2010
PROCEEDINGS

American Peanut Research
and
Education Society, Inc.

Volume 42

Volume 42

2010 PROCEEDINGS

of

THE AMERICAN PEANUT RESEARCH AND EDUCATION SOCIETY, INC.

Meeting
Clearwater Beach, Florida
July 12-15, 2010

Publication Date
October 2010

Editor: James L. Starr
Production Editor: Irene Nickels
apres_nickeli@att.net

TABLE OF CONTENTS

BOARD OF DIRECTORS

2010-11

President ..... Maria Gallo (2011)

Past President ..... Barbara Shew (2011)

President-elect ..... Todd Baughman (2011)

Executive Officer ..... James L. Starr (2011)

University Representatives:
- (VC Area) ..... Thomas Isleib (2013)
- (SE Area) ..... Scott Tubbs (2013)
- (SW Area) ..... Jason Woodward (2011)

USDA Representative ..... Jack Davis (2013)

Industry Representatives:
- Production ..... Robert Sutter (2012)
- Shelling, Marketing, Storage ..... Julie Marshall (2013)
- Manufactured Products ..... Victor Nwosu (2011)

National Peanut Board Representative ..... Michael Davis (2011)

Director of Science and Technology of the
- American Peanut Council ..... Howard Valentine (2011)

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

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

APRES COMMITTEES

2010-11

Program Committee

Todd Baughman, chair	(2011)

Finance Committee

Kelly Chamberlin, chair	(2011)
Barbara Shew	(2010)
Peter Dotray	(2011)
Chad Godsey	(2011)
Timothy Brenneman	(2012)
Austin Hagan	(2012)
Jim Starr, ex-officio	

Nominating Committee

Kelly Chamberliln, chair	(2010)
Barbara Shew	(2010)
Patrick Phipps	(2010)
Peter Dotray	(2010)
Jim Elder	(2010)

Publications and Editorial Committee

Naveen Puppala, chair	(2010)
Thomas Isleib	(2010)
Diane Rowland	(2011)
Kira Bowen	(2012)
Nathan Smith	(2012)
Jason Woodward	(2012)

Peanut Quality Committee

Victor Nwosu, chair	(2011)
Pat Donahue	(2010)
Jim Elder	(2010)
Mike Kubicek	(2011)
Max Grice	(2011)
Michael Franke	(2012)
Dell Cotton	(2012)
Timothy Sanders	(2012)

Public Relations Committee

Ryan Lepicier, chair	(2012)
Shelly Nutt	(2011)
Barry Tillman	(2011)
John Erickson	(2012)
Sandy Newell	(2012)
Betsy Owens	(2012)

Bailey Award Committee

Albert Culbreath, chair	(2010)
Peggy Ozias-Akins	(2010)
Kris Balkcom	(2010)
Emily Cantonwine	(2011)
Thomas Stalker	(2012)
David Jordan	(2012)

Fellows Committee

Todd Baughman, chair	(2010)
James Todd	(2010)
Charles Simpson	(2010)
Tom Isleib	(2011)
Jay Chapin	(2011)
Hassan Melouk	(2011)

Site Selection Committee

Barry Tillman, chair	(2011)
Ames Herbert	(2010)
Jason Woodward	(2010)
Maria Gallo	(2011)
Jay Chapin	(2012)
Jack Davis	(2012)
John Beasley	(2013)
Peggy Ozias-Akins	(2013)

Coyt T. Wilson Distinguished Service Award Committee

Elizabeth Grabau, chair	(2011)
Baozhu Guo	(2010)
Joe Dorner	(2010)
Naveen Puppala	(2011)
Ames Herbert	(2012)
Mark Black	(2012)

Dow AgroSciences Awards Committee

C. Corley Holbrook, chair	(2011)
Scott Tubbs	(2010)
Carroll Johnson	(2011)
Jay Chapin	(2011)
Mark Burow	(2011)
John Damicone	(2011)
John Beasley	(2011)

Joe Sugg Graduate Student Award Committee

Robert Kemerait, chair	(2011)
Patrick Phipps	(2010)
Phat Dang	(2011)
Thomas Isleib	(2012)
Timothy Grey	(2012)

PAST PRESIDENTS

Barbara Shew	(2009)	Hassan A. Melouk	(1988)
Kelly Chenault Chamberlin	(2008)	Daniel W. Gorbet	(1987)
Austin K. Hagan	(2007)	D. Morris Porter	(1986)
Albert K. Culbreath	(2006)	Donald H. Smith	(1985)
Patrick M. Phipps	(2005)	Gale A. Buchanan	(1984)
James Grichar	(2004)	Fred R. Cox	(1983)
E. Ben Whitty	(2003)	David D. H. Hsi	(1982)
Thomas G. Isleib	(2002)	James L. Butler	(1981)
John P. Damicone	(2001)	Allen H. Allison	(1980)
Austin K. Hagan	(2000)	James S. Kirby	(1979)
Robert E. Lynch	(1999)	Allen J. Norden	(1978)
Charles W. Swann	(1998)	Astor Perry	(1977)
Thomas A. Lee, Jr.	(1997)	Leland Tripp	(1976)
Fred M. Shokes	(1996)	J. Frank McGill	(1975)
Harold Pattee	(1995)	Kenneth Garren	(1974)
William Odle	(1994)	Edwin L. Sexton	(1973)
Dallas Hartzog	(1993)	Olin D. Smith	(1972)
Walton Mozingo	(1992)	William T. Mills	(1971)
Charles E. Simpson	(1991)	J.W. Dickens	(1970)
Ronald J. Henning	(1990)	David L. Moake	(1969)
Johnny C. Wynne	(1989)	Norman D. Davis	(1968)

FELLOWS

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

BAILEY AWARD

2010 T.B. Brenneman and J. Augusto
2009 S.R. Milla-Lewis and T.G. Isleib
2008 Y. Chu, L. Ramos, P. Ozias-Akins, C.C. Holbrook
2007 D.E. Partridge, P.M. Phipps, D.L. Coker, 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
1998 J.L. Starr, C.E. Simpson and T.A. Lee, Jr.
1997 J.W. Dorner, R.J. Cole and P.D. Blankenship
1996 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
1995 J.S. Richburg and J.W. Wilcut
1994 T.B. Brenneman and A.K. Culbreath
1993 A.K. Culbreath, J.W. Todd and J.W. Demski
1992 T.B. Whitaker, F.E. Dowell, W.M. Hagler, F.G. Giesbrecht and J. Wu
1991 P.M. Phipps, D.A. Herbert, J.W. Wilcut, C.W. Swann, G.G. Gallimore and T.B. Taylor
1990 J.M. Bennett, P.J. Sexton and K.J. Boote
1989 D.L. Ketring and T.G. Wheless
1988 A.K. Culbreath and M.K. Beute
1987 J.H. Young and L.J. Rainey
1986 T.B. Brenneman, P.M. Phipps and R.J. Stipes
1985 K.V. Pixley, K.J. Boote, F.M. Shokes and D.W. Gorbet
1984 C.S. Kvien, R.J. Henning, J.E. Pallas and W.D. Branch
1983 C.S. Kvien, J.E. Pallas, D.W. Maxey and J. Evans
1982 E.J. Williams and J.S. Drexler
1981 N.A. deRivero and S.L. Poe
1980 J.S. Drexler and E.J. Williams
1979 D.A. Nickle and D.W. Hagstrum
1978 J.M. Troeger and J.L. Butler
1977 J.C. Wynne
1976 J.W. Dickens and T.B. Whitaker
1975 R.E. Pettit, F.M. Shokes and R.A. Taber

JOE SUGG GRADUATE STUDENT AWARD

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

COYT T. WILSON DISTINGUISHED SERVICE AWARD

2010	Dr. Albert K. Culbreath	1999	Dr. Ray O. Hammons
2008	Dr. Frederick M. Shokes	1998	Dr. C. Corley Holbrook
2007	Dr. Christopher L. Butts	1997	Mr. J. Frank McGill
2006	Dr. Charles E. Simpson	1996	Dr. Olin D. Smith
2005	Dr. Thomas B. Whitaker	1995	Dr. Clyde T. Young
2004	Dr. Richard Rudolph	1993	Dr. James Ronald Sholar
2003	Dr. Hassan A. Melouk	1992	Dr. Harold E. Pattee
2002	Dr. H. Thomas Stalker	1991	Dr. Leland Tripp
2001	Dr. Daniel W. Gorbet	1990	Dr. D.H. Smith
2000	Mr. R. Walton Mozingo		

DOW AGROSCIENCES AWARD FOR EXCELLENCE IN RESEARCH

2010	Peter A. Dotray	2000	Timothy B. Brenneman
2009	Joe W. Dorner	1999	Daniel W. Gorbet
2008	Jay W. Chapin	1998	Thomas B. Whitaker
2007	James W. Todd	1997	W. James Grichar
2005	William D. Branch	1996	R. Walton Mozingo
2004	Stanley M. Fletcher	1995	Frederick M. Shokes
2003	John W. Wilcut	1994	Albert Culbreath, James Todd and James Demski
2002	W. Carroll Johnson, III	1993	Hassan Melouk
2001	Harold E. Pattee and Thomas G. Isleib	1992	Rodrigo Rodriguez-Kabana

1998 Changed to Dow AgroSciences Award for Excellence in Research

DOW AGROSCIENCES AWARD FOR EXCELLENCE IN EDUCATION

2010	David L. Jordan	2001	Thomas A. Lee
2009	Robert C. Kemerait, Jr.	2000	H. Thomas Stalker
2008	Barbara B. Shew	1999	Patrick M. Phipps
2007	John P. Damicone	1998	John P. Beasley, Jr.
2006	Stanley M. Fletcher	1996	John A. Baldwin
2005	Eric Prostko	1995	Gene A. Sullivan
2004	Steve L. Brown	1993	A. Edwin Colburn
2003	Harold E. Pattee	1992	J. Ronald Sholar
2002	Kenneth E. Jackson		

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

PEANUT RESEARCH AND EDUCATION AWARD

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
1990	G. Sullivan
1989	R.W. Mozingo
1988	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

ANNUAL MEETING PRESENTATIONS

Technical Sessions

BREEDING, BIOTECHNOLOGY AND GENETICS I

BAYER EXCELLENCE IN EXTENSION

WEED SCIENCE

POSTER SESSIONS

JOE SUGG GRADUATE STUDENT COMPETITION

PHYSIOLOGY AND SEED TECHNOLOGY

PLANT PATHOLOGY, NEMATOLOGY, AND ENTOMOLOGY I

PLANT PATHOLOGY, NEMATOLOGY, AND ENTOMOLOGY II

BREEDING, BIOTECHNOLOGY AND GENETICS II

BREEDING, BIOTECHNOLOGY AND GENETICS III

BREEDING, BIOTECHNOLOGY AND GENETICS IV

BREEDING, BIOTECHNOLOGY AND GENETICS V

PROCESSING AND UTILIZATION I

PROCESSING AND UTILIZATION II

PRODUCTION TECHNOLOGY

ECONOMICS

BREEDING, BIOTECHNOLOGY AND GENETICS I

Assessment of Genetic Diversity Changes in U.S. Runner-type peanut cultivars Released between 1943 and 2009 Using Simple Sequence Repeat (SSR) Markers. S.R. MILLA-LEWIS*, M.C. ZULETA, and T.G. ISLEIB, Department of Crop Science, North Carolina State University, Raleigh, NC 27695-7629.

The objective of this study was to assess allelic diversity changes among 59 peanut (Arachis hypogaea L.) cultivars of the runner market-type released between 1943 and 2009 using simple sequence repeat (SSR) markers. Thirty four SSR primer pairs amplified a total of 154 alleles. The mean number of alleles per locus was 4.5, ranging from two to ten. The informational worth of each marker was evaluated by calculating the polymorphic information content (PIC) for each locus. PIC values ranged from 0.05 to 0.76, with an average of 0.37. Changes in the average genetic diversity were analyzed with respect to breeding periods, breeding programs, and breeding cycles. Our results indicated that (i) at the gene level, allelic diversity has increased significantly through decades of breeding, (ii) at the population level, genetic diversity was at its lowest during the pre-1980s time period and gradually increased in each subsequent decade, and (iii) most of the observed SSR variation occurred within, rather than among, time periods. Visual representation of the principal coordinate analysis clearly demonstrated increases in the variation present in each subsequent breeding decade, reaching its maximum in the 2000s. Therefore, it appears that runner-type peanut breeders have been successful at developing improved peanut cultivars while increasing levels of diversity in the last three decades of breeding.

Utilizing Real-Time PCR to Reveal *ahFAD2* Genotypes in Segregating Peanut Populations. N.A. BARKLEY*, M.L. WANG, R.N. PITTMAN, USDA-ARS Plant Genetic Resources Conservation Unit, Griffin, GA 30223.

Oleic acid (C18:1), a monounsaturated, omega-9 fatty acid is an important agronomic trait in peanut cultivars because it provides increased shelf life, improved flavor, enhanced fatty acid composition, and a beneficial effect on human health. Consequently, an emphasis has been placed on breeding peanuts with high levels of oleic acid and low levels of linoleic acid (C18:2), a polyunsaturated, omega-6 fatty acid. In an attempt to increase genetic diversity, specifically disease resistance of high oleic acid lines, crosses between lines containing high oleic to linoleic ratios (high O/L), wild species, and cultivated botanical varieties (*Arachis hypogaea* ssp. *hypogaea* var. *hirsuta* or *peruviana*) were prepared. The main bottleneck of breeding research is rapid detection of the trait(s) of interest. Therefore, genotyping assays were developed to detect wild type and mutant alleles in both *ahFAD2A* and *ahFAD2B,* which are known to affect oleic acid (C18:1) and linoleic acid

(C18:2) levels. Total fatty acid composition and the *ahFAD2* genotypes were determined in the parents and the progeny of four crosses, as well as, some selected peanut germplasm. The O/L ratio varied from 0.85 to 30.30 in the four crosses evaluated. The oleic acid trait segregated in a digenic (15:1) or a monogenic (3:1) manner dependent on the genotype of the parents used in the cross. Statistical analysis demonstrated that oleic acid was negatively correlated with linoleic and palmitic acid (C16:0), but positively correlated with two long chain fatty acids, gadoleic (C20:1) and lignoceric acid (C24:0). Combining the fatty acid profiles determined by gas chromatography with each individual's genotype provides valuable insight on the effect of each genotype on the oleic acid and correlated fatty acid content in peanut seeds.

First Insight into Population Structure and Linkage Disequilibrium in Peanut, and Association Mapping of Drought Tolerance-Related Traits in the US Peanut Minicore Collection. V. BELAMKAR, Department of Plant and Soil Science and Center for Biotechnology and Genomics, Texas Tech University, Lubbock, TX 79409; M. GOMEZ and J.L. AYERS, Texas AgriLife Research, Texas A&M System, Lubbock, TX 79403; P.R. PAYTON, Plant Stress Germplasm Development Unit, USDA-ARS, Lubbock, TX 79415; N. PUPPALA, Agricultural Sciences Center, New Mexico State University, Clovis, NM 88001; and M.D. BUROW*, Texas AgriLife Research, Texas A&M System, Lubbock, TX 79403 and Department of Plant and Soil Science, Texas Tech University, Lubbock, TX 79409.

Ninety-six genotypes comprising 92 accessions of the US peanut minicore collection, diploid progenitors *A. duranensis* (AA) and *A. ipaënsis* (BB), and a component line of the cultivar Florunner and the synthetic amphidiploid accession TxAG-6 were investigated with 392 SSR marker bands amplified with 32 highly-polymorphic SSR markers. Both distance and model-based (Bayesian) cluster analysis revealed the presence of structured diversity. UPGMA analysis divided the population into four subgroups, two major subgroups representing subspecies fastigiata and hypogaea, a third containing mixed individuals, and the last containing diploid progenitors and TxAG-6. Similarly, model-based clustering identified four subgroups - fastigiata and hypogaea subspecies, a third consisting of diploid progenitors and TxAG-6, and a fourth being mixed. At the significance threshold of $p \leq 0.01$, marker loci pairs with distance <50cM, beyond 50cM, and unlinked were found in strong LD. Linkage disequilibrium stretched to a longer distance within the fastigiata subspecies, in accord with LD extending to great distances in self pollinated crops. Minicore accessions were screened for six drought tolerance-associated traits namely, SPAD chlorophyll, canopy temperature, flower count, leaf closure, plant height and width, in two environments, over two growing seasons (2007 and 2008). Unified mixed

linear model (MLM) analysis incorporating population structure and kinship identified several SSR loci associated with drought tolerant traits. The current findings imply LD mapping could be an excellent tool to exploit the natural variation present in cultivated peanut.

Development and Characterization of Two Peanut RIL Mapping Populations. C.Y. CHEN*, USDA-ARS National Peanut Research Laboratory, Dawson, GA 39842; B.Z. GUO, USDA-ARS Crop Protection and Management Research Unit, Tifton, GA 31793; C.C. HOLBROOK, USDA-ARS Crop Genetics and Breeding Research Unit, Tifton, GA 31793; M.L. WANG, USDA-ARS Plant Genetic Resources Conservation Unit, Griffin, GA 30223; and A.K. CULBREATH, Department of Plant Pathology, The University of Georgia, Tifton, GA 31793.

An appropriate mapping population, suitable marker system, and the software for analyses of data are the critical elements for genetic linkage map construction and quantitative trait loci (QTLs) identification. We have developed two RIL mapping populations that derived from the crosses of 'Tifrunner' x 'GT-C20'and 'SunOleic 97R' x 'NC94022'. The parents used in the crosses possess very divergent traits either in agronomic phenotypes or disease resistance. The progenies of a total of 248 $F_{2:7}$ lines for 'Tifrunner' x 'GT-C20' and 352 $F_{2:7}$ lines for 'SunOleic 97R' x 'NC94022' have been assessed under field conditions for descriptive traits on plant, pods, and seeds and TSWV resistance in two growing seasons. Two hundred sixty nine and 173 SSR polymorphic markers also have been used to assess these two populations, respectively. The descriptive statistics for agronomic traits and resistance to diseases were computed considering the maximum, the mean and the minimum values, the standard deviation, the coefficient of variation, and the distribution of frequency. Cluster analysis and estimation of genetic distances among and within populations were conducted with SSR marker data. The repeatability coefficient was calculated to estimate the accuracy of the phenotypic measurements through the methods variance analysis, principal components analysis, and structure analysis. Our results showed that the two progenies segregated for resistance to TSWV and other traits, thus illustrating the usefulness of genetic linkage map construction and QTLs identification.

Species and Genome Relationships in *Arachis*: A Molecular Phylogeny. S.A. FRIEND, Department of Biological Science, Virginia Tech, Blacksburg, VA, 24061-0406; D. QUANDT, Rheinische Friedrich-Wilhelms-Universität, Nees-Institut für Biodiversität der Pflanzen, Meckenheimer Allee 170, D-53115, Bonn, Germany; S.P. TALLURY* and H.T. STALKER, Department of Crop Science, North Carolina State University, Raleigh, NC 27695-7629, and K.W. HILU, Department of Biological Science, Virginia Tech,

Blacksburg, VA 24061-040.
The genus *Arachis* (Fabaceae) is comprised of 80 species restricted to South America. The existing monograph divided the genus into nine sections and provides an intuitive assessment of evolutionary relationships, but a comprehensive phylogenetic analysis of the genus is lacking. To test the current systematic treatment of the genus, we reconstructed a phylogeny for *Arachis* using nuclear ITS and plastid *trn*T-*trn*F sequences from a total of 48 species representing all nine sections. ITS cloning of the allotetraploid species of section *Arachis* indicated the presence of A and B genome alleles and chimeric sequences. Our study also showed species from section *Extranervosae* as the first emerging lineage in the genus, followed by sections *Triseminatae* and *Caulorrhizae*, and two terminal major lineages, which we refer to as erectoides and arachis. Species in the arachis lineage formed two major clades, arachis I that includes the B and D genomes species and the aneuploids, and arachis II that includes the A genome species. Our results substantiated the sectional treatment of *Caulorrhizae* and *Triseminatae*, but demonstrated that five sections (*Arachis, Erectoides, Procumbentes,* and *Trierectoides*) are not monophyletic. A detailed study of the genus *Arachis* with denser taxon sampling, additional genomic regions, plus information from morphology and cytogenetics is needed for a comprehensive assessment of its systematics.

A Novel Set of SSRs Developed from BAC-end Sequences and Its Application in Construction of Genetic Linkage Map. G.H. HE*, Tuskegee University, Tuskegee, AL 36088; V. PENMETSA, University of California, Davis, CA 95616; M. YUAN, Shandong Peanut Research Institute, Qingdao, Shandong 266100, China; H. WANG, Shandong Peanut Research Institute, Qingdao, Shandong 266100, China; B.Z. GUO, USDA, ARS, Crop Protection and Management Unit, Tifton, GA 31793; R.K. VARSHNEY, International Crops Research Institute for the Semi-Arid Tropics, Patancheru, India. D.R. COOK; University of California, Davis, CA 95616.
Despite the availability of several thousand simple sequence repeat (SSR) primer pairs for cultivated peanut, exceedingly low rates of polymorphism constrain the number of useful markers. To address this deficiency we have mined DNA sequences from the ends of bacterial artificial chromosome (BAC) clones for additional novel SSRs. 4,448 BAC end sequences of *A. hypogaea* Tifrunner were obtained from 3784 BAC clones that were selected based on hybridization to peanut NBS-LRR disease resistance genes; these sequences yielded 142 new SSRs (RGH-SSRs) that met our criteria for SSR content and length. These same *A. hypogaea* BAC clones were fingerprinted to produce physical map contigs of regions of the peanut genome containing disease resistance gene homologs. In addition, we sequenced 25,000 randomly

selected BAC clones of *A. duranensis*, resulting in 41,856 end sequences and 1392 SSRs that met criteria for length and content. A total of 1152 functional primer pairs were analyzed for polymorphism across a panel of eight parental genotypes of four populations. The polymorphic SSR markers were used to construct a high density of genetic linkage map.

Developing a High-Density Molecular Map of the A-Genome Species *A. duranensis*. E. NAGY, Y. GUO, S. KHANAL, and C. TAYLOR, Institute of Plant Breeding, Genetics, and Genomics, University of Georgia, Athens, GA 30602; S. KNAPP, Monsanto Inc., Woodland, CA 95696, P. OZIAS-AKINS, Department of Horticulture, The University of Georgia, Tifton Campus, Tifton, GA 31793-0748; H.T. STALKER* and N. NIELSEN, Department of Crop Science, North Carolina State University, Raleigh, NC 27695-7629.

Although markers have been mapped into linkage groups of both wild and cultivated peanut since the early 1990's, the maps have been extremely low density. This is in large part because identifying highly polymorphic parents has been problematic, the cultivated peanut has two genomes (A and B), and the species is polyploid which results in many gene duplications. To overcome difficulties associated with molecular polymorphism, Expressed Sequence Tag libraries were created to facilitate identifying Simple Sequence Repeats (SSR) and Single Nucleotide Polymorphism (SNP) markers in peanut. Further, to circumvent problems associated with the allotetraploid *A. hypogaea*, the progenitor species *A. duranensis* was used for genetic mapping experiments with the goal of utilizing the data for fine-mapping in the cultivated species. The objectives of this research were to first identify a large number of SSRs and SNPs in peanut and then to map polymorphic markers into linkage groups. Two *A. duranensis* accessions PI 475887 and Grif. 15039 were used for this study. Normalized cDNA was produced from leaf and root tissues of both accessions from which 22,356 and 21,487 long-read ESTs from leaves and roots, respectively, were produced for PI 475887 using the Sanger technology. Short-read ESTs also were produced from leaves (212,938 and 296,242 for PI 475887 and Grif. 15039, respectively) and roots (266,575 and 235,245 for PI 475887 and Grif. 15039, respectively). In addition, 2,134 SSR markers developed from an *A. hypogaea* EST database were evaluated for polymorphism in the two diploid accessions. A total of 2,319 markers were mapped into 10 linkage groups, including 971 SSRs, 221 single-stranded DNA conformation polymorphism (SSCP) markers, and 1,127 SNPs. This represents the first high-density map for a peanut species. The linkages identified in this study will be an invaluable resource for sorting the A and B genomes and linkage relationships in the cultivated species.

Construction of a Genetic Linkage Map and Identification of QTLs for Resistance to TSWV in Cultivated Peanut (*Arachis hypogaea* L.).

H. QIN* USDA-ARS, Crop Protection and Management Research Unit, Tifton, GA; Y. LI, Department of Plant Pathology, The University of Georgia, Tifton, GA; Y. GUO, Center for Applied Genetic Technologies, The University of Georgia, Athens, GA; G. HE, Center for Plant Biotechnology, Tuskegee University, Tuskegee, AL; C. CHEN, USDA-ARS, National Peanut Research Laboratory, Dawson, GA; A. CULBREATH, Department of Plant Pathology, the University of Georgia, Tifton, GA; S. KNAPP, Center for Applied Genetic Technologies, the University of Georgia, Athens, GA; D. COOK, Department of Plant Pathology, the University of California-Davis, CA; C.C. HOLBROOK, USDA-ARS, Crop Genetics and Breeding Research Unit, Tifton, GA; M.L. WANG, USDA-ARS, Plant Genetic Resources Conservation Unit, Griffin, GA; B.L. TILLMAN, North Florida Research and Education Center, the University of Florida, Marianna, FL; T. ISLEIB, Dept. of Crop Sci., North Carolina State University, Raleigh, NC; B. GUO, USDA-ARS, Crop Protection and Management Research Unit, Tifton, GA.

A genetic linkage map is critical for identifying the QTL (quantitative trait loci) underling targeted traits. Over the last few years, progress has been made in marker developmentfrom multiple sources enabling the expansion of quality resources needed for genotypingapplications in cultivated x cultivated populations. The most recently published intra-specific maps were constructed from the crosses of cultivated peanuts (Varshney et al. 2009; Hong et al. 2010), in which only 135 and 175 simple sequence repeat (SSR) markers were sparsely populated in 22 linkage groups, respectively, representing the 20 chromosomes of *A. hypogaea*. A high resolution linkage map with sufficient markers will increase the chances of QTL identification. Two intra-specific $F_{2:7}$-RIL (recombinant inbred line) populations of 248 and 352 lines derived by single seed descent from crosses between 'Tifrunner' × GT-C20 and 'SunOleic 97R' × NC94022' have been developed and used in this study. The primary phenotype evaluation conducted in 2009 ($F_{2:5}$) has demonstrated that a significant divergence among RILs of both populations was obvious. The populations are suitable for linkage map construction and QTL analysis. We have collected 4,574 SSR markers and screened for polymorphisms in the parents. Of these SSRs, 269 and 173 markers were polymorphic in these two populations, respectively, and used for the genetic map constructions. The constructed linkage genetic map for S population has 20 linkage groups (LG) with 186 mapped loci (173 SSRs and 13 with two loci). In 2009, we conducted field evaluation of $F_{2:5}$ lines for disease resistance to TSWV with two replications. From our preliminary result, one QTL for TSWV resistance has been identified. The identified QTL may explain 40% phenotypic

variation. The seeds for these populations have been advanced to next generation ($F_{2:7}$) and more field phenotypes will be conducted in 2010 for confirming this major QTL. This map will be compared with the genetic map from T population. Furthermore, an integrated map will be constructed from these two populations with more markers to better cover the peanut genome.

BAYER EXCELLENCE IN EXTENSION

Peanut Production and Extension Programs in Northampton County North Carolina. C. ELLISON*, D.L. JORDAN, B.B. SHEW, and R.L. BRANDENBURG, North Carolina Cooperative Extension Service, Raleigh, NC 27695.

Northampton County, North Carolina has always been a traditional peanut growing county. In 1989 Northampton Farmers planted 26,278 acres of peanut across the entire county. The peanut production infrastructure was in place to handle a peanut farmer's crop literally just down the road. Today peanut production is still part of the agricultural industry in Northampton County but many adjustments have taken place. Several growers have sold their peanut equipment and have replaced peanuts with more cotton and soybeans. Peanut acres have deceased down to an average of 4500 acres over the last 5 years. Gone are the days of growing quota peanuts. The growers who remain are carefully looking at production cost and available resources before making a decision on signing a peanut contract.

Tillage Systems with Peanut in Halifax County, North Carolina: An Historical Perspective. A. WHITEHEAD, JR.* and D.L. JORDAN, North Carolina Cooperative Extension Service, Raleigh, NC 27695.

Twenty years ago approximately 25,000 acres of peanut were produced in Halifax county North Carolina exclusively in conventional tillage systems. A significant portion of fields where peanut were produced are considered at high risk for water erosion. Declines in soil productivity and crop yield due to intensive conventional tillage practices led to development of regulations subsequently leading to implementation of soil conservation practices to address erosion issues on many fields in the county. Several peanut growers began experimenting with no-till production but experienced little success. However, one grower began using strip till as an alternative to both conventional and reduced tillage and over the course of the past 20 years this practice has proven to be very successful. Advantages often expressed by growers implementing strip tillage include soil moisture conservation, reduced erosion, less disease and insect problems, and improved soil productivity and higher yield of peanut and other crops. Today, approximately 50% of the 5100 acres of peanut are planted using

some form of reduced tillage. These systems range from strip tillage into stubble from the previous crop to a single disking operation in the fall and establishment of a small grain cover crop followed by spring strip tillage at planting.

Evaluation of Georgia-02C Peanut for Maximum Maturity and Potential Value Enhancement Following Significant Cold Stress. P.M. CROSBY*, Emanuel County Extension, University of Georgia, Swainsboro, GA 30401; R. MCWILLIAMS, Burke County Extension, University of Georgia, Waynesboro, GA 30830; J.P. BEASLEY, Department of Crop and Soil Science, University of Georgia, Tifton, GA 31793; and E.J. WILLIAMS, Department of Biological & Agricultural Engineering, University of Georgia, Tifton, GA 31793, Retired.

Over the past 4 or 5 years, the peanut cultivar Georgia O2-C has become one of Southeast Georgia's most consistent yielding peanut cultivars. During this time, county agents and farmers from the area observed that this cultivar tends to hold on to peanuts even after perceived maturation, and to add yield and grade after significant cold stress. To test this hypothesis, a study was designed to quantify peanut maturity, yield, and grade over an extended harvest period through the onset of cold stress.

