peanut meetings, creating a display table that can be used to advertise APRES, an updated membership brochure.

Membership in APRES currently stands at 334 Individual members and 26 Institutional members for a total of 360 members. Total membership in 2013-14 was 314. Renewal notices were issued in May and 181 members have renewed for 2014-15. Outstanding renewals are 153 of which 68 are likely to renew. The remaining 90 are critical; 29 of which are students who may have moved into other fields of study or work. Institutional members stand at 26. Eighteen (18) renewals have been received to date. All non-renewals will be contacted with a reminder following the Annual Meeting.

The Committee offered three resolutions honoring the contributions and lives of two recently deceased members of the Society, namely Roy Pittman, Jr. and J.C. Wells. The resolutions will be read at the General Business meeting and recorded into the official proceedings of the 46th APRES Annual Meeting.

Bailey Award Committee
Chairman Naveen Puppala reported that nominatons were received from all seven eligible sessions of the 2013 Annual Meeting and nominees were notified shortly after the meeting. Nine manuscripts were received and accepted for final evaluation. The winning paper will be presented at tomorrow's awards ceremony.

Fellows Committee Report
President Tim Brenneman reported that Fellow's Committee Chairman John Damicone forwarded 3 names for the attribute of Fellow of the Society. The Committee unanimously recommended and the Board unanimously agreed:

To bestow the honor of Fellow of the Society
in a recognition ceremony at the 46th Annual Meeting in San Antonio, TX on:

Todd A. Baughman, Oklahoma State University
Austin K. Hagan, Auburn University
Emory M. Murphy, Georgia Peanut Commission

Site Selection Committee:
Barry Tillman, Committee Chairman, stated the Committee gave it their best shot to arrange a joint meeting with the Southern Peanut Growers Conference. Unfortunately, the Edgewater Hotel in Panama City, FL was unwilling to meet the APRES hotel room rate price point. The SPGC is still negotiating their 2016 contract with the Edgewater and we have asked them to join us at the Hilton Clearwater, if their membership decides to make a change. The Committee began looking at other properties and has settled on returning in 2016 to the Hilton Clearwater Beach in Florida. Room rates will be $145/night inclusive of resort fees. A government rate of $99/night was also negotiated. In 2017, the APRES staff did an informal survey of attendees to this year's annual meeting and found overwhelming support to return to Albuquerque/Santa Fe area. Jason Wooward et.al. will begin looking into properties in the area.

Coyt T. Wilson Distinguished Service Award Committee:
Chairman Corley Holbrook reported the Coyt T Wilson Service Award Committee reached a unanimous recommendation for the 2014 award: Dr. Thomas G. Isleib.

Joe Sugg Graduate Student Competition Award Committee
Chairman Bob Kemerait reported the Joe Sugg Graduate Student Competition will take place tomorrow morning. Thirteen presentations are expected. Winners of the Award will be announced during the awards ceremony tomorrow evening.

Dow AgroSciences Awards Committee
Chairman Eric Prostko reported the Dow AgroSciences Award Committee did not meet at the APRES annual meeting in 2014 because committee business was taken care of prior to the APRES annual meeting. Information on the award was sent to the membership and the committee received nominations for both the Dow AgroSciences Award for Excellence in Research and the Award for Excellence in Education. Nomination packets were distributed

to committee members electronically, and the vote on the nominations was conducted electronically. Dr. Jason Woodward, Texas A&M AgriLife Extension Service/Texas Tech University is this year's recipient of the Dow AgroSciences Award for Excellence in Education, and Dr. Mike Baring, Texas A&M University is this year's recipient of the Dow AgroSciences Award for Excellence in Research.

Program Committee:
Program Chairman Naveen Puppala recognized the outstanding help and support of Technical Program Chairman Jason Wood and Local Arrangements Chairman Gary Schwarzlose. Attendance for 2014 is 261 total; 188 participants; 46 spouses; 27 children. Feedback from the Opening Session speakers has been excellent. BASF and Bayer Crop Sciences were recognized as sponsors of Wednesday night dinner. Dow AgroSciences was recognized as the sponsor of the Thursday night reception. Texas Tech University sponsored the Fun Run. Texas Pest Management Association sponsored the Spouses Program which was a trip to Natural Bridge Caverns. The Texas Peanut Producers Board sponsored the Monday night Peanuts at the Park outing. The North Carolina Peanut Growers Association once again sponsored the Joe Sugg Graduate Student Competition. A host of sponsors supported the Ice Cream Social.

Jason reported the 46th Annual Meeting scheduled 104 presentations. Included in these presentations were 2 symposiums (The Status and Prospective of Peanut Phenotyping and the Bayer Excellence in Extension and Extension Techniques) and 21 were posters.

An online survey link will be sent to all attendees asking them to evaluate the meeting.

Other Business:

APRES and Peanut Science Survey
At the request of the Board, the Publications & Editorial Committee Chairman Diane Rowland put together a membership survey to gather information on how to expand the circulation of Peanut Science and improve APRES membership programs and activities. The survey is currently being circulated and 36 responses have been received-to-date (a 12% response rate which is the average for most surveys). The survey will remain open until after the Annual Meeting.

There being no other business, the meeting was adjourned at 6:45 p.m.

BUSINESS MEETING AND AWARDS CEREMONY

AMERICAN PEANUT RESEARCH AND EDUCATION SOCIETY
Menger Hotel
San Antonio, TX
JULY 10, 2014

1. **President's Report**..Tim Brenneman

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

3. **Awards Presentation**
   Coyt T. Wilson Distinguished Service Award……………………………..…….. Jack Davis
   Dow AgroSciences Awards for Research and Education……………….………Eric Prostko
   Bailey Award ……………………………………………………………..……Naveen Puppala
   Joe Sugg Graduate Student Competition…………………….………………Robert Kemerait
   Fellows Awards……………………………………………………..……John Damicone

4. **New Business**
   Committee Reports:
   (a) Nominating Committee .... Ames Herbert
   (b) Finance Committee...Todd Baugham
   (c) Public Relations Committee ....Tim Brenneman
   (d) Peanut Quality Committee .... ……………….Jim Elder
   (e) Site Selection Committee.. Barry Tillman
   (f) Publications and Editorial Committee.. Diane Rowland
   (g) Program Committee...Naveen Puppala

5. **Other Business**

6. **Installation of New Officers** ……………………………………….………Naveen Puppala
   Past President's Award……………………………..…………………..Tim Brenneman

5. **Adjourn**……………………………………………………..………………..Naveen Puppala

MINUTES

BUSINESS MEETING AND AWARDS CEREMONY
AMERICAN PEANUT RESEARCH AND EDUCATION SOCIETY
Menger Hotel
San Antonio, TX
July 10, 2014

President's Report

It has been an honor to serve as president of APRES this past year. This organization means a lot to me and has played an important role in my career. In fact, this is the 31st consecutive meeting I have attended, having given at least one paper at each of these meetings, and often bringing graduate students as well. I attended my first several meetings as a graduate student, working with Dr. Pat Phipps at Virginia Tech. I loved the direct interaction with senior researchers in my field, and from the start felt like I was an important part of the peanut research community. During that time I also attended several national and regional plant pathology meetings. Those meetings were informative, but did not spark my interest the way APRES did. I loved the interaction and camaraderie at the meeting, and it was clear that if you had something of importance to present to the peanut community, APRES was the place to be. Looking back, I am certain that my career would have been much less productive, and certainly less enjoyable, if APRES did not exist. Serving as President also helped me realize how much work it takes to run this organization, particularly since I served during the transition to a new executive officer. We all owe a huge debt of gratitude to those who have gone before and given countless hours to make this organization what it is today. We even have one of the founding members and past presidents of APRES, Dr. Charles Simpson, who is still active in the society and in attendance today. The amazing thing is that he really doesn't look much different today than he did 30 years ago! Thank you Charles, for all you have done.

To illustrate the personal side of APRES, I would like to recognize Gerald and Wendy Harrison who are present today. They first met at the APRES meeting here in San Antonio in 1985, were engaged at the 1991 APRES meeting in San Antonio, and returned to the meeting in San Antonio in 1997 with their twin girls who are now grown and off to college. Certainly APRES is an important part of their lives. I would also like to recognize the representatives from Birdsong Peanuts, who are celebrating 100 years in the business this year. Birdsong is a family-owned business that has played a huge role in the peanut industry and the development of APRES over the years. We congratulate them and wish them many more years of success.

APRES has also had some difficult years, having to deal with shrinking budgets and down-sizing. However, we have maintained a strong, vital organization, in large part due to the tremendous level of commitment and dedication many members have for this organization. We are making a lot of changes in the administration of the society to better position us for the future. Here are some of the highlights of those changes:

- We hired a new Executive Officer, Kim Cutchins, who brings a wealth of management experience and new ideas, as well as a broad knowledge of the peanut industry. We are grateful to Dr. Jim Starr for his years of service in this position.
- The APRES offices were moved to Tifton, Georgia, in August. This is where Kim lives,

as well as more APRES members than any other location.

- Membership is trending positive with a 3-year increase year over year
- A new financial firm was hired to handle the APRES bookkeeping, compilation of financial statements, tax reporting, and annual audit. The APRES financial house is in good shape with assets of $250,000+
- The APRES website information has been updated and new information added that should be easier for members to access. Of particular note, Jason Woodward has completed the task of digitizing and uploading the Proceedings of every Annual Meeting since it was formed in 1969. This was also recently done with all back issues of Peanut Science, making the peanut literature data base very accessible.
- APRES added two new features to the website this year—online abstract submission and a new credit card payment system—which will make it easier to manage and track information.
- We are currently conducting a membership survey to provide a guide for the future. I encourage you all to complete the survey and share any ideas
- Entered into a joint contract with AOCS to publish the next installment in the Advances in Peanut Science book which will be published in 2015

I am particularly encouraged by the addition of Kim Cutchins to our organization. We were in serious need of an organizational overhaul, and Kim has already made great progress. APRES is in good hands administratively. We also have some new, energetic members of the Board of Directors and committees. I encourage you all to get involved in APRES activities by presenting papers, participating in committees, publishing in Peanut Science, and generally promoting the organization whenever possible. Do not be afraid to volunteer; there is plenty to do!

As for me, I will probably never catch Charles Simpson, but I hope to be a part of APRES for years to come. I look forward to great things ahead, and thank you for the privilege of being President this year.

READING OF THE PREVIOUS MEETING'S MINUTES:
The minutes of the 45th Annual Meeting Business Session were distributed via email to the membership and posted online; therefore, the reading of the minutes was waived. It was moved by and seconded by

the minutes of the 45th Annual Meeting Business Session be approved.

NEW BUSINESS

COMMITTEE REPORTS:
Nominating Committee –
Corley Holbrook reported for Chairman Ames Herbert. The Nominating Committee met June 10th via conference call to discuss positions on the APRES Board of Directors which will be coming open at the July Board meeting. All members of the Committee were present. Committee members discussed requirements for being a Board member, which are 5-year member of APRES, served on 3 different Committees, and familiar with APRES and its members. Using the stated criteria, the Committee recommends the following slate of nominees for the APRES 2014-15 Board of Directors:

President-Elect:	***Tom Stalker, NC State University***
Southwest University Representative:	***Peter Dotray, Texas Tech University***
Industry Rep – Manufactured Product:	***Jim Elder, The J.M. Smucker Company***

American Peanut Council Representative: ***Howard Valentine***

Each nominee has been contacted and has agreed to serve, if elected. In concluding his report, Ames requested that the criteria to serve on the Board and to move into the officer rotation be announced at the Board meeting and Business Meeting to encourage more participation and to expand the pool of eligible candidates.

Additionally, incoming APRES President Naveen Puppala presented the Committee rosters for 2014-15.

President Brenneman called for any nominations from the floor. There being none. Chris Butts made a motion to close the nominations, seconded by Albert Culbreath, and unanimously passed. Jason Woodward made a motion, seconded by Gerald Harrison to accept the nominees as presented.

The nominees as presented were unanimously approved by the APRES members.

Committee Reports Continued:
APRES Committee reports were delivered by their Committee Chair. Full reports can be found later in the Proceedings. President Tim Brenneman thanked all for their year's work and service to the organization. It was moved by Charles Simpson, seconded by Gerald Harrison:

to accept the Reports of the APRES Committees.

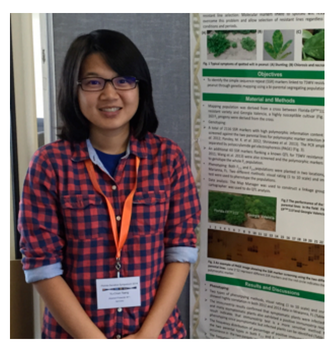
Other Business:
Tim Brenneman recognized the new President, Naveen Puppala, who adjourned the meeting.

Presentation of Awards

Joe Sugg Graduate Student Competition-

Chairman Bob Kemerait reported thirteen presentations were heard during the 2014 Joe Sugg Graduate Student Competition. He complimented all on the quality of their research and presentations. This year's winners are:

First Place –
Yu-Chien Tseng, University of Florida
"Identifying SSR markers Linked to TSWV Resistance in Peanut Cultivar, Florida-EPTM"113"
(Dr. Barry Tillman, major professor)



Second Place –
Blaire Colvin, University of Florida
"Influence of Peg Strength and Maturity on TifGuard Yield and Digging Loss".
(Dr. Diane Rowland, major professor)

Chairman Kemerait thanked the North Carolina Peanut Growers for sponsoring this great competition and investing in the development of future peanut researchers. He reminded all that in addition to receiving the award, the first place winner receives $500 and the second place winner receives $250.