On May 13 2009, Georgia 02-C peanut was planted at the Southeast Georgia Research and Education Center in Midville, Georgia. Harvest dates were arranged in a randomized block design with 4 replications. A hull scrape maturity test was conducted on Sept. 10th at 120 days after planting (DAP) to project the first digging date which was September 30th at 140 DAP. Hull scrape maturity tests (4 reps) were conducted weekly through November, and pod-stem breakdown and pod losses were observed. Seven harvests for yield and grade were conducted from Sept. 30th until Nov. 21st. Weekly harvests were planned, but impossible due to heavy rain.

In the 2009 trial, the highest yield (5328 lbs/a) was observed on October 27th at 167 DAP. This was 8 days later than the first near-freezing cold spell (35° F), although 13 of the prior 20 days since Sept. 29th had nighttime temperatures less than 60° F. Peanut grade as indicated by total sound mature kernels reached a maximum of 77% on Oct. 21st, approximately 1 week before maximum yield and remained level throughout the other digging dates.

Detailed data from hull scrape maturity profiles showing pod movement through and into maturity groups was recorded. Maximum yield corresponded with 37%, 68%, and 76% when harvestable pods were grouped as black; brown plus black; and orange plus brown plus black,

respectively. Pod stems remained strong and little pod-stem breakdown was evident through the date of maximum yield, even though black pods were observed in hull scrape profiles for the preceding 5 weeks. This data suggests that pod stems for Georgia O2-C may have more resistance to maturity breakdown compared to previous observation in other varieties, and may be partially responsible for the longer time between planting and harvesting and the greater flexibility in timeliness of digging.

Randolph County Nighttime Peanut Fungicide Study: Year Two. V.S. HADDOCK*, Randolph County Extension, The University of Georgia, Cuthbert, GA 39840; T. BRENNEMAN, Department of Plant Pathology, The University of Georgia, Tifton, GA 31793; and J.L. RIGSBY, Randolph County Peanut Producer, Cuthbert, GA 39840.

Severity of soil borne diseases in peanuts in the form of Limb Rot (*Rhizoctonia solani*), CBR *(Cylindrocladium Black Rot)* and Southern Stem Rot (white mold*, Sclerotium rolfsii)* were estimated for peanut plots in Randolph County and how these diseases affected yield, grade, and dollar value per acre. UGA research has shown the potential for increases of 1000 -1500 lbs/A when spraying fungicides at nighttime when the leaves are folded compared to daytime sprays when leaves are fully expanded. The premise is that "relaxed" peanut canopy allows better spray penetration and efficacy during nighttime applications. The plot used in Randolph County had a two year peanut rotation with a history of disease including aerial rhizoctonia and Southern Stem Rot. Six total plots were evaluated with three replications of Georgia-06G peanuts for night and daytime fungicide applications. All practices were the same in the plots with the exception of the soil borne fungicide application times. Year one was an Abound program with only two Abound sprays (22 oz. /A) applied at night. In 2009 a *tebuconazole* program with Folicur (7.2 oz. /A) and Toledo (7.2 oz. /A) with generic *chlororthalonil* ~ Chloronil (1pt. /A) applied in a four block night spray program was used. Spray times were between 5:00 – 6:00 A.M. in order to utilize the moisture from dew. In 2009, yields were still high for the nighttime program at 494 lbs/A more for the daytime program. The two year average is 804 lbs/A. Disease ratings revealed white mold as the only soil borne disease of note. Nighttime plots showed a 20% reduction in white mold. Early and late leaf spot were also heavy with defoliation ranges from 40 – 75%. There was no statistical difference in leaf spot control between the plots.

Deer and Hog Mega Fence on Peanuts. R.l. PETCHER*, Regional Extension Agent in Agronomy for Southwest Alabama, Washington Co. Extension Office, Chatom, AL. 36518; A. THORNBURG, Grower in Mobile, Al; and S. SMITH, Extension Wildlife Specialist,

Auburn University, Al 36849.
Deer and hogs and other wildlife are doing extensive damage to our crops and especially peanuts. Results from a survey conducted in 2008 resulted in 10 % or a $16 million loss to our crops just in Southwest Al. Some fields were totally abandoned. The costs of wildlife fence are prohibitive to most Alabama growers. However, a less expensive cost efficient fence, the deer and hog mega fence was constructed and tested in 2009 and again in 2010. A three strand high tinsel electric fence is constructed around a field. Three feet out from this fence is a one strand high tinsel electric fence. The idea of the two separate fences is to disorientate the deer and hogs. Once the fence is constructed it is plugged in immediately with a high mega charger. It is utmost important that the charger have a high joule output (8 or 12 joule). This fence is cost efficient and proved 99.9 % effective in controlling wildlife in 2009. Further research is being conducted on even less expensive fencing and in other areas and crops in Alabama.

A Study of The Effects of Certain Fungicides & Combinations of Fungicides on the Incidence of Disease in Peanut. P.D. WIGLEY*, Calhoun County Extension, University of Georgia, Morgan, GA 39866; and R.C. KEMERAIT, Department of Plant Pathology, University of Georgia, Tifton, GA 31793-0748.
Field experiments were conducted to evaluate eight fungicide systems for control of leaf spot, white mold, and rhizoctonia pod rot during the 2009 growing season. The systems that were evaluated included a four block Folicur program (sprays 3 - 6) with Headline (spray 1) & Bravo (spray 7); Tilt Bravo (sprays 1 & 2) + Abound (sprays 3 & 5), with Bravo (sprays 4, 6 & 7); Provost @ 8 oz per acre (sprays 3, 4, 5 & 6) with Bravo (sprays 1, 2 & 7); Provost @ 10.7 oz per acre (sprays 3, 4, 5 & 6) with Bravo (sprays 1, 2 & 7); Elast (sprays 1, 2, 3, 4, 5, 6) with Folicur (sprays 3, 4, 5 & 6) and Bravo (spray 7); Evito (sprays 3 & 5) with Tilt Bravo (sprays 1 & 2) and Bravo (sprays 4, 6 & 7); Abound (sprays 3 & 5) with Provost (sprays 4 & 6) with Tilt Bravo (sprays 1 & 2) and Bravo (spray 7); Bravo (sprays 1, 2, 3, 4, 5, 6, & 7). Treatments were applied according to manufactures recommendation. Disease control ratings were taken from each plot. Disease control ratings for leaf spot showed some statistical differences while rhizoctonia ratings were not statistically different. Yields were statistically different across treatments.

WEED SCIENCE

Peanut Tolerance and Weed Control Following Fomesafen Applied at Different Rates and Timings in Texas. P.A. DOTRAY*, Texas Tech University, Texas *Agri*Life Research, and Texas *Agri*Life Extension Service, Lubbock, TX 79409-2122; W.J. GRICHAR,

Texas *Agri*Life Research, Beeville, TX 78102; and L.V. GILBERT, Texas *Agri*Life Research, Lubbock, TX 79403.

Fomesafen (Reflex) is a herbicide that has effectively controlled broadleaf weeds and woollyleaf bursage [*Ambrosia grayi* (A. Nels.) Shinners] in cotton (*Gossypium hirsutum* L.). In Texas, Reflex was recently labeled for use in cotton west of I-35 as a fall or spring preplant use only, but a recent 24C will allow applications up to 14 days before planting and use postemergence-directed. There is currently no label for use in peanut and the minimum rotational interval before planting peanut is 10 months. The objective of this research was to examine peanut tolerance to Reflex 2SL applied at 0, 0.19, 0.25, 0.38, and 0.50 lb ai/A (0, 12, 16, 24, and 32 oz/A) preemergence (PRE), at ground-crack (AC), and early postemergence (EPOST, 21 days after planting). This study was conducted under weed-free conditions at Lamesa, TX in 2008 (Flavorrunner 458) and 2009 (Tamrun OL02) and under weedy conditions at Yoakum in 2009 (Tamrun OL02). In 2008 at Lamesa, Reflex applied PRE at 12 to 32 oz/A caused up to 59% peanut injury 47 days after application (DAA). More injury was observed as Reflex rate increased. Late-season (Sep 26) injury was still apparent following PRE applications. Reflex applied AC or EPOST caused up to 50 and 54% injury, respectively. More injury was observed as the Reflex rate increased and injury was still apparent late-season. Peanut yield was reduced following Reflex applied PRE at all rates, AC at 24 and 32 oz/A, and EPOST at 16, 24, and 32 oz/A relative to the non-treated control (5196 lb/A). In 2009 at Lamesa, Reflex applied PRE at 16 to 32 oz/A caused 6 to 15% peanut injury 21 DAA, 6 to 23% injury 35 DAA, and 8 to 46% injury mid-season (July 2). As in 2008, injury increased as Reflex rate increased. Late-season (Sep 25) injury up to 44% was still apparent following PRE applications. Reflex applied AC or EPOST caused up to 36 and 15% injury, respectively. More injury was observed as the Reflex rate increased and injury following 16 to 32 oz/A treatments was still apparent late-season. Peanut yield was reduced following Reflex applied PRE at 16 to 32 oz/A rates; AC at 12, 16, and 32 oz/A; and EPOST at 24 oz/A. In 2009 at Yoakum, peanut injury 34 days after planting (DAP) with Reflex applied PRE ranged from 8 to 23% while Reflex injury from AC applications ranged from 22 to 38%. No injury from Reflex applied EPOST was noted at the 34 DAP rating since this was only 12 days after application. When evaluated 76 DAP, peanut injury with Reflex applied PRE, AC, or EPOST ranged from 17 to 53% and increased as the rate of Reflex increased. Results from this study suggest that Flavorrunner 458 (2008) and Tamrun OL02 (2009) are very susceptible to Reflex applied PRE, AC, and early postemergence at rates from 12 to 32 oz/A. Although Reflex provided good to excellent control of certain broadleaf weeds, peanut injury with PRE, AC, or EPOST applications was unacceptable. Future label changes that would allow Reflex use in peanut seem unlikely based on this data collected on

the Texas High Plains (Flavorrunner 458 and Tamrun OL02), south Texas (OL02 and previously in OL01 and OL07), Georgia (Georgia Green), and Florida (SunOleic 97R).

Influence of Tillage, Herbicide Programs and Cropping Systems on the Management of Bengal Dayflower. D.E. PARTRIDGE TELENKO* and B.J. BRECKE, West Florida Research and Education Center, University of Florida, Jay, FL 32565.

Weed management programs in conventional vs. strip-tillage peanut were evaluated for effectiveness in controlling Bengal dayflower in 2008 and 2009. Strip-tillage increased Bengal dayflower infestation by 21 and 17% over conventional-tillage in both 2008 and 2009 respectively. Conventional tillage also had slightly higher but non-significant peanut yield in both years. Ten peanut herbicide programs were evaluated in each tillage system. In 2008 only Dual Magnum + Gramoxone Inteon + Induce at cracking (AC) followed by Dual Magnum + Cadre + Induce postemergence (POST) and Dual Magnum + Gramoxone Inteon + Basagran AC followed by Pursuit + Induce POST provided acceptable Bengal dayflower management (>74% control). In 2009 all herbicide programs, except the low input program of Gramoxone Inteon + Induce AC, provided at least 78% Bengal dayflower control. Herbicide programs that included Strongarm, Cadre, or Pursuit in a POST application had 92% or greater weed control. In 2008 all herbicide programs improved peanut yield over the untreated while in 2009 only programs with a POST application of Strongarm or Cadre improved peanut yield over the untreated.

In another study peanuts and cotton were planted in conventional or strip-tillage under high, medium, low or no herbicide input programs in 2008 and 2009 to evaluate influence on Bengal dayflower density and control. In 2008 Bengal dayflower control was the greatest in conventional tillage for both crops. However, in 2009, no differences were detected between tillage treatments or between cropping systems. In both years all herbicide programs improved control over the untreated, but in 2008 only the medium and high input programs maintained acceptable control (>80%). In both years weed counts were taken during the mid- and late-season. Only the high input herbicide programs significantly reduced the total number of Bengal dayflower plants compared to the untreated control in both years. No significant differences in yield were detected between the herbicide programs in peanuts or cotton in 2008. In 2009 the high and the medium herbicide programs improved yield in peanut over the untreated, but no differences between programs were detected in cotton.

Weed Management in Narrow- vs. Wide-Row Peanut. B. BRECKE*, West Florida Research and Education Center, University of Florida, Jay, FL 32565; and D. STEPHENSON, Dean Lee

Research and Extension Center, Louisiana State University, Alexandria, LA 71302.
Research was conducted in Florida during 2005 through 2008 to evaluate weed management systems in narrow (38 cm)- and wide (76 cm)-row peanut. Benghal dayflower control increased when peanut row spacing was narrowed. Paraquat + bentazon early-postemergence (EPOST) followed by (fb) imazapic or imazethapyr mid-postemergence (MPOST) or chlorimuron late-postemergence (LPOST) controlled Benghal dayflower at least 90%. Imazapic EPOST with or without 2,4-DB MPOST controlled Benghal dayflower 98 to 100%. Diclosulam or flumioxazin preemergence (PRE) fb paraquat + bentazon EPOST fb 2,4-DB MPOST or either PRE herbicide fb 2,4-DB MPOST did not increase Benghal dayflower control compared with imazapic-containing treatments. Browntop millet control was 98 to 100% for treatments with imazapic or imazethapyr EPOST and control was greater in narrow-row compared to wide-row peanut. All herbicide treatments controlled pitted morningglory at least 90% and peanut row spacing did not influence control. Only treatments with imazapic EPOST as a component controlled sicklepod at least 90%. No difference between peanut row spacing was observed for sicklepod control. In general, peanut planted in narrow-rows yielded greater than wide-row peanut. Few differences in peanut yield were observed among herbicide treatments, but all treatments resulted in yields greater than the nontreated control. Data indicates that seeding peanut in narrow-rows will improve control of Benghal dayflower and browntop millet and will increase peanut yield compared to wide-row peanut.

The Art and the Science of Cultivation for Weed Control in Organic Peanut. W.C. JOHNSON, III*, USDA-ARS, Coastal Plain Experiment Station, Tifton, GA 31793-0748.
Cultural weed control is the basis on which an integrated system of weed management in organic peanut is based. The cultural practices evaluated for weed control were row patterns and seeding rates, integrated with cultivation intensity. Results showed that peanut seeded in wide rows (two rows, 91 cm apart), at a density of 20 seed/m, and cultivated weekly for at least 6-wk was the most effective regime evaluated. Weeds were not effectively controlled in peanut seeded in twin rows (two pairs of rows, each pair 46 cm apart with each row in the pair 17 cm apart) at a density of 10 seed/m. However, when peanut in twin-row patterns were seeded at 20 seed/m, weeds were controlled by intense cultivation with a tine weeder. These results suggest that in-row plant spacing is critical for successful weed control with cultivation and independent of row pattern. Peanut seeded at 20 seed/m improved crop competition with weeds and greatly facilitated overall weed control with cultivation. It was noted that cultivation needed to be initiated before weed emergence, which coincided with peanut emergence (‘cracking’).

Weeds already emerged were not consistently controlled with the tine weeder, regardless of the duration or frequency of cultivation. These basic concepts were also proven to be effective in transition to organic production in plantings of millet and southern pea.

Weed Control Programs in Peanut with Reflex, Sharpen, and Spartan.
E.P. PROSTKO* and T.L. GREY, Department of Crop & Soil Sciences, The University of Georgia, Tifton, GA 31793.
Because peanut is considered to be a minor crop by many outside the southern U.S., research and development for potential new herbicides is limited. Therefore, the objectives of this research were to evaluate the use of Reflex (fomesafen), Sharpen (saflufenacil), and Spartan (sulfentrazone), for weed control in peanut and to compare these herbicides to current standards such as Strongarm (diclosulam) and Valor (flumioxazin). Replicated, small-plot, field trials were conducted in 2009 at two locations in Georgia (Tifton, Plains). Preemergence (PRE) applications of the following treatments were evaluated: Strongarm 84WG at 0.45 oz/A; Valor SX 51WG at 3 oz/A; Strongarm at 0.23 oz/A + Valor @ 1.5 oz/A; Spartan 4F @ 4, 5, 6, and 8 oz/A; Reflex 2SL at 12 and 16 oz/A; and Sharpen 2.85SC at 1 and 2 oz/A. All treatments also included Prowl H_20 3.8ASC at 34 oz/A (PRE) and Cadre 2AS at 4 oz/A + Agrioil at 1% v/v (POST). In Tifton, both rates of Reflex and Sharpen at 2 oz/A caused significant peanut stunting that was observable as late as 55 days after treatment. In Plains, the greatest amount of peanut injury (leaf burn) observed was from Spartan at 6 and 8 oz/A. At both locations, all PRE treatments provided ≥ 92% control of Palmer amaranth (*Amaranthus palmeri*). In Tifton, annual morningglory (*Ipomoea* spp.) control was ≥ 98% with all PRE treatments except Reflex (75%), Sharpen at 1 oz/A (85%), and Spartan at 4 and 5 oz/A (83-88%). In Plains, Florida beggarweed (*Desmodium tortuosum*) control was ≥ 91% with all PRE treatments except Reflex (36-57%). Peanut yields were significantly reduced by both rates of Reflex and Sharpen, and Spartan at 8 oz/A at the Tifton location. Yield data was not collected at the Plains location due to excessive moisture conditions at harvest.

POSTER SESSIONS

Yield and 100-Seed Weight of Improved Mexican Peanut Breeding Lines with Bunch and Spreading Growth Habits.
S. SANCHEZ-DOMINGUEZ*, Departamento de Fitotecnia, Universidad Autónoma Chapingo, Chapingo, México C.P. 56230; and T.G. ISLEIB, Department of Crop Science, North Carolina State University, Raleigh, NC 27695-7629.
Peanut is an important legume crop in southern Mexico where 85% of the crop is grown during the rainy season. However, average pod yield

of the rainy season crop is poor (1300 kg ha-1) because unimproved landrace cultivars are grown by the peasants. Improved cultivars are needed. In 2002 the best Mexican peanut cultivars, selected during 1994-2000, were crossed at the North Carolina State University peanut breeding program, among themselves and with other improved peanut lines including Perry. Breeding populations were received in Mexico in 2003, and evaluated on campus from 2004 to 2006. Spreading and bunch growth habits were observed. In 2007 through 2009 two different trials were conducted in different localities of the states of Morelos and Puebla. In this paper some results are reported from experiments conducted during 2009 in Cuauchichinola, Morelos, Mexico. Data were obtained from small plots of 2.64 m2. Although additional yield components were recorded, only peanut pod yield and 100-seed weight are presented. Of 14 lines with bunch growth habits, 1-06Ch, 4-06Ch, 8-06Ch, and 10-06Ch ranked in the group with the highest pod yields. Line 4-06Ch had the greatest yield (2127 kg ha-1), but those of the other three lines exceeded the national average yield indicated above. Criollo de Ocozocuautla, a landrace control in the trial, had the greatest 100-seed weight (80.8 g). Among lines with spreading growth habit, line 6-06Ch ranked first in pod yield (3174 kg ha-1) while 14-06Ch ranked last (1487 kg ha-1). Line 6-06Ch had a 100-seed weight of 71.4 g, intermediate to the extremes for the improved lines set by 20-06Ch (61.2 g) and 19-06Ch (80.2 g). Pod yield in 6-06Ch was more correlated with mature pod number than to seed size.

Attempt to Remove Peanut Allergens from Peanut Extracts Using IgE-Attached Magnetic Beads. S.-Y. CHUNG* and E.T. CHAMPAGNE, Southern Regional Research Center, USDA-ARS, New Orleans, LA 70124.

Immunoglobulin E (IgE) antibodies from sera of peanut-allergic individuals are known to bind specifically to major peanut allergens, Ara h 1 and Ara h 2. The objective of this study was to determine the efficiency of magnetic beads (Dynabeads) attached with IgE antibodies in the removal of major peanut allergens from peanut extracts. Anti-human IgE antibodies were attached to magnetic beads by incubating Protein G-Dynabeads with goat anti-human IgE antibodies. The resultant anti-IgE-beads were incubated, respectively, with two sera (containing IgE antibodies) of peanut-allergic individuals. This process produced the IgE-Dynabeads which were further incubated with a peanut extract containing major peanut allergens. Allergens that bound to the IgE-beads were retrieved, using 0.1 M glycine hydrochloride, pH 2.5. The retrieved allergens and beads-treated extracts were analyzed by SDS-PAGE and Western blots. Results showed that the majority of major peanut allergens remained in the treated extract, and only small amounts of the allergens, especially Ara h 1, bound to the beads. It was concluded that while the IgE-Dynabeads bound major peanut allergens, the system was

not efficient enough to remove peanut allergens to produce a less allergenic peanut extract. Further optimization of the IgE-bead system is needed.

Expansion of a Direct Shoot Organogenesis System in Peanut to include U.S. Varieties. S. BURNS* and M. GALLO, Agronomy Department, The University of Florida, Gainesville, FL 32611-0300; and B.L. TILLMAN, Agronomy Department, North Florida Research and Education Center, The University of Florida, Marianna, FL 32446-8091.

The most successful method for producing transgenic peanut is particle bombardment of somatic embryos. One of the major disadvantages of this approach is the time required to produce mature plants (8-12 months). An alternative to lengthy bombardment and regeneration protocols is *Agrobacterium*-mediated transformation employing direct shoot organogenesis. This strategy allows for mature, transgenic plants to be obtained quickly (3 - 4 months). Peanut cultivars, 'Florida-07' (Runner), 'Georgia Green' (Runner), 'Georgia Brown' (Spanish), 'New Mexico-A' (Valencia), and 'VC2' (Virginia), were selected to represent all four market types. Two types of cotyledonary explants were examined, those that previously had an attached embryo-axis upon cotyledon separation (explant A) and those that were embryo-axis-free upon separation (explant B). Explants were placed on shoot induction medium (MS salts, B5 vitamins, 3% sucrose, 0.8% agar, 10 µM 2,4-D, pH 5.8) with N6-benzyladenine (BA) concentrations ranging from 10 µM - 80 µM for Florida-07, Georgia Green, and VC2, 10 µM - 320 µM for Georgia Brown, and 10 µM - 640 µM for New Mexico-A. Following a four-week culture period, explants were visually rated based on a scale of 1 to 4, where 1 = slight greening, no growth; 2 = greening, callus-like growth, no adventitious bud formation; 3 = greening, adventitious bud formation; and 4 = greening, adventitious bud formation, small plantlet development. A difference in shoot induction was observed for the cotyledon explants examined ($Pr > [t] = <0.0001$). Explant A had greater shoot induction with a visual rating of 1.75, while explant B had a rating of 1.64 ($Pr > [t] = <0.0001$). Additionally, cultivars responded to the culture conditions differently (cultivar * BA interaction). Georgia Green on 40 µM BA producing the most shoot buds (31.2%) and the highest visual rating (2.22), followed by VC2 on 10 µM BA (17.3%, 1.84), New Mexico-A on 640 µM BA (15.9%, 1.84), Georgia Brown on 80 µM BA (9.1%, 1.73), and Florida-07 on 40 µM BA (5.6%, 1.82). Of the tested varieties, Georgia Green, New Mexico-A and VC2 appear to be the best suited for future transformation experiments based on their shoot bud production.

Relative Interference of Eight Palmer Amaranth Populations with Peanut and Other Crops. A. CHANDI*, D.L. JORDAN, J.D. BURTON, A.C. YORK, and S. MILA-LEWIS, North Carolina State University,

Raleigh, NC; and A.S. CULPEPPER and J. WHITAKER, University of Georgia, Tifton and Statesboro, GA.

Palmer amaranth (*Amaranthus palmeri*) has become difficult to control in southern row crops due to development of resistant biotypes that are no longer controlled by acetolactate synthase-inhibiting herbicides and/or glyphosate. This weed is extremely competitive and can cause complete crop failure in some instances. Previous research suggests that biotypes or populations of individual weed species can interfere with crop yield differently. It is suspected that differences in crop response to populations of Palmer amaranth may exist, and determining the relative difference in interference by glyphosate-resistant (GR) populations and glyphosate-susceptible (GS) populations is of interest. The objective of this research was to compare early season interference of corn (*Zea mays*), cotton (*Gossypium hirsutum*), peanut (*Arachis hypogaea*), snap bean (*Phaseolus vulgaris*), and soybean (*Glycine max*) growth by eight Palmer amaranth populations collected from Georgia and North Carolina. Seeds from eight Palmer amaranth populations and corn, cotton, peanut, soybean, and snap bean were planted in 15 cm round plastic pots containing commercial soil medium in two parallel rows 2.5 cm apart. Approximately 6 crops seeds and 25 Palmer amaranth seeds were planted in each pot and eventually thinned to one crop and one Palmer amaranth plant per pot. The experimental design was a randomized complete block with ten replications and the experiment was conducted twice. Height of the Palmer amaranth and crop plants was determined every 5 days beginning one wk after pots were thinned to one Palmer amaranth and one crop plant per pot up to 40 days after emergence (DAE). At 40 DAE, Palmer amaranth and crop plants were severed at the soil surface and fresh and dry weights determined. Corn leaf tips and number of nodes per soybean plant were also recorded at harvest. Data for plant height and weight were subjected to analysis of variance for a six levels of crop (no crop, corn, cotton, peanut, snap bean, soybean) by nine levels of Palmer amaranth population (no Palmer amaranth and eight populations from North Carolina and Georgia) factorial treatment arrangement. Means of significant main effects and interactions were separated using Fisher's Protect LSD test at $p \leq 0.05$.

The interaction of crop by population was not significant for crop height and fresh weight or Palmer amaranth height. However, this interaction was significant for Palmer amaranth fresh weight. Main effect of crop was significant for all parameters while the main effect of population was significant for crop fresh weight (but not crop height) and Palmer amaranth height and population. Lack of an interaction of crop by Palmer amaranth population for crop fresh weight suggests that interference from Palmer amaranth populations is similar for corn, cotton, peanut, soybean, and snap bean. In contrast, the interaction of crop by population was significant for Palmer amaranth fresh weight suggesting that Palmer amaranth growth was affected differently depending on crop.

This interaction was most likely caused by the wide range of competitive ability of the crops used in this experiment and the relative uniformity of Palmer amaranth populations. In absence of a crop, Palmer amaranth fresh weight varied among populations. Corn and snap bean were the most competitive crops with Palmer amaranth resulting in relatively low Palmer amaranth weight across all populations. A range of differences in Palmer amaranth weight was noted when comparing populations with cotton, soybean, and peanut. These crops are less competitive than corn and snap bean most likely allowing differential growth of Palmer amaranth populations. This difference in competitiveness was noted for Palmer amaranth height where cotton, soybean, and peanut reduced height by 40 DAE by approximately 17% while presence of corn and snap bean reduced height by approximately 50%. Results from this experiment indicate that interactions among crops by Palmer populations can occur with respect to early season interference with growth of both crops and weeds. However, the effect of these Palmer amaranth populations on crop growth did not vary with respect to crop selection. One important question of interested is whether there is a fitness penalty for glyphosate resistance in GR weed populations compared with GS populations. While results from this

Peanut Response to Simulated Drift Rates of Dicamba, Glufosinate, and 2,4-D. J. JOHNSON*, D.L. JORDAN, L.R. FISHER, J. PRIEST, and P.M. EURE, North Carolina State University, Raleigh, NC.

Development and utilization of dicamba, glufosinate, and 2,4-D resistant crop cultivars potentially will have a significant influence on weed control in the southern United States. However, off-site movement to adjacent non-tolerant crops is a concern in many areas of eastern North Carolina, especially where peanut and tobacco are produced. Cotton, peanut, soybean, tobacco, and many vegetable crops not resistant to these herbicides are often grown in close proximity to one another, and practitioners will need to consider potential adverse effects on these crops. Research was initiated in 2009 to determine response of these crops to simulated drift rates of dicamba, glufosinate, and 2,4-D when applied at two locations for each crop in early June to crops planted in early to mid May (cotton, peanut, soybean) or when tobacco was transplanted in April. The highest rate of these respective herbicides was 0.125 lb ai/acre, 0.27 lb ai/acre, and 0.24 lb ai/acre. Herbicides were applied at four additional rates going as low as 0.000488 lb/acre (dicamba), 0.017 lb/acre (glufosinate), and 0.00093 lb/acre (2,4-D). Peanut yield was reduced by only the highest rate of either glufosinate or 2,4-D. Dicamba at 0.125 lb/acre reduced pod yield at one location while rates of 0.125 and 0.03125 lb/acre reduced yield at a second location. Although not reported here, yield of cotton, soybean, and tobacco generally were affected more than yield of peanut. Results from these experiments will be used to emphasize the need for diligence in

application of these herbicides in close proximity to adjacent crops that are susceptible as well as the need to clean sprayers completely before spraying sensitive crops. Additionally, these data will be used to correlate visual injury with yield loss when these herbicides damage susceptible crops.

Summary of Peanut Response to Tillage in North Carolina from 1997-2009. D.L. JORDAN* and P.D. JOHNSON, North Carolina Cooperative Extension Service, Raleigh, NC.

Reduced tillage peanut (*Arachis hypogaea* L.) production continues to gain interest in North Carolina. Informal surveys at county production meetings revealed that 10% (1998), 23% (2005), and 41% (2009) of growers produced peanut on a portion of their acreage in reduced tillage. Research with virginia market type peanut has been conducted since 1997 to develop recommendations for reduced tillage systems. When pooled over 53 experiments from 1997-2009, pod yield was 3.1% higher (133 lbs/acre) in conventional tillage compared with reduced tillage. However, in a number of these trials yield in reduced tillage was equal to or greater than yield in conventional tillage. Yield in conventional tillage was higher in higher in 28 of 53 trials (53%) compared with reduced tillage which was higher in 47% of trials. Yield often favored conventional tillage when major differences were noted between tillage systems. The range of difference between tillage systems was 15% lower in conventional tillage compared to reduced tillage to 28% higher in conventional tillage compared with reduced tillage. These data indicate that strip tillage is increasingly a viable option for peanut growers in North Carolina. However, defining soils that are more conducive to reduced tillage production continues to be important, and research continues in an effort to assist in making recommendations to producers on implementation of reduced tillage systems for peanut.

Growth and Yield of Valencia, Spanish, Virginia and Runner Market Type Peanuts in Various Row Spacings. S. MAAS and N. RAJAN, Department of Plant and Soil Science, Texas Tech University, Lubbock, TX; R. NUTI and R. SORENSEN, USDA-ARS, National Peanut Research Lab, Dawson, GA 39842; P. PAYTON, USDA-ARS, Cropping System Research Lab and N. PUPPALA*, New Mexico State University, Agricultural Science Center at Clovis, NM 88101.

Currently, the majority of peanuts grown in New Mexico and West Texas are planted in single rows on beds 36 to 40 inches apart. In 2006-2008, several field studies were conducted with Valencia peanuts comparing single row, twin row, and diamond planting patterns in various populations. The basic conclusion of this research was that twin row and diamond planting patterns were at times superior to single row planting. It was also observed that increasing the seeding rate of Valencia

peanuts could improve yield at an economically sustainable level. In 2009, we decided to start new experiments that include all four peanut market types in single row, twin row, and diamond planting patterns at the recommended six seed per foot of row. Because of the range of maturity in these market types, an early and a late harvest was made in an attempt to show the interaction of market type and planting pattern yield potential over time. In 2009, the diamond planting pattern had overall poor emergence which drastically affected the yield. The single row and twin row plots emerged with good uniformity. Yield for 'Valencia C' ranged between 2,500 and 3,830 lb/A when harvested early and 4,270 and 4,590 lb/A at the late harvest. Grade for 'Valencia C' improved between 4 and 6 points between harvest timings. When harvested early in twin rows, 'Tamnut OL06' had 27% better yield than single rows or diamond planting. Early harvest grade also improved for Spanish when planted in twin rows by 2 points. The late harvest yield for 'Tamnut OL06' ranged between 4,560 and 5,030 lb/A with grades of 72 and 73. Although not significant, the Virginia variety 'Gregory' showed potential for a yield advantage when harvested late in twin rows over single rows and diamond planting with 18% higher yield. This was the highest yield in the experiment. The yield range for early harvested 'Gregory' was 3,220 and 4,170 lb/A and 5,020 to 6,010 lb/A for late harvest. Virginia grade improved 4 to 6 points between early and late harvest. The runner market type 'Flavor Runner 458' had better yield in single rows compared to diamond planting when harvested early. Twin row runners harvested early produced 4,200 lb/A which was similar to single row and diamond planting patterns. The late harvested runners ranged between 5,200 and 5,790 lb/A for all planting patterns with grades 4 to 7 points better than early harvested runners. This experiment will be repeated in 2010.

Use of Aerial Remote Sensing Imagery for Estimating Peanut Ground Cover and Leaf Area Index. N. RAJAN, and S. MAAS, Department of Plant and Soil Science, Texas Tech University, Lubbock, TX; R. NUTI, USDA-ARS, National Peanut Research Lab, Dawson, GA 39842; P. PAYTON, USDA-ARS, Cropping System Research Lab, Lubbock, TX; and N. PUPPALA*, New Mexico State University, Agricultural Science Center, Clovis, NM 88101.

Leaf area index (LAI) and ground cover (GC) are important parameters as they are directly related light interception, plant growth, and yield. However determination of LAI and GC are often tedious processes and, for LAI require destructive sampling. Hence, remote sensing can be a tool for determining LAI and GC non-destructively. Numerous spectral-based models are available in the literature for estimating LAI. Many of these spectral-based models depend on the empirical relationships between LAI and vegetation indices, which sometimes make them site- and sensor-specific. We have conducted a study in a peanut field in

Brownfield, TX to develop a procedure based on the Perpendicular Vegetation Index (PVI) to estimate GC and LAI. Aerial images were collected three times during the growing season using the Texas Tech Airborne Multispectral Remote Sensing System (TTAMRSS) at an altitude of approximately 3000 m. As the first step, vegetation cover is estimated from the ratio of the PVI for an image pixel to the PVI of full vegetation canopy (100% ground cover). In the second step, vegetation cover is converted to LAI using a model relating GC to LAI. The major advantages of using PVI compared to other indices such as Normalized Difference Vegetation Index (NDVI) is that that this method does not rely on empirical relationships.

Utility of Flumioxazin in Texas Peanut. P.A. DOTRAY*, Texas Tech University, Texas *Agri*Life Research, and Texas *Agri*Life Extension Service, Lubbock, TX 79409-2122; W.J. GRICHAR, Texas *Agri*Life Research, Beeville, TX 78102; and L.V. GILBERT, Texas *Agri*Life Research, Lubbock, TX 79403.

Flumioxazin (Valor SX) was registered for use in peanut in 2001. Valor SX may be applied prior to planting or preemergence (within 48 hours after planting and prior to peanut emergence). In 2008 and 2009, several studies were conducted in grower fields across the Texas Southern High Plains to evaluate peanut response to Valor SX in large plot replicated trials. In 7 studies over 2 years, Valor SX at 2 oz/A did not reduced peanut yield relative to the non-treated control. In 11 of 12 studies over 2 years, Valor SX at 3 oz/A did not cause a peanut yield reduction; however, in one of four experiments in Dawson County, yield loss in Flavorrunner 458 following Valor SX at 3 oz/A was observed. Although peanut injury has been observed in other states, in the High Plains when rates exceeded labeled recommendations, and at one location (following Valor SX at 3 oz/A) in these studies, this herbicide is a valuable option for peanut growers with minimal risks and will provide effective early-season weed control for four to six weeks. Studies were initiated in 2009 and 2010 to determine peanut response to Valor SX at 0, 2, and 3 oz/A and Gramoxone Inteon at 0, 8, and 16 oz/A applied alone and in tank mixture applied preemergence (PRE) or at ground crack (AC). In 2009, peanut stand ranged from 9.2 to 10.8 plants per 3 feet of row and no treatment caused a reduction in stand relative to the non-treated control (9.7 plants/3 feet). Only Valor SX applied AC at 2 and 3 oz/A injured peanut, but this injury was no greater than 5%. Yield from Valor-treated plots ranged from 3424 to 3608 lb/A, and were not reduced relative to the non-treated control (3297 lb/A). Results from this study suggest that Valor SX alone or in tank mix with Gramoxone Inteon is a safe herbicide option to peanut producers in our region. The current Valor SX label states that applications must be made within 48 hours of planting. There is a risk of peanut injury if Valor SX applications are delayed and peanuts are emerging.

Assessment of Oil Content and Fatty Acid Variability in Peanut Wild Relatives. M.L. WANG, USDA-ARS, PGRCU, 1109 Experiment Street, Griffin, GA 20223; H.T. STALKER, Department of Crop Science, North Carolina State University, Raleigh, NC 27695; and R.N. PITTMAN*, USDA-ARS, PGRCU, 1109 Experiment Street, Griffin, GA 20223.

Peanut wild relatives contain useful alleles and can be potentially used as a secondary gene pool for improving cultivated peanuts. The variability of oil content and fatty acid composition in these peanut wild relatives were not well assessed. Sixty accessions representing 40 species within *Arachis* genus covering different genomes (A, B, and D) with different chromosome numbers (18 – 40) and ploidy levels (2x – 4x) were selected from the USDA peanut germplasm collection and evaluated for their oil content and fatty acid composition with nuclear magnetic resonance (NMR) and gas chromatography (GC). Significant variability of oil content and fatty acid composition has been identified among these peanut wild relatives. The information obtained in this study would be useful for further screening peanut wild relatives and introgression of wild species alleles into cultivated peanut in breeding programs.

Helping Producers Adjust to Management of Large-Seeded Runner-Type Peanut Cultivars. J.P. BEASLEY, JR*, R.S. TUBBS, G.H. HARRIS, JR., and J.E. PAULK, III, Crop and Soil Sciences Department, University of Georgia, Tifton, GA 31793; and N.B. SMITH and A.R. SMITH, Agricultural and Applied Economics Department, University of Georgia, Tifton, GA 31793.

Five of the more recent runner-type peanut (*Arachis hypogaea* L.) cultivar releases in the southeast have a seed size that is significantly larger than ‘Georgia Green’. The large-seeded cultivars include ‘Georgia-06G’, ‘Florida-07’, ‘Tifguard’, ‘Georgia-07W’, and ‘AP-4’. The seed count per pound for these cultivars ranges from approximately 600 to 650, compared to 800-850 seed per pound for Georgia Green. This difference in seed size has resulted in some challenges for producers. When sown at the recommended six seed per row-foot rate, the larger seed size cultivars require approximately 30 pounds per acre more seed than Georgia Green. The typical range of seeding rate between Georgia Green and the large-seeded cultivars is 105 to 135 pounds or more per acre. At a seed cost of $0.75 per pound, the cost differential between the two seed sizes is approximately $22.50 per acre more to plant the large-seeded cultivars. Trials were established at three locations in 2008 and 2009 in Georgia to determine if the large-seeded cultivars could be planted at reduced rates in order to lower seed cost per acre without reducing yield potential. Data from the trials indicated no difference in yield ($p<0.05$) for large-seeded cultivars planted at 5.2 seed per row-foot

compared to 6 seed per row-foot. The results indicate a cost savings in seed. Another challenge is the calcium requirement for large-seeded runner cultivars. Trials were established in 2009 to determine the "pegging zone" threshold for large-seeded cultivars. Preliminary data indicates the large-seeded cultivars will require a higher "pegging zone" calcium level. The exact level has yet to be determined.

Effect of Peanut Cultivars Selection and Soil-insecticide Treatments on Disease, Insect Pests, and Yield in Alabama. H.L. CAMPBELL*, A.K. HAGAN, and K.L. BOWEN, Dept of Entomology and Plant Pathology, Auburn University, AL 36849; L. WELLS, Wiregrass Research and Extension Center, Headland, AL 36345; and M. PEGUES, Gulf Coast Research and Extension Center, Fairhope, AL 36532.

In 2009, ten commercial runner peanut cultivars were evaluated for their reaction to insect pests and to late early and late leaf spot, rust, stem rot (SR), and *Tomato spotted wilt virus* (TSWV) at the Wiregrass Research and Extension Center (WREC) in Headland, AL and the Gulf Coast Research and Extension Center (GCREC) in Fairhope, AL. Recommendations of the Alabama Cooperative Extension System for tillage, fertility, weed, and nematode control were followed. Soil insecticide sub-plot treatments included Temik 15G at 6.5 lb/A, Thimet 20G at 4 lb/A, and a non-insecticide treated control. A high input fungicide program for the control of leaf spot diseases and SR was followed. A RCB with six replications was used. Plots consisted of four 30-ft rows spaced 36 to 38-in apart. Incidence of TSWV was assessed at three different dates during the growing season. Leaf spot was rated using the Florida 1-10 leaf spot scoring system and rust was rated using the ICRISAT 1-9 rust rating scale. Hit counts for SR were taken immediately after plot inversion (hit equaled $\leq$ 1 foot of consecutive diseased plants per row). Yields are reported at $\pm$ 10% moisture. Late leaf spot was the dominant foliar disease at both locations however rust pressure was high at the GCREC due to late season rains. At the WREC, the soil insecticides Temik 15G and Thimet 20G significantly reduced TSWV incidence on five and seven of the cultivars, respectively. Neither soil insecticide reduced TSWV incidence on Florida 07 or Georgia 06G. While Thimet 20G reduced SR incidence compared with Temik 15G, leaf spot ratings and yield for the soil insecticide treated and the non-treated peanuts was similar. Low disease ratings were not always associated with the highest yields. With the exception of Georgia Green, TSWV incidence had no impact on yield. Georgia 07W and McCloud, which were two of the higher yielding cultivars, had the highest leaf spot ratings. At the GCREC, the soil insecticides Temik 15G and Thimet 20G reduced the incidence of TSWV and increased yield when compared with the nontreated control. Significant reductions in rust severity obtained with Thimet 20G were not reflected in higher pod

yields. Low leaf spot, rust and SR ratings for York and Georgia 02C translated into higher yields. Yields for AP-4, Florida 07, Georgia 06G, Georgia Greener, and Tifguard were similar to those reported for the current industry standard Georgia Green.

Electronic Ag News for Farmers, Agribusiness and Community Leaders.

W.J. ETHREDGE, JR*, Seminole County Extension, The University of Georgia, Donalsonville, GA 39845.

Seminole County Extension responds to need for farmers, agribusiness and general public to have timely tips and educational information. New era of electronic communication brings need for timely agricultural information through email and the internet. Agricultural awareness for community leaders and the general public is important as decisions are made by these folks who need to be more informed and up to date about what is going on in agriculture. New generation of farmers want information electronically available.

The agent developed “Seminole Crop E News” electronic newsletter to disseminate breaking news concerning agriculture. He developed an email list of farmers, agribusiness folks, and local community leaders and is continually expanding it. This newsletter contains many photos of crops, insects, disease problems and farm activities. It includes hot topics of concern to growers and excerpts from scientist’s newsletters and links to websites and downloads of timely interest.

“Seminole Crop E News” has been well received by farmers and others on the over 200 person email list that receives the newsletters. Newsletters are placed on our UGA Seminole County Extension website (http://www.ugaextension.com/seminole/) and can also be accessed on other websites such as sowegalive.com, Agfax.com , and WTVY.com.

Effect of Storage Environment on Seed Viability of Runner Cultivars.

M.W. GOMILLION*, B.L. TILLMAN, and G. PERSON, University of Florida, Agronomy Department, NFREC, Marianna, FL 32446.

A long-term seed storage environment is important in maintaining good seed viability for commercial seed production operations. This study was conducted to determine what type of storage condition best plays a role in certain cultivars having better seed viability than others. During 2008, we harvested about 90 early, medium, and late maturing cultivars from two yield tests and placed them in two different locations for a year. The first location was in a cold storage unit of a temperature range of 45-50 degrees Fahrenheit all the time, while the second location was in a warehouse bin with temperatures fluctuating with the outside weather through the year. During 2009, we tested the cultivars three different times with a rag-doll germination test, a water conductivity test, and a soil germination test, only once at the end. The tests were performed three

months apart from each other, first in March, second in July, and finally in December. Seed germination with the rag-doll tests showed little to no correlation between test one and two in the cold unit and warehouse storage.(P = ?) However, their seemed to be a significant difference on the second and third rag-doll test between the two storage environments. (P = ?). Water conductivity tests showed very little correlation between test one and two in the cold unit and warehouse storage. (P = ?). But, their were bigger differences between the second and third test between the two storage environments (P = ?), showing some of the peanut cultivar seeds deteriorating by the third test, with a higher leachate reading than they had on the second test.

Effect of Herbicide and Fungicide Tank-mixes on Disease and Weed Control in Peanut. W.J. GRICHAR*, Texas AgriLife Research, Beeville, TX 78102; P.A. DOTRAY, Texas AgriLife Research, Lubbock, TX 79403; A.J. JAKS, Texas AgriLife Research, Beeville, TX 78102; and J. WOODWARD, Texas AgriLife Extension Service, Lubbock, TX 78102.

Postemergence weed control and foliar and/or soilborne disease control are major concerns for peanut growers across the state. Requests from peanut growers about the possibility of mixing postemergence herbicides with a foliar fungicide seem to increase every year because of the need to reduce field operations in order to reduce fuel costs. Therefore, field studies were conducted in south, central, and west Texas from 2007 through 2009 to determine the effects of various tank-mix combinations of postemergence herbicides (acifluorfen, clethodim, sethoxydim, imazapic, imazethapyr, lactofen, and 2,4-DB) with three commonly used peanut fungicides (prothioconazole + tebuconazole, pyraclostrobin, tebuconazole, fluazinam, and boscalid) on annual grass and broadleaf weed control as well as foliar and soil-borne disease control.
Weed control. Broadleaf signalgrass [*Brachiaria platyphylla* (Griseb.) Nash], Texas millet [*Urochloa texana* (Buckl.) R. Webster] and southern crabgrass [*Digitaria ciliaris* (Retz.) Koel] control was not reduced (at least 87%) when clethodim or sethoxydim were tank-mixed with any of the fungicides compared with clethodim or sethoxydim applied alone. In west Texas, the combination of 2,4-DB and prothioconazole + tebuconazole did result in antagonism in one year with only 30% Palmer amaranth (*Amaranthus palmeri* L.) control. In south Texas, lactofen, imazapic, or 2,4-DB alone or in combination with any of the fungicides did not result in reduced control of Palmer amaranth. However, either acifluorfen or imazethapyr plus pyraclostrobin and imazethapyr plus pyraclostrobin resulted in reduced Palmer amaranth control from either of the herbicides alone. Lactofen, acifluorfen, imazapic, and 2,4-DB alone or in combination with fungicides provided at least 97% control of smellmelon (*Cucumis melo* L. var. Dudaim Naud). Imazethapyr alone controlled smellmelon only 79% while imazethapyr in combination with

any of the fungicides provided at least 90% control. All herbicides alone or in combination with prothioconazole + tebuconazole, pyraclostrobin, or tebuconazole controlled pitted morningglory at least 90% with the exception of lactofen plus pyraclostrobin which resulted in 79% control.

Disease control. Early leafspot (*Cercospora arachidicola* S. Hori) was the predominant species at all locations in both years. When fungicides were applied in combination with broadleaf herbicides at Lamesa none of the fungicide-herbicide combinations resulted in greater leafspot than the respective fungicide alone. At Yoakum, all fungicide-herbicide combinations resulted in less leafspot than the untreated check in 2008 and 2009; however, in 2009, reduced leafspot efficacy was noted with pyraclostrobin + imazapic and tebuconazole + clethodim, acifluorfen, or imazapic compared with pyraclostrobin or tebuconazole alone. Southern blight (*Sclerotium rolfsii* Sacc.) pressure was only present at the Yoakum location and was considered light. When fungicides were applied in combination with herbicides, all fungicide-herbicide combinations, with the exception of pyraclostrobin plus 2,4-DB, produced no more southern blight disease than the respective fungicide alone. No effects on Sclerotinia blight (*Sclerotinia minor* Jagger) control were noted when clethodim or sethoxydim were applied in combination with boscalid or fluazinam.

Peanut Injury. When broadleaf herbicides were evaluated, lactofen and acifluorfen resulted in peanut injury and the addition of prothioconazole + tebuconazole pyraclostrobin, or tebuconazole did not enhance crop injury. No injury was observed following imazapic, imazethapyr, or 2,4-DB alone but enhanced peanut injury was observed when pyraclostrobin was added to imazapic, imazethapyr, or 2,4-DB; when tebuconazole was added to 2,4-DB or imazapic; and when prothioconazole + tebuconazole was added to imazapic, imazethapyr or 2,4-DB depending on location and year. When grass herbicides were evaluated, no peanut injury was noted in south Texas while in the High Plains, clethodim plus either tebuconazole or prothioconazole + tebuconazole and sethoxydim in combination with any of the fungicides resulted in increased peanut injury when compared with the untreated check.

Thrips Management in Peanut: Evaluation of New Insecticides and Peanut Varieties. D.A. HERBERT, JR.*, S. MALONE, Department of Entomology, Virginia Tech Tidewater Agricultural Research and Extension Center, Suffolk, VA 23437; M. BALOTA, Department of Plant Pathology, Physiology, and Weed Science, Virginia Tech Tidewater Agricultural Research and Extension Center, Suffolk, VA 23437; R. BRANDENBURG, B. ROYALS, Department of Entomology, North Carolina State University, Raleigh, NC, 27695; V. MASCARENHAS, Syngenta Crop Protection, Inc., Nashville, NC 27856; and R. WILLIAMS, E.I. DuPont de Nemours and

Company, Raleigh, NC 27613.

In 2009, five thrips management experiments were conducted in peanut, four in Suffolk, VA and one in North Carolina. Two evaluated experimental seed treatments (Cruiser 70WS, A17460, A17461, A17462) and compared them to standards (Thimet 20G and Temik 15G). One evaluated different rates of DPX-HGW86 20SC applied as a liquid in-furrow and compared them to the same standards. A fourth evaluated foliar broadcast insecticides (Orthene 97, Radiant SC, Karate Z, Ecotec, and Requiem 25EC). The fifth evaluated virginia-type peanut varieties/lines ('VT 003069', 'VT 003194', 'VT 004152', 'VT 024077', 'VT 024051', 'VT 9506083-3', and 'Bailey') for susceptibility to thrips.

In the seed treatment tests, there were significant differences in plant injury caused by thrips feeding on all four sample dates, with all treatments except those with fungicide alone performing better than the non-treated check. Plants in treatments with in-furrow applications of Thimet 20G or Temik 15G had the least injury, but seed treatments that included insecticides were very close, and often were not significantly different. Results were similar with numbers of thrips. On most sample dates, seed treatments that included insecticides and the in-furrow insecticide treatments had the fewest thrips. This was especially apparent on 9 Jun when the immature population peaked at 120 per 10 leaflet sample in the non-treated check. On that date all insecticide treatments (seed and in-furrow) were equally effective at reducing immature populations. Late-season *Tomato spotted wilt* incidence (hits per 80 row ft) included a high of 12.8 in the numbered compound 'A17461', 10.8 in the non-treated check, and a low of 2.8 in the Thimet treatment. Pod yield data followed these trends with the lowest yields in the non-treated checks, ranging from 5,040 to 5,293 lb/acre. Yields with the other treatments were much higher and ranged from 5,589 to 6,165 lb/acre. The highest yields were achieved with the in-furrow treatments (Thimet 20G, Temik 15G) and the seed treatments with Cruiser 70WS and the numbered compound 'A17460'. These ranged from 5,831 to 6,165 lb/acre. In North Carolina, similar results were observed in the experimental seed treatments (Cruiser 70 WS, A17460, A17461, and A17462) when compared to standards (Thimet 15G and Temik 15G). There were significant differences in plant injury by thrips feeding on all three sample dates with all treatments except those with fungicide alone performing better than the untreated check. Treatments with in-furrow applications of Thimet 15G or Temik 15G had the least plant injury compared to the fungicide treatments, but all had significantly less plant injury than the untreated check on all three sample dates. Results were similar with numbers of thrips collected (both adult and immature). The in-furrow insecticides and the fungicide weren't significantly different from the untreated check when it came to adult thrips control except for Thimet 15G. The numbers of immature thrips were reduced using A17461 and Temik 15G when compared to the untreated check. At 70

days post-plant the incidence of TSWV wasn't significantly different among the treatments when compared to the untreated check with an average 2.5 symptomatic plants per treatment. At 101 days post-plant compound A17462 had fewer symptomatic plants than those treated with Temik 15G, Cruiser 70 WS, compounds A17460, and A17461. None of the treatments were significantly different from the untreated check. Yield data showed no significant difference among the treatments with an average yield of 5,553 lb/acre.

In the DPX-HGW86 20SC liquid in-furrow test, all treatments had significantly less plant injury relative to the non-treated check on all four sample dates. The DPX-HGW86 20SC treatments held well until the 9 Jun rating, then provided less control compared with the in-furrow treatments with Thimet 20G and Temik 15G. There were differences between treatments for adult tobacco thrips populations on 27 May and 2 Jun but not on later sample dates. At the adult peak (2 Jun), only Temik 15G treated plots had significantly fewer thrips than the non-treated check. All treatments had significantly fewer immature tobacco thrips than the non-treated check on 2 and 9 Jun, with no differences between treatments on these dates. Treatments significantly reduced *Tomato spotted wilt* incidence on 28 Sep relative to the non-treated check, with differences between treatments. Yields were statistically the same among treatments and resulted in an average increase of 603 lb/acre compared with the non-treated check.

In the foliar broadcast insecticide test, there were significant differences in plant injury on all four sample dates, with Requiem 25EC not differing from the non-treated check on any date. Karate Z and a tank mix of Ecotec + Karate Z were also not different from the check on the dates when thrips injury was the most severe. The treatments that provided the best control and had the least injury were tank mixes of Ecotec + Radiant SC and Ecotec + Orthene 97. Five of nine treatments had yields that were not different from the check including Requiem 25EC, Karate Z, Ecotec + Karate Z (2 rates), and the low rate of Ecotec + Radiant SC. The highest yields were obtained with tank mixes of Ecotec (high and low rates) + Orthene 97, Ecotec (high rate) + Radiant SC, and Orthene 97 alone.

In the virginia-type variety/lines test, there were significant differences in plant injury on two of four sample dates, with VT 9506083-3 and Bailey having the most injury. Number of adult thrips differed significantly on one of four sample dates (2 Jun), also the "peak" date for adults, with a range of 8.8 (VT 003069 and VT 024077) to 20.5 (VT 024051) adult thrips per 10 terminal leaflets. Numbers of immature thrips were not significantly different on any sample date, with a range of 52.3 to 108.5 thrips per 10 terminal leaflets on the peak date of 9 Jun. Late-season evaluation of *Tomato spotted wilt* indicated significant differences

between treatments, with Bailey having the fewest hits (7.5/80 row ft), and VT 004152 and VT 024077 having the most (21.25 and 21.50, respectively). Yields were significantly different, with a range of 5,102 (VT 9506083-3) to 6,241 (VT 003194) lb/acre.

Development of a Low-cost and High-throughput Polyacrylamide Gel System for Peanut Genotyping with Simple Sequence Repeat (SSR) Markers. J. FOUNTAIN, USDA-ARS, Crop Protection and Management Research Unit, Tifton, GA; H. QIN, USDA-ARS, Crop Protection and Management Research Unit, Tifton, GA and University of Georgia Department of Plant Pathology, Tifton, GA; P. DANG, and C. CHEN, USDA-ARS, National Peanut Research Laboratory, Dawson, GA; M. WANG, USDA-ARS, Plant Genetic Resources Conservation Unit, Griffin, GA; B. GUO, USDA-ARS, Crop Protection and Management Research Unit, Tifton, GA.

Traditionally, peanut cultivar development has been dominated by conventional breeding methods, which have greatly increased yield and will continue to play an important role in peanut genetic improvement. Applications of MAS (marker-assisted selection) in plant breeding have been shown to increase significantly the rate of genetic gain when compared to conventional breeding. The cost of genotyping and throughput are still a concern in marker-assisted selection in peanut breeding. The objective of this study is to introduce a simple, low-cost, and high-throughput protocol for genotyping in peanuts. The developed system was based on polyacrylamide gel to separate PCR amplified DNA fragments and silver stain to visualize the bands. In this system, one electrophoresis unit (cost less than $200) can hold two vertical 52-sample slab gels, and the cost of the unit is less than $200. The electrophoresis runs about 1 hr and 40 min at 180 V for a 9% polyacrylamide gel or 1 hr and 20 min at 160 V for a 6% polyacrylamide gel. The silver stain takes 30 min. After stained, the gels can be placed on the light-box for genotyping score and the gel image can be photographed using digital camera. The cost per gel is estimated at $0.54 and the cost for silver stain is estimated at $0.37. Therefore, the total cost could be as low as $0.018 per data point, excluding PCR reaction and DNA extraction cost. This system has been successfully used in our peanut genetic mapping, and could generate over 1,000 data points by one person a day.

Application of the CSM–CROPGRO–Peanut Model in Assisting with the Performance Evaluation of Peanut Lines at the Early Stage of Yield Testing. J. ANOTHAI*, A. PATANOTHAI, K. PANNANGPETCH, S. JOGLOY, Department of Plant Science and Agricultural Resources, Faculty of Agriculture, Khon Kaen University, Khon Kaen 40002, Thailand; K.J. BOOTE, Agronomy Department, University of Florida, Gainesville, FL 32611-0500; and

G. HOOGENBOOM, Department of Biological and Agricultural Engineering, The University of Georgia Griffin, GA 30223-1797.
The success in deriving the cultivar coefficients from a reduced set of field data allows the use of crop models in assisting with performance evaluation of crop breeding lines at the early testing stage. At this stage, the lines are normally tested in only a few environments, and selection decisions are based on these limited tests. The model can provide simulated yield of the tested peanut genotypes for a wide range of environments and in multiple years. These simulated yield data can help plant breeders make decisions on line selection more accurately and effectively. However, the actual practice of this application so far has not been evaluated with real data. The objective of this study was to evaluate the application of the Cropping System Model (CSM)–CROPGRO–Peanut in assisting with performance evaluation of peanut breeding lines at the early testing stage. Two sets of peanut lines in the preliminary yield trial (PYT) stage, referred to as Set I and Set II, were yield tested at Khon Kaen University for three environments during 2004–2005. Separate experiments for these lines were also simultaneously conducted for two seasons to obtain reduced data sets for determining the cultivar coefficients that are needed for the CSM–CROPGRO–Peanut model. The model was then used to simulate pod yield of the test lines for the same three environments in which they were actually tested in the PYTs. In addition, the model was used to simulate pod yield for 130 locations that covered all major peanut production areas in Thailand for 30 years for a total of 3,900 unique environments in order to extend the range of the environments of the PYTs. Three selection scenarios were employed based on genotypic ranking by observed yield from the PYTs, by simulated yield for 3,900 environments, and by both observed and simulated yields. The results showed that model simulation picked up more genotype x environment (G x E) interaction in extending the range of the test environments from 3 to 3,900. Among the top 50% highest yielding lines in Sets I and II, actual PYTs and model simulations were found to identify the same four out of nine lines in Set I and nine out of 12 lines in Set II. The results from the model simulations also indicated that some lines with high yield potential could have been eliminated in the early stage of yield evaluation if selection was based on only observed yield from the PYT. Likewise, some lines with high observed yield could have also been eliminated if selection was based on only simulated yield. It was concluded that using both simulated yield based on the CSM-CROPGRO-Peanut model and observed yield from actual PYT as the basis for selection will ensure that these lines will not be eliminated, and will make line selection at the early evaluation stage more effective.

Variability of Total Oil Content in Peanut Across the State of Texas. M.R. BARING*, J.N. WILSON, Soil and Crop Sciences Dept., Texas

AgriLIFE Research, College Station, TX 77843-2474; C.E. SIMPSON and J. CASON, Soil and Crop Sciences Dept. Texas AgriLIFE Research, Stephenville, TX 76401-0004; M.D. BUROW and J. AYERS, Texas AgriLife REC, Lubbock, TX 79403.