The Bailey Award –

Chairman Naveen Puppala reported that nominations were received from all seven eligible sessions of the 2013 Annual Meeting and nominees were notified shortly after the meeting. Nine manuscripts were received and accepted for final evaluation. The Bailey Award for the best paper from the 2013 APRES Annual Meeting was presented to:

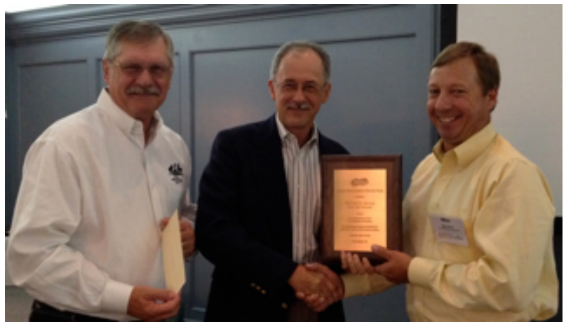
Babu Srinivasan
University of Georgia
"Effects of Host Resistance to Tomato Spotted Wilt Virus on the Virus Itself and Its Vector".
Authors:
R. Srinivasan, A. Culbreath, R. Kemerait, and R.S. Tubbs

Dow AgroSciences Awards for Excellence in Research & Education

Chairman Eric Prostko reported information on the award was sent to the membership and the committee received nominations for both the Dow AgroSciences Award for Excellence in Research and the Award for Excellence in Education. Nomination packets were distributed to committee members electronically, and the vote on the nominations was conducted electronically. The 2014 awardees are:

Education Award –
Dr. Jason Woodward,
Texas A&M AgriLife Extension Service
Texas Tech University

Research Award –
Dr. Mike Baring
Texas A&M University



Chairman Prostko thanked Dow AgroSciences for once again sponsoring the awards and recognizing the value of great research and education. In addition to a plaque, recipients receive a check for $1,000.

Fellows of the Society -

Chairman John Damicone stated that 3 names were forwarded for the attribute of Fellow of the Society to the Committee. Each name was unanimously recommended to the Board for bestowing the honor of Fellow of the Society. The Board unanimously agreed and tonight we are recognizing the newest honorees of Fellow of the Society: The first recipient is:

Todd A. Baughman
Oklahoma State University

Dr. Todd Baughman made significant contributions to the peanut industry as an extension agronomist and weed scientist at Texas A&M University over 15 years beginning in 1996. He is recognized by the peanut industry in the Southwest as an authority on weed identification, herbicide selection, and crop injury issues. Dr. Baughman conducted peanut variety trials throughout the state of Texas and was an integral part in the development and adoption of many new varieties. Dr. Baughman's extension program provided educational information on peanut production and weed management to producers in Texas at over 600 producer meetings and to more than 25,000 clientele during his tenure in Texas. Dr. Baughman developed and maintained the 'Texas Peanut Program' website. This one-stop location for research and educational information on peanut production in Texas was recognized by the American Society of Agronomy with the Award of Excellence for Websites in 2005. Dr. Baughman has an extensive record of service to APRES, serving as President, and member and chair of the Board of Directors and several other committees. He has received numerous awards for his programming excellence including the DowAgro Sciences Award for Excellence in Education from APRES in 2012. His dedication to the peanut industry has continued at Oklahoma State University where he is a Program Support Leader at the Institute for Agricultural Biosciences in Ardmore and maintains an active weed control program on summer crops including peanut. Dr. Baughman is most deserving of this recognition and it is an honor to present him with APRES Fellow award.

Chairman Damicone announce the second honoree is:

Austin K. Hagan
Auburn University

Dr. Hagan has demonstrated excellence in research and extension at Auburn University where he has worked as an Extension and Research Plant Pathologist since 1980 and was awarded the title of Alumni Professor. Dr. Hagan's successful research program has addressed several aspects of peanut production systems and how they affect diseases. His efforts have helped with the release and grower acceptance of the AuPnuts and Peanut RX programs, which have increased producer profits by not only limiting fungicide applications, but providing savings in labor, energy and chemical costs. Dr. Hagan has published more than 52 articles in refereed journals such as Peanut Science along with 459 technical research reports. Equally relevant is Dr. Hagan's dedication to his extension appointment and communicating research results. He has published 111 extension bulletins and articles, as well as numerous circulars and other extension publications. In addition, Dr. Hagan has faithfully served APRES in many ways, most notably as President, Member and chair of the Board of Directors, and member and chair of several committees. He received the Dow AgroSciences Award for Excellence in Education in 2011 in recognition of his extension program in peanut disease management. Dr. Hagan's many contributions to APRES, the science of plant pathology, and peanut producers of Alabama is hereby recognized through this Fellow award.

Chairman Damicone announced the third honoree is:

Emory M. Murphy
Georgia Peanut Commission

Emory Murphy has provided outstanding commitment to the peanut industry over a 33-year career as the Assistant Executive Director of the Georgia Peanut Commission working in research, education, promotion, and administration. Emory developed and expanded a world-class research facilitation program that has invested over $16 million to support research of over 100 scientists during his career and 30 to 50 projects per year. Extension and education has also been at the forefront of his efforts in at the Georgia Peanut Commission. He developed extension meetings to report to the growers on the research initiatives of the Georgia Peanut Commission, eventually partnering with the UGA Peanut Team in outreach to farmers. Emory was the coordinator of the annual Georgia Peanut Farm Show, the largest single-commodity farm show in the state. He partnered with UGA and USDA-ARS to develop research seminars for farmers. In 1987 he co-founded of the Georgia Peanut Tour to promote peanuts to manufacturers and processors and remained actively involved in facilitating the successful event. Emory was an active participant in APRES having served on the Board of Directors in 1987 and from 2008-2010. Emory also served on the

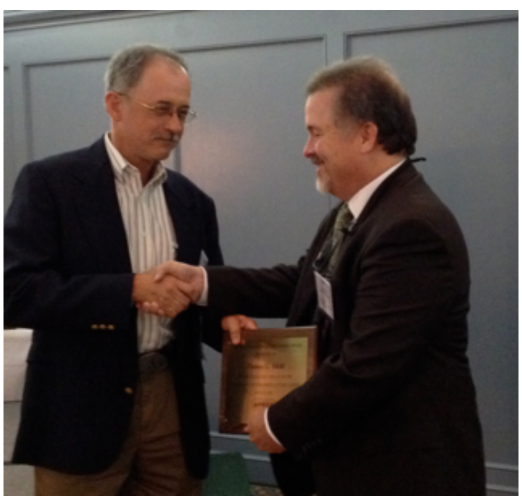
Program Committee, Site Selection Committee, and Peanut Quality Committee. Emory was a great supporter of APRES, actively promoting attendance to the APRES annual meetings to Georgia county extension agents
and by funding much of the research presented at the annual meetings, which he regularly attended. His commitment to excellence in the promotion of peanut research and education in Georgia and through APRES is recognized by his election as Fellow.

Coyt T. Wilson Distinguished Service Award –

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

Committee members for 2014 were Austin Hagan, Ames Herbert, Nathan Smith, and Corley Holbrook, Chair. All business for this committee was conducted electronically. After reviewing all nominations, the committee unanimously recommended that the 2014 Coyt T. Wilson Distinguished Service Award be presented to Dr. Thomas G. Isleib. Dr. Isleib has been a loyal member of APRES throughout his career as a peanut breeder at North Carolina State University. In view of his many contributions in service to APRES, he is highly deserving of the 2014 Coyt T. Wilson Distinguished Service Award.

Respectfully submitted,
C. Corley Holbrook, chair



Dr. Thomas G. Isleib.

The APRES Coyt T. Wilson Award recognizes an individual who has contributed two or more years of distinguished service to the American Peanut Research and Education Society. It is given in honor of Dr. Coyt T. Wilson who contributed freely of his time and service to the organization in its formative years.

The unanimous selection for this year's award, Dr. Thomas G. Isleib, Professor and Peanut Breeder at North Carolina State University, exemplifies this spirit of service. Dr. Isleib has been a loyal member of APRES for 29 years. He has served on many key APRES committees, including the Publications and Editorial, Site Selection, Nominating (chair, 2003-04), Program (chair, 2001-02), Site Selection (chair, 1994-95), Fellow, and Coyt T. Wilson Distinguished Service Award Committees (chair, 2001-02). Dr. Isleib's commitment to graduate educations is indicted by his two terms of service on the Joe Sugg Graduate Student Award Committee. Finally, Dr. Isleib served on the APRES Board of Directors (2010-13), and as President (2002-03), President Elect, and Past President.

In addition to his committee activities, Dr. Isleib served four terms (1994-2000; 2006-2008) as Associate Editor of *Peanut Science*, and has served as a reviewer for *Peanut Science*, throughout his career. This editorial service reflects a tremendous commitment of time and expertise for the good of APRES and peanut scientists in general. Tom supports *Peanut Science* by regularly submitting and publishing his work in the journal. He is author or co-author of 49 *Peanut Science* articles.

Tom has been a very strong supporter of participation in APRES meetings and has avidly promoted the annual meeting to his graduate students, staff, and colleagues. He has attended every APRES meeting since being hired as the NCSU peanut breeder in 1990. He is author or co-author of over 100 abstracts published in the meeting Proceedings. His students regularly participate in the Joe Sugg Graduate Student Award Competition and always give excellent presentations.

Tom is himself a Bailey Award nominee and a Bailey Award winner (2011). He received the Dow AgroSciences Award for Excellence in Research (2001) and was made a Fellow of APRES in 2007 in recognition of his many outstanding contributions as a peanut scientist and breeder. He, in turn, is very sincere and generous in his commitment to recognizing service to APRES and the scientific community, often providing both formal and informal support for award nominations for his peers.

Tom's tireless commitment to APRES and the peanut industry sets an extremely high standard for all who know him. In view of his many contributions in service to APRES, Dr. Tom Isleib is highly deserving of the 2014 Coyt T. Wilson Distinguished Service Award.

Past President Award:

As his first order of business, newly-elected President Naveen Puppala presented Tim Brenneman with the Past President's award.

Committee Reports

Public Relations Committee –

2014-15 Chairman Jason Woodward reported for outgoing Chairman Ryan Lepecier. The Committee met in February to discuss strategies for improving communication with the APRES membership, including attending peanut meetings, creating a display table that can be used to advertise APRES, and an updated membership brochure.

Membership in APRES currently stands at 334 Individual members and 26 Institutional members for a total of 360 members. Total membership in 2013-14 was 314. Renewal notices were issued in May and 181 members have renewed for 2014-15. Outstanding renewals are 153 of which 68 are likely to renew. The remaining 90 are critical; 29 of which are students who may have moved into other fields of study or work. Institutional members stand at 26. Eighteen (18) renewals have been received to date. All non-renewals will be contacted with a reminder following the Annual Meeting.

The Committee offered two resolutions honoring the contributions and lives of two recently deceased members of the Society, namely Roy Pittman, Jr. and J.C. Wells. The resolutions recognizing their lifetime contributions were read, followed by a moment of silence for Roy Pittman, Jr. and J.C. Wells.

Resolution Honoring Life of APRES Member: Roy Nyal Pittman Jr., Ph.D

Whereas, Roy Nyal Pittman Jr. was born on June 26, 1947 in Amarillo, Texas, and

Whereas, he graduated from Amarillo High School in 1966, and received a Bachelors degree in Science from Texas A & M in 1970; Dr. Pittman furthered his education and received his Masters of Science degree from West Texas State in 1974, and his Ph.D from Oklahoma State in 1978, conducting his research on the wild Arachis species.

Whereas, Roy was the first full-time curator for cultivated and wild species of peanut, and,

Whereas, Roy led the effort to develop national standards for *Arachis hypogaea* descriptors, and

Whereas, he participated in collecting several new Arachis species and numerous peanut land races and cultivars in South America, and,

Whereas, he served in the peanut CRSP project in Bolivia for more than 15 years, and,

Whereas Roy was active in APRES and served on many committees during his tenure as a member, and,

Whereas, Roy retired from the USDA-ARS as an Agronomist/Peanut Curator in January 2014, and, Whereas, Dr. Pittman is survived by his brother, Billy Pittman of Amarillo, TX; 2 nephews, Kyle Pittman of Amarillo, TX, and Schuyler Pittman and wife, Rei of Albuquerque, NM, and

Whereas, he died February 4, 2014, be it resolved that the American Peanut Research and Education Society remembers and honors Roy N. Pittman Jr.'s life and contributions to the peanut industry.

Resolution Honoring Life of APRES Member: J.C. "Jay" Wells

Whereas, J.C. "Jay" Wells was born on August 27, 1921 in Tifton, GA, and

Whereas, Mr. Wells joined the department of Plant Pathology at NC State University in 1950 as an extension specialist, and developed highly effective demonstration programs on a wide variety of field crops, and was instrumental in bringing industry support to extension programs, and,

Whereas, Mr. Wells was an early supporter of the National Peanut Research Conference in 1957 and the American Peanut Research and Education Association in 1969, attending both inaugural conferences, and,

Whereas, Mr. Wells co-authored the first published account of Striga (witchweed) in the Western Hemisphere; initiated a program to demonstrate the importance of nematodes on peanut; provided extension support to researchers and recommendations to growers coping with the widespread epidemics of CBR in the 1970's; and earned the Outstanding Extension Service Award in 1975, and

Whereas, Mr. Wells retired from NCSU IN 1980, but continued an active career consulting for Kalamazoo Spice Company, traveling the world as a research scientist, and

Whereas Mr. Wells is survived by his wife of 72 years, Elsie Wells, of Greenville; two daughters, Barbara Wade and husband, Jesse, of Pamlico Beach, and Melinda Howell and husband, Gary, of Merrill, WI; two sisters, Mary Prine and husband, Gordon, of Gainesville, FL and Doris Goodwin, of Americus, GA, and

Whereas, he died November 10, 2013, be it resolved that the American Peanut Research and Education Society remembers and honors Jay Well's life and contributions to the peanut industry.