The state of Texas has three major growing regions; South, Central, and West, with a history of peanut production. The Texas AgriLIFE peanut breeding program conducts a replicated advanced yield trial at multiple locations within each of these regions annually. We routinely sample high oleic varieties from each of these environments across multiple years and locations and we have found that it is common for oleic/linoleic fatty acid ratios in the West Texas environment to be as much as 10 points lower than ratios from the South and Central, Texas environments. We initiated a study using entries from our advanced line test to determine if there was an inter-regional and or intra-regional effect on total oil content variability between and within the entries. The hypothesis of the study was that we would see differences in total oil content between the three regions based on the differences we have detected with O/L ratios. The study was comprised of five cultivars used as checks in our yield tests and five of our breeding lines for a total of ten entries. Three replications of each entry were tested for two South Texas, two West Texas, and two Central Texas locations. All of the samples were tested with a Nuclear Magnetic Resonance (NMR) machine which was used as a non-destructive test to determine the total oil content of a sample. Random samples of 70g sound mature kernels (SMK) were shelled from each replication of each entry and then three 20g subsamples from each of the 70g samples were tested using the NMR. Samples were harvested from the 2008 and 2009 growing seasons. Initial results indicate that unlike the O/L ratios, there were no significant regional differences due to locations for total oil content. Peanut maturity was the greatest contributing factor to the differences detected in the total oil content of the genotypes in this study.

Herbicide and Application Timing Influence Cutleaf Groundcherry Biomass and Seed Production. A.J. PRICE* and C.D. MONKS, USDA-ARS National Soil Dynamics Laboratory, Auburn, AL 36832 and Agronomy and Soils Department, Auburn University, Auburn, AL 36849.

A field experiment was conducted to evaluate herbicide and application timing on cutleaf groundcherry population, biomass, seed production, and peanut yield. Treatments included: 1) a non-treated control; 2) hand pruning; 3) diclosulam applied preemergence (PRE) at 0.027 kg ai/ha alone; 4) paraquat applied at cracking postemergence (POST) at 0.14 kg ai/ha followed by bentazon at 0.56 kg ai/ha alone or mixed with 5) 2,4-DB at 0.22 kg ae/ha; 6) acifluorfen at 0.28 kg ai/ha; 7) imazapic at 0.07 kg ai/ha; or 8) chlorimuron ethyl at 0.00875 kg ai/ha. Hand pruning and POST herbicides were applied at four weekly intervals beginning June

23rd. Diclosulam applied PRE provided season-long cutleaf groundcherry control; imazapic applied at the two earliest POST timing also provided excellent control. Use of basagran alone or mixed with chlorimuron ethyl, or hand pruning increased cutleaf groundcherry biomass and subsequent seed production compared to the non-treated control in almost all comparisons. Peanut yield reflected cutleaf groundcherry control. Utilizing herbicides that injure but do not control cutleaf groundcherry may increase seed production.

Root Distribution Patterns of Peanut Genotypes under Mid-Season Drought. N. JONGRUNGKLANG*, B. TOOMSAN, N. VORASOOT, S. JOGLOY, A. PATANOTHAI, Department of Plant Science and Agricultural Resources, Khon Kaen University, Khon Kaen 40002, Thailand; K.J. BOOTE, Agronomy Department, University of Florida, Gainesville, FL 32611-0500; and G. HOOGENBOOM, Department of Biological and Agricultural Engineering, The University of Georgia, Griffin, GA 30223-1797.
Peanut root distribution patterns are not well understood and have not been studied extensively. There is a lack of information on the classification of root distribution patterns for many peanut genotypes under mid-season drought, which could be useful for peanut drought breeding programs. The goal of this study was to determine the root distribution pattern of 40 peanut genotypes under mid-season drought. The experiment was conducted in 2007 on the research farm of Khon Kaen University, Thailand. All plots were well-irrigated, except during the period from 50 to 83 days after planting when water was withheld, corresponding to a mid-season drought. Root samples were obtained using the auger method on the most water-stressed date at the end of the drought period. The samples were collected at two positions, including at the center between two plants in the row and between row positions. The soil was sampled to a depth of 90 cm and was separated into three layers, including upper (0 to 30 cm), middle (30 to 60 cm) and deeper (60 to 90 cm) soil layers. Root length density (RLD) was analyzed with the Winrhizo program. For each peanut genotype the relative contribution to each layer was calculated and defined as %RLD. Then, the forty peanut genotypes were categorized as either high and low %RLD depending on the mean of %RLD in each layer for the three soil layers. The range for the high %RLD genotypes for the upper layer was 67.3-56.1%, whereas the range for the low %RLD genotypes was 54.9-39.1%. For the middle layer, the range of the high %RLD genotypes was 33.4-27.2%, while the range for the low %RLD was 27.0-17.8%. For the lower layer, the range for the high %RLD genotypes was 28.7-17.4%, while the range for the low %RLD genotypes was 17.0-5.6%. The 40 peanut genotypes were then categorized into six combinative groups, based on the high and low %RLD for each of the three layers. The relationship between %RLD in the lower layer (60 to 90 cm) and yield

was determined and found to be positive, indicating that %RLD in the lower layer is an important trait that affects pod yield and top dry weight under mid-season drought conditions.

Simple Sequence Repeat Marker Variability Among *Arachis* Species. E. JONES*, H.T. STALKER, S. TALLURY, S. MILLA-LEWIS, and D. PETRIK, Department of Crop Science, North Carolina State University, Raleigh, NC 27695-7629; and S. KNAPP, Monsanto Inc., Woodland, CA 95696.

Developing species-specific DNA markers is desirable for both maintaining germplasm purity and identifying interspecific peanut hybrids. The objective of this study was to identify species-specific Simple Sequence Repeat (SSR) markers in *Arachis* species. Cultivar NC-V 11 and 64 accessions of 42 wild *Arachis* species, representing all sections of the genus except Trierectoides, were analyzed with 55 SSR primer pairs. Either one or two plants per accession were evaluated, but very low levels of polymorphism were observed within accessions. The 55 primer pairs generated 948 SSR marker bands among all the 42 species. Between 17 (*A. pusilla*) and 134 (*A. correntina*) SSR marker bands were observed for an individual species, most of which also were observed in other species of the genus. However, from one to 12 unique bands were identified in 30 species that allowed positive identification of entries. A few species, for example *A. duranensis*, were highly variable and accessions within the taxa could be separated. The diploid and tetraploid species of section Rhizomatosae were highly divergent and *A. burkartii* is an unlikely progenitor of the tetraploids. Species within sections Caulorhizae and Triseminatae had two and six common banding patterns, respectively, each of which was unique from other species. One common marker was observed between two species in section Heteranthae, but the band also occurred in sections Arachis and Rhizomatosae. A common marker was observed among the five species in section Erectoides, but it was also found in sections Extranervosae, Procumbense, and Rhizomatosae. Finally, seven common markers were observed among the three Procumbentes species, six of which were found in species of one to several other sections. This study identified many unique banding patterns within species of the genus *Arachis* that will be useful for preserving the wild *Arachis* genetic resources and for identifying interspecific peanut hybrids.

Use of Single Sequence Repeat (SSR) Markers for Mapping Quantitative Trait Loci (QTL) Influencing Early Maturity in Peanut (*Arachis hypogaea* L.). F. VILLEGAS CHIRINOS*, S.R. MILLA-LEWIS, and T.G. ISLEIB, Dept. of Crop Science, North Carolina State Univ., Raleigh, NC 27695-7629; and S.J. KNAPP, Monsanto Inc., Woodland, CA 95696.

Early maturing peanut cultivars are a necessity in Virginia-Carolina and west Texas, regions that have short growing seasons with to cool night

temperatures at season's end. However, breeding early cultivars is difficult because peanut maturity involves complex biochemical processes that are influenced by many genes and the environment. Furthermore, current methods for maturity assessment are laborious and relatively subjective. Molecular markers provide a powerful tool to improve the efficiency of breeding methods when using Marker Assisted Selection (MAS). Among these markers, Simple Sequence Repeats (SSRs) are highly polymorphic even among the highly conserved elite US cultivated peanut genomes. Establishment of associations between specific genomic regions and early maturing phenotypes, and subsequent implementation of MAS could provide an efficient and objective assessment method of maturity. In the present study, two populations of recombinant inbred lines (RILs) were developed from the crosses of a high-oleic backcross derivative of Chico, a very early maturing Spanish-type cultivar, by PI 313949 and PI 365550, two Bolivian PIs with pronounced late maturity. A total of 200 and 191 polymorphic markers for the Chico / PI 313949 and Chico / PI 365550 populations, respectively, were identified from a set of 426 SSR markers that had been previously found to be variable among other cultivated peanuts. These markers were used to genotype the populations and to create two linkage maps. Subsequently, genotypic and phenotypic data were analyzed, in order to identify QTL associated with early maturity.

Cultivating Leaf Spot Resistant Peanuts and the Next Generation of Plant Breeders. H.C. KENT, Specialized 4-H, Science, Engineering and Technology, University of Florida, Marianna, Florida, 32446; J. VENN*, M. GALLO, Agronomy Department, University of Florida, Gainesville, Florida 32611; and B.L. TILLMAN, NFREC, University of Florida, Marianna, FL 32446.

For over 30 years University of Florida's peanut breeding program has made it a priority to develop and deploy leaf spot resistant peanut cultivars. Utilization of leaf spot resistant peanut cultivars would lessen environmental impact of repeated fungicide applications while reducing production costs. Leaf spot resistant peanut lines have been developed but suffer from poor seed quality and delayed maturity. Poor seed germination may be tied to low seed calcium concentration and low antioxidant capacity. This project will determine if antioxidant capacity and seed calcium levels are related to germination and seedling emergence in breeding populations diverse for those traits. In addition to classical breeding, we will utilize a transgenic approach to develop novel germplasm with the potential for leaf spot resistance and normal relative maturity. The focus of this project, using classical and transgenic approaches, is to develop a commercially viable peanut cultivar with acceptable seed germination quality, normal maturity, and resistance to leaf spot.Knowledge of careers in plant breeding is lacking in secondary schools. Our project seeks to educate a key demographic group (middle

and high school students) about the importance of plant breeding in agriculture and about careers in plant breeding. By improving students' scientific literacy and exposing them to potential careers in plant breeding, we anticipate more students will be motivated towards this career path. A 4-H Youth Development curriculum will be developed to introduce plant breeding and career/ educational opportunities in plant breeding and related fields. We will provide a pedagogically sound set of educational and career exploration experiences to students. This includes exposure to plant breeding research, career information and examination of the contributions of famous plant breeders. This integrated research and education project is supported by a grant from the National Institute of Food and Agriculture under the Agriculture and Food Research Initiative, Plant Breeding and Education Program of 2009.

High Oleic Peanut Update. D.W. GORBET, B.L. TILLMAN, and G. PERSON, University of Florida, North Florida Research and Education Center, Marianna, FL 32446

Peanut seed have approximately 50% oil which is primarily composed of fatty acids (FA). The three main FAs are palmitic (16:0), oleic (18:1) and linoleic (18.2), which constitute about 90% of the oil. Oleic and linoleic are unsaturated and more desirable from a health standpoint. Oleic is much more stable than linoleic, which oxidizes 10 times faster producing off flavors and unhealthy byproducts. High oleic gives longer shelf-life and is most desirable from several health aspects.High oleic peanuts have oil chemistry essentially the same as olive oil. The first high oleic (80±% oleic) peanut (HOP) cultivar was SunOleic 95R, released by UF in 1995. Numerous HOPs have been released since 1995 by UF, U GA, TAES, AgraTech, and NC State in the US, as well as programs in Australia, Argentina, South Africa, and possibly others. Early releases in the US were very susceptible to Tomato Spotted Wilt Virus, which delayed production in the SE USA. There is currently significant production of HOPs in the SW (Texas, OK) and the SE (GA, FL, AL). Almost all of the SW acreage is in HOPs. Cultivars currently in production in the SE are FL-07, Ga-02C, AgraTech 215, Fla. Fancy, and McCloud. SW production includes Flavor runner 485, TAES ---------- and AgraTech 215. HOPs available to growers and the industry include runner, Virginia, and Spanish market-types. Australian production and marketing has moved totally to HOPs, noting the shelf-life and health advantages. The US has been slow to market HOPs to the consumer and inform consumers of the benefits. Many other crops are currently producing or developing high oleic cultivars (sunflower, canola, soybean, oats, corn, etc.).

Identification and Characterization of Multi-gene Family Encoding Germin-like Proteins in Cultivated Peanut (*Arachis hypogaea* L.).

X. CHEN, T. BRENNEMAN, A. CULBREATH, Department of Plant Pathology, the University of Georgia, Tifton, GA; M.L. WANG, USDA ARS, Plant Genetic Resources Conservation Unit, Griffin, GA; C.C. HOLBROOK, USDA-ARS, Crop Genetics and Breeding Research Unit, Tifton, GA; and B.Z. GUO*, USDA-ARS, Crop Protection and Management Research Unit, Tifton, GA.

Germins and germin-like proteins (GLPs) play diversified roles in plant development and basic defense. In this study, 36 EST-clones encoding GLPs were identified. Sequence similarity analysis demonstrated that the peanut genome possessed multi-gene family encoding at least 8 GLPs, named *AhGLP*1 to *AhGLP*8. Out of the 8 *AhGLP*s, three (*AhGLP*1 *AhGLP*2 and *AhGLP*3) were identified in 14, 10 and 7 EST clones, respectively, whereas the remaining ones were identified in a single clone. The length of the deduced amino acid residues of *AhGLP*s is ranged from 208 to 223 with exceptions of *AhGLP*6 and *AhGLP*8, which was incomplete at carboxyl terminus. All the AhGLPs contained a possible N-terminal signal peptide with a range of 17-24 residues in length excluding AhGLP7, which was predicted to contain a non-cleavable amino-terminal sequence. Phylogenetic analysis showed that these AhGLPs were classified into three subfamilies (subfamily 1, 2 and 3). All AhGLPs shared the conserved structural motifs that other known GLPs have. Southern blot analysis revealed that *AhGLP*1 and *AhGLP*2 likely have at least four copies in the allotetraploid peanut genome. The recombinant mature AhGLP1 and AhGLP2 proteins were successfully expressed in *E. coli*. The purified recombinant AhGLP2 protein shows the superoxide dismutase activity in enzymatic assay. However, attempts to demonstrate oxalate oxidase (OXOX) activity for AhGLP2 protein have failed. The superoxide dismutase (SOD) activity related to AhGLP2 was stable up to 70oC and resistant to high concentration of hydrogen peroxide, which revealed that AhGLP SOD might be a manganese-containing SOD. Moreover, AhGLP2 was capable of providing protection in *E. coli* against oxidative damage attributable to free radicals caused by the herbicide paraquat, suggesting that AhGLP associated with SOD activity will likely protect peanut from reactive oxygen metabolites. In summary, the results provide the insight information into the diverse nature of the peanut GLP family and suggest that some of AhGLPs might play an important role in plant defense responding to environmental abiotic or biotic stress.

2009 Dry Land Evaluation of Seven Peanut Varieties in Irwin County, Georgia. P. EDWARDS*, Cooperative Extension, University of Georgia, Ocilla, GA 31774; J.P. BEASLEY, J.E. PAULK, Department of Crop and Soil Science, University of Georgia, Tifton, GA 31793; T.B. BRENNEMAN, A.K. CULBREATH, R.C. KEMERAIT, Department of Pathology, University of Georgia, Tifton, GA 31793; D.S. CARLSON, Cooperative Extension,

University of Georgia, Fitzgerald, GA 31750
Research was conducted to evaluate seven planted peanut varieties. Farmers continue to look for successful peanut varieties comparable to Georgia Green as well as the best value. A large portion of peanut acreage planted is dry land and this test provided valuable information. The field selected for this study was planted using conventional tillage methods and was dry land. Varieties that were assessed included: Georgia Green, Georgia Greener, Georgia O2C, Georgia O6G, Florida O7, Georgia O7W, and Tifgard. The planting date was May 19, 2009, and the digging date was determined based on maturity sampling. The experimental design was a randomized complete block. Each of the five replications contained seven plots. The trial was planted with John Deere air planter. Each of the four single row plots was planted on 36 inch row centers with similar row lengths across the trial. The plot lengths were measured using GPS. Stand counts were taken after emergence. Each plot was rated for leaf spot, white mold, and tomato spotted wilt virus (TSWV). These diseases did not significantly impact yield or grade. Yield was determined on each plot. Each variety was graded.

JOE SUGG GRADUATE STUDENT COMPETITION

Evaluating Florida-07 for Leaf Spot Tolerance. S. BURNS* and M. GALLO, Agronomy Department, The University of Florida, Gainesville, FL 32611-0300; and B. TILLMAN, Agronomy Department, North Florida Research and Education Center, The University of Florida, Marianna, FL 32446-8091.
Florida-07, a peanut cultivar recently released by the University of Florida, displays classic symptoms of leaf spot susceptibility, having numerous lesions and heavy defoliation. However, it has been observed to produces good yields even with severe symptoms of leaf spot. Therefore, our hypothesis is that Florida-07 possesses tolerance to leaf spot. To test this hypothesis, Florida-07 was compared to a known leaf spot susceptible cultivar, AP-3, and a known resistant, York. Experiments were conducted in Gainesville, FL in 2008 and Marianna, FL in 2008-2009 seasons. For all years and locations, late leaf spot (*Cercosporidium personatum* (Berk and M. A. Curtis) Deighton) appeared to be the predominant foliar pathogen. The experimental design was a randomized complete block with a split-plot treatment arrangement and three replications. The cultivars were assigned to the sub-plots and fungicide treatment (full-season vs. no spray) was assigned to the main plots. Data collected included area under the disease progress (AUDPC) curve for visual leaf spot rating (Florida 1-10 scale), lesion/leaf percentage, lesion density, and average lesion area. Following harvest, pod yield and seed grade were determined. In regard to visual rating, lesion/leaf percentage, and lesion density, the rate of

disease progression (AUDPC) was the same in sprayed and non-sprayed York, sprayed AP-3, and sprayed Florida-07. Disease progression was also observed to be the same in non-sprayed AP-3 and non-sprayed Florida-07, but at a rate significantly faster than the aforementioned cultivar*treatments. Regardless of cultivar*treatment, lesion growth occurred at the same rate. Based on these data, we conclude that Florida-07 and AP-3 possess the same degree of susceptibility to late leaf spot disease. The impact of leaf spot on pod yield of Florida-07 was similar to its impact on pod yield of AP-3 in two out of three tests, but in the third test, leaf spot impacted pod yield of Florida-07 (968 lbs/A loss) less than it did AP-3 (1778 lbs/A loss) ($p>t=0.0524$). On average, however, yield loss (sprayed minus non-sprayed) of AP-3 (1440 lbs/A) was not different than that of Florida-07 (1026 lbs/A). Therefore, we can also conclude that in some environments, Florida-07 may provide a degree of tolerance to late leaf spot disease that AP-3 does not possess. However, on average, these results suggest that Florida-07 does not possess significant tolerance to leaf spot.

Summary of Compatibility Trials With Agrochemicals Applied to Peanut.

G.B.S. CHAHAL*, D.L. JORDAN, J.D. BURTON, B.B. SHEW, R.L. BRANDENBURG, and D. DANEHOWER, North Carolina State University, Raleigh, NC 27695.

Co-application of herbicides, fungicides, insecticides, plant growth regulators, micronutrients, or adjuvants can broaden the spectrum of pest control and increase efficiency of pest management practices in peanut (*Arachis hypogaea* L.). Research was conducted in 2008 and 2009 to determine interactions of five way mixtures applied for control of weeds, diseases and insects and to improve row definition in peanut. The herbicides clethodim, lactofen, imazapic, imazethapyr, sethoxydim, and 2,4-DB were evaluated in separate experiments when applied alone or in combination with three fungicide treatments (no fungicide, chlorothalonil plus tebuconazole, or pyraclostrobin), two insecticide treatments (no insecticide or lambda-cyhalothrin), three micronutrient treatments (no micronutrient, boron, or manganese), and two adjuvant/conditioning agent treatments (nonionic surfactant or Class Act for imazapic, no adjuvant or Class Act for 2,4-DB, crop oil concentrate or Class Act for clethodim and lactofen). Canopy defoliation of peanut caused by early leaf spot (*Cercospora arachidicola*) and late leaf spot (*Cercosporidium personatum*) was evaluated during 2008 and 2009. Pyraclostrobin and chlorothalonil plus tebuconazole (2008) or chlorothalonil and tebuconazole plus prothioconazole (2009) were applied alone or in combination with two insecticide treatments (no insecticide or lambda-cyhalothrin), three micronutrient treatments (no micronutrient, boron, or manganese), and three herbicide treatments (no herbicide, clethodim plus crop oil concentrate, or 2,4-DB). Two

additional sprays of each pyraclostrobin followed by chlorothalonil were applied in both years on half of each plot. Experiments were also conducted to compare corn earworm [*Helicoverpa zea* (Boddie)] and fall armyworm [*Spodoptera frugiperda* (J.E. Smith)] control with two insecticide treatments (lambda-cyhalothrin and fenapropathrin) applied alone or with three herbicide treatments (no herbicide, clethodim plus crop oil concentrate, or 2,4-DB), two fungicide treatments (no fungicide or pyraclostrobin), and three micronutrient treatments (no micronutrients, boron, or manganese). One experiment was conducted during 2009 with the insecticide acephate for thrips (*Franklinella* spp.) control in combination with three non-residual herbicide treatments (no herbicide, paraquat, or bentazon), four residual herbicide treatments (no herbicide, *S*-metolachlor, dimethenamid-P, or alachlor) for thrips control in peanut. Experiments were also conducted to compare efficacy of prohexadione calcium in improving the row definition and visibility when applied alone or in combination with two insecticide treatments (no insecticide or lambda-cyhalothrin), two fungicide treatments (no fungicide or prothioconazole plus tebuconazole), two herbicide treatments (no herbicide or 2,4-DB), and three micronutrient treatments (no micronutrients, boron, or manganese). A portion of the prohexadione-treated plots received one additional spray of prohexadione calcium. Prohexadione calcium was applied with crop oil concentrate and nitrogen solution.

Weed control was affected in several instances by adjuvant/conditioning agent, micronutrients, and fungicides while insecticide had the least observable influence of herbicide efficacy. However, no clear trend was observed within or across herbicide comparisons. Canopy defoliation was lower when fungicides were applied three times compared to a single fungicide application regardless of the agrochemical combination. The micronutrients boron and manganese negatively affected fungicide efficacy in some but not all experiments. When interactions were observed among fungicide combinations, in most cases the percent canopy defoliation differences among treatments were minor. Populations of fall armyworm and corn earworm were low and therefore no conclusion about the role of co-application could be drawn from these experiments. However, there was no increase in crop phytotoxicity when insecticides were applied with other agrochemicals. Damage from tobacco thrips feeding did not differ appreciably when acephate was applied alone or with other agrochemicals. However, peanut was damaged more by some combinations of herbicides, especially when tobacco thrips damage was high in cases where acephate was not included. Prohexadione calcium improved row visibility, especially when applied sequentially. Applying prohexadione calcium with other agrochemicals did not negatively affect ability of prohexadione calcium to improve row visibility. Sequential applications of prohexadione calcium were more effective than single applications in improving row visibility

regardless of the agrochemical combination. Collectively, results from experiments with up to five-way mixtures used for weed, disease, or insect control and combinations of prohexadione calcium with other agrochemicals demonstrate the complexity of defining interactions among co-applied combinations.

Influence of Sod-Based Rotation on Peanut Yield and Pest Development. W.L. DRAKE*, D.L. JORDAN, J.L. HEITMAN, M. SCHROEDER-MORENO, Y. CARDOZA, R.L. BRANDENBURG, and B.B. SHEW, North Carolina State University, Raleigh, NC 27695; and T. CORBETT, C. BOGLE, W. YE, and D. HARDY, North Carolina Department of Agriculture and Consumer Services, Raleigh, NC.

Sod-based production systems have been successful in some regions of the southeastern and mid-Atlantic region of the United States as an alternative to conventional tillage systems. Research was conducted in North Carolina to compare corn, cotton, peanut, and soybean yield when these crops were strip tilled following four years of tall fescue versus four years of either corn or cotton grown in no till or strip till systems. Cotton yield was higher following tall fescue at all locations compared with yield following agronomic crops. Yield of corn was lower following tall fescue compared with agronomic crops while peanut and soybean were not affected by previous cropping history. Additional treatments in peanut included conventional tillage following both cropping systems, and pod yield was lower at all locations when peanut was strip tilled into either tall fescue or residue from corn or cotton compared with conventional tillage systems. No major differences in soil bulk density or porosity were noted when comparing tall fescue or agronomic crops. Populations of soil parasitic nematodes were often lower in peanut following tall fescue compared with agronomic crops. These experiments indicate that sod-based systems may be an effective alternative to reduced tillage systems, especially for cotton. However, benefits were not observed for peanut or soybean and corn was negatively affected by tall fescue sod.

Evaluation of Pesticide Efficacy in Situations where Spray Application is Delayed. P.M. EURE*, D.L. JORDAN, G.S. CHAHAL, J.S. BACHELER, A.C. YORK, R. SEAGROVES, and J. HINTON, North Carolina State University, Raleigh, NC 27695.

Weather events, equipment failure, and other unforeseen events can prevent the timely application of spray solutions. Although pesticides are often left in the spray tank for numerous days, there is little information available to growers concerning the effects of delayed applications on efficacy. The objective of this research was to determine the influence of delayed spray application on efficacy of pesticides commonly applied to peanut. Research was conducted in North Carolina during 2009 to determine the influence of delayed applications on efficacy of peanut

fungicides, herbicides, insecticides, and prohexadione calcium. Treatments included four timings of mixing prior to application: mixing the day of the application (0 day), and mixing 3, 6, and 9 days prior to application. Pesticides were stored in plastic bottles in the dark at room temperature. Pesticide solutions were agitated thoroughly immediately prior to application. Four trials were conducted with the Sclerotinia blight (*Sclerotinia minor*) fungicides boscalid and fluazinam. Two trials were conducted with fungicides that control early leaf spot (*Cercospora arachidicola*) and late leaf spot (*Cercosporidium personatum*) including chlorothalonil, pyraclostrobin, tebuconazole, and prothioconazole plus tebuconazole. One trial was conducted with acephate for early season tobacco thrips (*Frankliniella fusca*) control. In separate experiments, corn earworm (*Heliothis zea*) insecticides included fenpropathrin, indoxacarb, and lambda-cyhalothrin, each evaluated in one experiment. Three trials were conducted with the preemergence herbicides diclosulam, dimethenamid, flumioxazin, imazethapyr, pendimethalin, and *S*-metolachlor. In separate experiments, postemergence herbicides included dicamba, glufosinate, glyphosate, imazethapyr, lactofen, and paraquat. Two trials were conducted with the plant growth regulator prohexadione calcium. Pesticides were applied at the manufacturer's suggested use rate in municipal water at pH 6.5. Visual estimates of percent weed control, canopy defoliation (caused by early and late leaf spot), plant condition rating (percentage of the canopy expressing disease), damage from thrips feeding, and row visibility were used as indicators of agrichemical efficacy as influenced by the time elapsed between mixing and application. Efficacy of chlorothalonil, pyraclostrobin, tebuconazole, and prothioconazole plus tebuconazole, and boscalid was not affected by delayed spray applications. However, in 1 of 4 trials fluazinam mixed three days prior to application controlled Sclerotinia blight better than the 0, 6, and 9 day mixes. When considering thrips and corn earworm insecticides, delayed application of spray solutions did not affect efficacy of acephate, fenpropathrin, indoxacarb, and lambda-cyhalothrin. Preemergence and postemergence herbicides diclosulam, dimethenamid, flumioxazin, imazethapyr, pendimethalin, and *S*-metolachlor were not affected by delayed applications. However, efficacy of lactofen and paraquat were affected by delayed applications although differences were sporadic. In the plant growth regulator study, prohexadione calcium efficacy was not influenced by delayed spray applications. While these data suggest that growers should be aware of possible inconsistent pest control with certain pesticides that sit in the spray tank for extended periods of time, additional research is needed to clearly define the scope of this potential issue.

Effect of Soil Calcium Levels on Peanut Fruit and Seed Development.
B.P. PATHAK*, M. JAIN and M. GALLO, Agronomy Department, The University of Florida, Gainesville, FL 32611-0300; B.L.

TILLMAN, North Florida Education and Research Center, University of Florida, Marianna, FL 32446-7906; A.C. HARMON, Biology Department, The University of Florida, Gainesville, FL 32611-8256; M.A. GRUSAK, USDA-ARS Children's Nutrition Research Center, Houston, TX 77030-2600; and J. McKINNEY, Agronomy Department, The University of Florida, Gainesville, FL 32611-0300.

Calcium is an essential plant nutrient that plays a significant role in peanut seed development. Previous studies have examined the effect of calcium on peanut seed development at the end of the growing season. However, the stage at which developing seeds are most affected by a lack of calcium remains unclear. Therefore, the effect of calcium on peanut seed development of two runner varieties, C99R and Georgia Green, was studied under field conditions with low calcium soils. To attain sufficient calcium levels in half of the test plots, gypsum was applied at 30 and 60 days after planting. Underground developing fruits were sampled throughout the growing season from random one meter rows. Data were collected on pod length, seed and pod stage, fruit development, number of segments and number of seeds on each individual fruit sampled. The seeds and pods from four developmental stages also were analyzed for calcium concentration. Pod length was not affected by calcium levels. However, calcium deficiency resulted in fewer two segmented pods ($P = 0.04$), fewer fruit with two seeds ($P = 0.04$) and more immature and aborted seeds ($P = 0.001$). Although results were similar for both varieties, the effect of calcium on C99R fruit and seed development was greater than for Georgia Green. Pods had twice the calcium concentration of seeds irrespective of genotype and treatment. While gypsum application increased the concentration in both pod (2.46 mg/g) and seed (1.01 mg/g), in low calcium soils the concentration was 1.59 mg/g in pod ($P < 0.001$) and 0.73 mg/g in seed ($P < 0.0001$).Georgia Green had higher calcium concentrations in both tissues compared to C99R.

In addition to being a plant nutrient, calcium also serves as a secondary messenger, coupling physiological responses to environmental and developmental signals. Likewise, protein kinases are important in numerous signal transduction pathways that influence developmental processes. Several lines of evidence reiterate the important role for calcium and calcium dependent protein kinases (CDPKs) during seed development. Therefore, CDPK expression was explored as a candidate sensor during peanut seed development. Quantitative RT-PCR and Western blot analyses showed expression of CDPK during immature stages of seed development in both pod, as well as seed tissues. However, in contrast to pods, seeds showed higher CDPK transcript and protein levels under calcium deficient conditions. Immunolocalization data showed decoration of immunoreactive CDPK primarily in the outer

most cell layers of the pericarp and around vascular bundles linked by lateral connections in developing pods, as well as the single vascular trace which supplies nutrients to the developing ovule.

Cultivation Duration and Frequency Effects on Two Peanut Cultivars Under Organic Management. D.Q. WANN* and R.S. TUBBS, Department of Crop and Soil Sciences, University of Georgia, Tifton, GA 31793; W.C. JOHNSON, III, USDA-ARS, Coastal Plain Experiment Station, Tifton, GA 31793; and A.K. CULBREATH, Department of Plant Pathology, University of Georgia, Tifton, GA 31793.

Weed management is a significantly limiting factor in developing commercial organic peanut (*Arachis hypogaea* L.) production in the southeastern U.S. However, previous research indicates that cultivation can be an effective method of weed control and subsequent yield improvement in organic peanut systems. The objective of this study was to assess the effects of various frequencies and durations of cultivation with a flexible tine ("flex-tine") cultivator on peanuts grown under organic management. Two cultivars ('Georganic' and 'Tifguard') were planted in Tifton, GA in 2008 and 2009. Flex-tine cultivations were initiated 7-10 days after planting and were conducted at two frequencies (weekly or twice weekly) for three durations (3 wks, 4 wks, or 5 wks). All cultivated plots received cultivation with flat sweeps at least once and were hand weeded during the growing season. An uncultivated, unweeded control treatment was also included for comparison. Yields varied among cultivated treatments (3523 kg ha^{-1} to 4335 kg ha^{-1} in 2008 and 3418 kg ha^{-1} to 3698 kg ha^{-1} in 2009) but differences were not significant ($p < 0.05$). However, all cultivated treatments displayed significantly higher yields ($p < 0.05$) than the uncultivated controls both years (1139 kg ha^{-1} in 2008 and 2215 kg ha^{-1} in 2009). Final plant stand was also greater in all cultivated treatments (3.6 plants ft^{-1} to 4 plants ft^{-1}) than in the uncultivated treatment (1.8 plants ft^{-1}) in 2008 ($p < 0.05$). In 2009, the once weekly/4 wks, twice weekly/4 wks, and once weekly/5 wks treatments resulted in significantly higher plant stands than the uncultivated treatment (2.4 plants ft^{-1}) at $p < 0.05$. There were no significant differences in hand weeding times among treatments ($p < 0.05$). These results indicate that a combination of flex-tine cultivation, flat sweep cultivation, and hand weeding can significantly improve yield potential of peanuts grown in an organic management scenario.

Enhancement of Folate in Virginia and Runner Type Peanuts Through Biofortification. N. JUBA*, E. GRABAU, Department of Plant Pathology Physiology and Weed Science, Virginia Tech, Blacksburg, VA 24061; and K. HARICH, Department of Biochemistry, Virginia Tech, Blacksburg, VA 24061.

A metabolic engineering approach will be used to improve the nutritional

content of peanut kernels. Folate, also known as vitamin B9, is an essential vitamin that must be obtained from dietary sources because humans lack the enzymes to make folate *de novo*. Deficiency in folate is correlated with cancer, cardiovascular disease, anemia, and most notably neural tube birth defects such as spina bifida. A folate biofortification strategy has been used to introduce two folate biosynthetic enzymes into peanut. The two key pathway enzymes are GTP cyclohydrolase I (GCHI) and aminodeoxychorismate synthase (ADCS), both obtained from the model plant Arabidopsis. GCHI has been shown to control flux through the folate pathway and ADCS can be limiting in GCHI over-expressing plants as shown previously in other studies. Genes for the two enzymes have been placed under the control of publically available or licensable vector DNA components allowing seed-specific expression of folate biosynthetic enzymes in peanut kernels. Peanut embryonic callus from twelve Virginia and five Runner type cultivars have been transformed using particle bombardment. Two different bombardment strategies were implemented; circular plasmid transformation and linear minimal cassette transformation. Minimal cassette transformation was used facilitate the elimination of unwanted DNA elements such as the vector backbone and antibiotic resistance or other selectable markers and to allow simultaneous introduction of multiple traits. Regeneration and testing of transgenic plants are in progress.

Preliminary Results from Seed Production in Rhizoma Peanut and Tissue Culture Regeneration from the Seed-derived Explants. O. AINA*, and K.H. QUESENBERRY, Agronomy Department, The University of Florida, Gainesville, FL 32611-0300.

Lack of significant seed production is a major limitation to genetic improvement of rhizoma peanut (*Arachis glabrata* Benth). The first objective of this study was to evaluate the seed producing potential of rhizoma peanut cv. 'UF Tito' and 'UF Peace'. The second objective was to assess tissue culture regeneration induced in explants derived from seeds obtained from both cultivars. In a field experiment, plant canopy characteristics were observed and seeds were harvested from 50 cm^2 subplots. Plant height, canopy spread, canopy density, flowering density, immature pegs per subplot, pedicel length, seed per subplot, individual seed weight, 100-seed weight, and flowers per subplot were recorded. Preliminary results revealed significant differences ($P<0.05$) between the two cultivars for all characters measured except canopy spread and canopy density. Mean seed yield of 'UF Peace' (404 ± 57 $Kgha^{-1}$) was significantly higher than that of 'UF Tito' (167 ± 52 $Kgha^{-1}$), but 100-seed weight of 'UF Tito' (28.8 ± 2.5 g) was higher than 'UF Peace' (20.0 ± 0.9 g). Shoot regeneration on semi-solid MS media with 4.4 gl^{-1} thidiazuron and 2.2 gl^{-1} 6-(α,α-dimethylallylamino)-purine or 6-benzylaminopurine was induced in seed derived explants from both cultivars. Browning of

explants due to oxidation of phenolic compounds was a major obstacle to high frequency shoot formation. Experiments are currently underway to determine if supplementation of the culture media with activated charcoal or ascorbic acid will improve the frequency of shoot formation.

Evaluation of Genetic Variability of Seed Calcium Concentration in Peanut (*Arachis hypogaea* L.). S. THORNTON*, M. GALLO, Agronomy Department, The University of Florida, Gainesville, FL 32611-0300; B. TILLMAN, Agronomy Department, North Florida Research and Education Center, University of Florida, Marianna FL, 32446-8091.

Calcium is one of the most limiting nutrients in the production of peanuts, and deficient seed calcium concentration is known to cause reductions in seed quality and germination. However, little research has been done to investigate the possibility of improving the Ca concentration by traditional breeding. In order to investigate the genetic control of seed ca concentration a series of experiments were conducted. Seeds of 44 commercial varieties and 7 breeding lines differing in maturity, seed vigor, and resistance to leaf spot were sampled from yearly variety tests conducted in 2005 through 2008 at two locations (Marianna, FL and Gainesville, FL). Calcium and potassium concentrations were measured for 10 seeds per sample by inductively coupled plasma spectroscopy. These data were analyzed using Proc MIXED to calculate variance components, which were then used to determine broad sense heritability. Grade data were also collected for these varieties and compared with the calcium and potassium data using Proc CORR to determine whether a correlation existed between seed characteristics and seed calcium and potassium concentrations. The calculated broad-sense heritability was 0.33, which indicates the potential for peanut breeders to develop cultivars with higher seed calcium concentration. However, potassium concentration was affected to only a small degree by either environmental or genetic factors. Calcium concentration was correlated with various grade components, in particular those related to seed and pod size, as well as hull percentage. Potassium concentration was not correlated with any grade components.

PHYSIOLOGY AND SEED TECHNOLOGY

Evaluation of Virginia-type Peanuts for Gas exchange and Transpiration Ratio. M. BALOTA *, Tidewater Agricultural Research & Extension Center, Virginia Tech, Suffolk, VA 23437; and T. ISLEIB, North Carolina State University, Raleigh, NC 27695-7629.

In Virginia – Carolina region precipitation amount is adequate but its distribution is not for peanut production. Soils are sandy in most fields; they have reduced water holding capacity and lose water faster than

plants can uptake. Under these conditions plants experience short but frequent drought episodes. Development of more water-efficient cultivars and with ability to adapt to this type of drought is, therefore, imperative.

In 2009, a study was initiated to examine early season transpiration ratio of thirty Virginia-type peanut (*Arachis hypogaea* var. *hypogaea*) cultivars and advanced breeding lines at the Tidewater Agricultural Research and Experiment Station in Suffolk, VA. Transpiration ratio was derived from the leaf CO_2 assimilation (A)/transpiration (E) rate (A:E), and from A/stomatal conductance to water vapor (g_s), (A:g_s). Both, A:E, and A:g_s are known to be correlated to the whole plant water use efficiency (WUE) in peanut and other crops.

Variation among the genotypes was significant for all traits evaluated. Average A:E was 2.46 mmol CO_2 mol-1 H_2O at the end of a 3-week period without rain (PWR), 2.23 before the PWR, and 2.41 when the PWR was interrupted by rain. Similarly, A:g_s was 46.7 µmol CO_2 mol-1 H_2O before the PWR, 69.4 during PWR, and 40.43 after the PWR. A:g_s was 77.4 µmol CO_2 mol-1 H_2O for NC-V 11,77.1 for VA-98R, 71.9 for CHAMPS, and 71.6 for Florida Fancy during the PWR; A:g_s was 49 µmol CO_2 mol-1 H_2O for Phillips and 47.9 for Georgia 08V during the PWR. The A:g_s ranged from 59 to 65 µmol CO_2 mol-1 H_2O for Gregory, Perry, Bailey, and Sugg. For the same characteristic, N05006, N05008, and N04074FCT exceeded 90 µmol CO_2 mol-1 H_2O, showing the greatest transpiration efficiency during the PWR.

Oil Content of Commercial Peanut Varieties Grown Under Reduced Irrigation and Seeding Rate in West Texas. J.L. AYERS* and M.D. BUROW, Texas AgriLife Research, Lubbock, TX 79403, and Texas Tech University, Department of Plant and Soil Science, Lubbock, TX 79409.

Eight commercial varieties representing all four market types of peanut have been tested under three irrigation levels and three seeding rates in 2006, 2007 and 2008 at two locations with differing soil types in West Texas. Irrigation levels consisted of 75, 50 and 25% of reference evapotranspiration replacement. Seeding rates were 100, 50 and 25% of the normal seeding rates based on market type. The 75%(full) irrigation rate has shown to be higher in oil content and produce more gallons of oil per acre than the 50 and 25% rates. No significant differences have been found for oil content or gallons of oil per acre for the three seeding rates. This suggests that reducing seeding rates can reduce input costs without sacrificing profits to the producer. Varietal difference have been found, with Olin and Spanco yielding higher oil contents than NM Valencia C and TamnutOL06 for the erect varieties, and the runner varieties Flavorrunner 458, TamrunOL02 and TamrunOL07 yielding higher oil contents than the Virginia variety Gregory. The runner and Virginia varieties have shown to produce more gallons of oil per acre

than the Spanish and Valencia varieties due differences in yield. Minimizing inputs such as irrigation and seeding rate combined with proper varietal selection can allow for profitability of growing peanuts for oil in West Texas.

Peanut Physiological Response to Late Leaf Spot. J.E. ERICKSON*, M.P. SINGH, K.J. BOOTE, B.L. TILLMAN, and S. BURNS, Agronomy Department, University of Florida, Gainesville, FL 32611.

Late leaf spot (*Cercosporidium personatum*) is one of the predominant pathogens causing reduction in pod yield for peanut producers in the southeastern U.S. Cultivar improvement and reduced fungicide use through improved understanding of host-pathogen interactions offer a promising way to improve yield and reduce cost of peanut production. Therefore, we collected data on disease severity, leaf gas exchange, growth, partitioning and yield of two commercial runner type varieties differing in late leaf spot resistance under fungicide treated and non-treated conditions in the field. Leaf spot pressure was fairly heavy near Gainesville, Florida, in 2009, resulting in significantly greater area under disease progress curve (AUDPC) values for Carver compared to York, consistent with their disease resistance ratings for leaf spot. Accordingly, total pod yield was greater for York, averaging 3346 kg ha-1 compared to 2821 kg ha-1 in Carver. A biweekly commercial fungicide schedule increased yield by 533 kg ha-1. Interestingly, there was no significant interaction between cultivar and fungicide schedule, indicating that the benefit of fungicide was the same in absolute terms for both varieties. However, the relative increase in yield due to York was only 13% in fungicide-treated plots compared to 26% in untreated plots. Although not significant, fungicide seemed to increase both pod number and average pod size in both cultivars. Fungicide did not affect defoliation in York, but reduced defoliation in Carver. Reductions in leaf photosynthesis at comparable disease severities tended to be greater in York, which could help explain why AUDPC values were greatly reduced compared to Carver while yield only increased marginally. Thus, future efforts to enhance leaf spot resistance should focus on sustaining leaf photosynthesis following infection, which would complement reduced defoliation and spread of disease.

Simulating Weather Effects on Yield of Different Peanut Cultivars in the Georgia Variety Performance Trials with the CSM-CROPGRO-Peanut Model. K.J. BOOTE*, Agronomy Department, University of Florida, Gainesville, FL 32611-0500; and G. HOOGENBOOM, Agricultural and Biological Engineering Department, Griffin, GA 30223-1797.

The Peanut Variety Performance Tests conducted annually in Georgia and other states are valuable data sources for plant breeders and farmers to compare variety performance. These trials offer additional

opportunity to evaluate weather risk on peanut production as well as cultivar by environment interactions. In this research, we used the CSM-CROPGRO-Peanut model to simulate peanut yield for the rainfed and irrigated trials conducted at Tifton, Plains, and Midville and to evaluate weather risk from rainfall pattern, rainfall deficit, and heat stress on production. We also evaluated cultivar differences in yield potential under irrigated and rainfed conditions. Simulations were conducted for 1997 through 2009 seasons for both irrigated and rainfed conditions across the three sites. Site characteristics for inherent soil fertility were adjusted to give the mean yield across cultivars per site under irrigated conditions. Site characteristics of soil water holding capacity and rooting pattern with depth were adjusted to set mean yield across cultivars per site under rainfed conditions. Then cultivar traits of life cycle and partitioning intensity were adjusted to mimic differences among cultivars in life cycle and yield potential in irrigated and rainfed conditions. Irrigated predictions were reasonably close with the default model traits, but to accurately predict yield under rainfed conditions required modifying soil traits to increase water-holding capacity and create deeper rooting pattern. Cultivars were compared to the Georgia Green cultivar because it is the dominant cultivar and because it was part of the trials across all years and sites.

PLANT PATHOLOGY, NEMATOLOGY, AND ENTOMOLOGY I

Assessment of 'Tifguard' Cultivar for Disease and Nematode Management of Peanut. R.C. KEMERAIT*, A.K. CULBREATH, T.B. BRENNEMAN, H. SANDERS, and G. JAGDALE, Department of Plant Pathology, The University of Georgia; C.C. HOLBROOK and P. TIMPER, USDA-ARS; and R. BARENTINE and M. MAY, University of Georgia Cooperative Extension, GA.

'Tifguard' is a peanut cultivar that was released in 2007 and it is highly resistant to the peanut root-knot nematode (*Meloidogyne arenaria*). From the 2010 Peanut Rx disease risk index, Tifguard has been rated at 10, 15, and 10 points for resistance to tomato spotted wilt virus, leaf spot diseases, and stem rot, respectively. Based upon these ratings, Tifguard is thought among the most disease-resistant cultivars currently available to growers. Trials were conducted between 2007 and 2009 to assess the disease and nematode resistance of Tifguard compared to 'Georgia Green'. The experimental design used in each trial was a randomized complete block design with four to six replications per study. Trials were conducted in fields naturally infested with *M. arenaria* in 2007 and 2009 on the Coastal Plain Experiment Station in Tift County, GA and in 2009 on a commercial field in Decatur Co., GA. In 2007, the average post-season root-gall rating for Georgia Green was 3.78 (0-10 scale) while Tifguard rated 0.07. In the same trial, Tifguard yielded 4891 lb/A while Georgia Green yielded 2762 lb/A. In the two trials conducted in Tifton in

2009, Tifguard with Thimet (5 lb/A) yielded 3430 lb/A and 2338 lb/A while Georgia Green yielded 2439 lb/A and 1726 lb/A, respectively. Post-season galls per 2 g of root tissue were 171.8 for the Georgia Green and 19.8 for Tifguard. In the commercial field study, the end of season root-gall rating and yield for Georgia Green were 3.0 and 2635 lb/A, respectively, and for Tifguard, 0.083 and 4925, respectively. In fungicide trials conducted in Tifton in 2008 and 2009, leaf spot and stem rot ratings were numerically lower for Tifguard than for Georgia Green. Tifguard is an appropriate cultivar to plant in the southeastern United States for the management of *M. arenaria*, tomato spotted wilt virus, leaf spot, and stem rot, and for its yield potential.

Variation Among *Botrytis cinerea* Isolates Obtained from Peanut Fields in West Texas. J.E. WOODWARD* and L.D. KAHLER, Texas AgriLife Extension Service, Lubbock TX 79403; J.L. STARR, M.A. GREGORY, and C.M. KENERLEY, Department of Plant Pathology and Microbiology, Texas A&M University, College Station, TX 77843.

Botrytis blight, caused by *Botrytis cinerea*, is considered a minor disease of peanut (*Arachis hypogaea*). Recent epidemics occurring in Georgia and west Texas occurred under low temperatures (~20 °C) and increased precipitation. Symptoms characteristic of Botrytis blight include prolific sporulation and the development of darkly pigmented mycelia; however, in Texas the disease is easily confused with Sclerotinia blight, caused by *Sclerotinia minor* or *S. sclerotiorum*. Recent observations have shown that all three pathogens are present within the region. The objective of this study was to document genotypic and phenotypic differences of *B. cinerea* isolates (n = 33) obtained from peanut fields. Reference isolates of *S. minor*, *S. sclerotiorum* and *Sclerotium rolfsii* (causal agent of Southern blight) were included for comparison. Growth chamber studies were conducted to determine the influence of temperature on hyphal growth and sclerotial development *in vitro*. Hyphal growth was measured 24, 48, and 72 after inoculation onto potato dextrose agar. Data were used to calculate area under hyphal growth curve values. Sclerotia production was assessed after 2 weeks incubation. Isolates were arranged in a randomized complete block design with three replications and the study was conducted three times. Data were subjected to analysis of variance and means were separated via Fisher's Protected LSD ($P \leq 0.05$). Evaluation of isolates revealed considerable differences in colony color, sporulation, and the production of sclerotia. Mycelia of *B. cinerea* were placed into three categories white, light or dark gray. Mycelia of the *S. minor* and *S. rolfsii* isolates were white, compared to the darkly pigmented mycelia of the *S. sclerotiorum* isolate. Hyphal growth of the *B. cinerea* isolates evaluated varied by temperature. The optimum temperature ranged between 15 and 25 °C for most isolates; however, several isolates exhibited

abnormally slow growth and did not respond to changes in temperature. Temperature optima for the *S. minor* and *S. sclerotiorum* isolates were between 20 and 25 °C, whereas, maximum *S. rolfsii* growth was observed at 30 °C. Differences in the appearance and production of sclerotia were observed among isolates. A total of 14 isolates failed to produce sclerotia, whereas, sclerotial production for the remaining isolates was grouped into four categories based on size (small or large) and frequency (few or abundant). Optimal temperature for the production of sclerotia varied for the *B. cinerea* isolates evaluated. Overall, the optimum temperature for sclerotia production was between 15 and 20 °C; however, several isolates were capable of forming sclerotia from 10 to 25 °C with one isolate producing an appreciable number of sclerotia at 30 °C. Results from previous studies indicated that the optimal temperature range for Botrytis blight infection is 15 to 20 °C. From this study, the temperature optima for *B. cinerea* was within this range for many of the isolates evaluated; however, growth for several isolates occurred between 20 and 25 °C, which is more consistent with *Sclerotinia* spp. This coupled with the various morphological characteristics of *B. cinerea* isolates may further complicate diagnosis Sclerotinia blight.

Response of Nematode Resistant (Tifguard) and Susceptible (C724-19-25) Peanut to Fungicides and Fumigants in a Field with *Meloidogyne arenaria* and *Cylindrocladium parasiticum*. T.B. BRENNEMAN*, Department of Plant Pathology, The University of Georgia, Tifton, GA 31793-0748; and P. TIMPER and C. HOLBROOK, USDA/ARS, Tifton, GA 31794.

Experiments were conducted in 2008 and 2009 to evaluate the effects of root knot nematode (*Meloidogyne arenaria*) and Cylindrocladium black rot (CBR) caused by *Cylindrocladium parasiticum* on a nematode-susceptible (C724-19-25) and a nematode-resistant peanut genotype (Tifguard). C724-19-25 is an F4-derived F5 sister line of Tifguard, and therefore similar except for the gene introduced for nematode resistance. All plots were coversprayed with Bravo and Convoy to control leaf spot and stem rot. Treatments included the following: 1) Vapam (15 GPA) which is active on nematodes and CBR, 2) Proline (5.7 oz in furrow) + Provost (10.3 oz sprays 3-6), and 3) Provost (10.3 oz sprays 3-6), both of which are active on CBR but not nematodes, 4) Vapam + Proline + Provost, and 5) nontreated control. Nematode damage was greater in 2009 with ratings of 4-5 on C724-19-25 (0-10 scale with 0 = no galling), and Tifguard had almost no galling. Nontreated plots had 21 – 43% CBR and, incidence was higher on C724-19-25 than Tifguard in 2009 when nematode damage was more severe. Vapam did not reduce nematode galling either year, and reduced CBR in 1 of 2 years for each cultivar. Treatments 2 and 4 reduced CBR in all cases except for C724-19-25 in 2008, but Provost alone (Trt 3) only reduced CBR on Tifguard in

2008. Treatment 4 increased yield on both genotypes in 2008 only. Treatment 2 increased yield on C724-19-25 in 2008 only, and treatment 1 increased yield on Tifguard in 2008 only. Yield was generally higher on Tifguard, especially with the nematode damage to C724-19-25 in 2009 (4932 and 3557 lb/A, respectively, in nontreated plots). Although Tifguard is considered susceptible to CBR, the excellent resistance it has to root knot nematode also results in reduced CBR incidence due to the interaction of those two diseases on root health.

Comparison of Fungicides and Fungicide Mixtures for Post-Infection Efficacy Against Early Leaf Spot. A.K. CULBREATH*, T.B. BRENNEMAN, and R.C. KEMERAIT. Dept. of Plant Pathology, University of Georgia, Tifton, GA 31793-0748.

In the southeastern U.S., management of leaf spot diseases of peanut (*Arachis hypogaea*) caused by *Cercospora arachidicola* and *Cercosporidium personatum* is heavily dependent on multiple applications of fungicides. With the protectant fungicide chlorothalonil, application before infections occur is essential. The strobilurin fungicide pyraclostrobin allows flexibility in time of application and spray interval for leaf spot control, and has provided excellent control with initial applications that were much later than would be effective for chlorothalonil. Growers are encouraged to make initial applications of any fungicide before infection occurs, but for various reasons, that is not always possible. In recent years, pyraclostrobin has been used successfully in situations where leaf spot infections were already established. These type of applications represent increased risk of developing resistance to pyraclostrobin. The objective of this study was to determine whether other fungicides or fungicide mixtures could be effective for stopping leaf spot epidemics after infection had occurred. Fifteen fungicide treatments, including a nontreated control and chlorothalonil (1.26 kg a.i./ha) (Bravo WeatherStik) standard were applied twice, with first application at 70 days after planting (DAP) and a second application at 85 DAP. Leaf spot ratings of all plots were > 2.1 on the Florida 1-10 leaf spot severity scale before the first fungicide was applied. All plots received a cover spray of chlorothalonil (1.26 kg a.i./ha) 105 DAP. Early leaf spot (*C. arachidicola*) was the predominant foliar disease observed. Among fungicide treatments, final Florida 1-10 scale leaf spot severity ratings were 9.3 for the nontreated control; 7.6 in the chlorothalonil (1.26 kg a.i./ha) standard; 5.9 for mixtures of chlorothalonil (0.84 kg a.i./ha) and thiophanate methyl (0.20 kg a.i./ha) (Topsin 4.5F); 5.3 for prothioconazole (0.2 kg a.i./ha) (Proline 480 SC); and ranged to 4.4 (LSD = 0.6) in three fungicide treatments. Of those three treatments, two consisted of different formulations of pyraclostrobin (Headline 2.09 EC and Headline 250 SC). The third treatment consisted of tank mixtures of chlorothalonil (0.84 kg a.i./ha), prothioconazole (0.10 kg a.i./ha), and thiophanate methyl (0.20 kg a.i./ha). Results

corroborated that the 2.09 EC formulation of pyraclostrobin is an effective treatment after leaf spot infections have occurred. These results indicate there is no difference in efficacy of the 2.09 EC and 250 SC formulations of pyraclostrobin. In addition, applications of mixtures of chlorothalonil, prothioconazole and thiophanate methyl provided levels of leaf spot control similar to that of the pyraclostrobin treatments. This combination may represent a non-strobilurin fungicide alternative to pyraclostrobin for use n situations where leaf spot epidemics have started in advance of the initial fungicide application.

How Good is Bailey? – Exploiting Disease Resistance Through Earlier Planting and Reduced Fungicide Inputs. J.W. CHAPIN* and J.S. THOMAS, Department of Entomology, Soils, and Plant Sciences, Clemson University, Edisto REC, 64 Research Road, Blackville, SC 29817.

Early peanut planting (prior to 5 May) is restrained in South Carolina due to concerns of increased risk from tomato spotted wilt tospovirus and stem rot, *Sclerotium rolfsii* Sacc. However, the ability to begin planting earlier has several potential advantages to include taking advantage of favorable soil moisture; reduced risk of late leaf spot, *Cercosporidium personatum* (Berk. and Curt.) Deighton; greater opportunity for rain-fed fields to recover from mid-season drought stress; less buying point congestion; and a reduced risk of yield and quality losses in wet harvest years (including less risk to cotton which typically is harvested after peanuts). Standard and resistant virginia-type varieties (cultivars NC-V 11 and Bailey, respectively) were planted on four dates (18 April, 1 May, 19 May, and 3 June) and treated with three levels of soil fungicide protection (none, tebuconazole 2X, and tebuconazole 4X). All treatments were protected from leaf spot with five total applications of either chlorothalonil or a chlorothalonil + tebuconazole tank-mix. A standard phorate in-furrow treatment (4.4 lb 15G/ac) was used to suppress thrips and spotted wilt disease in all plots. Leafhopper injury, *Empoasca fabae* (Harris), was greater in Bailey than NC-V 11. Thrips injury, *Frankliniella fusca* (Hinds), and tomato spotted wilt stunting were greater in NC-V 11 and in earlier plantings. Stem rot incidence was reduced only on the final planting date, with mean stem rot infections exceeding 25% of row length in untreated NC-V 11 for each of the first three plantings. Stem rot was markedly affected by variety, in that even the untreated Bailey plots had 92, 96, 81, and 48% less stem rot than 4x soil fungicide treatments of NC-V 11 on the above four planting dates, respectively. Soil fungicide level had a significant effect on stem rot incidence, but there was less fungicide response in Bailey. Variety had a marked effect on yield, in that for every planting date, untreated Bailey plots produced greater yield than 4x fungicide treatments of NC-V 11. Crop value (based on yield, TSMK, and ELK) was significantly affected by variety and soil fungicide level. Crop value was not affected by

planting date across varieties, but there was significant interaction of planting date and variety for crop value. For NC-V 11 the greatest crop value was obtained with maximum soil fungicide treatment and a mid-May planting. However, Bailey produced greater crop value than NC-V 11, and optimum crop values were attainable with earlier planting dates and less soil fungicide. These results and those of three previous test years demonstrate a remarkable level of disease resistance in Bailey that can potentially be exploited to allow S. C. growers to plant earlier and reap benefits beyond the direct advantage of disease resistance. Bailey will require increased protection from potato leafhopper injury and will probably require greater use of growth regulator or guidance systems due to excessive canopy growth.

PLANT PATHOLOGY, NEMATOLOGY, AND ENTOMOLOGY II

Occurrence of Sclerotinia blight on Peanut in Lee County, Texas. H.A. MELOUK*, USDA-ARS, Wheat, Peanut and other Field Crops Research Unit, Department of Entomology and Plant Pathology, Oklahoma State University, Stillwater, OK 74078; W.J. GRICHAR, Texas AgriLife Research, Beeville, TX 78102; and K.D. CHAMBERLIN, USDA-ARS, Wheat, Peanut and other Field Crops Research Unit, 1301 N. Western, Stillwater, OK 74075.

A peanut field, north of Giddings in Lee County, TX, planted with the peanut cv. OLin in 2009 had about 5% incidence of Sclerotinia blight on October 29. Diseased stems of peanut plants were collected, and a culture of Sclerotinia minor (SM.TX1) was generated from a single sclerotium, and maintained at 25+2 C on Potato-Dextrose-Agar medium containing 100 ppm streptomycin sulfate. The pathogenicity of the SM.TX1 isolate along with an S. minor isolate from Oklahoma (SM.M6) was tested on two peanut cultivars, Okrun (OK) and Tamspan 90 (T-90). The pathogenicity tests were performed as described by Faske et al (Peanut Sci. 33:7-11, 2006). Starting three days after inoculation, lesion length measurements were recorded for the infected stems and continued on a 24 hour basis through day 7, after which time the rate of lesion expansion (RLE) in mm/day was calculated. The pathogenicity test was conducted twice. In the first experiment, mean RLE on cv. OK for SM.TX1 was 31, which was significantly ($P > 0.001$) higher than that of SM.M6 at 26. On cv.T-90, RLE for SM.TX1 was 22, which was significantly ($P > 0.022$) higher than that of SM.M6 at 19. In the second experiment, mean RLE on cv. OK for SM.TX1 was 19, which was significantly ($P > 0.006$) higher than that of SM.M6 at 10. On cv. T-90, RLE for SM.TX1 was 19, which was significantly ($P > 0.005$) higher than that of SM.M6 at 8. These findings demonstrate that the new S. minor isolate SM.TX1 is more virulent than that of the Oklahoma isolate SM.M6 under greenhouse test conditions, and the new S. minor isolate SM.TX1

has the potential to be more damaging under field conditions.