Finance Committee:

Financial Statements as of June 30, 2014 - Chairman Todd Baughman reviewed the budget approved at the June Board meeting compared to expenses through the end of June. Income received is $64,615 vs. budgeted $92,350. He noted that additional income is expected to be received for Annual Meeting sponsorships that should keep the budget on track. Expenses through June are $32,937 vs. budget of $88,175. Again, Todd noted that the majority of expenses are related to the Annual Meeting and will show up in the next couple of months. He highlighted that Peanut Science income and expenses will be over budget due to the fact that the July-December 2013 issue were not billed until January of this year and the 2014 fiscal year will reflect expenses for three (3) issues instead of the budgeted two (2) issues. The APRES Balance Sheet (cash basis) as of June 30, 2014 consists of: Total assets = $255,389, consisting of cash and CDs; Liabilities and equity are employment taxes $518, retained earnings of $222,524, net income of $32,346 totaling $255,389.

2013 Taxes – Herring CPA Group prepared and filed the 2013 APRES tax forms. Total revenue of $90,415; total expenses of $84,497 were indicated. Cash and investments on hand at the beginning of the year was $217,231 and $223,041 at the end of the year. Total assets at the beginning of the year was $217,231 and $223,041 at the end of the year. Total liabilities at the beginning of the year were $626 and $581 at the end of the year. Net assets or fund balances were $216,605 at the beginning of the year and $222,523 at the end of the year.

Credit Card Payment System – The Finance Committee met and discussed APRES's current credit card payment system through Sterling Payment Systems. Over the past year, Todd stated the Executive Officer has been fielding numerous member complaints about the Sterling system. Upon investigation, it was learned that the Sterling system does not integrate well with the web and is not able to supply members with the payment information needed to file their paperwork. Additionally, the Sterling system does not easily supply the data needed for our accountants to properly record membership fees, specifically who is the member vs. who paid the bill, requiring an inordinate amount of staff time to manage. The APRES web designer recommended we compare the PayPal credit card payment system vs. Sterling. It was found that PayPal (which was designed for web use) should integrate easily with the APRES website as well as provide easy to share transaction receipts and reports. The PayPal system accepts all the major credits cards as well as gift cards and PayPal dollars. A user does not have to register with PayPal to pay by credit card. In a comparison of fees, PayPal charges 2.2% on the amount of the transaction, plus $.30 per transaction vs. Sterling's average of 5.7%. The Committee is seeking the Board's endorsement to end the APRES contract with Sterling Payment Systems and to move the PayPal Payment System. It was moved by Todd Baughman, seconded by Howard Valentine, and unanimously approved to:

Not renew the Sterling Payment Systems contract and to change the APRES credit card payment system to PayPal.

APRES Investment Policy – Todd reported that the Committee has discussed over the last couple of years about expanding APRES' investment policy from bank CDs and bank money market accounts to include other avenues which might result in additional income for the organization. At its meeting yesterday, the Committee reviewed several options proposed by Fidelity and Vanguard for potential investment of the $115,000 APRES currently has in CDs. The Committee chose to look at Fidelity and Vanguard because of their excellent financial rankings and low management fees. Todd related that currently APRES CDs are earning between .3%-2.18% and upcoming CD rates at Stillwater National Bank (APRES' bank) range from .2% for 6 months to 1.25% for 60 months.

The mutual funds recommend by Fidelity and Vanguard have a 3-year return average of 4.36%-9.65% and a 10-year return average of 4.63%-6.16%. All of the recommended funds are a mixture of stocks and bonds with varying degrees of each. The Committee is recommending that the funds from CDs maturing this fall be moved into the Vanguard LifeStrategy Income Fund (VASIX), which is made up of 20% stocks and 80% bonds.

The Board discussed the pros and cons of expanding the APRES investment policy as well as whether to move a portion or all of the CD funds into a new investment area. David Jordan made the motion, seconded by Howard Valentine, and the Board unanimously approved:

To move all funds ($115,000) currently in CDs at Stillwater National Bank into the Vanguard LifeStrategy Income Fund (VASIX) account.

Peanut Science - Todd asked Peanut Science Editor Tim Grey to share the financial outlook for Peanut Science which currently operates on a break-even basis. Tim stated he has been reviewing the Allen Press contract for publishing Peanut Science with the Executive Officer for potential cost savings. The 3-year contract ends December 2015 and APRES is locked into the Allen Press pricing schedule until that time. They have been in contact with Allen Press and have notified them that they will be looking at additional avenues to potentially publish Peanut Science as it is felt there are substantial cost savings to be had given the advances in technology. Tim reported that a subcommittee had looked at reducing author publishing charges, but given our current contract with Allen Press, found that it is not viable at this point without additional financial resources (grants, new members, sponsorships, etc.) to offset the expenses. All of these potential revenue sources are being explored. The goal of the Subcommittee is to be able to charge a minimal flat fee ($250-$500) per article, and ultimately, move to no cost to publish for APRES members with a flat fee for non-members.

Respectfully submitted,
Todd Baughman, chair

American Peanut Research and Education Society
Statement of Assets, Liabilities, and Equity - Cash Basis
As of June 30, 2014

ASSETS

Current Assets	
Cash-Checking	$79,931.97
Cash-MMA Savings	48,068.22
Cash-CD	14,082.36
Cash-CD	18,023.46
Cash-CD	19,594.58
Cash-CD	17,165.42
Cash-CD	13,361.04
Cash-CD	32,866.73
Cash-Bayer Checking	12,294.76
Total Current Assets	255,388.54
TOTAL ASSETS	**$255,388.54**

LIABILITIES AND EQUITY

Current Liabilities	
Federal W/H Taxes	$129.00
Fica W/H Taxes	237.64
Medicare W/H Taxes	55.58
State W/H Taxes	95.83
Total Current Liabilities	518.05
Equity	
Retained Earnings	222,524.02
Net Income	32,346.47
Total Equity	254,870.49
TOTAL LIABILITIES & EQUITY	**$255,388.54**

American Peanut Research and Education Society
Statement of Revenues and Expenses - Cash Basis
For the 6 Months Ended June 30, 2014

	2014
Income	
Peanut Science	$12,165.00
Miscellaneous Income	500.00
Annual Dues	
Sustaining-Gold Level	1,700.00
Sustaining-Silver Level	1,500.00
Institutional	1,500.00
Individual-Student	450.00
Individual-Post Doc/Tech Support	150.00
Individual-Retired	375.00
Individual-Regular	12,925.00
Total Annual Dues	18,600.00
Contribution - Dow	5,000.00
Contributions - General	1,100.00
Meeting Registration	27,250.00
Total Income	64,615.00
Expense	
Office Supplies	183.97
Contract Labor	26.00
Dues and Subscriptions	275.00
Webpage Maintenance	20.00
Accounting	1,437.50
Annual Meeting - Awards	189.95
Bank Charges	11.00
Corp Registration Fees	30.00
Credit Card Charges	1,264.36
Peanut Science Publishing	13,973.18
Peanut Science Editor Stipend	3,000.00
Taxes - Payroll	1,026.78
Wages - Executive Officer	11,499.96
Total Expense	32,937.70
Net Ordinary Income	31,677.30
Other Income	
Interest Income	669.17
Total Other Income	669.17
Net Income	**$32,346.47**

American Peanut Research and Education Society
Profit and Loss - Budget vs. Actual

	2013	2014		
	ACTUAL	ACTUAL YTD	PROPOSED BUDGET	
	Jan - Dec 13	Jan - Jun 14	FY 2014	% of Budget
Ordinary Income/Expense				
Income				
Peanut Science	$9,120.00	$12,165.00	$10,100.00	120.45 %
Miscellaneous Income	330.00	500.00	250.00	200.0%
Annual Dues				
Sustaining-Gold Level	500.00	1,700.00		
Sustaining-Silver Level	900.00	1,500.00		
Institutional	700.00	1,500.00		
Individual-Student	200.00	450.00		
Individual-Post Doc/Tech Supp	150.00	150.00		
Individual-Retired	75.00	375.00		
Individual-Regular	8,725.00	12,925.00		
Annual Dues - Other	9,320.00	0.00	22,000.00	
Total Annual Dues	20,570.00	18,600.00	22,000.00	84.55%
Contribution - Bayer Fund	0.00	0.00	5,000.00	0.0%
Contribution - Dow	5,000.00	5,000.00	5,000.00	100.0%
Contribution - Joe Sugg Award	750.00	0.00		
Contributions - General	9,350.00	1,100.00	15,000.00	7.33%
Meeting Registration	43,750.00	27,250.00	35,000.00	77.86%
Total Income	88,870.00	64,615.00	92,350.00	69.97%

American Peanut Research and Education Society
Profit and Loss - Budge vs. Actual
(Continued)

Expense				
Miscellaneous Expense	0.00	0.00	250.00	0.0%
Insurance	0.00	0.00	100.00	0.0%
Office Supplies	0.00	183.97	0.00	0.0%
Contract Labor	348.75	26.00	350.00	7.43%
Dues and Subscriptions	375.00	275.00		0.0%
Webpage Maintenance	822.50	20.00	1,500.00	1.33%
Accounting	1,647.15	1,437.50	1,950.00	73.72%
Annual Meeting				
Awards	3,578.82	189.95	4,000.00	4.75%
Program	1,250.60	0.00		
Annual Meeting - Other	35,435.64	0.00	35,000.00	0.0%
Total Annual Meeting	40,265.06	189.95	39,000.00	0.49%
Bank Charges	2.75	11.00	25.00	44.0%
Corp Registration Fees	0.00	30.00	50.00	60.0%
Credit Card Charges	2,344.66	1,264.36	2,350.00	53.8%
Legal Fees	0.00	0.00	250.00	0.0%
Office Expenses	0.00	0.00	250.00	0.0%
Peanut Science Publishing	12,013.94	13,973.18	12,500.00	111.79 %
Peanut Science Editor Stipend	0.00	3,000.00	3,000.00	100.0%
Postage	249.65	0.00	50.00	0.0%
Taxes - Payroll	1,802.17	1,026.78	1,800.00	57.04%
Travel - Bayer Prog Ext Agents	0.00	0.00	5,000.00	0.0%
Travel - Officer	1,615.17	0.00	1,200.00	0.0%
Wages - Executive Officer	23,008.72	11,499.96	18,550.00	61.99%
Total Expense	84,495.52	32,937.70	88,175.00	37.36%
Net Ordinary Income	4,374.48	31,677.30	4,175.00	758.74 %
Other Income				
Interest Income	1,545.32	669.17	1,300.00	51.47%
Total Other Income	1,545.32	669.17	1,300.00	51.48%
Net Income	**$5,919.80**	**$32,346.47**	**$5,475.00**	**590.8%**

PUBLICATIONS AND EDITORIAL COMMITTEE REPORT –
Chairman Diane Rowland that the Committee has been working on several projects:

Book Update – Based on the recommendation of the Board last year, the P&E committee formed an ad hoc committee to formulate an outline for a production focused update of the APRES book volumes. That was completed and several publishers have been contacted including the ASA Trisocieties publishers, Springer, and UGA Press. Currently, the UGA Press quote is approximately 10 K. The Board suggested that AOCS (the current publishers of the Genomics volume that is in development) be contacted to determine if they would be willing to publish and provide a quote for cost. AOCS was contacted and a quote of $15,485 was received. Therefore, the P&E committee to submitted a request to the Board to move forward with the UGA quote. The Board unanimously agreed and the P&E Committee will contact UGA Press.

APRES and Peanut Science Survey - At the request of the Board, the Publications & Editorial Committee Chairman Diane Rowland put together a membership survey to gather information on how to expand the circulation of Peanut Science and improve APRES membership programs and activities. The survey is currently being circulated and 90 responses have been received-to-date. The survey will remain open until after the Annual Meeting and the results will assist APRES in planning for the future.

Digitized Proceedings - Jason Woodward who volunteered to create digitized copies of APRES Proceedings announced that every APRES Proceedings from the first Annual Meeting in 1969 to 2013 can now be found online on the APRES website, www.apresinc.com. Additionally, the Proceedings of the five National Peanut Research Conferences (1957, 1962, 1964, 1966, 1968) which led to the formation of APRES can also be found on the website.

***Peanut Science* - Editors Report – July 1, 2013 to June 30, 2014**
The Associate Editors of *Peanut Science* meeting is set for Tuesday, July 8th, 2014 at the Annual APRES meeting at the Menger Hotel at San Antonio, TX. *Peanut Science* Volumes 40-1 was released online in July 2013, with Volume 40-2 released March 2014 online via the website AllenPress. *Peanut Science* Volume 41-1 was released in May 2014, and Volume 41-2 will be released in August 2014. Both contain 8 articles each, for a total of 16 in 2014. Dr. Chris Butts managed the final manuscripts submitted under his tenure as editor in early 2014, and continues to serve as an Editor in lieu of manuscripts submitted when Dr. Grey is an author.

Four associate editor terms expired in 2014 and they will be recognized at the 2014 meeting:

Payton Paxton
Graeme Wright
Chad Godsey
Peter Dotray

Three new associate editors have been appointed to the committee with terms beginning in 2014:

Maria Balota
Shyamalrau Tallury
Glenn Wehtje

Kim Cutchins as EO for APRES along with AllenPress have been working to make *Peanut Science* available online to a greater number of clients via EBSCO information services. One goal is to establish an Impact Factor for *Peanut Science*. If you go to Google.com and enter '*Peanut Science'*, the journal is the first return and listed returns for *Peanut Science* are the first 4 websites along with APRES (#3). At Googlescholar.com the request for *Peanut*

Science returns 410,000 hits, with many journal articles, and Dr. Boote's 'Growth Stages of Peanut' from 1982 listed first if sorted by relevance. The goal of APRES is to continue the promotion of Peanut Science to a wider audience, improve the number of submissions, and increase the relevance of the journal.

Various journal performance statistics are shown in Tables 1 and 2 for the 12-month time period from January 1, 2013 to Dec 31, 2013 for manuscripts assigned to Dr. Grey as editor. Also below are submissions by year from 2010 to June 2014 by month along with the associate editors. There were 21 total submissions in 2013.

Table 1. Performance statistics of reviewers for articles submitted to Peanut Science between 01 January 2013 and 31 December 2013.