New Sources of CBR Resistance Among Runner-Type Peanut Cultivars.
W.D. BRANCH* and T.B. BRENNEMAN. Dept. of Crop and Soil Sciences and Dept. of Plant Pathology, respectively, University of Georgia, Coastal Plain Expt. Station, Tifton, GA 31793-0748.
Cylindrocladium Black Rot (CBR) caused by Cylindrocladium parasiticum Crous, Wingfield, & Alfenas syn. C. crotalariae (Loos) Bell & Sobers is a major disease problem in southeast U.S. peanut (Arachis hypogaea L.) production. Field trials were conducted during the past two-years (2008-09) at a test site that has a long history of continuous peanut production (> 30 yrs) near the Coastal Plain Expt. Station to evaluate for CBR resistance among runner-type peanut cultivars. All plots were artificially inoculated with microsclerotia of C. parasiticum at approximately 50 days after planting each year. Highly significant differences ($P \leq 0.05$) were found among the cultivars for both CBR resistance and tomato spotted wilt virus (TSWV) resistance which was also present each year, but the predominant disease was CBR. Georgia Greener, Georgia-06G, Georgia-07W, Georgia-02C, and Carver were consistently found to be the most resistant; whereas, C-99R and Tifguard were the most susceptible each year. In a separate test conducted in 2009 at a different location, Georgia Greener also had the least difference and Tifguard had the greatest difference between noninoculated versus inoculated plots for pod yield. These combined test results demonstrate that useful levels of CBR resistance are currently available in promising new sources of runner-type peanut cultivars.

New In-Furrow Fungicide Options Provide Control of Cylindrocladium Black Rot of Peanut in Virginia and Runner Cultivars.
P.M. PHIPPS* and D.E. PARTRIDGE TELENKO, Tidewater Agricultural Research and Extension Center, Virginia Tech, Suffolk, VA 23437; and G.H. MUSSON, Bayer CropScience, Research Triangle Park, NC 27709.
Two trials in 2009 planted with either Brantley (trial 1) or CHAMPS (trial 2) evaluated suppression and control of CBR with foliar sprays of Provost 433SC 8 or 10.7 fl oz/A, and a seed-furrow treatment at planting with Proline 480SC 5.7 fl oz/A or Propulse 400SC 14.69 fl oz/A. Reference standards included 1) three foliar sprays of Provost at the low or high rate followed by Bravo 720SC 1.5 pt/A and 2) Vapam 42% 7.5 gal/A with foliar sprays of Provost followed by Bravo. No significant differences in CBR incidence were found in treatments with the low or high rate of Provost. Proline in the seed furrow and foliar sprays of Provost 10.7 fl oz significantly reduced CBR incidence by 43 and 33% while the Vapam standard reduced incidence by 52 and 55% in trial 1 and 2, respectively. Propulse in furrow reduced CBR incidence by 83% in trial 1 and 57% in trial 2. Yield was increased significantly ($P=0.01$) by

treatments with Propulse in furrow or Vapam in trial 1. No significant differences in yield were detected in trial 2, however, yield was highest for Propulse in furrow or Vapam treatment. The response of peanut cultivars to Proline or Vapam for control of CBR was evaluated in 2009. Main plots were treated with and without Proline or Vapam and subplots were planted to either Virginia- or runner-type cultivars. Proline in furrow suppressed CBR significantly in Virginia-type cultivars on 25 Aug and 11 Sep, but only Vapam significantly reduced CBR incidence on 14 Oct. Bailey and Perry without Proline or Vapam exhibited good CBR resistance, Florida Fancy showed moderate resistance, and CHAMPS was highly susceptible. CBR incidence tended to be lower in runner-type cultivars with the most susceptible cultivar being GA Green and the least susceptible being GA-02C. Treatments with Proline across runner-types suppressed CBR incidence significantly on 11 Sep, whereas only Vapam significantly reduced CBR incidence on 14 Oct. Yield of Virginia-type cultivars tended to increase with Proline and were significantly increased by Vapam. Similarly, runner-type yields were increased significantly by only Vapam. The total value of yield was improved $53 and $75/A by Proline and $172 and $127/A by Vapam on Virginia- and runner-type cultivars, respectively. These studies provided evidence that in-furrow application of Proline suppresses CBR, whereas Propulse provides CBR control that is similar to Vapam. Additional studies in 2010 are designed to determine if Propulse in furrow could become an acceptable replacement for Vapam.

Multiple Disease Resistance in High O/L Peanut. J.L. STARR*, Department of Plant Pathology and Microbiology, Texas AgriLife Research, College Station, TX 77843; M.R. BARING, Department of Soil and Crop Sciences, Texas AgriLife Research, College Station, TX 77843; and C.E. SIMPSON and J. CASON, Texas AgriLife Research, Stephenville, TX 76401.

The diseases caused by root-knot nematodes (Meloidogyne arenaria), Sclerotinia minor (Sclerotinia blight), and the Tomato Spotted Wilt Virus are factors that limit yields and productivity of peanut in Texas. Moderate to high levels of resistance to each of these separate diseases has been developed previously, but not in a single peanut genotype. Here we report the development of multiple disease resistant peanut lines. Further, these resistance traits have been introgressed into peanut genotypes that also have ratios of oleic to linoleic fatty acids (O/L) of greater than 10. Resistance to root-knot nematodes suppresses nematode reproduction by more than 90% and was developed by introgression of the resistance from wild Arachis spp. into A. hypogaea. Moderate resistance to the TSWV and Sclerotinia blight was derived from the ccultivar Tamrun 96. The high O/L ratio trait was derived from SunOleic 95R. Several lines with yield potential equal to that of the popular cultivar Tamrun OL07 and superior to Florunner have been identified.

Tillage, Planting Date, Cultivar, and Row Pattern impacts Diseases and Yield of Peanut. A.K. HAGAN*, C.H. CAMPBELL, K.L. BOWEN. Auburn University, AL 36849; L. WELLS. Wiregrass Research and Extension Center, Headland, AL 36849.

Impact of tillage, planting date, cultivar, and row pattern on peanut yield as well as on the severity of tomato spotted wilt virus (TSWV), leaf spot diseases, and stem rot was evaluated on a site maintained in a peanut – cotton – peanut rotation. Rows for the conservation tillage plots were laid out in rye killed with Roundup in early March with a KMC subsoiler + coulter + rolling basket rig. Conventional tillage plots were turned with a moldboard plow and worked to seed bed condition with a disk harrow. Peanut cultivars Georgia Green and Tifguard were planted on April 24, May 14, and June 2, 2009. Row spacing included single 36-in or twin rows spaced 7 in apart on 36-in centers. The experimental design was a split–split-split plot with tillage as the whole plot, planting date as the split plot, peanut cultivar as the split-split plot and row spacing as the split-split-split plot, which consisted of four 30-ft rows in four replications. All plots received seven applications of Bravo Weather Stik 6F at 1.5 pt/A at 2-wk intervals for leaf spot control. While TSWV hit counts and leaf spot severity was assessed just prior to plot inversion, stem rot incidence was determined immediately after plot inversion. While TSWV was similar across all planting dates on conventional-till Georgia Green and Tifguard peanuts, disease incidence was lower on both cultivars under conservation tillage on the June 2 compared with the April 24 planting date. TSWV incidence was significantly lower for the twin than single row conventional-till peanuts but disease ratings for conservation-till single and twin row peanuts were similar to the single row conventional-till peanuts. While tillage did not have a significant impact on leaf spot severity on Tifguard, higher leaf spot ratings were seen for the conventional- than conservation-till Georgia Green peanuts. Regardless of tillage practices, Tifguard had lower leaf spot ratings than Georgia Green. In addition, higher leaf spot ratings were noted for conventional- than conservation-till peanuts at the May 14 but not the other planting dates. For the conventional-till peanuts, leaf spot ratings were higher at the May 14 than April 24 planting date but were similar across all planting dates for the conservation-till peanuts. On Georgia Green, stem rot incidence declined at each successive planting date, while Tifguard had less stem rot damage at the later two compared with the April 24 planting date. Stem rot incidence was lower on Tifguard than Georgia Green as well as under conservation than conventional tillage. Yield of Georgia Green and Tifguard varied by tillage practices and planting date. When under conventional tillage, Tifguard had higher yields than Georgia Green at the April 14 and June 2 but not at the May 14 planting date but yields of both cultivars under conservation tillage, which were usually lower compared with the same cultivars under conventional tillage, were

similar at April 14 and June 2 planting dates. Higher yields were obtained with the twin compared with single row peanuts. The combination of the least disease and highest yields would likely be realized by planting Tifguard on twin rows in late May or early June using conventional tillage.

BREEDING, BIOTECHNOLOGY AND GENETICS II

Comparison of Varietal Grade and Yield Performance in Florida (USA) versus Queensland (Australia). G.C. WRIGHT*, Peanut Company of Australia, Kingaroy, Queensland, Australia, 4610; Y.S. CHAUHAN and D. FLEISCHFRESSER, AgriSciences Queensland, Department of Employment, Economic Development and Innovation, Kingaroy, Queensland, Australia, 4610; and B.L. TILLMAN, University of Florida, Marianna, FL 32446.

In Australia and the USA, peanut is routinely graded with the larger kernels referred to as 'Jumbos'. They attract appreciable price premiums because they are more mature, better tasting, and hence increase profitability for both growers and the industry. Factors such as drought, insect, disease incidence and other stresses are known to affect the proportion of 'Jumbos', however even in the absence of such stress factors large differences across environments have been observed, but not documented. In this study we compared kernel grades of 4 peanut cultivars; Chifley (UF00620), Holt (UF98509), Page (UF97611) and UF 37 (UF05308) grown in Bundaberg, Queensland, Australia (24o 51' S, 152 o 21' E), and in Gainesville, Florida, USA (29o 39' N, 82 o 20' W). All crops were grown under non-limiting conditions. Kernel grades were determined using the standard USA grading system. When averaged over all cultivars, peanuts grown in Bundaberg had nearly a third more 'Jumbos' compared to Gainesville (43% compared to 33%). The proportion of 'Jumbos' at Bundaberg would have been even higher if most of the 14.5% of sound splits resulting from over dry samples were included. 'Medium' grade kernels were considerably higher in Gainesville (42%) compared to Bundaberg (11%). For both 'Jumbo' and Medium' grades, cultivar and location differences were highly significant, however their interactions were not. The sound mature kernels (SMK's) produced at Bundaberg had 100-kernel weights which were 17% higher than at Gainesville. The Bundaberg environment was also more favorable for obtaining higher average pod yields (6.7 t/ha compared to 5.6 t/ha at Gainesville). These yield results are also well supported by our peanut crop modeling analyses using the Agricultural Production Systems Simulator (APSIM), where average potential pod yields of 8.2 t/ha at Bundaberg and 6.4 t/ha at Gainesville were predicted during the period from 2001 to 2009. The higher proportion of 'Jumbo' kernels, and higher 100-kernel weight and yields in the Bundaberg compared to Florida environments appears to be related to higher solar radiation and

lower maximum temperatures. The effect of these climatic factors on these yield and quality attributes needs to be confirmed as it could lead to the identification of homoclimes of Bundaberg which could be targeted for high quality peanut production.

Characterization of Early-Maturing Peanut Breeding Lines. M.D. BUROW* and J.L. AYERS, Texas AgriLife Research, Texas A&M System, Lubbock, TX 79403, and Texas Tech University, Department of Plant and Soil Science, Lubbock, TX, 79409; A.M. SCHUBERT, Texas AgriLife Research, Texas A&M System, Lubbock, TX 79403; C.E. SIMPSON, Texas AgriLife Research, Texas A&M System, Stephenville, TX 79403; and M.R. BARING, Texas AgriLife Research, Texas A&M System, College Station, TX 77843.

We have identified a high-yielding, early-maturing runner line that yielded as well as or better than FlavorRunner 458 and Tamrun OL02 and matures earlier by approx two weeks. Seeds have a high oleic:linoleic fatty acid composition and are similar in size to Florunner. Several related lines yield well also but do not mature as early. Runner lines of a different population have demonstrated high yield, excellent shellout, and early maturity, and have some potential for tolerance to TSWV and Sclerotinia. Advanced Spanish and Valencia breeding lines outyield check varieties and are tolerant to Sclerotinia minor.

Genotypic Variation in the Antioxidant Activity of Peanuts. K.-Y. PHAN-THIEN*, H.N. WONG, N.A. LEE, School of Chemical Engineering, University of New South Wales, Sydney, NSW 2052, Australia; G.C. WRIGHT, Peanut Company of Australia, Kingaroy, QLD 4610 and D. FLEISCHFRESSER, AgriSciences Queensland, Department of Employment, Economic Development and Innovation, Kingaroy, QLD 4610, Australia.

'Functional foods' promote human health beyond the provision of essential nutrition, and are a major growth area for the agrifood industry and related research activity. It would be advantageous to incorporate functional food traits into the national peanut breeding program as criteria of kernel quality, with the ultimate goal of developing new cultivars that would boost health-focused product development, differentiation, and marketing. Peanut kernels contain a range of antioxidant phytochemicals including several phenolic acids, flavonoids and stilbenes (e.g. resveratrol), which benefit consumer health through apparent anti-inflammatory, antimicrobial and anticancer activities. We screened 58 genetically diverse peanut lines from the Australian breeding program for their antioxidant activity using four popular in vitro assays, i.e. the ORAC, ABTS, DPPH and Folin-Ciocalteu Total Phenols assays. This paper discusses the extent of genotypic variation in antioxidant activity, role of in vitro assays, their methodology and

potential for their incorporation as future selection criteria in the breeding program.

Genetic Gain for Pod Yield in the North Carolina State University Peanut Breeding Project. T.G. ISLEIB*, S.C. COPELAND, and S.R. Milla-Lewis, Dept. of Crop Science, N.C. State Univ., Raleigh, NC 27695-7629; and M. BALOTA, Va. Polytechnic Inst. & State Univ. Tidewater Agric. Res. & Ext. Ctr., Suffolk, VA 23437.

The peanut breeding program at N.C. State University released its first cultivar derived from hybridization and selection in 1952. Since 1944 when W.C. Gregory was hired, the program has been led by a series of trained plant breeders including D.A. Emery, J.C. Wynne, and for the past 20 years, T.G. Isleib. One of the measures of success of a breeding program is its rate of genetic gain, ΔG, especially for yield. Since 1990, a database has been maintained of yield and grade means for lines entered in trials in North Carolina as part of the in-state testing program (the "N.C. database"). A similar database has been maintained for line means in the individual tests conducted as part of the Peanut Variety and Quality Evaluation (PVQE) program, the official variety test for the Virginia-Carolina production region (the "PVQE database"). These databases provide the information necessary to estimate genetic gain. In the N.C. database, yields were analyzed for all lines that were retained for testing in three or more years; in the PVQE database for two or more years. Because lines are generally tested at least two years in the N.C program before "graduating" to the PVQE program, these subsets both contain similar arrays of lines although the N.C subset includes more and more recent lines while the PVQE subset includes only those lines considered productive enough to advance to the regional testing program. Effects of years and locations were removed, and mean yields for lines were adjusted to a common environmental level. The first year of evaluation of each line was identified, and the adjusted means were used as dependent variables in a regression against first year of testing. Separate regressions were performed for lines released as cultivars and those still considered experimental. Using the N.C database, the gain for cultivars was curvilinear, characterized by a quadratic equation that was relatively flat in the period represented by NC 7 through Perry then increased at approximately the same rate as the experimental lines which showed a linear response increase in yield over time, $Y= 40.03X – 76461$ ($r = 0.54$, $P<0.05$), i.e., yield increased by 40 lb/A yr. Genetic gain was less when only the elite lines tested in the PVQE program were considered: $Y = 27.072X – 49820$ ($r = 0.59$, $P<0.05$). The relative lack of ΔG observed for the period represented by NC 7 (first year of testing 1974) through Perry (first year of testing 1993) may reflect the occurrence of new diseases during the time frame of data collection, 1990-2009. Old cultivars that were selected and released prior to the advent of Tomato spotted wilt and Sclerotinia blight across

the VC region would be unlikely to perform well in trails conducted from the mid-1990s on.

Status of the Core and the Mini Core Collections for the U.S. Germplasm Collection of Peanut. C.C. HOLBROOK*, USDA-ARS, Tifton, GA 31793; M.D. BUROW, Texas AgriLIFE Research, Lubbock, TX 79403; T.G. ISLEIB, Department of Crop Science, N.C. State University, Raleigh, NC 27695; and R.N. PITTMAN, USDA-ARS, Griffin, GA 30223.

To maximize their usefulness, core and mini core collections should be dynamic. The peanut core collection was developed in the early 1990's, and the mini core was developed in the late 1990's. Research has shown that these collections can be used to improve the efficiency and effectiveness of identifying valuable traits in the entire germplasm collection, and both of these collections have been widely used to mine valuable genes from the germplasm collection. However, both of these collections need to be updated and revised to better represent additions to the entire collection and changing needs of the peanut breeding community. The first objective was to add accessions to represent additions to the entire collection since the core was selected. Data were generated and analyzed, and it was concluded that 41 accessions need to be added to the core collection. A subsample of these accessions will also be added to the mini core collection. Recent discussions in the Peanut Crop Germplasm Committee has indicated the need for homogeneous accessions for some users of these germplasm collections. We examined evaluation data to identify accessions in the core and the mini core which appear to be heterogeneous. The possibility of the selection and storage of homogeneous subsamples will be discussed.

BREEDING, BIOTECHNOLOGY AND GENETICS III

Determining the Oleic/linoleic acid Ratio in a Single Peanut Seed: A Comparison of Two Methods. K.D. CHAMBERLIN* and H.A. MELOUK, USDA-ARS, Wheat, Peanut and other Field Crops Research Unit, 1301 N. Western, Stillwater, OK 74075; R. MADDEN and J. DILLWITH, Department of Entomology and Plant Pathology, Oklahoma State University, Stillwater, OK 74078; Y. BANNORE and Z. EL RASSI, Department of Entomology and Plant Pathology, Oklahoma State University, Stillwater, OK 74078; and M. PAYTON, Department of Statistics, Oklahoma State University, Stillwater, OK 74078.

Peanut varieties with high oleic/linoleic acid ratios have become preferred by the peanut industry due to their increased shelf life and improved health benefits. Many peanut breeding programs are trying to incorporate the high oleic trait into new and improved varieties and are in

need of diagnostic tools to track its inheritance early in development and at the single seed level. Traditionally, gas chromatography has been used to accurately determine the properties of peanut oil, but this method generally requires modification of oil after extraction and possible destruction of the seed sample. In this study, oil was extracted from approximately 0.10 g of peanut seed tissue taken from the distal end, leaving the embryonic end of the seed intact for subsequent germination. Over 100 samples were processed, covering runner, Spanish and Virginia market types. Oil extractions were analyzed for oleic/linoleic acid ratio using (1) capillary electrophoresis (CE) and (2) gas chromatography (GC). Results showed that the two methods are 100% in agreement in determining whether a peanut seed is “high-oleic” or “normal oleic” in oil content. Furthermore, the two methods are highly correlated ($r = 0.96$; $p < 0.0001$) with respect to determining the exact oleic/linoleic acid ratio from each sample. Results from this study validate the use of CE as a diagnostic tool for breeding programs to identify individual high oleic peanut seed for further testing and development.

Release of ‘Sugg’ Virginia-Type Peanut Cultivar. S.C. COPELAND*, T.G. ISLEIB, and S.R. MILLA-LEWIS, Dept. of Crop Science, N.C. State Univ., Raleigh, NC 27695-7629; B.B. SHEW and J.E. HOLLOWELL, Dept. of Plant Pathology, N.C. State Univ., Raleigh, NC 27695-7903; H.E. PATTEE, Dept. of Biological and Agricultural Engineering, N.C. State Univ., Raleigh, NC 27695-7625; T.H. SANDERS, L.L. DEAN, and K.W. HENDRIX, USDA-ARS Market Quality and Handling Res. Unit., Raleigh, NC 27695-7624; M. BALOTA, Va. Polytech. Inst. & State Univ. Tidewater Agric. Res. & Ext. Ctr., Suffolk, VA 23437; and J.W. CHAPIN, Clemson Univ. Edisto Agric. Res. & Educ. Ctr., Blackville, SC 29817.

The peanut breeding program at N.C. State University, in collaboration with state and federal scientists in North Carolina, Virginia, and South Carolina, announces the release of Sugg virginia-type peanut (*Arachis hypogaea* L.) cultivar. Sugg, named in honor of Norfleet “Fleet” Sugg and the late Joseph “Joe” Sugg, two cousins who served consecutively as executive directors of the N.C. Peanut Growers Assoc. from 1966 through 1993, was developed by the N.C Agric. Res. Serv. and was released in 2009. It is an F_6-derived inbred line deriving 50% of its ancestry from virginia-type cultivar Gregory, 25% from Gregory sister linbe N90010E, and 25% from Sclerotinia-resistant runner cultivar Tamrun 98. Sugg is partially resistant to resistant to three of the four most common diseases in the Virginia-Carolina peanut production area: Cylindrocladium black rot (CBR), Sclerotinia blight (SB), and tomato spotted wilt virus (TSWV). It is susceptible to early leaf spot. It has seeds with pink testa averaging 886 mg seed-1, mean jumbo pod content of 44% , fancy pod content of 44%, extra large kernel content of 48%, sound mature kernel content of 66%, and total kernel content of

74%. Yield and grade of Sugg were evaluated over 8 years in the N.C. State Univ. trials, over 5 years in the three-state Peanut Variety and Quality Evaluation (PVQE) program, and over one year in the Uniform Peanut Performance Test (UPPT). Its yield has been superior in all those testing programs. In the 2005-2009 PVQE trials, yield of Sugg was greater than the mean yield of other virginia-type cultivars tested over the same period (5229 vs. 4928 kg ha-1, $P<0.01$) but less than the yield of Bailey (5229 vs. 5462, $P<0.05$), the highest yielding cultivar tested, and not different from the yield of NC-V 11 (5229 vs. 5098 kg ha-1, ns), the next highest-yielding cultivar. Sugg has superior pod brightness for use in in-shell peanut products, and its flavor profile is comparable to that of Florunner, the US peanut industry's flavor standard.

Characterization of a TILLING Resource for Peanut Mutants. J.E. KNOLL, M.L. RAMOS, Y. ZENG, Y. CHU, and P. OZIAS-AKINS*, Department of Horticulture and NESPAL, The University of Georgia Tifton Campus, Tifton, GA 31793-0748; and C.C. HOLBROOK, USDA-ARS, Coastal Plain Experiment Station, Tifton, GA 31793.

Cultivated peanut (*Arachis hypogaea* L.) is a tetraploid of relatively recent evolutionary origin. Evidence suggests that most orthologous genes from the two (A and B) ancestral genomes are transcribed and probably functional. The probability of identifying phenotypic changes in a mutant population of such a polyploid is therefore low. Mutations in genes potentially underlying a phenotype can be determined using a screening tool such as TILLING (Targeting Induced Local Lesions IN Genomes). This reverse genetics tool requires knowledge of gene sequence. We have generated a mutant population through chemical mutagenesis and screened it for mutations in allergen (*Ara h 1* and *Ara h 2*) and fatty acid desaturase (*FAD2*) genes. An array of mutations has been identified, most of which are silent or missense. Two knockout mutations have been recovered, one in each of *Ara h 1* (A-genome) and *Ara h 2* (B-genome) genes. The *Ara h 2* mutant does not produce the protein encoded by the B-genome gene. Protein analysis of the *Ara h 1* mutant is presently being conducted. Interestingly, *FAD2* mutants representative of the known functional changes in these genes that alter oleic to linoleic acid ratios in the seed were found in the mutant population.

Studying Nodulation Signaling using Non-nodulating Peanut Lines: Determining if the Constraint in Peanut Nodule Formation is Due to a Local or Systemic Signal. Y. LOPEZ*, M. GALLO, Agronomy Department, The University of Florida, Gainesville, FL 32611-0300; B. TILLMAN, North Florida Education and Research Center, University of Florida, Marianna, FL 32446-7906; and D.H.

POWELL, Department of Chemistry, University of Florida, Gainesville, FL 32611.

Grafting experiments have been useful in discerning the regulation of important process such as the effects of root and shoot systems in controlling nodulation, protein accumulation, translocation of flowering hormones, systemic RNA silencing, etc. The study of the peanut root nodule initiation and development is facilitated by the availability of peanut mutant lines that do not nodulated (*Nod-*), and its sister normal nodulating lines (*Nod+*) identified by Gorbet and Burton (1979). Reciprocal, self grafted and ungrafted seedlings were used to study the effect of the shoot and root on peanut nodulation. Previously sterilized, seeds were planted in 20 cm plastic pots, and sowed in 2:1 sand-vermiculite mixture. Growth chamber temperature was held at 16°C to 30°C and incandescent 100 bulbs extended photoperiod to 14 hours. Seven-to-ten day-old seedlings were grafted using the “straw-band” technique, and once the graft had taken, plants were inoculated with commercial Bradyrhizobium. Plastic bags were placed on plants to maintain high humidity. Either nitrogen free plant nutrient solution or 5 mM KNO3-supplemented nutrient solutions were used twice per week. The plant nodules were harvested 45 days after planting and characterized. Without exception, plants with *Nod-* mutant shoots grafted onto *Nod+* roots were nodulated. In contrast, plants with *Nod-* roots and *Nod+* shoots were nodule free, suggesting that the non-nodulating phenotype was strictly root controlled. The symbiotic event involves the molecular interaction between the plant and the rhizobia; during the initial stages, the host produces exudates called flavonoids and the rhizoid respond synthesizing lipo-chito-oligosaccharides or *Nod* factors and attach to the host. In a preliminary analysis, roots exudates of *Nod-* and *Nod+* plants were analyzed via reverse C18 HPLC/UV (280 nm) (-) ESI-MS. The flavonoid standards were apigenin, chrysin, genistein, kaempferol, luteolin, and naringenin. When compared to these standards, the root exudates from *Nod+* contained naringenin and apigenin. None of the six flavonoids were positively identified in the *Nod-* root exudates. Also, different root structures were observed among these non-nodulating mutants. Experiments are underway to confirm these finding and they will be discussed.

BREEDING, BIOTECHNOLOGY AND GENETICS IV

Systematic Identification of 2S, 7S and 11S Seed Storage Proteins of Cultivated Peanut. R. CALBRIX*, H.T. STALKER and N. NIELSEN, Department of Crop Science, North Carolina State University, Raleigh, NC 27695-7620.

Human allergy to peanut is due at least in part to hypersensitivity against the 2S, 7S and 11S seed storage proteins. Despite their importance in conditioning peanut allergy, a systematic identification of all the subunits

comprising these proteins has not been reported. For this purpose a library of cDNA produced from *A. hypogaea* cv. Tiffrunner at seed mid-maturation was sequenced using 454 FlexTitanium Technology from Roche. After assembly, about 32000 contigs were recovered from nearly 859000 raw sequences that represented genes transcribed during seed-fill. Analysis of genes sequences isolated from cDNA libraries produced at seed mid-maturation facilitated description of the diversity of families of genes encoding seed storage proteins. The 2S, 7S and 11S storage protein subunits were resolved into 8, 4 and 20 subgroups, respectively, based on sequence homologies. This result revealed that the complexity of peanut seed storage protein genes was substantially greater than that implied by immunological designations presently in use. PCR primer pairs specific for each seed storage family subgroup were created and used to amplify DNA seed mid-maturation cDNA isolated from *A. duranensis* and *A. ipaensis*. This permitted identification of those sequences that originated from A genome and those that came from B genome. A proteomic approach confirmed that seed storage proteins profiles of *A. ipaensis* and *A. duranensis* were different from one another and that the 2D electrophoretic pattern obtained from *A. hypogaea* seed proteins had spots originating from both putative progenitors.

Update on the Long Term Storage of *Arachis* Seeds. C.E. SIMPSON*, J.M. CASON, and B.D. BENNETT, Texas AgriLife Research, Stephenville, TX 76401-0004.

Germination tests were conducted on *Arachis* spp. seeds stored for varying lengths of time, ranging from twelve to 36 years. Previous tests had indicated that after 30 years many of the seeds had reached the maximum storage time. However, seeds from some of those same lots which produced zero germination at 30 years did actually germinate at 36 years, so not all seeds were dead six years ago. The most viable of the seed lots came from the *Arachis* section, and the least viable were members of the *Erectoides* section. This is the same result we have had in previous germination studies on these lots and other lots of the same groups but not necessarily the same species. The species tested included: *A. duranensis* (3 accessions), *A. correntina* (4), *A. villosa* (1), *A. stenosperma* (1), *A. kuhlmannii* (1), *A. monticola* (1), *A. hypogaea* (2), *A. batizocoi* (1), *A. paraguariensis* (2), *A. dardani* (2), *A. rigonii* (1), and *A. triseminata* (1). The sections represented were: *Arachis* (14 accessions), *Erectoides* (2), *Heteranthae* (2), *Procumbentes* (1), and *Triseminatae* (1). The overall average germination for the sections was: *Arachis* – 28.7, with a range from 0 to 70%; *Erectoides* – 18.6, with a range from 4.5 to 60%; *Heteranthae* 21.5 with a range from 14.9 to 20%; *Procumbentes* – 66.2% and *Triseminatae* 21%. In section *Arachis*, *A. duranensis* has survived the best at 62.6%, and large seeded *A. hypogaea* has done very poorly at 0% survival. The “old” *A. monticola* which is highly introgressed with *A. hypogaea* was only slightly better

than *A. hypogaea* at 1.3% (one seed of 74 germinated and made a plant). *Arachis correntina* has not survived well for the 36 years, with an average over four accessions of 2.2% (6 plants from 276 seed), and one accession had no germination of 49 seed. *Arachis batizocoi* was the only B genome species known in 1973 and it had 14 of 53 seed still viable; 26.4%. Conclusions from study of our long term storage of *Arachis* seed include: some species will store for extended times well beyond 25 years; other species will not store beyond the 20 to 25 year range. It appears that the large seeded *A. hypogaea* are among the lowest survivors beyond 25 years. In separate tests, some accessions of *A. hypogaea fastigiata vulgaris* (Spanish) germinated above 95% when stored past the 30 year time frame.

Screening for Drought Tolerance in Valencia Mini Core Collection. N. PUPPALA*, New Mexico State University Agricultural Science Center, Clovis, NM 88101; P. PAYTON and K.R. KOTTAPALLI, USDA-ARS Cropping Systems Research Laboratory, Lubbock, TX 79415.

Valencia peanuts are generally grown as an irrigated crop in eastern New Mexico and west Texas. Water is getting scare due to increase number of dairies in the region. Most of the peanut growing area is under Ogallalla aquifer. The objective of our research study is to identify and screen for drought tolerant lines among Valencia mini core collection. For any breeding program to be successful we need to identify germplasm lines that are tolerant to drought and at the same time yield high. Recently a Valencia core was developed from the USDA collection using 26 morphological descriptors. In this study we grew 80 PI's from the Valencia core collection developed by NMSU at Brownfield, Texas under full irrigation and limited irrigation. This paper will discuss the results in more detail.

Identification of a QTL Associated with Reduced Post-Harvest Aflatoxin Accumulation in Peanut (*Arachis hypogaea* L.). C.E. ROWE, V.J. VONTIMITTA, T.G. ISLEIB, and S.R. MILLA-LEWIS*, Department of Crop Science, North Carolina State University, Raleigh, NC 27695-7629.

Aflatoxins are toxic and carcinogenic metabolites produced by *Aspergillus flavus* Link ex. Fries and *A. parasiticus* Speare. Pre- and post-harvest contamination of peanut by aflatoxin is a major problem worldwide, causing profit loss for the peanut industry and raising serious human and animal health concerns. Peanut genotypes with resistance to aflatoxin accumulation should be an important part of an integrated aflatoxin management program. Aflatoxin content is expensive to measure and exhibits high environmental variation, thus, the use of molecular markers tightly linked to the trait would improve selection efficiency. This study was conducted to identify AFLP markers tightly

linked to genetic factors controlling reduced aflatoxin accumulation after infection with *Aspergillus flavus*. A segregating F_2 population was generated by crossing high-aflatoxin accumulating cultivar Gregory with low-aflatoxin accumulating interspecific tetraploid line GP-NC WS 2, phenotyped for aflatoxin accumulation using an in vitro assay, and screened with AFLP markers previously identified to be associated with reduced aflatoxin accumulation. An F-test was used to determine whether markers were associated with the trait, a genetic linkage map was generated, and interval mapping was used to identify regions of the genome that influence aflatoxin accumulation. Gregory supported significantly more aflatoxin production by *A. flavus* than GP-NC WS 2, and the F_2 population exhibited high-parent heterosis. Thirty-five of 38 AFLP markers used to screen the F_2 population had segregation distortion favoring the *A. hypogaea* cultivar. Six markers were significantly associated with reduced aflatoxin accumulation at the 5% significance level. Thirty-three markers were included in a genetic linkage map covering 60 cM. A putative QTL was identified at map position 9 cM that explains 6% of the variation for the trait. Linked markers could be utilized in a marker-assisted selection program to identify individuals that support low levels of aflatoxin accumulation.

BREEDING, BIOTECHNOLOGY AND GENETICS V

Physiological and Molecular Response to Mid- and Late-Season Water Deficit in Five Runner Peanut Genotypes. P.M. DANG*, C.Y. CHEN, R.B. SORENSEN and M.C. LAMB, USDA-ARS, National Peanut Research Laboratory (NPRL), Dawson, GA 39842; C.C. HOLBROOK, USDA-ARS, Crop Genetics and Breeding Research, Tifton, GA 31793; and B.Z. GUO, USDA-ARS, Crop Protection and Management Research Unit, Tifton, GA 31793.

Peanut production can be significantly impacted due to the duration or severity of drought in rainfed fields or limited water availability when plants need water the most, even in irrigated fields. Selection of drought resistant or tolerant variety can be very challenging due to location or year to year variability. Determining plant response to water deficit at different development stages may give us clues as the mechanism of drought resistance or tolerance, and the comparison of these responses across different peanut genotypes may indicate what plant mechanism was selected based on environmental challenge. In this experiment, five different runner peanut genotypes were evaluated for both mid- and late-season drought. These five tested genotypes were characterized by 400 SSR markers for an estimation of genetic similarity. Specific physiological measurements were conducted to confirm plant water stress. Leaves were collected from plants under different stages of water stress for gene expression study to determine possible mechanism of drought resistance. Understanding molecular response in different

peanut genotypes will help in the development of peanut genotypes that will have superior drought tolerance.

Progress in Breeding Peanut for Resistance to Leaf Spot Diseases. B.L. TILLMAN*, S. THORNTON, D.W. GORBET, NFREC, University of Florida, Marianna, FL 32446; B. MORTON, S. BURNS, and M. GALLO, Agronomy Department, University of Florida, Gainesville, FL. 32611.

Breeding peanut for resistance to leaf spot diseases (Early leaf spot [Cercospora arachidicola S. Hori] and Late leaf spot [Cercosporidium personatum (Berk and M. A.Curtis)) has been a goal of the University of Florida peanut breeding program for over 30 years. Moderate resistance was identified in PI203396 and related lines in the early 1970's. Using PI203396, six cultivars with moderate resistance to leaf spot have been developed by the University of Florida since 1986. However, only one of these cultivars was commercially successful. The other five suffered from poor seed germination and/ or poor seedling vigor and commercial production was terminated as a result. In addition to their resistance to leaf spot, these lines share common characteristics such as late relative maturity and resistance to spotted wilt and white mold diseases. Growers would benefit from this combination of traits so there is a need to understand why this group of germplasm suffers from poor seed germination. On-going research to determine the cause of poor seed germination and/or poor seedling vigor has identified several factors. First, the seed storage environment was found to reduce the germination and vigor of seeds of DP-1 but not other cultivars. Second, seeds of DP-1 were found to contain less calcium than other cultivars. In peanut, insufficient seed calcium concentration is linked to poor seed germination. Subsequently, seeds of several other lines and cultivars with characteristics and genetic background similar to DP-1 were found to have lower seed calcium concentration than other cultivars. Third, electrolyte leakage of seeds of DP-1 was greater than other cultivars and was correlated with germination and seedling emergence. Preliminary data suggests that the antioxidant capacity of DP-1 is less than other cultivars which could explain greater electrolyte leakage. This report will summarize the status of research in these areas.

Evaluating Peanut Seed and Leaf Proteome for Use in Drought Tolerance Screening. R. KATAM and S.M. BASHA*, Plant Biotechnology Lab, Florida A&M University, Tallahassee, FL 32317-7900.

In peanut, water stress (WS) significantly lowers plant resistance to *Aspergillus flavus* infection leading to aflatoxin contamination of peanut seed. One of the strategies adopted to decrease the risk of aflatoxin contamination in peanut is to identify and develop drought-tolerant peanut genotypes through molecular breeding. Objective of this research

was to study changes in leaf and seed proteome of drought-tolerant (DT) and drought-susceptible (DS) peanut genotypes due to WS for evaluating the possibility of using leaf proteome as a biochemical marker for determining drought tolerance. Over twenty peanut genotypes with diverse drought-tolerance characteristics collected from ICRISAT and ANGR Agricultural University, India were used in this study. Peanut plants growing in pot culture under greenhouse conditions were subjected to WS for 0 to 28 days. Seeds and leaves were collected from irrigated (control) and water stressed plants and analyzed by 2-DE. Differentially expressed proteins were identified using MALDI-TOF Mass Spectrometry. Peanut seed proteome showed that in DT genotypes expression of methionine-rich proteins was either maintained or up-regulated while they were significantly suppressed in DS genotypes when subjected to WS. Likewise, in leaf tissue of DT genotypes several photosynthesis and defense related proteins were over expressed due to WS while these proteins were either partially or completely suppressed in DS genotypes. In addition, four new proteins were induced following WS in drought-tolerant cv. Vemana. We have identified these proteins as serine/threonine protein phosphate PP1, glycine betaine, peroxidase 43 and SNF1 protein kinase which plays a role as defense. These data showed that the proteomic responses of both seed and leaf tissue of DT or DS genotypes are similar and hence, either tissue can be used for evaluating drought-tolerance characteristics of peanut germplasm. Supported by Peanut CRSP/USAID.

Systems Approach to Study the Response of Peanuts to Abiotic Stresses. K.R. KOTTAPALLI *, P. PAYTON, USDA-ARS Cropping Systems Research Laboratory, Lubbock, TX 79415; N. PUPPALA, New Mexico State University Agricultural Science Center, Clovis, NM 88101; and M. BUROW, Department of Plant and Soil Science, Texas Tech University, Lubbock, TX 79409; and R. RAKWAL, National Institute of Advanced Industrial Science and Technology (AIST), Tsukuba West, 16-1 Onogawa, Tsukuba 305-8569, Ibaraki, Japan.

To investigate regulatory processes and mechanisms underlying the response of peanut to abiotic stresses like heat, drought and salt, we adopted a systems biology approach. We have used the three “omics” platforms to study the response of a stress tolerant genotype in comparison to a susceptible line in leaf, root and pod tissues. Several clusters of gene, proteins and metabolite profiles were identified with different time-scales. We will discuss our findings on genes and proteins involved in a variety of cellular functions like lipids and starch synthesis, signal transduction, energy metabolism, seed maturation including desiccation tolerance, and proposed models demonstrating how novel pathways may impinge on the molecular mechanism of abiotic stress tolerance in peanuts.

PROCESSING AND UTILIZATION I

Peanut Roaster Temperatures Relative to Salmonella Kill. T. SANDERS* and K. HENDRIX USDA, ARS, Market Quality and Handling Research Unit, Raleigh NC 27695.

In response to the limited peanut butter contamination incident of 2006/7, studies were initiated to examine the effect of various time and temperature protocols on log kill levels for Salmonella on peanuts. The objective of the work was to establish time and temperature parameters necessary to reduce Salmonella on contaminated raw peanuts by a minimum of four logs using both oil and dry roasting conditions. Data from that study to include different market types of peanuts and a wide range of time and temperature protocols will be presented. Recently, contamination of peanut butter with Salmonella was responsible for 8 deaths and numerous illnesses. Cross-contamination from food handlers and processing are the major avenues of *Salmonella* contamination in food but poor sanitation and temperature abuse are also causes of Salmonella contamination. In response to requests from the peanut industry in general and manufacturers in particular, numerous roaster oven temperatures were evaluated as a needed first step to confirm that peanut roasters can and do deliver the appropriate time and temperature necessary for an appropriate Salmonella kill. Temperature profiles of ovens evaluated generally meet the time and temperature parameters necessary to achieve a 4 log kill of Salmonella.

An ELISA as a Quality Control Tool for Peanut Allergens in Processed Foods. E. YUSNAWAN, V. WONG, and N.A. LEE*, School of Chemical Engineering, Food Science and Technology, University of New South Wales, Sydney, NSW 2052, Australia

Peanut allergy has become one of the most severe allergies afflicting modern living because of its persistency and the life-threatening symptoms. The prevalence of peanut allergy is estimated at 0.4–0.6% in children and 0.3 – 0.7% in adults in developed countries. Without effective treatments and therapies for peanut allergy, sensitive and specific detection methods for tracing hidden or undeclared peanut allergens in processed foods are essential for consumer protection. This paper presents the development of a sensitive double-antibody-sandwich (DAS)-ELISA for the rapid detection of traces of peanut allergens in processed foods as a quality control tool. The sensitivity of the DAS ELISA for peanut allergens has been enhanced by utilising antibodies raised against different peanut cultivars. The assay exhibits a limit of detection of 1.4 μg L-1 and the range of detection of 1.4 – 300 μg L-1. Among the potential cross reactive food allergens tested, including tree nuts and legumes, only pine nut, cashew, blue lupin, and green bean show slight cross reactions. Preliminary validation using twelve food products spiking with peanut proteins at 11-300 μg L-1 showed

acceptable recoveries (80-122%), suggesting that this assay can be adopted as a effective quality control tool for the food processing industry.

Characterization of Folates in Peanuts. L.L. DEAN* and T.H. SANDERS, Market Quality and Handling Research Unit, USDA, ARS, SAA, Raleigh, NC 27695-7624; and M.L. WHITLEY, Department of Food, Bioprocessing, and Nutritional Sciences, North Carolina State University, Raleigh, NC 27695-7624.
The folate levels in a group of raw and roasted samples selected from the 2007 and the 2008 Uniform Peanut Performance Trials (UPPT) and from a set of raw samples from the Core of the Core of the Peanut Germplasm collection grown in 2006 and 2008 were determined. The samples were digested in protease and amylase to free the vitamers from the matrix. The homogenized samples were treated with an additional enzyme to deconjugate the polyglutamates. The different monomers of the folates present were determined using High Performance Liquid Chromatography coupled to Mass Spectrometry (HPLC-MS). Raw samples from the UPPT were found to have significantly higher levels of total folates compared to roasted. There were significant differences in folates between years for the Core of the Core samples although the relative relationship among samples remained the same in both years. The predominate vitamers found were 5-methyl-tetrahydrofolate and 5-formyl-tetrahydrofolate regardless of origin, PI or year.

Genetic Gain for Flavor in the North Carolina State University Peanut Breeding Project. H.E. PATTEE, Dept. of Biological and Agricultural Engineering, N.C. State Univ., Raleigh, NC 27695-7629; T.G. ISLEIB*, S.C. COPELAND, and S.R. MILLA-LEWIS, Dept. of Crop Science, N.C. State Univ., Raleigh, NC 27695-7629.
Since the early 1990s, the peanut breeding program at N.C. State University has monitored flavor of advanced breeding lines so that flavor could be used as a criterion in cultivar release decisions. The number of samples that can be assayed for flavor in a year are limited, so only advanced breeding lines have been monitored. As data have accumulated, lines with superior flavor profiles have been retained. The NCSU flavor database was mined to calculate the response of flavor attributes to selection over time, genetic gain or ΔG. Data on virginia-type cultivars, NCSU breeding lines tested for at least two years, and flavor standards Florunner and Georgia Green were analyzed and means computed, adjusted for appropriate covariates (linear and quadratic effects of roast color and intensity of the fruity attribute that can interfere with the perception of roasted peanut and sweet sensory attributes). In order to relate sensory attribute response to time, each genotype was characterized as to the first year it was subjected to

replicated testing of yield and grade. Regression of the intensities of sensory attributes on time revealed that ΔG has been greater in magnitude for the breeding lines developed in the late 1990s through the 2000s than it was for cultivars released from 1979 through 2005 (first tested 1974 through 2000). The response of breeding lines was +0.046 flavor intensity units (fiu) for roasted peanut, +0..58 fiu for sweet, and -0.032 fiu for bitter, compared with values of +0.008, +0.005, and -0.005 for the cultivars. We attribute this accelerated rate of gain for flavor to our program of regular monitoring of the flavor of advanced lines.

Physico-chemical Properties of Peanut Pancakes Made from an Instant Mix. VEERA C.K. YEMMIREDDY, YEN-CON HUNG*, Department of Food Science and Technology, The University of Georgia, Griffin, GA 30223.

Pancakes are very popular breakfast food items in several countries with different regional names. Majority of the commercial pancake formulations include all purpose flour as a major ingredient. Pancakes made with partially defatted peanut flour as a major ingredient will provide enormous nutritional benefits for consumers. The objective of this study was to develop a peanut pancake instant mix with light roasted partially defatted peanut flour (12%fat). Peanut pancake mix was prepared at 20, 30, 40 and 50% replacement of wheat flour along with other ingredients. Pancakes were made by mixing measured amount of instant mix with water and peanut oil with a wire whisk for about 2min then 40ml batter was poured on a griddle preheated to 190°C and cooked for 1.5 min on each side. Pancake made with 100% wheat flour was used as the control. Viscosity of the batter was determined at 20, 50 and 100 rpm using a brook-field viscometer and the values increased with increase in peanut flour concentration when compared with control. Color was determined using a Hunter colorimeter and expressed as color difference (ΔE) and the values were lower than control and shown variable trend among the samples. Textural properties were determined using an Instron Universal Testing Machine and the results indicated hardness, cohesiveness and chewiness values decreased with increasing peanut flour where as springiness values increased. Bulk density of the prepared pancakes was measured by using glass beads and the values showed variable trend among the samples when compared with the control. Moisture, fat, ash and protein content were determined using a vacuum oven, gold fisch fat extractor, muffle furnace and a LECO nitrogen analyzer, respectively. Peanut pancake had higher protein content and increased with increasing peanut flour. The developed peanut pancake instant mix has shown promise as a functional breakfast food item to replace regular wheat pancake mix.

Chemical and Bioactivities Characterization of Peanut Skin Phytochemicals. J.-T. CHEN, C.-H. YU, S.-M. LIN, and R.Y.-Y. CHIOU*, Department of Food Science, National Chiayi University, Chiayi, Taiwan; and L.S. KAN, Institute of Chemistry, Academia Sinica and Department of Bioengineering, Tatung University, Taipei, Taiwan.

Peanut skins contain substantial quantity of phytochemicals which deserve research attention. In this study, peanut kernel skins of four different-colored genotypes, including black, black-pink mix, red and pink were subjected to water extraction and followed by quantification and HPLC analysis. As further isolation and identification, one or both of cyanidin-3-sambuoside and cyanidin-3-sophoroside were identified as the major pigment of the black and black-pink colored skins. Total phenolics and flavonoid contents of all test skins were ranged from 40 to 68 mg gallic acid/g skin and from 0.1 to 19.6 quercetin/g skin, respectively. Higher flavonoid contents were detected in the extracts of black and black-pink mix skins than in other colored skins. As subjection of the water-extracts to bioactivities characterization, DPPH (α,α-diphenylhydrazyl) scavenging activities tested at 0.04 mg skin/mL water were equivalent to 4.4 to 10.8 µg/mL of butylated hydroxytoluene (BHT), reducing powers tested at 0.4 mg skin/mL water were equivalent to 29.3 to 137 µg/mL Vit C, and antioxidative potencies tested at 2 mg skin/mL water were equivalent to 14.3 to 51.6 µg/mL BHT. When the black and pink colored skin extracts were subjected to anti-inflammatory activities assessment with RAW 264.7 macrophage cells, the extracts were effective in inhibition of nitric oxide (NO) and IL-1β biosynthesis. As generalized, bioactive phytochemicals of peanut skins in regardless of color merit value-added product developments.

Peanut roots as a Potent source of Bioactive Compounds in Inhibition of Advanced Glycation End Products (AGEs) Formation. S.-H. WANG, J.-C. CHANG, and R.Y.-Y. CHIOU*, Department of Food Science, National Chiayi University, Chiayi, Taiwan.

Serum protein glycation and formation of advanced glycation end products (AGEs), usually enhanced by hyperglycemia, are closely related to subsequent complication of diabetes. Glycation is a nonenzymatic reaction between amino group of proteins and carbonyl group of reducing sugars. With an attempt to facilitate glycation to save time in screening of antiglycation compounds from peanut roots, a reliable procedure by reaction of bovine serum albumin (BSA) and fructose at 50oC for 24 h to form products with fluorescence enabling spectrophotometric quantification was suggested to be in substitute of reaction at 37oC for 7 days. As subjection of the products to electrophoresis, both reacted SDS-PAGE protein patterns were identical. By the procedure in determination of antiglycation activities of the 80%

methanol-extracts of dried peanut roots (1:20, w/v), most root extracts exhibited higher activities in inhibition of AGEs formation than did 1 mM aminoguanidine (AG), used as a positive control. The extracts were also inhibitory to formation of Amadori products and middle products of α-dicarbonyl compounds. Chemical and bioactivities characterization of the bioactive compounds of peanut roots in development of value-added products were also conducted.

Sensory Quality of Peanut Products Using an E-Nose. X. BREDZINSKI and F. PEDRETTI, Alpha M.O.S. America Inc., Hanover, MD 21076-1705; and J.A. MARSHALL*, JLA Global, Lubbock, TX 79407.

Human sensory panels have long been the standard for determining the sensory quality of foods. Many times the food tested poses health risks and undesirable flavors. Safety of human panels must be taken into consideration in the process. Fortunately technology has progressed to the point where an electronic nose (E-Nose) can be used to make the process faster, more efficient, less biased, and most importantly safer. JLA, an international system of laboratories and support for the system, has examined the use of the E-Nose for the purpose of sensory quality control.

JLA in conjunction with Alpha M.O.S. tested good sensory products including three common off-flavors with varying intensities. Samples were sent to Alpha M.O.S. and results indicated a clear resolution on PCA cluster analysis of low intensity off-flavors from desirable sensory samples. As a result of this study, JLA has acquired an E-Nose. During the 2009 harvest, JLA sampled peanuts from Virginia-Carolina, Southeastern and Southwestern production areas. Over three hundred samples were analyzed in triplicate on the E-Nose side-by-side with sensory panels. Ninety percent of samples scored within two standard deviations for “roasted peanutty” intensity with excellent repeatability on the E-Nose instrument. Results from this study as well as ongoing validation experiments will be presented.

Quantification of Peanut and Oilseed Texture as a Function of Processing. J.P. DAVIS*, K.M. PRICE, and L.L. DEAN, USDA ARS Market Quality and Handling Research, Raleigh NC 27695; D. SMYTH, Kraft Foods East Hanover, NJ, 07936; M.A. DRAKE, North Carolina State University, Dept. of Food, Bioprocessing & Nutrition Sciences, Raleigh NC 27695; and T.H. SANDERS, USDA ARS Market Quality and Handling Research, Raleigh NC 27695.

Texture is critical to consumer acceptability of many products including peanuts. Texture is a complex sensory experience that primarily relates to the way a product feels in the mouth; however, audio and visual inputs are also important. Limited data is available regarding peanut texture as

a function of processing, genetic and/or environmental factors. Accordingly, texture sensory data was collected for a range of commercially available peanuts processed under different conditions including dry roasting, oil roasting and water blanching/oil roasting among others. Select cultivars grown in different environments and subsequently processed equivalently were also tested. Two instrumental methods to quantify mechanical properties of the peanuts were also used to characterize samples. The first method involved individual compression testing of multiple split cotyledons whereas the second test utilized a Kramer shear cell (KSC) for simultaneous compression testing of multiple peanuts from a given sample. Moisture, oil, protein, sugar, density, and color data complemented sensory and mechanical data. Equivalent data was also collected for other common oilseeds including almonds, cashews and hazelnuts for comparison. Dry roasting or oil roasting generally decreased “hardness” while increasing sensory perception of “crunchiness” for peanuts and other oilseeds. Good correlations among oil and moisture contents were observed with sensory texture terms and mechanical measures. Instrumental relationships to sensory texture data are of particular interest due to the costs and time needed for collecting sensory data. In a comparison of 35 products, KSC peak force values linearly correlated with product hardness (R2= .74). Poorer correlations were observed in instrumental data and panel scores of “crunchiness” or “crispiness”. These terms, unlike “hardness”, which only accounts for perceived force during chewing, also account for perceived sound during chewing. This suggests the importance of collecting and quantifying audio data instrumentally to better predict and understand peanut and oilseed texture.

PRODUCTION TECHNOLOGY

Eliminating TSW Impact on Peanut with Rotation. D.L. WRIGHT, J.J. MAROIS, and G. ANGUELOV*, NFREC, University of Florida, Quincy, FL 32351.

Tomato spotted wilt virus has made significant changes to the way peanuts are grown in the southeast. There was no defense against the disease when it first occurred and yield and quality losses were severe. Symptoms first began around 1990 with losses reaching about 15% in 1997 followed by another peak in 2005 when about a 9% yield loss occurred. Scientist in the tri-state area developed a TSWV index to help reduce losses from this disease. There are no varieties that are immune to TSWV but some have tolerance and this along with planting date, plant population, insecticide use, row patterns, tillage and use of Classic or not all influence the amount of disease that can occur. Strip tillage into cover crops has been shown to reduce the incidence by about 50%. Our research has shown that peanuts can be striptilled into killed

bahiagrass reducing TSW by another 50% (very little TSW observed) allowing susceptible varieties to be planted at the normal planting date (pre TSW problems) while making yields that can only be made in the conventional system when planted 3-4 weeks later. This paper will discuss these and other advantages to this system and the reason this should be the 8th factor to consider in the TSWV index model.

Evaluating Inoculation of Two Peanut Cultivars after Long-Term Continuous Corn Production. R.S. TUBBS*, G.H. HARRIS, and J.P. BEASLEY, JR., Department of Crop and Soil Sciences, University of Georgia, Tifton, GA 31793-0748.

To maximize N-fixation, peanuts (*Arachis hypogaea* L.) need to have abundant nodulation with active Rhizobium. In fields with a recent history of peanut in rotation, inoculation may not be necessary because of adequate Rhizobia survival in the soil. However, in fields that have not been planted to peanut for five years or more, inoculation may be necessary to achieve optimized production. An experiment was planted in Tifton, GA during 2008-2009 in a field that had previously been planted to 25+ years of continuous corn to evaluate peanut response (yield, grade, nodulation, foliage color, plant biomass) to inoculation. Two peanut cultivars ('Georgia-06G' and 'AP-3') were planted as a main plot effect with three inoculation treatments (untreated, Optimize Lift, and Vault Liquid) as a sub-plot effect in a split plot design. There were no treatment interactions among the assessed variables in either year. Georgia-06G yielded and graded higher than AP-3 averaged over inoculant treatments, and also had darker foliage and larger plant biomass. When averaged over cultivars, the inoculant treatments outperformed the untreated peanuts in yield, nodulation, and foliage color. Inoculated peanuts averaged 1623 lb/ac more than non-inoculated peanuts in 2008, and 492 lb/ac higher in 2009. The sharp decline is attributed to a very wet season in 2009, especially within the first week after planting, potentially washing rhizobia away from the seed and/or killing some bacteria in the anaerobic conditions of the water-logged soil. These results show inoculation of peanuts in fields without native rhizobia is imperative to maximizing peanut performance. There are also indications that genetic variation in foliage color can be nearly as drastic as differences between inoculated and non-inoculated peanuts. Therefore, it is important that growers do not misdiagnose inoculant failure from planting different peanut varieties with drastically different hues in the same field.

Peanut Peg Strength and Post Harvest Pod Scavenging for Full Phenotypic Yield over Digging Date and Variety. R.C. NUTI, USDA-ARS National Peanut Research Laboratory, Dawson, GA 39842; C.C. HOLBROOK, USDA-ARS Crop Genetics and Breeding Research, Tifton, GA 31793; and A. CULBREATH, Department of Plant Pathology, University of Georgia, Tifton, GA 31794.

New peanut cultivars are available with very high yield potential and high levels of disease resistance. With rising input costs and shrinking return margins, all efforts must be made to harvest the full yield produced. Peanut crops are susceptible to high levels of pod loss during digging from a complex of factors. Peanut yield and grade generally improve until optimal maturity. At maturity, individual pods begin releasing from the plant, so late digging often causes considerable yield loss. The genetic characteristics of peg strength are likely to vary among cultivars and are currently unknown. In 2009, studies were conducted to measure peg strength and recover pods from soil in two studies. The first included early and late digging dates on cultivars Tifguard and Georgia-06G that included fungicide treatments purported to improve peg strength. The second experiment included 6 cultivars over 2 planting dates. After mechanical digging and harvest, hay was raked from the plot surface. A modified 2 row peanut shaker was used to dig and sift soil to recover pods left in the soil at digging. Pod yield, scavenged yield, and peg strength will be reported.

Conservation Tillage as a Solution to Drought in Both the Southeastern and Western Peanut Growing Regions. W.H. FAIRCLOTH*, USDA-ARS, National Peanut Research Laboratory, Dawson, GA 39842; D.L. ROWLAND, Texas A&M University, Uvalde, TX 78801; and P.P. PAYTON, USDA-ARS, Plant Stress and Germplasm Development Unit, Lubbock, TX 79415.
Conservation tillage cropping systems were introduced in the 1970s and much research has documented positive benefits such as decreased erosion, general soil improvement (carbon sequestration), and decreased labor, time, and fuel devoted to land preparation. Strip tillage, in-row subsoiling followed by a narrow seedbed preparation, is the most popular form of conservation tillage and research has validated that it can be used in peanut successfully despite concerns regarding digging, pegging, and disease. Often overlooked in discussions regarding conservation tillage are changes to crop physiology and growth, which have frequently resulted in greater water use efficiency while maintaining yield. Given that irrigation water is abundant but highly politicized in the Southeast, and that irrigation capacities are already decreased in the Western peanut regions, this drought mitigation should become the focus of conservation tillage research. Data that demonstrates this important concept will be presented from 2006-2009 research projects in Dawson, GA, and Lubbock, TX.

Evaluating the Potential of Variable Rate Fungicide Application to control Sclerotinia blight. C.B. GODSEY*, Plant and Soil Sciences, Oklahoma State University, Stillwater, OK 74078; J.P. DAMICONE, Entomology and Plant Pathology, Oklahoma State University, Stillwater, OK 74078; and R.K. TAYLOR, Biosystems

and Ag Engineering, Oklahoma State University, Stillwater, OK 74078.

Profit margin has continued to decrease in southwest peanut (*Arachis hypogaea* L.) production over the last several years. The most logical ways to increase profit margin is to either increase yields or decrease inputs. Precision management technologies have been adopted relatively slow in peanut production. Fungicide application is the largest expense in many peanut fields, especially in Sclerotinia blight (*Sclerotinia minor)* infected fields. Use of current technology may allow for targeting fungicide applications to control Sclerotinia. The objectives of this study were to 1) determine the potential of using active sensors, in-season, to determine variable rate applications for control of Sclerotinia and 2) determine the potential for using past season aerial imagery and other data layers to delineate fungicide management zones. Two separate Sclerotinia control trials were sensed at 2 to 3 wk intervals with a handheld GreenSeekerTM sensor to determine NDVI. In addition, two peanut fields in SW Oklahoma were identified in 2009 and aerial photographs were taken. Fields were grid soil sampled on 0.5 ac grid size to determine sclerotia densities throughout the field. Use of the GreenSeekerTM sensor was highly correlated with control of Sclerotinia and pod yield after October 1. Prior to this date, correlation in yield and NDVI was poor. Use of aerial imagery, elevation, and soil type appear to hold some promise in reducing fungicide application to control Sclerotinia.