Reviewer Performance Metric	Measure
Number of invitations	63
Number of Reviews	43
Number of Reviews declined	8
Un-invited before agreeing	12
Days to Respond to Invitation	3.33
Days to Complete Review (from Date Invited)	31.8
Days to Complete Review (from Date Agreed to Review)	33.47
Number of Reviews per Reviewer	1.24
Number of Late Reviews	19
Average Days Late	6.79
Submitted on time	23

Table 2. Submissions by year

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

For the calendar year 2013, there were 17 manuscripts accepted, 1 rejected, and 3 with decisions still in process.

Associate editors		
Christ Butts	USDA/ARS, Dawson GA	
Maria Balota	Virginia Tech,	
Albert Culbreath	UGA, Tifton GA	
Peter Dotray	TX Tech, Lubbock TX	Term expires 2014
Chad Godsey	Oklahoma St, Stillwater OK	Term expires 2014
Yen-Con Hung	UGA, Griffin GA	
Michael Marshall	Clemson, Blackville SC	
Paxton Payton	USDA/ARS, Lubbock TX	Term expires 2014
Diane Rowland	UFL, Gainesville FL	
Nathan Smith	UGA, Tifton GA	
Shyamalrau Tallury	Clemson University, SC	
Glenn Wehtje	Auburn University, AL	
Jason Woodward	TX A&M, Lubbock TX	
Graeme Wright	Peanut Company of Australia	Term expires 2014

There is always a need for more reviewers and replacements of associate editor's please check the website for entering of new reviewers information and initiations.

Peanut Science Editor Recognition –
The plaque recognizing Chris Butts contributions arrived too late to be presented to Chris at the 2014 meeting. Editor Tim Grey thanked Chris for his leadership as editor of Peanut Science for the past 6 years.

Peanut Quality Committee:

Chairman Jim Elder highlighted the discussions of the Peanut Quality Committee in his report:

High Peanut Fat Content: A consensus was drawn last year to reassess high fat issue this year once another crop year was in production. We are seeing approximately 1% to 2% lower fats than the previous year and are still at the higher end of normal but acceptable to manufacturers.

High Oleic Purity: A discussion of the issue of High Oleic purity was also continued from the previous year. The consensus is that the cause is multi-faceted and the only effective way to address is when all US varieties are High Oleic. Some thought that the level of HO purity in US varieties is better than Argentinian varieties.

Farmer Stock Storage: Since the peanut crops yield better with larger carryover, the question was raised should Farmer Stock storage conditions be upgraded to improve shelf life? The 2012 crop was so large that Farmer Stock peanuts were moved very rapidly to make room and were stored under various conditions and places. Some flavor problems occurred due to higher moistures and quick drying conditions and then meal/brittleness became a problem at the end of the storage period. H. Valentine commented that the GMP's for Farmer Stock peanut storage are defined and published. Warehouses that have ventilation fans have humidity control incorporated. The industry knows what to do and just needs to implement correctly.

High Oleic Conversion: The consensus is that the peanut industry does not have the ability to segregate and the only way to effectively implement is to convert all US varieties to HO. This was easier to do in the SW due to geography and the quota system at the time. It was brought up that the three University of Florida patents will expire in 2017. HO peanuts from the SE will be more economical to export via shipping out of Savannah. S. Fletcher stated that it will take a "super" variety with step change agronomics for the growers to switch from their historical plantings. It would probably take at least 3 – 5 years to totally convert the industry.

Certified Seed Acreage: T. Isleib presented a compilation of 2013 Certified Seed production acreage. This is a good summary of what will be planted for 2014. Georgia-06G comprises 85% of the SE Runner varieties. Georgia 09B is the largest Runner variety in the SW @ 28%. Bailey is the largest Virginia variety in the VC region. High Oleic cultivars comprise only 20% of the total US cultivars.

Peanut Parentage Map: T. Isleib also presented a work in progress of a peanut parentage map that shows linkages of Runner and Virginia market types.

2015 Quality Committee Membership: J. Elder's membership term is expiring. M. Kline from Hershey's has agreed to serve a three year term and serve as chairperson beginning next year.

Respectively submitted,
Jim Elder, Chair

PROGRAM COMMITTEE REPORT –

Program Chairman Naveen Puppala recognized the outstanding help and support of Technical Program Chairman Jason Wood and Local Arrangements Chairman Gary Schwarzlose. Attendance for 2014 is 261 total; 188 participants; 46 spouses; 27 children. Feedback from the Opening Session speakers has been excellent. Naveen thanked BASF and Bayer Crop Sciences for sponsoring the Wednesday night dinner; Dow AgroSciences for sponsoring tonight's reception; Texas Tech University as the Fun Run sponsor; Texas Pest Management Association for their sponsorship of the Spouses Program (a trip to Natural Bridge Caverns); The Texas Peanut Producers Board who sponsored the Monday night Peanuts at the Park outing; The North Carolina Peanut Growers Association who once again sponsored the Joe Sugg Graduate Student Competition; the sponsors of the Ice Cream Social and all the organizations who sent peanut products for attendees to snack on during the meeting..

Technical Program Chairman Jason Woodward reported the 46th Annual Meeting scheduled 104 presentations which included 2 symposiums (The Status and Prospective of Peanut Phenotyping and the Bayer Excellence in Extension and Extension Techniques) and 21 posters.

He asked all attendees to respond to a post-meeting survey to help APRES evaluate the meeting.

SITE SELECTION COMMITTEE REPORT –
Barry Tillman, Committee Chairman, stated the Committee gave it their best shot to arrange a joint meeting with the Southern Peanut Growers Conference in 2016. Unfortunately, the Edgewater Hotel in Panama City, FL was unwilling to meet the APRES hotel room rate price point. The SPGC is still negotiating their 2016 contract with the Edgewater and we have asked them to join us at the Hilton Clearwater, if their membership decides to make a change.

The Committee began looking at other properties and has settled on returning in 2016 to the Hilton Clearwater Beach in Florida. Room rates will be $145/night inclusive of resort fees. A government rate of $99/night was also negotiated.

In 2017, the APRES staff conducted an informal survey of attendees to this year's annual meeting and found overwhelming support to return to Albuquerque/Santa Fe area. Jason Wooward et.al. will begin looking into properties in the area.

APPENDIX

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

ARTICLE 1. NAME

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

ARTICLE II. PURPOSE

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

ARTICLE III. MEMBERSHIP

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

a. Individual memberships:

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

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

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

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

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

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

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

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

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

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

ARTICLE IV. DUES AND FEES

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

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

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

ARTICLE V. MEETINGS

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

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

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

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

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

ARTICLE VI. QUORUM

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

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

ARTICLE VII. OFFICERS

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

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

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

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

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

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

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

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

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

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

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

4. Supervise Administrative/Editorial assistant in:

a. Preparing routine correspondence with authors to provide progress report of manuscripts.

b. 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:

a. Development and review of galley proofs of individual articles.

b. Development and review of the journal proof (proof of all revised articles compiled in final publication format with tables of contents, page numbers, etc.)

c. Final publication and distribution to members and subscribers via electronic format.

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

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

ARTICLE VIII. BOARD OF DIRECTORS

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

a. The president
b. The most recent available past-president
c. The president-elect
d. Three University representatives - these directors are to be chosen based on their involvement in APRES activities, and knowledge in peanut research, and/or education, and/or regulatory programs. One director will be elected from each of the three main U.S. peanut producing areas (Virginia-Carolinas, Southeast, Southwest).
e. United States Department of Agriculture representative – this director is one whose employment is directly sponsored by the USDA or one of its agencies, and whose relation to peanuts principally concerns research, and/or education, and/or regulatory pursuits.
f. Three Industry representatives - these directors are (1) the production of peanuts; (2) crop protection; (3) grower association or commission; (4) the shelling, marketing, and storage of raw peanuts;(5) the production or preparation of consumer food-stuffs or manufactured products containing whole or parts of peanuts.
g. The President of the American Peanut Council or a representative of the President as designated by the American Peanut Council.
h. The Executive Officer - non-voting member of the Board of Directors who may be compensated for his services on a part-time or full-time salary stipulated by the Board of Directors in consultation with the Finance Committee.
i. National Peanut Board representative, will serve a three year term.

Section 2. Terms of office for the directors' positions set forth in Section 1, paragraphs d, e, 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 four members that represent the diverse membership of the Society and with each serving three-year terms. The Chairperson of the committee shall be from the region in which the future meeting site is to be selected as outlined in subsections (1) – (3) and the Vice-Chairperson shall be from the region that will host the meeting the following year. The Vice-Chairperson will automatically move up to chairperson. *All of the following actions take place two years prior to the annual meeting for which the host city and hotel decisions are being made.*

Site Selection Committee shall:

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

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

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

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

ARTICLE X. AMENDMENTS

<u>Section 1.</u> 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.

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

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

MEMBERSHIP (1975-2006)

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

MEMBERSHIP (2007-2014)

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

GUIDELINES for AMERICAN PEANUT RESEARCH AND EDUCATION SOCIETY

FELLOW ELECTIONS

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

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

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

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

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

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

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

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

Processing of Nominations

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

Recognition

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

Distribution of Guidelines

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

GUIDELINES for AMERICAN PEANUT RESEARCH & EDUCATION SOCIETY

BAILEY AWARD

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

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

The following should be considered for eligibility:

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

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

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

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

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

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

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

Manuscripts are judged using the following criteria:

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

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

a) notify session moderators for the upcoming meeting of their responsibilities in relation to judging oral presentations as set in the guidelines in APRES PROCEEDINGS,
b) meet with committee at APRES meeting,
c) collect names of nominees from session moderators by Friday a.m. of Annual Meeting,
d) provide Executive Officer and Bailey Award committee members the name of Bailey Award nominees,
e) notify nominees within two months of meeting,
f) set deadline in late Fall or early winter for receipt of manuscripts by Bailey Award chair,
g) distribute manuscripts to committee members,
h) provide Executive Officer with Bailey Award winner and paper title no later than May 15, and
i) Bailey Award chair's responsibilities are completed when the Executive Officer receives Bailey Award recipient's name and paper title.

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

GUIDELINES FOR THE AMERICAN PEANUT RESEARCH & EDUCATION SOCIETY'S

COYT T. WILSON DISTINGUISHED SERVICE AWARD

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

Eligibility of Nominators

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

Eligibility of Nominees

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

Nomination Procedures

Deadline.

The deadline date for receipt of the nominations by the chairman shall be March 1 of each year.

Preparation.

Careful preparation of the nomination based on the candidate's service to the Society is critical. The nominee may assist in order to assure the accuracy of the information needed. The documentation should be brief and devoid of repetition. Six copies of the nomination packet should be sent to the committee chair.

Format.

TITLE:
Entitle the document "Nomination of_____for the Coyt T. Wilson Distinguished Service Award presented by the American Peanut Research and Education Society".
(Insert the name of the nominee in the blank).

NOMINEE:
Include the name, date and place of birth, 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.

GUIDELINES for

DOW AGROSCIENCES AWARDS FOR EXCELLENCE IN RESEARCH AND EDUCATION

I. Dow AgroSciences Award for Excellence in Research

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

Eligibility of Nominees

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

II. Dow AgroSciences Award for Excellence in Education

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

Eligibility of Nominees

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

Eligibility of Nominators

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

Nomination Procedures

Nominations will be made on the Nomination Form for Dow AgroSciences Awards. Forms are available from the Executive Officer of APRES. A nominator's submittal letter summarizing the significant professional achievements and their impact on the peanut industry must be submitted with the nomination. Three supporting letters must be submitted with the nomination. Supporting letters may be no more than one page in length. Nominations must be postmarked no later than March 1 and mailed to the committee chair. Unsuccessful nominations will be reconsidered the following year and nominators will be contacted and given the opportunity to provide a letter that updates the nomination. After the second year unsuccessful nominations will be reconsidered only following submission of a new, complete nomination package.

Dow AgroSciences Awards Committee

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

PROGRAM
46th ANNUAL MEETING of the
AMERICAN PEANUT RESEARCH AND EDUCATION SOCIETY
San Antonio, Texas
July 8-10, 2014

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Michael Baring (2017)
Naveen Puppala (2017)

Program Highlights

Monday, July 7

2:00-4:00 pm Peanut Genomics Initiative .... Minuet

6:00-9:30 pm Peanuts at the Park .... San Antonio Missions Ballpark

Tuesday, July 8

8:00-12:00 APRES Golfing .... On Your Own (list of courses will be provided)

8:00-10:00 Seed Summit .... Minuet

10:00-12:00 Crop Germplasm Committee .... Minuet

12:00-6:00 APRES Registration .... Ballroom Foyer

8:00-4:00 Spouses' Hospitality Room .... Patio

3:00-6:00 Presentation Uploading .... Ballroom Foyer

Committee Meetings (round tables in corners)

1:00-1:30 Program Committee (Local Arrangements + Tech. Program + Moderators) .... Cavalier

1:30-2:30 Finance Committee .... Ballroom AB

1:30-2:30 Publications and Editorials Committee .... Ballroom AB

1:30-2:30 Associate Editors, *Peanut Science* .... Ballroom AB

1:30-2:30 Nominating Committee .... Ballroom AB

2:30-3:30 Dow AgroSciences Awards Committee .... Ballroom AB

2:30-3:30 Peanut Quality Committee .... Ballroom AB

2:30-3:30 Site Selection Committee .... Ballroom AB

2:30-3:30 Fellows Committee .... Ballroom AB

3:30-4:30 Public Relations Committee .... Ballroom AB

3:30-4:30 Bailey Award Committee .... Ballroom AB

3:30-4:30 Coyt T. Wilson Distinguished Service Award Committee .... Ballroom AB

3:30-4:30 Joe Sugg Graduate Student Award Committee .... Ballroom AB

6:30-8:00 "Flavors of the Southwest" Ice Cream Social .... Minuet

Program Highlights
Wednesday, July 9

7:00-4:00 APRES Registration .... Ballroom Foyer

8:00-4:00 Spouses' Hospitality Room .... Patio

7:00-8:00 Poster Setup .... Pre-function area

9:00-3:00 Spouse's Activity .... Natural Bridge Caverns

10:00-3:00 Presentation Uploading .... Ballroom Foyer

Morning

8:00-9:10 General Session .... Ballroom AB

9:10-9:30 BREAK .... Pre-function area

9:30-11:45 Plenary Session .... Ballroom AB

11:45-1:00 LUNCH (on your own)

Afternoon

1:00-3:15 Phenotyping Symposium .... Ballroom AB

1:00-3:15 Bayer Excellence in Extension and Extension Techniques .... Minuet

3:15-3:45 BREAK .... Pre-function area

Concurrent Sessions

3:45-5:00 Production Technology .... Ballroom C

3:45-5:00 Seed Technology and Physiology .... Cavalier

3:45-5:00 Plant Pathology and Nematology I .... Minuet

3:45-5:00 Breeding, Biotechnology and Genetics I .... Ballroom AB

Evening

5:05-6:45 Board of Directors .... Cavalier

5:05-6:45 PMIL Committee .... Renaissance

7:00-9:00 Bayer Crop Science/BASF Evening Meal .... Ballroom ABC

Program Highlights
Thursday, July 10

6:30-7:30 APRES Fun Run/Walk .... Hotel Lobby

7:00-12:00 APRES Registration .... Ballroom Foyer

8:00-4:30 Spouses' Hospitality Room .... Patio Room

Morning

8:00-9:45 Joe Sugg Graduate Student Competition .... Ballroom AB

9:45-10:15 BREAK .... Pre-function area

10:15-11:45 Joe Sugg Graduate Student Competition (cont.) .... Ballroom AB

11:45-1:00 LUNCH

Afternoon

Concurrent Sessions

1:00-3:15 Weed Science and Entomology .... Ballroom C

1:00-3:15 Plant Pathology and Nematology II .... Minuet

1:00-3:15 Breeding, Biotechnology and Genetics II .... Ballroom AB

1:00-3:15 Economics, Processing and Utilization .... Cavalier

3:15-3:30 BREAK .... Pre-function area

POSTER SESSION

4:45-5:45 Authors Present .... Pre-function area

Evening

5:00-6:00 APRES Business Meeting .... Minuet

6:00-7:00 Dow AgroSciences Awards Ceremony and Reception .... Minuet and Patio

7:00 ADJOURN .... DINNER ON YOUR OWN

OPENING SESSION

Moderator: ***Naveen Puppala, APRES President-Elect***
Meeting Room: ***Ballroom AB***

8:00 Call to Order .... **Timothy Brenneman**
APRES President

8:05 Welcome to San Antonio .... **Jody Hall**
Director of Global Sourcing, H-E-B Grocery

8:20 Agriculture: What the World Needs Now More Than Ever .... **Lowell B. Catlett**
Dean, College of Agricultural Consumer
& Environmental Sciences, New Mexico State University

8:50 Welcome from the Texas A&M University System.......... **Doug Steele**
Director, Texas A&M AgriLife Extension

9:05 Update on the Texas Peanut Industry .... **Shelly Nutt**
Executive Director, Texas Peanut Producer Board

9:15-9:45 BREAK

OPENING SESSION

Moderator: ***Jason Woodward, Texas A&M AgriLife Extension***
Meeting Room: ***Ballroom AB***

9:45 Overview of Texas Agriculture .... **Todd Staples**
Commissioner
Texas Department of Agriculture

10:10 Implications for Peanuts in the New Farm Bill........ **Joe Outlaw**
Co-Director, Texas A&M University
Agricultural and Food Policy Center

10:35 The Progress of the Peanut Genomics Initiative........ **David Bertiolli**
Professor of Genetics,
University of Brasilia

11:00 International Exploits of a Peanut Pathologist .... **Bob Kemerait**
Extension Plant Pathologist,
University of Georgia – Tifton

11:25 The Texas Irrigation Situation .... **David Brauer**
Research Agronomist,
USDA Conservation and Production Laboratory

11:50 Announcements........ **Jason Woodward**
Chair, Technical Program

11:50-1:00 LUNCH

THE STATUS AND PROSPECTIVE OF PEANUT PHENOTYPING

Organizers: ***Charles Chen, Auburn University and Corley Holbrook, USDA-ARS***
Meeting Room: ***Ballroom AB***

1:00 (1) **Advances in Phenotyping of Functional Traits in the Field Crops.** C.Y. CHEN*, Department of Crop, Soil and Environmental Sciences, Auburn University, Auburn, AL; C.L. Butts and P.M. DANG, USDA-ARS, National Peanut Research Lab, Dawson, GA; M.L. WANG, USDA-ARS, Plant Genetic Resources Conservation Unit, Griffin, GA.

1:15 (2) **Genetic Resources for Phenotyping.** C. C. HOLBROOK*, USDA-ARS, Tifton, GA; T. G. ISLEIB, North Carolina State Univ., Raleigh, NC; P. OZIAS-AKINS, Y. CHU, Univ. of Georgia, Tifton, GA, S. J. KNAPP; Monsanto, Woodland, CA; B. TILLMAN, University of Florida, Marianna, FL; B. GUO, USDA-ARS, Tifton, GA; N. A. BARKLEY, USDA-ARS, Griffin, GA; C. CHEN, Auburn University, Auburn, AL; and M. D. BUROW, Texas A&M AgriLife Research, Lubbock, TX.

1:30 (3) **Phenotyping for Foliar Disease Resistance.** A. K. CULBREATH*, Dept. of Plant Pathology, University of Georgia, Tifton, GA; C. C. HOLBROOK, and B. GUO, USDA-ARS, Tifton, GA; P. OZIAS-AKINS, Y. CHU, R. GILL, and J. Clevenger, Univ. of Georgia, Tifton, GA; T. B. BRENNEMAN, Dept. of Plant Pathology, University of Georgia, Tifton, GA; and T. G. ISLEIB, North Carolina State Univ., Raleigh, NC

1:45 (4) **Phenotyping Peanut Diseases caused by Soilborne Pathogens.** T. B. BRENNEMAN, Dept. of Plant Pathology, University of Georgia, Tifton, GA; B. Tillman and N. Dufault, University of Florida, Gainesville, FL.

2:00 (5) **Phenotyping for Abiotic Stress Tolerance.** M. D. BUROW*, J. CHAGOYA, M. GOMEZ S., Texas A&M AgriLife Research, Lubbock, TX, and Texas Tech University, Department of Plant and Soil Science, Lubbock, TX; P. PAYTON, G. BUROW, J. BURKE, USDA-ARS-CSRL, Lubbock, TX; K. KOTTAPALLI, Texas Tech University, Department of Plant and Soil Science, Lubbock, TX; N. PUPPALA, Agricultural Science Center, New Mexico State University, Clovis, NM; C. CHEN, Auburn University, Auburn, Alabama; P. DANG, USDA-ARS, Dawson, GA; D. ROWLAND, University of Florida, Gainesville, FL; C. HOLBROOK, USDA-ARS, Tifton, GA; S. LEAL-BERTIOLI, D. BERTIOLI, Empresa Brasileira de Pesquisa Agropecuaria, Recursos Geneticos e Biotecnologia, Brasilia DF, BRAZIL; H. D. UPADHYAYA, V. VADEZ, International Crops Research Institute for the Semi-Arid Tropics, Patancheru, Andhra Pradesh, India.

2:15 (6) **Potential Tools for Phenotyping for Physical Characteristics of Plants, Pods, and Seed.** C.L. BUTTS*, USDA, ARS, National Peanut Research Laboratory, Dawson, GA C.C. HOLBROOK, USDA, ARS, Crop Genetics and Breeding Research, Tifton, GA; M.C. LAMB, USDA, ARS, National Peanut Research Laboratory, Dawson, GA; and C.Y. CHEN, Crop, Soil & Environmental Sciences, Auburn University, Auburn, AL.

2:30 (7) **Phenotyping for Peanut Flavor.** T.G. ISLEIB, H.E. PATTEE, and S.C. COPELAND, Dept. of Crop Science, N.C. State Univ., Raleigh, NC; and T.H. SANDERS, L.O. DEAN, and K.W. HENDRIX, USDA-ARS Market Quality and Handling Research Unit, Raleigh, NC.

2:45 (8) **Phenotyping Peanut Seed Composition.** L. L. DEAN*, K. W. HENDRIX, and T. H. SANDERS, Market Quality and Handling Research Unit, USDA, ARS, Raleigh, NC; and C. M. KLEVORN, Department of Food, Bioprocessing, and Nutrition Sciences, North Carolina State University, Raleigh, NC.

3:00 (9) **Phenotyping Data Management.** H. VALENTINE*, The Peanut Foundation, Jasper, GA.

3:15-3:45 BREAK

BAYER EXCELLENCE IN EXTENSION AND EXTENSION TECHNIQUES

Moderator: *Keith Rucker, Bayer CropScience*
Meeting Room: *Minuet*

1:00 (10) **On-Farm Evaluation of a Seed Treatment and In-Furrow Granular Insecticide for Thrips and TSWV Management in Virginia and Runner-Type Peanuts.** J. K. CROFT*, Orangeburg County Clemson Extension Service, Orangeburg, SC; W. S. MONFORT, Edisto REC, Clemson University, Blackville, SC; P. DEHOND, Darlington County Clemson Extension Service, Darlington, SC; J. STOKES, Florence County Clemson Extension Service, Florence, SC.

1:15 (11) **Multi-Year (2009-2012) Research of In-Furrow and Topical Prothioconazole Treatments on Severity of Cylindrocladium Black Rot and White Mold Diseases of Peanut.** W. G. TYSON*, University of Georgia Cooperative Extension, Effingham County, Springfield, GA; and R. C. KEMERAIT, University of Georgia, Department of Plant Pathology, Tifton, GA.

1:30 (12) **Experiences and Results from Regional Peanut Field Days in Southeastern North Carolina.** R. HARRELSON*, D. L. JORDAN, P. D. JOHNSON, R. L. BRANDENBURG, and B. B. SHEW, North Carolina Cooperative Extension Service, Raleigh, NC; B. SUTTER, North Carolina Peanut Growers Association, Nashville, NC; and L. RANSOM, North Carolina Department of Agriculture and Consumer Services, Whiteville, NC.

1:45 (13) **Pest and Management Considerations for Peanut Production in West Texas.** K. S. SIDERS*, Texas A&M AgriLife Extension, Levelland, TX; and J. E. WOODWARD, Texas A&M AgriLife Extension, Lubbock, TX.

2:00 (14) **2013 Evaluation of In-Furrow and Foliar Fungicides for Disease Control of Peanut in Jay, Florida.** J. D. ATKINS*, D. E. P. TELENKO, L. JOHNSON, University of Florida, Jay, FL.

2:15 (15) **Survey of Key Production and Pest Management Practices in Peanut in North Carolina and Virginia during 2013.** J. MORGAN*, M. CARROLL, P. SMITH, R. RHODES, A. COCHRAN, A. BRADLEY, W. DRAKE, C. ELLISON, A. WHITEHEAD, C. TYSON, M. SMITH, T. BRITTON, N. HARRELL, C. FOUNTAIN, R. THAGARD, M. MALLOY, L. GRIMES, M. SHAW, R. HARRELSON, D. JORDAN, P. JOHNSON, R. BRANDENBURG, B. SHEW, K. WELLS, M. PARRISH, G. SLADE, J. SPENCER, J. REITER, B. COUNCIL, W. MARCUS, M. BALOTA, A. HERBERT, and H. MEHL.

2:30 (16) **Irrigated Evaluation of Six Peanut Varieties in Jenkins County, Georgia.** W.B. PARKER*, University of Georgia Cooperative Extension, Millen, GA; J. ARNOLD, J. P. BEASLEY and J.

E. PAULK, University of Georgia, Department of Crop and Soil Science, Tifton, GA.

2:45 (17) **<u>Extension Focuses on Peanut Education in Irwin County, Georgia.</u>** P. EDWARDS*, University of Georgia Cooperative Extension, Ocilla, GA.

3:00 (18) **<u>Classroom Instruction on Peanut Production to Elementary Children in Jeff Davis County, Georgia.</u>** T. VARNEDORE* and S. MARCHANT, University of Georgia Cooperative Extension, Hazlehurst, GA.

3:15-3:45 BREAK

PRODUCTION TECHNOLOGY

Moderator: ***Todd Baughman, Oklahoma State University***
Meeting Room: ***Ballroom C***

3:45 (19) **Effect of Plant Population and Replant Method on Peanut Production.** J. M. SARVER*, R. S. TUBBS, A. K. CULBREATH, N. B. SMITH, University of Georgia, Tifton, GA; J. P. BEASLEY JR., Auburn University, Auburn, AL; D. L. ROWLAND, University of Florida, Gainesville, FL.

4:00 (20) **Economic Assessment of the Peanut Replant Decision.** C. J. RUIZ*, College of Agricultural and Applied Economics, University of Georgia, Athens, GA; N. B. SMITH, J.M. SARVER, and R.S. TUBBS, University of Georgia, Tifton, GA.

4:15 (21) **Rate and Timing of Ammonium Sulfate Application on Peanut after an Inoculant Failure.** R. S. TUBBS*, and G. H. HARRIS, Crop and Soil Sciences Dept., University of Georgia, Tifton, GA.

4:30 (22) **Variable Depth Peanut Digger.** J. S. THOMAS*, K. R. Kirk, W. S. MONFORT, A. C. WARNER, Y. J. HAN, H. F. MASSEY, Clemson University, Edsito REC, Blackville, SC.

4:45 (23) **Peanut Response to Tillage and Rotation in North Carolina.** D. L. JORDAN* and P. D. JOHNSON, Department of Crop Science, North Carolina State University, Raleigh, NC; B. B. SHEW, Department of Plant Pathology, North Carolina State University, Raleigh, NC; R. L. BRANDENBURG, Department of Entomology, North Carolina State University, Raleigh, NC; and T. CORBETT and C. BOGLE, North Carolina Department of Agriculture and Consumer Services, Raleigh, NC.

SEED TECHNOLOGY AND PHYSIOLOGY

Moderator: *Brent Besler, Syngenta Crop Protection*
Meeting Room: *Cavalier*

3:45 (24) **Four-Year Performance of CruiserMaxx Peanuts®: An Insecticide Seed Treatment from Syngenta.** W. FAIRCLOTH*, H. MCLEAN, and S. MARTIN, Syngenta, Greensboro, NC.

4:00 (25) **Effect of Planting Date on Growth and Production of Virginia-type Cultivars and Breeding Lines.** M. BALOTA*, Tidewater Agric. Res. & Ext. Center, Virginia Tech, Suffolk, VA; T. G. ISLEIB, Department of Crop Sciences, North Carolina State University, Raleigh, NC; and S. P. TALLURY, Pee Dee Res. & Educ. Center, Clemson University, Florence, SC.

4:15 (26) **Maturity and Development of the High Oleic Trait in Different Peanut Market Types.** L. L. DEAN*, K. W. HENDRIX, and T. H. SANDERS, Market Quality and Handling Research Unit, USDA, ARS, Raleigh, NC; and C. M. KLEVORN, Department of Food, Bioprocessing, and Nutrition Sciences, North Carolina State University, Raleigh, NC; and C. C. Holbrook, Crop Breeding and Genetics Research Unit, Tifton, GA.

4:30 (27) **Effect of Elevated Growth Temperature on Acclimation Capacity to Water Deficit Stress.** P. PAYTON*, J. MAHAN, USDA-ARS Cropping Systems Research Laboratory, Lubbock, TX; K. R. KOTTAPALLI, Center of Genomics and Biotechnology, Texas Tech University, Lubbock, TX; G. WRIGHT, Peanut Company of Australia, Kingaroy, QLD; R. C. N. RACHAPUTI, Center for Plant Science, Univ. of Queensland, Brisbane St Lucia, QLD; D. Rowland, Agronomy Dept., Univ. of Florida, Gainesville, FL; and J. MOSEL, D. TISSUE, Hawkesbury Institute for the Environment, Univ. of Western Australia, Richmond, NSW.

4:45 (28) **Soluble Leaf Carbohydrates as Indicators of Drought-Stress Response in Runner Peanuts.** M. ROY, Crop, Soil and Environmental Science Department, Auburn University, Auburn AL; P. DANG, USDA-ARS National Peanut Research Lab, Dawson, GA; C. CHEN and J. HOWE*, Crop, Soil, and Environmental Science Department, Auburn University, Auburn, AL.

PLANT PATHOLOGY AND NEMATOLOGY I

Moderator*:** ***John Damicone, Oklahoma State University
Meeting Room*:** ***Minuet

3:45 (29) **Calcium Nutrition on Peanut: Beyond Lime and Gypsum.** G.H. HARRIS*, Dept. of Crop and Soil Sciences, University of Georgia, Coastal Plain Experiment Station, Tifton, GA; and J. HOWE, Crop, Soil, and Environmental Science Department, Auburn University, Auburn, AL.

4:00 (30) **Stem Rot (White Mold) and Tomato Spotted Wilt Disease Resistance among Peanut Genotypes.** W. D. BRANCH*, Dept. of Crop and Soil Sciences and T. B. BRENNEMAN, Plant Pathology, University of Georgia, Coastal Plain Experiment Station, Tifton, GA.

4:15 (31) **Greenhouse-Based Inoculation Methods for Sclerotinia Blight Resistance in Peanut.** R. S. BENNETT * and K. D. CHAMBERLIN, USDA-ARS, Wheat, Peanuts and Other Field Crops Research Unit, Stillwater, OK.

4:30 (32) **Assessment of Peanut Seedlings for Resistance *Rhizoctonia solani*.** J. E. WOODWARD*, Texas A&M AgriLife Extension Service and Plant and Soil Science, Texas Tech University, Lubbock, TX; M. R. BARING, Soil and Crop Science Department, Texas A&M University, College Station, TX; and T. A. WHEELER, Texas A&M AgriLife Research, Lubbock, TX.

4:45 (33) **Effect of Application Pressure and Water Volume on Azoxystrobin Concentration on Peanut Foliage and Soil.** T. A. WHEELER*, Texas A&M AgriLife Research, Lubbock, TX; M. G. ANDERSON, Texas A&M AgriLife Extension Service, Seminole, TX; S. A. RUSSELL Texas A&M AgriLife Extension Service, Brownfield, TX; and J. E. WOODWARD, Texas A&M AgriLife Extension Service, Lubbock, TX.

BREEDING, BIOTECHNOLOGY AND GENETICS I

Moderator: ***Michael Baring, Texas A&M AgriLife Research***
Meeting Room: ***Ballroom AB***

3:45 (34) **Cross Compatibility Studies in *Arachis* Wild Species to Identify New Species.** C. E. SIMPSON*, Texas A&M AgriLife Research, Stephenville, TX; J. F. M. VALLS, Curator of *Arachis* wild species, EMBRAPA/CENARGEN. Brasilia, DF, Brazil; J. M. CASON and B. D. BENNETT, Texas A&M AgriLife Research, Stephenville.

4:00 (35) **Recovery and Purification of Spanish High Oleate Peanut 'AT-9899'.** Z. B. CHEN, Dept. of Crop Sciences, the University of Georgia, Griffin, GA; M. L. WANG, USDA-ARS, Plant Genetic Resources Conservation Unit, Griffin, GA; M. C. LAMB and P. M. DANG, USDA-ARS, National Peanut Research Lab, Dawson, GA; J. BOSTICK, Alabama Crop Improvement Association, Headland, AL; and C. Y. CHEN*, Department of Crop, Soil and Environmental Sciences, Auburn University, Auburn, AL.

4:15 (36) **Development and Utilization of InDel Markers to Identify Peanut (*Arachis hypogaea* L.) Disease Resistance.** P. M. DANG*, USDA-ARS, National Peanut Research Laboratory, Dawson, GA; L. LIU, Department of Agronomy, Agricultural University of Hebei, Baoding, China; C. Y. CHEN, Department of Agronomy and Soils, Auburn University, Auburn, AL.

4:30 (37) **Effects of Cool and Warm Locations on Fatty Acid Profiles in the Uniform Peanut Performance Test.** S. C. COPELAND*, and T. G. ISLEIB, Dept. of Crop Science, N.C. State Univ., Raleigh, NC; and T. H. SANDERS, L. O. DEAN, and K. W. HENDRIX, USDA-ARS Market Quality and Handling Research Unit, Raleigh, NC.

4:45 (38) **Characterization of the Thermal Acclimation Response in Peanut: Physiology, Transcript, and Metabolic Profiling of two Contrasting U.S. Mini-Core Accessions at Reproductive Growth Stage.** P. PAYTON*, J. MAHAN, J. BURKE, USDA-ARS Cropping Systems Research Laboratory, Lubbock, TX; K. R. KOTTAPALLI, Center of Genomics and Biotechnology, Texas Tech University, Lubbock, TX; M. BUROW, Texas A&M AgriLife Research, Lubbock, TX; N. PUPPALA, New Mexico State University Ag. Science Center, Clovis, NM.

JOE SUGG GRADUATE STUDENT COMPETITION

Moderator: ***Bob Kemerait, University of Georgia***
Meeting Room: ***Ballroom AB***

8:00 (39) **Influence of Planting Date on Peanut Response to Selected Pest Management Practices.** M. D. INMAN*, D. L. JORDAN, and P. D. JOHNSON, Department of Crop Science, North Carolina State University, Raleigh, NC; R. L. BRANDENBURG, Department of Entomology, North Carolina State University, Raleigh, NC; and B. B. SHEW, Department of Plant Pathology, North Carolina State University, Raleigh, NC.

8:15 (40) **Row Pattern, and Row Spacing Effects in Peanut.** M. T. PLUMBLEE*, R. S. TUBBS, The University of Georgia, Department of Crop and Soil Sciences, Tifton, GA.

8:30 (41) **Maturity Effects on Contamination of High-Oleic Peanut Lots with Normal-Oleic Seeds of a Large Seeded Virginia Type Peanut Variety.** C. M. KLEVORN*, K. W. HENDRIX, T. H. SANDERS, L. L. DEAN, Market Quality and Handling Unit, USDA-ARS, Raleigh, NC; and N. A. BARKLEY, Plant Genetic Resources Conservation Unit, USDA-ARS, Griffin, GA.

8:45 (42) **Influence of Peg Strength and Maturity on Tifguard Yield and Digging Loss.** B. COLVIN*, D. ROWLAND, J. FERRELL, A. CULBREATH, and J. ERICKSON Agronomy Department, The University of Florida, Gainesville, FL and Department of Plant Pathology, The University of Georgia, Tifton, GA.

9:00 (43) **Fungicide Sensitivity of *Sclerotium rolfsii* Isolates from Florida Peanut Fields.** K. KHATRI* and N. S. DUFAULT, Plant Pathology Department, University of Florida, Gainesville, FL.

9:15 (44) **Leaf Drop in the Phyllosphere: Comparing the Contribution of Early and Late Leaf Spot.** A. FULMER*, A. CULBREATH, and R. KEMERAIT, JR., Department of Plant Pathology, The University of Georgia, Tifton, GA.

9:30 (45) **Chemical Properties and Sensory Analysis of Equivalently Roasted Peanuts using an Industrial Relevant Roaster.** X. SHI*, Department of Food, Bioprocessing and Nutrition Sciences, North Carolina State University, Raleigh, NC; L. O. Dean, T. H.SANDERS, J. P.DAVIS, USDA ARS, Market Quality and Handling Research Unit, Raleigh, NC.

9:45-10:15 BREAK

10:15 (46) **Development of Molecular Markers for Blanchability in the US Minicore.** D. J. O'CONNOR*, R. C. N. RACHAPUTI, R. J. HENRY, A. FURTADO, Queensland Alliance for Agriculture and Food Innovation, The University of Queensland, St Lucia, QLD; and G. C. WRIGHT, Peanut Company Australia, Kingaroy, QLD.

10:30 (47) **Screening for Drought Tolerance, Nematode Resistance and the High Oleic Trait by Marker-Assisted Breeding.** J. C. CHAGOYA*, Texas A&M AgriLife Research, Lubbock, TX and Department of Plant and Science, Texas Tech University, Lubbock, TX; R. CHOPRA, Department of Plant and Science, Texas Tech University, Lubbock, TX; M. R. BARING, Texas A&M AgriLife Research, College Station, TX; and M. D. BUROW, Texas A&M AgriLife Research, Lubbock, TX and Department of Plant and Science, Texas Tech University, Lubbock, TX.

10:45 (48) **Genotypic Response of Peanut to Optimum and Limited Irrigation.** J. HAWKINS*, C. DENBOW, and G. PILOT, Plant Pathology, Physiology and Weed Science Department, Virginia Polytechnic Institute and State University, VA; H. FRAME, Crop, Soil, and Environmental Science Department, Virginia Polytechnic Institute and State University, VA; and M. BALOTA, Pathology, Physiology and Weed Science Department, Virginia Polytechnic Institute and State University, Tidewater Agricultural Research and Extension Center, VA

11:00 (49) **Identifying SSR Markers Linked to TSWV Resistance in Peanut Cultivar, Florida-EPTM'113'.** Y-C. TSENG*, B. L. TILLMAN, North Florida REC, Agronomy Department, University of Florida, Marianna, FL; and J. WANG, Agronomy Department, University of Florida, Gainesville, FL.

11:15 (50) **Validation of Illumina-generated Inter-specific SNPs in Peanut.** R. CHOPRA*, Dept. of Plant and Soil Sciences, Texas Tech University, Lubbock, TX; G. BUROW, USDA-ARS-CSRL, Lubbock, TX; A. FARMER, National Center for Genome Resources, Santa Fe, NM; J. A. MUDGE, National Center for Genome Resources, Santa Fe, NM; C. E. SIMPSON Texas A&M AgriLife Research, Stephenville, TX; and M.D. BUROW Texas A&M AgriLife Research, Lubbock, TX, and Dept. of Plant and Soil Sciences, Texas Tech University, Lubbock, TX.

11:30-1:00 LUNCH

WEED SCIENCE AND ENTOMOLOGY

Moderator: ***Peter Dotray, Texas Tech University***
Meeting Room: ***Ballroom C***

1:00 (51) **Peanut Injury and Yield as Affected by Exposure to 2,4-D and Dicamba.** B. BRECKE*, R. LEON, West Florida Research and Education Center, University of Florida, Jay, FL; and J. FERRELL, Agronomy Department, University of Florida, Gainesville, FL.

1:15 (52) **New Peanut Cultivar Response to Paraquat Applications.** E. P. PROSTKO*, Department of Crop & Soil Sciences, The University of Georgia, Tifton, GA.

1:30 (53) **Characterizing Variability in Postemergence Herbicide Tolerance in Peanut Breeding Lines.** R. G. LEON*, West Florida Research and Education Center, University of Florida, Jay, FL; and B. TILLMAN, North Florida Research and Education Center, University of Florida, Marianna, FL.

1:45 (54) **Peanut Tolerance to ET Applied Postemergence.** R. M. MERCHANT*, P. A. DOTRAY, Plant and Soil Science, Texas Tech University, Lubbock, TX; and W. J. GRICHAR, Soil and Crop Sciences, Texas A&M University, College Station, TX.

2:00 (55) **Performance of Besiege™ Insecticide on key Lepidopteran Pests of Peanuts.** V. MASCARENHAS*, H. MCLEAN and J. KOENIG, Syngenta Crop Protection, Greensboro, NC .

2:15 (56) **The Role of Winter Weed Flora on Tomato Spotted Wilt Virus Epidemics in Georgia with Emphasis on Peanut.** R. SRINIVASAN*, D. RILEY, S. DIFFIE, A. SHRESTHA, University of Georgia, Department of Entomology, Tifton, GA; and A. Culbreath, University of Georgia, Department of Plant Pathology, Tifton, GA.

2:30 (57) **Evaluating Thrips Management Strategies in North Carolina and Virginia.** R. L. BRANDENBURG, Department of Entomology, N. C. State University, Raleigh, NC; D. A. HERBERT, JR., Department of Entomology, Virginia Tech, Suffolk, VA; D. L. JORDAN, Department of Crop Science, N. C. State Univ., Raleigh, NC; B. R. ROYALS, Department of Entomology, N. C. State Univ., Raleigh, NC; and S. MALONE, Department of Entomology, Virginia Tech, Suffolk, VA; P. D. Johnson, Department of Crop Science, N. C. State Univ., Raleigh, NC.

2:45 (58) **Multi-State Evaluation of a Seed Treatment and In-Furrow Granular Insecticide for Thrips and TSWV Management in Virginia and Runner-Type Peanut.** W. S. MONFORT*, Edisto REC, Clemson University, Blackville, SC; A. HERBERT, Tidewater AREC, Virginia Tech, Suffolk, VA ; D. JORDAN, Dept. of Crop Science, North Carolina State University, Raleigh, NC; R. BRANDENBURG,

Dept. of Entomology, North Carolina State University, Raleigh, NC; J. BEASLEY, Dept. of Crop, Soil and Environmental Sciences, Auburn University, Auburn, AL; M. ABANEY, Dept. of Entomology, University of Georgia, Tifton, GA; R. SRINIVASAN, Dept. of Entomology, University of Georgia, Tifton, GA; and A. CULBREATH, Dept. of Plant Pathology, University of Georgia, Tifton, GA.

3:00-3:45 BREAK

PLANT PATHOLOGY AND NEMATOLOGY II

Moderator*:** ***Jason Woodward, Texas A&M AgriLife Extension
Meeting Room*:** ***Minuet

1:00 (59) **Evaluating Peanut Genotypes for Drought Tolerance and Aflatoxin Contamination.** J. M. LUIS*, Department of Plant Pathology, University of Georgia, Tifton, GA; P. OZIAS-AKINS, Department of Horticulture, University of Georgia, Tifton, GA; C. C. HOLBROOK, Crop Genetics and Breeding Research Unit, USDA-ARS, Tifton, GA; and, R. C. KEMERAIT, JR., Department of Plant Pathology, University of Georgia, Tifton, GA.

1:15 (60) **Recent Advances for Management of *Meloidogyne arenaria* on Peanut in Georgia.** R. C. KEMERAIT and T. B. BRENNEMAN, Dept. of Plant Pathology, University of Georgia, Tifton, GA.

1:30 (61) **Comparison of Georgia-06G and Georgia-12Y with Seven Levels of Fungicide Inputs.** T. B. BRENNEMAN*, Department of Plant Pathology; W. D. BRANCH, Department of Crop and Soil Science; and A. K. CULBREATH, Department of Plant Pathology, University of Georgia, Tifton, GA.

1:45 (62) **Evaluation of Fungicide Programs for Control of Early Leaf Spot and Stem Rot of Peanut in Oklahoma.** J. P. DAMICONE* and T. J. PIERSON, Department of Entomology and Plant Pathology, Oklahoma State University, Stillwater, OK.

2:00 (63) **Effect of Phorate Insecticide on Tomato Spotted Wilt in New Field Resistant Peanut Cultivars.** A. K. CULBREATH*, Dept. of Plant Pathology, University of Georgia, Tifton, GA; R. SRINIVASAN and M. R. ABNEY, Dept. of Entomology, University of Georgia, Tifton, GA; W. D. BRANCH, Dept. of Crop and Soil Science, University of Georgia, Tifton; C. C. HOLBROOK, USDA-ARS, Coastal Plain Experiment Station, Tifton, GA; and B. TILLMAN, North Florida Research and Education Center, University of Florida, Marianna, FL.

2:15 (64) **Seeding Rate Impact on Diseases and Yield of Selected Runner Peanut Cultivars in a Rainfed Production System in Southwest Alabama.** A. K. HAGAN*, H. L. CAMPBELL, K. L. BOWEN. Auburn University, AL; L. WELLS. Wiregrass Research and Extension Center, Headland, AL.

2:30 (65) **Initial Evaluation of a Weather Based Decision Support System for Early Season Fungicide Sprays of *Sclerotium rolfsii* in Peanuts.** N. S. DUFAULT* The Dept. of Plant Pathology, University of Florida, Gainesville, FL; R. L. BAROCCO, The Doctor of Plant Medicine Program, University of Florida, Gainesville, FL.

2:45 (66) <u>Initial Evaluations of Solatenol ™ Fungicide - A New SDHI Fungicide for Peanut.</u> H. MCLEAN, V. MASCARENHAS, K. Buxton, and A. H. TALLY. Syngenta Crop Protection, LLC, Greensboro, NC.

3:00-3:45 BREAK

BREEDING, BIOTECHNOLOGY AND GENETICS II

Moderator*:** ***Kelly Chamberlin, USDA-ARS, Stillwater, OK
Meeting Room*:** ***Ballroom AB

1:00 (67) **Single Nucleotide Polymorphism (SNP) Detection in Cultivated Peanut Using the Diploid Wild Progenitor Reference Genomes.** J. CLEVENGER*, Y. GUO, and P. OZIAS-AKINS, Institute of Plant Breeding, Genetics & Genomics, University of Georgia, Tifton, GA.

1:15 (68) **Genetic Mapping of *FAD2* Genes and their Relative Contribution towards Oil Quality in Peanut (*Arachis hypogaea* L.).** M. K. PANDEY, H. WANG, L. QIAO, S. FENG, P. KHERA*, A. K. CULBREATH, University of Georgia, Department of Plant Pathology, Tifton, GA; M. L. WANG, N. A. BARKLEY, USDA-ARS, Plant Genetics Resources Conservation Unit, Griffin, GA; J. WANG, University of Florida, Department of Agronomy, Gainesville, FL; C. C. HOLBROOK, USDA-ARS, Crop Genetics and Breeding Research Unit, Tifton, GA; M. K. PANDEY, P. KHERA, R. K. VARSHNEY, International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), Patancheru, India; B. Z. GUO, USDA-ARS, Crop Protection and Management Research Unit, Tifton, GA.

1:30 (69) **Genotype-by-Irrigation Interaction in the Georgia State Peanut Trials.** T. G. ISLEIB* and S. C. COPELAND, Dept. of Crop Science, N.C. State Univ., Raleigh, NC; J. GASSETT, Dept. of Crop and Soil Sci., Univ. of Georgia, Griffin, Georgia; and W. D. BRANCH and A. E. COY, Dept. of Crop and Soil Sci., Coastal Plain Exp. Sta., Univ. of Georgia, Tifton, GA .

1:45 (70) **Pedigree of Southeastern Runner Peanut Cultivars and the Potential for Yield Improvement.** B. L. TILLMAN*, North Florida REC, Agronomy Department, University of Florida, Marianna, FL.

2:00 (71) **Phenotypic, Biochemical, and Genetic Characterization of the U.S. Peanut Core Collection.** N. A. BARKLEY*, USDA ARS PGRCU Griffin, GA; G. E. MACDONALD, Agronomy Department, University of Florida, Gainesville, FL; B.L. Tillman Agronomy Department, University of Florida Marianna, FL; and C.C. Holbrook USDA ARS Crop Genetics and Breeding, Tifton, GA .

2:15 (72) **Identification of Additional FAD2 Genes plus DGAT Genes in Peanut, and Mapping of QTLs for Fatty Acid Composition in Peanut.** M. D. BUROW*, Texas A&M AgriLife Research, Lubbock, TX, and Texas Tech University, Department of Plant and Soil Science, Lubbock, TX; R. CHOPRA, Texas Tech University, Department of Plant and Soil Science, Lubbock, TX 79409; J. CHAGOYA, Texas A&M AgriLife Research, Lubbock, TX; B. S. VIDIGAL, Universidade de Brasília, Departamento de Biologia Celular, Brasilia, DF, Brazil; S. C. M. LEAL-BERTIOLI, M. C. MORETZSOHN, and P. GUIMARÃES MESSENBERG, Empresa Brasiliera de Pesquisa Agropecuária, Recursos Genéticos e Biotecnologia, Brasília, DF Brazil; and D. J. BERTIOLI, Universidade de Brasília, Campus Universitário, Brasília, DF Brazil.

2:30 (73) **Genetic Mapping and QTL Analysis for Oil Concentration in Peanut.** J. N. WILSON*, Texas A&M AgriLife Research, College Station, TX; R. CHOPRA, Texas Tech University, Department of Plant and Soil Science, Lubbock, TX; M. R. BARING, Texas A&M AgriLife Research, College Station, TX; M. S. GOMEZ, Texas A&M AgriLife Research, Lubbock, TX 79403; C. E. SIMPSON, Texas A&M AgriLife Research, Stephenville, TX; J. C. CHAGOYA and M. D. BUROW, Texas A&M AgriLife Research, Lubbock, TX; and Texas Tech University, Department of Plant and Soil Science, Lubbock, TX.

2:45 (74) **Candidate SNP Markers for High Oleate Content in Peanut.** Y. Y.TANG, C. T.WANG, X. Z.WANG, Q. WU and Q. X. SUN, Shandong Peanut Research Institute (SPRI), Qingdao, China.

3:00-3:45 BREAK

ECONOMICS, AND PROCESSING AND UTILIZATION

Moderator: *Jack Shanklin, Birdsong Peanut Co.*
Meeting Room: *Cavalier*

1:00 **(75)** **2014 Farm Bill: More Flexibility and More Complicated.** N. B. SMITH, University of Georgia, Tifton, GA.

1:15 **(76)** **Consolidation and Concentration in the U.S. Peanut Industry.** F. D. MILLS, JR*, H. G. JACKSON ROE, K. E. WEBER, Department of Agricultural and Industrial Sciences, Sam Houston State University, Huntsville, TX.

1:30 **(77)** **An Economic Analysis of Alternatives Insecticide in the Management of Thrips and Tomato Spotted Wilt Virus in Peanut.** A. WRIGHT*, University of Georgia, Athens, N. B. SMITH, R. SIRINIVASAN , A. K. CULBREATH, R. C. KEMERAIT, R. S. TUBBS, University of Georgia, Tifton, GA; and A. K. HAGAN, Auburn University, Auburn, AL.

1:45 **(78)** **Simple Flotation Test for Raw Cotyledons Predicts Textural Attributes of Roasted Snack Peanuts.** D. A. SMYTH*, Kraft Foods, Planters R&D, East Hanover, NJ; and M. FRANKE, Birdsong Peanut Company, Brownfield, TX.

2:00 **(79)** **Survey of Postharvest Quality Characteristics During Long-Term Farmers Stock Storage.** C. L. BUTTS*, M. C. LAMB, USDA, ARS, National Peanut Research Laboratory, Dawson, GA; and T. H. SANDERS, USDA, ARS, Market Quality and Handling Research Unit, Raleigh, NC.

2:15 **(80)** **Structural and Anti-glycative Activities Characterization of the Phytochemicals Extracted from Different-colored Peanut Skins.** S. H. WANG, J. C. CHANG and R. Y. Y. CHIOU*, Department of Food Science, National Chiayi University, Chiayi, Taiwan, ROC.

2:30 **(81)** **Germinated Peanut Kernels as a Potent Enzyme Source in Mediating Resveratrol Dimerization.** P. C. CHIU*, Y. J. LI, Department of Applied Chemistry, Chiayi, National Chiayi University; and R. Y. Y. CHIOU, Department of Food Science, National Chiayi University, Chiayi, Taiwan, ROC.

2:45 **(82)** **Process Optimization of Blister Fried Peanuts.** E. H. MCDOWELL, M. ADAMS, J. LILLEY, S. RENN, Y. THOR; North Carolina State University, Dept. of Food, Bioprocessing & Nutrition Sciences, Raleigh, NC; and B. L. WHITE, and J. P. DAVIS*, USDA ARS, Market Quality and Handling Research Unit, Raleigh, NC.

3:00 **(83)** **Evaluation of Flavor in Roasted Virginia- and Runner-type Peanut Breeding Lines.** H. E.

PATTEE*, T. G. ISLEIB, and S. C. COPELAND, Dept. of Crop Science North Carolina State University, Raleigh, NC; and T. H. SANDERS, L. O. DEAN, and K. W. HENDRIX, USDA-ARS Market Quality and Handling Research Unit, Raleigh, NC.

3:15-3:45 BREAK

POSTER SESSION

Facilitators: *John Cason, Texas A&M Research and Rebecca Bennett, USDA-ARS*
Location: *Pre-Function Area*

3:45-5:00

(84) **Undocumented Positive Traits Associated with Introgression of Root-knot Nematode Resistance from the Wild Species.** M. R. BARING*, Soil and Crop Sciences Dept., Texas A&M AgriLife Research, College Station, TX; C. E. SIMPSON, J. M. CASON, Soil and Crop Sciences Dept., Texas A&M AgriLife Research, Stephenville, TX; M. D. BUROW and J. E. WOODWARD, Soil and Crop Sciences Dept., Texas A&M AgriLife Research, Lubbock, TX.

(85) **Development of an Introgression Pathway for Resistance to *Sclerotium rolfsii* Sacc.** J. M. CASON*, B. D. BENNETT, C. E. SIMPSON, Texas A&M AgriLife Research, Stephenville, TX 76401; M. R. BARING, Department of Soil and Crop Science, Texas A&M University, College Station, TX 77843; and M. D. BUROW, Texas A&M AgriLife Research, Lubbock, TX, 79403, Department of Plant and Soil Science, Texas Tech University, Lubbock, TX, 79409.

(86) **QTL Mapping for Bacterial Wilt Resistance in Peanut (*Arachis hypogaea* L.)** Y. L. ZHAO, Tuskegee University, Tuskegee, AL; C. ZHANG, H. CHEN, Fujian Agriculture and Forestry University, Fuzhou, China; M. YUAN, Shandong Peanut Research Institute, Qingdao, China; R. NIPPER, Floragenex Inc., Portland, OR; C. S. PRAKASH, Tuskegee University, Tuskegee, AL; W. J. ZHUANG, Fujian Agriculture and Forestry University, Fuzhou, China; and G. H. HE*, Tuskegee University, Tuskegee, AL.

(87) **An Efficient Cotyledonary Node-based Organogenesis System for *Agrobacterium*-mediated Transformation of Peanut (*Arachis hypogaea* L.).** Y. F HSIEH*, J. WANG, Plant Molecular and Cellular Biology Program, University of Florida, Gainesville, FL; M. JAIN, Plant Pathology Department, University of Florida, Gainesville, FL; and M. GALLO, Molecular Biosciences and Bioengineering Department, University of Hawaii at Mānoa, Honolulu, HI.

(88) **Seed Proteome Responses to Water-deficit Stress: Merging Transcriptome and Proteome Data.** K. R. KOTTAPALLI, Center of Genomics and Biotechnology, Texas Tech University, Lubbock, TX; N. PUPPALA, New Mexico State University Ag. Science Center, Clovis, NM; P. HAYNES, Dept. of Chemistry and Biomolecular Sciences, Macquarie University, North Ryde, NSW; P. PAYTON, USDA-ARS Cropping Systems Research Laboratory, Lubbock, TX.

(89) **Identification of Quantitative Trait Loci (QTL) Controlling Important Fatty Acids in Peanut (*Arachis hypogaea* L.).** M. L. WANG, N. A. BARKLEY, USDA-ARS, Plant Genetics Resources Conservation Unit, Griffin, GA; M. K. PANDEY, H. WANG*, L. QIAO, S. FENG, P. KHERA, A. K. CULBREATH, the University of

Georgia, Department of Plant Pathology, Tifton, GA; J. WANG, the University of Florida, Department of Agronomy, Gainesville, FL; C. C. HOLBROOK, USDA-ARS, Crop Genetics and Breeding Research Unit, Tifton, GA; M. K. PANDEY, P. KHERA, R. K. VARSHNEY, International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), Patancheru, India; B. Z. GUO, USDA-ARS, Crop Protection and Management Research Unit, Tifton, GA.

(90) **Identification of SNP Markers and Candidate Genes for Branching Habit in Peanut by a Combination of RNA-Seq and Bulk Segregant Analysis.** G. KAYAM, A. FAIGENBOIM AND R. HOVAV*, Department of Field Crops, Plant Sciences Institute, ARO, Bet-Dagan, Israel.

(91) **Comparison of Germination and Freeze Damage for Lines of the Cultivar Bailey Expressing Differences in Fatty Acid Composition.** A. DE LUCA-WESTRATE*, D. L. JORDAN, R. P. PATTERSON, T. G. ISLEIB, S. C. COPELAND, and L. SNYDER. Department of Crop Science, North Carolina State University, Raleigh, NC.

(92) **Yield Combined Analysis of on Campus Four Years Evaluation of Peanuts Bred Lines in Southern Mexico.** S. SANCHEZ-DOMINGUEZ*, G. R. MORALES-ROMERO, C. SANCHEZ-ABARCA, Depto de Fitotecnia, Universidad Autónoma Chapingo, Chapingo Mex., 56230, and T. ISLEIB, North Carolina State University, Raleigh NC.

(93) **Release of OLé Spanish Peanut.** K. D. CHAMBERLIN*, R. S. BENNETT, H. A. MELOUK, USDA-ARS, Wheat, Peanut and Other Field Crops Research Unit, Stillwater, OK; J. P. DAMICONE, Department of Entomology and Plant Pathology, and C. B. GODSEY, Department of Plant and Soil Sciences, Oklahoma State University, Stillwater, OK.

(94) **Identification of SNP Markers and Candidate Genes for Branching Habit in Peanut by a Combination of RNA-Seq and Bulk Segregant Analysis.** G. KAYAM, A. FAIGENBOIM and R. HOVAV*, Department of Field Crops, Plant Sciences Institute, ARO, Bet-Dagan, Israel.

(95) **Relative Performance of Different Peanut Market-types in West Texas.** J. H. RAMIREZ*, J. E. WOODWARD, B. RODRIGUEZ, J. I. YATES, Texas A&M AgriLife Extension Service, Lubbock, TX; and M. R. BARING, Soil and Crop Science Department, Texas A&M University, College Station, TX.

(96) **Determination of Optimum Soil Moisture for Growth of *Aspergillus flavus*.** R. E. PREVATT, III* and K. L. BOWEN; Entomology and Plant Pathology, Auburn University, Auburn, AL.

(97) **Recovery of Peanut Yield from Short Rotations after Six Years of Corn, Cotton, Soybean, and Wheat Cropping Systems.** B. B. SHEW*, Department of Plant Pathology, North Carolina State University, Raleigh, NC; and D. L. JORDAN and P. D. JOHNSON, Department of Crop Science, North Carolina State University, Raleigh, NC; R. L. BRANDENBURG, Department of Entomology, North Carolina State University, Raleigh, NC; and T. CORBETT and C. BOGLE, North Carolina Department of Agriculture and Consumer Services, Raleigh, NC.

(98) **Impact of Planting Date, Cultivar, and Insecticides on Thrips, Diseases, and Yield of Peanut in Alabama.** H. L. CAMPBELL*, A. K. HAGAN, K. L. BOWEN, Dept. of Entomology and Plant Pathology, Auburn University, AL; and L. WELLS, Wiregrass Research and Extension Center, Fairhope, AL.

(99) **Peanut Tolerance to Preemergence herbicides.** T. A. BAUGHMAN*, Institute for Agricultural Biosciences, Oklahoma State University, Ardmore, OK; P. A. DOTRAY, Plant and Soil Science Department, Texas Tech University, Lubbock, TX; W. J. GRICHAR, Texas A&M AgriLife Research, Corpus Christi, TX.

(100) **Weed Response to Postemergence Herbicides when using Different Surfactants.** W. J. GRICHAR*, Texas A&M AgriLife Research, Corpus Christi, TX; P. A. DOTRAY, Texas A&M AgriLife Research, Lubbock, TX; and M. A. MATOCHA, Texas A&M AgriLife Extension Service, College Station, TX.

(101) **Peanut Response to Fluridone in North Carolina.** M. D. INMAN*, D. L. JORDAN, and P. D. JOHNSON, Department of Crop Science, North Carolina State University, Raleigh, NC.

(102) **Zidua Weed Management Systems in Peanut.** M. R. MANUCHEHRI*, P. A. DOTRAY, Plant and Soil Science Department, Texas Tech University, Lubbock, TX; W. J. GRICHAR, Texas A&M AgriLife Research, Corpus Christi, TX; T. A. BAUGHMAN, Institute for Agricultural Biosciences, Oklahoma State University, Ardmore, OK; T. S. MORRIS, R. M. MERCHANT, Plant and Soil Science Department, Texas Tech University, Lubbock, TX; and J. D. REED, BASF, Wollforth, TX.

(103) **Economics of an Inoculant Rescue Trial in Georgia.** A. R. SMITH*, N. B. SMITH, Department of Agricultural and Applied Economics, R. S. TUBBS, Department of Crop and Soil Sciences, University of Georgia, Tifton, GA.

(104) **In-furrow and Emergence Applications of Prothioconazole Fungicides for Control of Soilborne Diseases in Peanut.** H. L. MEHL* and P. M. PHIPPS, Tidewater Agr. Res. & Ext. Ctr., Virginia Tech, Suffolk, VA.

Summary

2014 APRES Annual Meeting

July 8-10 * San Antonio, TX

The 46th Annual Meeting of the American Peanut Research and Education Society (APRES) was held July 8-10, 2014 at the Menger Hotel in San Antonio, TX . Outgoing APRES President Tim Brenneman (University of Georgia) presided over the very well attended meeting of 261 attendees, including 188 members and 73 spouses and children.

Technical Program Chairman Jason Woodward (Texas A&M) arranged 106 presentations from peanut scientists around the world. Highlights of the program included opening addresses by:

Jody Hall, Director of Global Sourcing for H-E-B Grocery; welcomed the crowd to San Antonio. This locally based, privately-owned, high-end grocery chain of 350 stores shared their experiences on entering the peanut product category with H-E-B branded products (peanut butter, in-shells, roasted peanuts, granola bars…) that are giving category leaders a run for their money.

Lowell Catlett, Dean College of Agricultural, Consumer & Environmental Sciences, New Mexico State University gave a rousing and amusing presentation *on Agriculture: What the World Needs Now More Than Ever*, highlighting the greater role technology will play in the future.

Doug Steele, Director, Texas A&M AgriLife Extension, *Welcome from Texas A&M University System*, spoke on their motto of Extending knowledge, Providing Solutions through their programs of teaching, research, service, and extension education which focus on Building stronger communities; Feeding the world; Protecting the environment; Improving health and wellness; Enriching youth knowledge; and Growing the Texas economy.

Shelly Nutt, Executive Director, Texas Peanut Producers Board, *Update on the Texas Peanut Industry*, provided an overview of this year's Texas crop, stating acreage planted has held steady over the last 3-4 years. Crop conditions have improved in some areas as drought has lessened. The TPPB is focused on increasing Southwest peanut consumption, using social media tools such as Facebook, Twitter, You Tube to increase consumer awareness. Two new cookbooks are available for download from their website—*Good Nutrition {and a taste as big as Texas}* and *Peanuts & Diabetes*.

Todd Staples, Commissioner, Texas Department of Agriculture, *Overview of Texas Agriculture*, welcomed the group to Texas thanking the group for their contributions to agriculture. He noted the value of Texas agriculture on the Texas economy and well as its impact across the world. ($100 billion annually)

Joe Outlaw, Co-Director, Texas A&M University Agricultural and Food Policy Center, *Implications for Peanuts in the New Farm Bill*, gave a detailed overview for the Farm Bill as it relates to peanuts, which can be found at https://afpc.tamu.edu/pubs/7/647/new%20file.pdf.

Bob Kemerait, Extension Plant Pathologist, University of Georgia-Tifton, *International Exploits of a Peanut Pathologist,* shared his triumps, trials and travails of testing new products. He also shared early data results on Bayer's new seed treament nematicide (Velum Total). This biological based technology is showing positive results and potentially opening a new avenue for nematode control, which is greatly needed since the loss of Temik. Registration is pending, anticipating approval for 2015.

David Bertiolli, Professor of Genetics, University of Brasilia, *The Progress of the Peanut Genomics Initiative,*detailed the progress on sequencing the peanut genome, specifically how the completed genome sequences for the two parental diploid species will be useful in putting together the tetraploid hypogaea. They have completed progenitor wild species which they hope will lead to more rapid introgression of characteristics with high levels of resistance to all major peanut diseases.

David Brauer, Research Agronomist, USDA Conservation and Production Laboratory, *The Texas Irrigation Situation,* described the multi-faceted effort to address the dropping level of the Ogallala aquifer. Dave focused primarily on the hydrology of the area and steps that are being implemented to prolong its use for irrigation from irrigation management systems to precipitation management (furrow diking) to new water saving technologies for feeding operations (including wastewater reuse).

Two Symposium on *The Status and Prospective of Peanut Phenotyping*, moderated by Charles Chen and the *Bayer Excellence in Extension and Extension Techniques*, moderated by Keith Rucker, Bayer CropScience were held.

Breakout Sessions topics included: Production Technology; Seed Technology and Physiology: Plant Pathology and Nematology 1&2; Breeding, Biotechnology and Genetics 1&2; Weed Science and Entomology; Economics and Processing and Utilization

Twenty-four (24) scientific posters were also displayed.

Another highlight of the APRES meeting is the annual **Joe Sugg Graduate Student Competition**. Fifteen M.S. and Ph.D. degree students gave outstanding presentations. This year's competition winners are: **First Place – Yu-Chien Tseng, University of Florida** (Dr. Barry Tillman, major professor) *"Identifying SSR markers Linked to TSWV Resistance in Peanut Cultivar, Florida-EPTM113"* and **Second Place – Blaire Colvin,** also of the University of Florida (Dr. Diane Rowland, major professor) *"Influence of Peg Strength and Maturity on Tifguard Yield and Digging Loss"*.

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

The highest honor the Society bestows on an individual, **Fellow of the Society**, was awarded to: Dr. Todd Baughman, Oklahma State University; Dr. Austin Hagan – Auburn University; and Emory Murphy – Georgia Peanut Commission.

Dr. Jason Woodward of Texas A&M AgriLife Extension and Texas Tech University was selected as this year's recipient of **the Dow Agrosciences Award for Education**.

Dr. Michael Baring of Texas A&M AgriLife Research was selected as this year's recipient of the **Dow Agrosciences Award for Research**.

The **Coyt T. Wilson Award for Distinguished Service** to APRES went to Dr. Tom Isleib of North Carolina State University.

The **Bailey Award** for the best paper from the 2013 Annual Meeting went to Rajagopalbabu "Babu" Srinivasan (Presenter) and co-authors Drs. Albert Culbreath, Bob Kemerait, and Scott Tubbs for their paper, *"Effects of Host Resistance to Tomato Spotted Wilt Virus on the Virus Itself and the Vector"*.

Peanut Science Editor Tim Grey recognized Graeme Wright (PCA), Chad Godsey (OSU), Peter Dotray (TTU), and Paxton Payton (USDA/ARS) for their six years of service as Associate Editors of *Peanut Science*.

At the conclusion of the meeting, **new officers and directors** for the Society were inducted. Outgoing President, Dr. Tim Brenneman (University of Georgia), presented the gavel to incoming President, Dr. Naveen Puppala (New Mexico State University). President-Elect is Tom Stalker of North Carolina State University. Newly elected directors are Peter Dotray, Texas Tech University; Jim Elder, The J. M. Smucker Company, and Howard Valentine, Peanut Foundation. The first action of President Puppala's term was to present Dr. Tim Brenneman (UGA) with the Past President's Award.

The 2015 APRES meeting will be held July 14-16 at the Francis Marion Hotel in Charleston, SC.

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