ECONOMICS

Investment Analysis of Conventional vs Conservation Tillage Equipment for Peanut. A.R. SMITH* and N.B. SMITH, Department of Agricultural and Applied Economics, The University of Georgia, Tifton, GA 31793-1209.

Peanuts are a capital intensive crop because of the specific inputs and equipment needed to produce and harvest a high yield crop. When investing in equipment, farmers have a choice between traditional peanut production equipment (conventional tillage) and reduced tillage equipment (conservation tillage). There has been growing interest in conservation tillage peanut production because of incentives from government programs, benefits to soil and water quality, and cost savings on labor and equipment. An investment analysis of conventional tillage peanut production equipment was compared to that of conservation tillage equipment. The impact of higher fuel and chemical prices on the investment decision were evaluated using a sensitivity analysis. Breakeven yields and prices needed to realize a return on investment were also calculated.

Potential Economic Impact of the Conservation Stewardship Program on U.S. Peanut Farms. A. McCORVEY* and S.M. FLETCHER,

National Center for Peanut Competitiveness, Agriculture and Applied Economics Department, The University of Georgia, Griffin, GA 30223-1797.

The Food, Conservation, and Energy Act (FCEA) of 2008 established the Conservation Stewardship Program (CSP) with an optional supplemental payment for adopting a Resource Conserving Crop Rotation (RCCR). This program is to be administered through USDA/NRCS and will be available to all producers in the United States if they comply with enrollment criteria. In order to receive payments, the participant will sign a 5 year contract, agree to implement the CSP plan, operate and maintain the conservation activities, and maintain and make available appropriate records documenting applied conservation activities and production system information. A participant may receive an optional supplemental payment for adopting a RCCR, but must first comply with CSP criteria. After the first sign-up period in late 2009, the combined payments for CSP/RCCS have ranged from $40/ Ac to $80/Ac per year. The CSP/RCCR has a yearly payment limitation of $40,000 per individual and a 5 year payment limit of $200,000 per contract. The CSP/RCCR is considered in compliance with the World Trade Organization (WTO) green box requirements and is viewed as a potential viable option for an alternative farm safety net to historical farm programs that are under much scrutiny in the upcoming Farm Bill. The National Center for Peanut Competitiveness (NCPC) analyzed the potential economic impact of this program on their 22 U.S. Representative Peanut Farms. Data based on conversations with state NRCS staff were incorporated into the modeling. Preliminary results indicate the program to be a viable option for U.S. peanut producers.

Economic Viability of U.S. Peanut Farms: 2010-2015. S.M. FLETCHER* and A. McCORVEY, National Center for Peanut Competitiveness, Agriculture and Applied Economics Department, The University of Georgia, Griffin, GA 30223-1797.

Production costs of commodities typically grown in the Southern UnitedStates have decline to some extent since the record high costs realized during the 2008 growing season. Unfortunately, commodity prices have also declined for most commodities. Given the fluctuation of costs of production coupled with uncertainties in the commodity markets it is difficult to predict the economic viability of the current year, let alone what the future holds for the U.S peanut farms. To address this question for Southern agriculture and more specifically the peanut farming industry, the National Center for Peanut Competitiveness (NCPC) utilized its U.S. Representative Peanut Farms Database. Using FAPRI's January 2010 Baseline, 6 of the 22 farms, or 27% are forecast to have good economic viability for 2010 through 2015. Three farms, or 14% are forecast to have marginal economic viability, and 13 farms, or 59% are forecast to have poor economic viability by 2015. Although the January

2010 forecast shows some improvement over the August 2009 FAPRI Baseline where only 18% of the farms were green, the results still indicate troubling economic times for most representative peanut farm. This analysis is not promising for the United States peanut farming industry. Unless overall profitability of all crops produced on a peanut farm in the United States increases, the economic viability is in jeopardy for this sector of the country.

MINUTES OF THE BOARD OF DIRECTORS MEETING
42nd Annual Meeting, Hilton Clearwater Beach Resort,
Clearwater Beach, Florida
July 14, 2010

President Barbara Shew called the meeting to order at 5:00 PM and welcomed everyone. Present were T. Baughman, C. Butts, J. Chapin, M. Davis, M. Gallo, C. Johnson, R. Kemerait, E. Murphy, V. Nwosu, E. Prostko, N. Smith, J. Starr, R. Sutter, H. Valentine, J. Woodward.

President Shew called on J. Starr, Executive Officer, to present the minutes of the last Board of Directors meeting, conducted at the 2009 Annual Meeting held in Raleigh, NC. The minutes as reported in the 2009 Proceedings, Vol. 41, were approved.

The following reports were presented and approved by the Board.

Executive Officer Report - J. Starr reviewed the financial status of the society and reported that the society remains in sound financial condition. Two Ad Hoc committees have worked to address issues of annual meetings, business matters, and review of the By-Laws to determine any adjustments that may need to be made to reflect current operating procedures and membership matters. Starr announced the intention of Irene Nickels, Administrative Assistant, to retire effective 31 December 2011 and the need to have a new business model identified by that date and fully operational for the annual meeting in 2012. Starr also requested permission to spend ca $200 on thank you gifts for persons who are not members of APRES but provided substantial assistance at the meeting, especially Mrs. Jennifer Tillman. This request was approved by a voice vote.

Program Committee - M. Gallo reported that there were 103 presentations for the meeting. Further the committee requested that the members need additional notices concerning registration deadlines, would like to have the draft program sent to members several weeks before the meetings, if it might not be possible to set up an online registration procedure and, finally, electronic submission of abstracts. The Executive Officer was instructed to look into these requests.

CAST Report - No report given. APRES is no longer a full member of CAST with voting previliges but is now an Associate Member with an annual cost of $750.

Finance Committee - APRES ended the fiscal year with $221,139.95 in total assets and no libilities. This represents an increase of $31,534 from the previous year. Of the assets, there were $59,269.28 (petty cash and checking account) in operating funds, $160,885.92 in reserve

(Certificates of Deposits, Money Market account, and the Bayer Account) and the remainder in nonpermanent assets (computer, printer, etc.). The budget projections for 2010/2011 were for expenditures and receipts of $125,400 each. This report was accepted and approved by the Board.

Site Selection Committee - The contract for the meeting in San Antonio, TX at the Historic Menger Hotel has been signed. For 2012 the Site Selection committee utilized the services of the Helms Brisco agency to evaluate potential sites and assist in the development of a draft contract. The committee initially recommended meeting in Raleigh, NC at either the Sheraton or the Mariott City Center. The Board accepted the report and will make a decision on meeting site following further deliberations.

Nominating Committee - The Nominating Committee offered the following persons for office in the Society.

President-Elect – Todd Baughman
Board of Directors, Industry rep – Julie Marshall
Board of Directors, VC region – Tom Isleib
Board of Directors, SE region – Scott Tubbs
Board of Directors, USDA rep – Jack Davis

The Board agreed to present this list of nominees to the membership for consideration at the Business meeting.

Public Relations Committee - The Public Relations Committee of the American Peanut Research and Education Society met via e-mail prior to the 2010 annual meeting. Members of the Public Relations committee for 2010 were: John Erickson, Ryan Lepicier (Chair), Sandy Newell, Shelly Nutt, Betsy Owens and Barry Tillman.

News releases were sent to several states from the Executive Officer of APRES to publicize this meeting. In addition to those releases, information was disseminated to research and extension offices and county agents. The committee recommends that all members encourage scientists and county agents working in peanut to join the society. Photographic records of recognized significant achievements of members are to be made at the meeting.

Another role of the committee is to recognize members or prominent individuals in the peanut industry that have deceased with resolutions that honor their contributions accordingly, the following resolution is offered

Michael Schubert, Ph.D.
Whereas, Michael Schubert, Ph.D., 63, of Slaton, Texas, formerly of

Longworth and Yoakum, Texas, was born March 9, 1946, in Sweetwater, Texas, graduated from Sweetwater High School in 1964, earned his bachelor's and master's degrees from Texas Tech in agronomy and his doctorate from Texas A&M in plant physiology, and

Whereas, he was employed by the Texas A&M Experiment Station as a research scientist working primarily with peanuts in Yoakum (1976-1993) and Lubbock (1993 to 2009) , and

Whereas, he was coordinator of the Peanut Precision Agriculture group and the Western Peanut Growers Research Farm; he incorporated global positioning satellite-referenced peanut yield mapping into peanut field research in West Texas; he collaborated with peanut breeders on adaptation and performance of germplasm and advanced lines to the West Texas environment and on genetic alteration of peanut fatty acid profiles, and

Whereas, he was an elder and active member in the Westminster Presbyterian Church in Lubbock and Palo Duro Presbyterian Church., and

Whereas, he died Monday, November 9, 2009 in San Antonio, Texas, be it resolved that the American Peanut Research and Education Society remembers and honors Michael Schubert's life and contributions to the peanut industry.

The committee's report was accepted by the Board and the resolution will be read at the annual business meeting.

Editor of Peanut Science - The two primary goals set forth for **Peanut Science** by the editor and the Publications and Editorial Committee were achieved during the 2009-2010 fiscal year. Article submission and tracking went online (www.editorialmanager.com/peanutscience) in mid-January 2010. Through June 30, 2010, a total of eight manuscripts have been submitted through the interactive website.

Secondly, there was an average of approximately 90 days for return the first manuscript review to the authors. Opportunity to improve exists and should be improved to achieve the goal of 60 d required for the first review to be returned to the corresponding author.

The second major goal of the journal was to get some of the legacy issues (prior to Vol 32) scanned and published on line. The Editor and APRES Executive Director submitted proposals to approximately 13 peanut organizations to provide $600 each to assist in funding the legacy project. To date, the American Peanut Shellers Association, Georgia

Peanut Commission, National Peanut Buying Points Association, National Peanut Board, Peanut Foundation, and the South Carolina Peanut Producers Board have provided or pledged to provide the $600 requested. Every article published in Peanut Science beginning with Volume 1, originally published in 1974, has been scanned and available on-line in pdf format for viewing and download (www.PeanutScience.com). Total cost for the legacy project was $12,817.44.

The following Peanut Science associate editors' terms have been completed: J. Damicone, B. Tillman, M. Gallo. The following persons have agreed to serve three-year terms as associate editors ending in 2013: D. Rowland, A. Herbert, N. Puppala, J. Woodward and T. Stalker. Drs. Rowland and Herbert are volunteering for a second three year term while Drs. Puppala, Woodward, and Tom Stalker are being submitted for endorsement by the Publications and Editorial Committee and approval by the APRES Board of Directors.

The Peanut Science Financial Report and Budget is included in the overall APRES Financial Report. The cost of producing and publishing the current issues (Volume 36(2) and Volume 37(1)) was less than the income generated from page charges.

The Board voted to accept the Editor's report.

Publications and Editorial Committee - The Publication and Editorial committee met Tuesday afternoon in Clearwater, FL. Members present were Chris Butts, Jason Woodward, Naveen Puppala, and Tim Brenneman. Chris Butts presented the Peanut Science Editors report, including the budget which was accepted by the committee (see attached). The highlights of the year were a successful transition to electronic publishing, which has gone very smoothly, and completion of the scanning and on line publishing of the legacy issues of Peanut Science. All current and previous issues of the journal are now available and searchable in electronic format. This is a major achievement and will help insure that this wealth of information will be readily available to future generations.

One pending item not addressed by the committee this year was whether to accept "Notes" or "Short communications" in Peanut Science, and if so what the guidelines should be for those. A set of guidelines for such abbreviated publications used by other journals has been collected, and this can be addressed further by the current committee.

The Board voted to accept the committee's report

Peanut Quality - The Peanut Quality Committee has appointed M. Kline as Sectretary of the committee. At Committee meeting the following issues were discussed: Seed purity, Essentially derived varieties; Quality traits other than HOA. Their full report is published elsewhere in these Proceedings.

The Board voted to accept the committees report.

Bailey Award Committee - The committee's business related to the 2010 Bailey Award winner was conducted by email, prior to the annual meeting. Nominations were received from all eleven eligible sessions of the 2009 annual meeting. Nine manuscripts were received for final evaluation by the committee. The winning paper is from presentation titled "Control of Foliar and Soilborne Peanut Pathogens with Morning, Evening or Daytime Applications of Fungicide." by T.B. BRENNEMAN* and J. AUGUSTO, Department of Plant Pathology, The University of Georgia, Tifton, GA 31793-0748. Tim Brenneman was the presenter.

The chair would like to thank the committee for serving as reviewers and their timely responses. Special appreciation is expressed to committee members Peggy Ozias-Akins and Kris Balkcom who complete their three year terms.

The Board voted to accept the committee's report

Coyt T. Wilson Distinguished Services Award Committee - The Coyt T. Wilson Award Committee received two nominations for the award, materials were distributed electronically to all committee members for review. Chris Butts replaced Joe Dorner as a committee member. Based on committee vote, Albert Culbreath was selected as this year's awardee. The Board voted to accept the committee's recommendation

Dow Agrosciences Awards Committee - The Dow AgroSciences Award Committee did not meet at the APRES meetings in 2010 because committee business was taken care of prior to the APRES annual meeting. In 2010 the committee received two nominations for the Dow AgroSciences Award for Excellence in Research and two nominations for the Award for Excellence in Education. Nomination packets were distributed to committee members electronically, and the vote on the nominations was conducted electronically. Dr. David Jordan is this year's recipient of the Dow AgroSciences Award for Excellence in Education, and Dr. Peter Dotray is this year's recipient of the Dow AgroSciences Award for Excellence in Research.

Fellows Award Committee - The committee received only a few nominations but was able to select Christopher Butts as a Fellow for 2010.

J**oe Sugg Graduate Student Award Committe**e - There were nine students who presented papers in the competition for 2010. The committee selected the following individuals as the award winners.

1st place - Olubunmi Aina
2nd place - D.Q. Wann

Ad Hoc Long Range Planning Committee - A six-question survey was prepared by the APRES Ad-Hoc Committee and submitted to the membership in November 2009. The survey was sent to 251 members and 67 responded; 27% participation.

Four conclusions can be reached from the survey and are the basis on which courses of action be directed:

1. 90% of respondents viewed the historic meeting time of APRES (first full week after Independence Day) to be either the best time for the annual conference or an acceptable time.
2. It was the opinion of 50% of the respondents that APRES meeting sites rotate among the three peanut producing regions and not linked to individual states in each region on a rotating basis.
3. 83% of respondents would be in favor of considering periodic combined conferences with groups of complimentary mission, including the Southern Peanut Growers Conference.
4. There was no clear preference among survey respondents regarding future APRES administration, although comments were made to base related decisions on reducing costs of operation.

The APRES Ad-Hoc Committee recommends that the Board of Directors consider the results of this survey and integrate these results into future actions to ensure continued viability of APRES. Furthermore, the Ad-Hoc Committee encourages the APRES Board of Directors to consider the survey results in the global sense and not solely on the four conclusions listed above.

Based on the findings of this survey, the Board is proceeding with restructuring of annual meetings in terms of length and rotation among regions. The Board requested that C. Johnson proceed with making initial contact with the Southern Peanut Farmers Federation to determine if a joint meeting might be possible in 2013. Further the Board instructed the officers (Gallo, Shew, and Starr) to further investigate the alternative business models for the society.

The meeting was adjourned at 7:00 pm.

OPENING REMARKS BY THE PRESIDENT
AT THE 2010 BUSINESS MEETING AND AWARDS CEREMONY
President Barbara Shew
July 15, 2010

Thanks to the Program Chair, Maria Gallo, the Technical Program Chair, Barry Tillman, and the Local Arrangements Chair, Greg McDonald, for putting together an outstanding meeting and program.

APRES has made a great deal of progress in the past 4-5 years in laying a foundation for the immediate future, and adapting as a smaller but still important society. For example:

The transition to on-line publication of Peanut Science has been smooth and successful. Thanks to the efforts of Editor in Chief Chris Butts and the Publications and Editorial Board, the journal is maintaining a regular publishing schedule. The 2009 issue had the most pages ever published in Peanut Science, 203, and 94 pages were published in this year's first issue. The legacy project to make back issues available on line has been completed, which is a very important accomplishment.

APRES is fiscally sound. We are running in the black and our reserves meet or exceed accepted standards for a society of our size. We have undertaken a new model for meeting rotation and the meeting program. The model is still experimental, but seems to be working. We have more changes coming up in the near future with the planned retirement of Irene Nickels in about 18 months, and with Jim Starr expecting to step down as Executive Officer not long after that. Over the next year, the Board and various committees will consider whether we need a new governance model and if so, how it should be structured.

This next year, we will work to update by-laws to reflect these various changes and to codify ways our operations have evolved over time. We should be proud of what APRES has accomplished as an organization. We have been open to change and have adjusted well to the changes we have made so far. I hope the membership will continue to be open minded and patient as we work through the changes yet to come. As peanut scientists and members of the peanut industry, we have taken to heart the admonishment to do more with less. Programs continue to publish papers, educate graduate students, release new varieties, and innovate in information delivery. The chemical industry has kept pace with a wide array of new and very effective products. Growers produce record yields on fewer acres.

Before I leave the present and near future, I want to urge us to keep track of our history. The founding generation is already retired or nearly retired. APRES has not had a historian position nor have we been

particularly good guardians of our history. I suggest we rectify this as soon as we can by preparing a comprehensive and up to date history of APRES.

As I've already alluded to, we are seeing a bit of the changing of the guard. Many of our younger members are stepping into leadership roles and are doing an excellent job. The graduate student competition continues to be the highlight of our annual meeting. We have many outstanding people in early to mid career who are lending new energy to APRES and the peanut industry.

I come to you today, though, concerned about the longer term future of APRES. APRES was founded in a time of expanding horizons and expanding membership. Membership peaked in 1985, with 742 members total and 513 individual members. Since then we have been buffeted by forces that have relentlessly put downward pressure on membership. Our current individual membership is about 185. These trends show every sign of continuing or perhaps even accelerating in the coming years. Recently, by far the greatest force has been economic. State budgets across the country are in shambles. Education, much less research, is no longer considered safe from deep budget cuts. A much longer term trend has been a move away from investment in commodity-oriented research, either fundamental or applied, at the state and federal levels. Similar trends have started to prevail in extension at the specialist and county levels. At the same time, the agricultural chemical industry has undergone a prolonged period of consolidation. This has been reflected in a drop in our sustaining memberships from a high of 39 in 1981 to 10 in 2009. These trends show no sign of reversing. Universities depend more and more on competitive grants to maintain their research, and increasingly, extension programs. This dependency on grant funds means that new university hires are selected with an eye towards their potential to generate grant support. Unfortunately this puts peanuts in a bad position. Federal grant programs generally are not oriented toward funding of commodity-based research and extension. Traditionally, commodity-based research was viewed as being well-supported by appropriated funds. Competitive grants were intended to fulfill broader missions. The appropriated funds have gone away, but the belief that competitive grants should not be commodity oriented still prevails. Some attempts have been made to set aside certain grant programs to be more directed to commodity needs. However, peanuts are handicapped relative to other crops. Peanuts are often specifically excluded from funding intended to help small and so-called specialty crops. Peanuts also have not been the beneficiaries of special earmark initiatives similar to those found in other crops, such as the Scab Initiative for wheat and barley, or even the Sclerotinia Initiative, which is limited to Midwestern crops. Thus, peanuts are in a sort of no-man's

land where competitive and earmarked grant funding is concerned. Since grant potential is now the driver in hiring decisions, it will be ever harder to convince our administrators and colleagues to define and fill university "peanut positions" when new positions open through retirements or new hiring initiatives.

The replacement issue will come into greater play in the coming years. In 2008, the median age in my disciplinary society, the American Phytopathological Society, was 52. I believe the demographics of APRES are about the same. This means that a wave of retirements is almost upon us. We are seeing the leading edge of that wave already with buy-outs and other early retirement incentives being used to cope with budget cuts.

Realistically, I think it's entirely possible that no more than half of the university "peanut" positions that come open in the next 5 to 10 years will be re-hired as "peanut" positions, whether basic, applied, or extension. People with commodity orientations will almost surely have more responsibilities than ever, either for doing basic research or for work on multiple commodities.

We will need to tell decision makers about the value of and need for peanut research and education in all its varieties if we are to have any hope of maintaining a credible presence in research and extension.
Even to maintain an APRES membership of 150 -200 is going to take a tremendous amount of work as decisions about program directions and hiring are made over the next few years. Unless these trends unexpectedly reverse, our fate is to be a much smaller society in 10-15 years than we were 30 years ago. While pushing as hard as we can to stabilize our numbers, we would be wise to prepare for the changes that appear to be coming due to forces we can't control. We need to have the courage to imagine a path for APRES that reflects the likelihood of a smaller membership. The "way we always have done things" with a membership of 400 or even our current numbers may not be workable for a membership of 100 or 150.

As we consider the changes we chose to make, and the changes that fate will require us to make, I urge you to consider the statement of purpose in our by-laws:

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.

In short, our mission is to promote peanut education and research through scientific meetings, programs, and publications. The name of the society is an exact reflection of the purpose stated in the by-laws. This is still a sound purpose and our core mission as a society. I urge those of you who will lead the way as we make short-term and long-term changes to consider this mission carefully, and be sure that the changes we make be in service to this mission. The mission remains the same; only the means to accomplish it will change.

BUSINESS MEETING AND AWARDS CEREMONY
AMERICAN PEANUT RESEARCH AND EDUCATION SOCIETY
The Hilton Clearwater Beach Resort
Raleigh, North Carolina
July 15, 2010

1. **President's Report** .....Barbara Shew

2. **Reading of Minutes of Previous Meeting** ..... ……J. Starr

3. **New Business**

   a. Finance Committee.....Kelly Chamberlin
   b. Public Relations Committee John Erickson
   c. Peanut Quality Committee ..... Victor Nwosu
   d. Site Selection Committee.....Barry Tillman
   e. Publications and Editorial Committee ..... Naveen Puppala
   f. Editor's report and new Peanut Sci. Associate Editors ……Chris Butts
   g. Program Committee..... Maria Gallo
   h. Other Business - Ad Hoc committee……..Carroll Johnson
   i. Nominating Committee .....Kelly Chamberlin

4. Awards Presentations

   a. Coyt T. Wilson Distinguished Service Award .....Baozhu Guo
   b. Fellows Award..... Todd Baughman
   c. Bailey Award .....Albert Culbreath
   d. Joe Sugg Graduate Student Competition .....Robert Kemerait
   e. Dow AgroSciences Awards for Research & Education .. Corley Holbrook
   f. Past President's Award.....Maria to Austin

FINANCE COMMITTEE REPORT

Balance Sheet Year End - June 30, 2010

Assets

Petty Cash Fund	$ 582.16
Checking Account	58,687.12
Certificate of Deposit #3	12,821.90
Certificate of Deposit #4	16,747.95
Certificate of Deposit #6	18,804.80
Certificate of Deposit #7	16,074.13
Certificate of Deposit #8	12,529.31
Certificate of Deposit #9	15,940.66
Certificate of Deposit #10	30,000.00
Money Market Account	25,954.88
Bayer Account	12,012.30
Computer/Printer/Equipment	984.74
TOTAL ASSETS	**$221,139.95**

Liabilities

None	**0.00**
Fund Balance	**$221,139.95**

Approved APRES budget for 2010-2011. All values rounded to the nearest dollar amount

Receipts	Budget 2009-10	Actual 2009-10	Proposed 2010-11
Meeting Reg	$31,500	$45,547	$35,000
Annual Dues	27,000	33,348	30,000
Contributions – Ice Cream Social	11,000	8,000	8,000
Contribution- Dow	5,500	7,000	7,000
Contribution – Bayer Fund Replenishment	5,000	2,960	14,000
Contribution – Syngenta	5,000	5,000	5,000
Contribution- Other	0	1,800	1,800
Contribution – NC Peanut Growers, Joe Sugg Award	750	750	750
Interest	3,270	3,279	3,300
Peanut Science	16,500	17,946	20,300
Miscellaneous Income*	250	3,127	250
TOTAL	**$105,770**	**$128,804**	**$125,4000**
Difference		**$23,034**	

*Includes donations for the Peanut Science Legacy Project and sales of Advances in Peanut Science.

Expenditures	Budget 2009-10	Actual 2009-10	Proposed 2010-11
Annual Meeting	$29,000	$21,444	$33,500
Awards	4,000	3,796	4,000
CAST	700	750	750
Corp. Registration Fees	100	30	300
Legal Fees	650	861	900
Executive Officer	19,400	18,021	18021
Administrative Assistant	23,890	20,889	21864
APRES portion of FWT, FICA, Medicare, SWT	0	3096	3100
Peanut Sci – Publishing	14,500	10,040	29,700
Proceedings – publication	300	0	0
Postage	350	525	550
Travel - Officers	3,500	2,843	2,500
Office Expenses	3,500	2431.28	3,000
Travel - Bayer Program for Extension agents	5,000	3011	5,000
2010 meeting exp	0	5,000	0
Bank Charges	40	33	40
Miscel (refund/overpayment)	0	195	75
American express	40	73	100
Sterling Credit Cards	800	1861	2000
Total	**$105,770**	**$94,902**	**$125,400**
Difference		**$10,868**	

2010-11 BUDGET

Receipts	Budget 2009-10	Actual 2009-10	Proposed 2010-11
Meeting Reg	$31,500	$45,547	$35,000
Annual Dues	27,000	33,348	30,000
Contributions – Ice Cream Social	11,000	8,000	8,000
Contribution- Dow	5,500	7,000	7,000
Contribution – Bayer Fund Replenishment	5,000	2,960	14,000
Contribution – Syngenta	5,000	5,000	5,000
Contribution- Other	0	1,800	1,800
Contribution – NC Peanut Growers, Joe Sugg Award	750	750	750
Interest	3,270	3,279	3,300
Peanut Science	16,500	17,946	20,300
Miscellaneous Income*	250	3,127	250
TOTAL	**$105,770**	**$128,804**	**$125,150**
Difference		**$23,034**	

*Includes donations for the Peanut Science Legacy Project and sales of Advances in Peanut Science.

Total Receipts **$**

Expenditures	Budget 2009-10	Actual 2009-10	Proposed 2010-11
Annual Meeting	$29,000	$21,444	$33,500
Awards	4,000	3,796	4,000
CAST	700	750	750
Corp. Registration Fees	100	30	300
Legal Fees	650	861	900
Executive Officer	19,400	18,021	18021
Administrative Assistant	23,890	20,889	21864
APRES portion of FWT, FICA, Medicare, SWT	0	3096	3100
Peanut Sci – Publishing	14,500	10,040	29,700
Proceedings – publication	300	0	0
Postage	350	525	550
Travel - Officers	3,500	2,843	2,500
Office Expenses	3,500	2431.28	3,000
Travel - Bayer Program for Extension agents	5,000	3011	5,000
2010 meeting exp	0	5,000	0
Bank Charges	40	33	40
Miscel	0	195	75

(refund/overpayment)			
American express	40	73	100
Sterling Credit Cards	800	1861	2000
Total	**$105,770**	**$94,902**	**$125,400**
Difference		**$10,868**	

Total Expenditures **$**

2009-10 BALANCE SHEET

ASSETS	June 30, 2009	June 30, 2010
Petty Cash Fund	$ 682.67	$ 582.16
Checking Account	40,384.00	58,687.12
Certificate of Deposit #3	12,365.34	12,821.90
Certificate of Deposit #4	16,151.28	16,747.95
Certificate of Deposit #6	18,282.30	18,804.80
Certificate of Deposit #7	15,502.78	16,074.13
Certificate of Deposit #8	12,146.95	12,529.31
Certificate of Deposit #9	15,552.86	15,940.66
Certificate of Deposit #10	0.00	30,000.00
Money Market Account	43,132.94	25,954.88
Bayer Account	12,051.82	12,012.30
Inventory of Peanut Science and Technology Books	108.00	0.00
Inventory of Advances in Peanut Science Books	1,500.00	0.00
Computer/Printer/Equipment	1,316.39	984.74
TOTAL ASSETS	**$189,177.32**	**$221,139.95**
Liabilities		
No Liabilities	0.00	0.00
Fund Balance	$189,177.32	$221,139.95
TOTAL LIABILITIES & FUND BALANCE	**$189,177.32**	**$221,139.95**

STATEMENT OF ACTIVITIY FOR YEAR ENDING 06/30/09

RECEIPTS	**June 30, 2009**
Advances Book	$ 536.76
Ann Mtg Reg	30,896.00
Contributions	33,350.00
Dues	27,651.22
Interest	4,179.10
Misc Income (overpayment of student fees)	150.00
Peanut Science	47.00
Peanut Science Page Charges	17,720.00
PS&T Income	455.77
TOTAL RECEIPTS	**$114,985.85**

EXPENDITURES	
American Express – monthly card fee	$ 34.70
Annual Meeting	32,984.86
(Program-7,437.79/AV-5,832.70/Awards-4,292.53/ Breaks/Meals-14,222.31/Reg-57.42 /Entertainment-500.00 Supplies-equip-235.99)	
Ann Mtg Advance Hotel pymt – Florida	1,000.00
Bank Charges	32.00
CAST Membership	679.00
Corporation Registration	55.00
Legal Fees	632.00
Misc (pay VA Tech – overpayment of student fees)	150.00
Office Expenses	2,764.48
Peanut Science	14,264.75
Postage	313.22
(publications=18.13/general=295.09)	
Refund – Harrassowitz dues	210.00
Salary – Exec Off	18,021.00
(FICA=1,024.21/Medicare=239.58/FWT=2,750.00)	
Salary – Admin Assist	20,179.44
(FICA=1,355.38/Med=316.94/FWT=1,077.00/SWT=440.00)	
FICA – APRES portion	2,368.44
Medicare – APRES portion	553.92
Oklahoma Withholding	360.00
Oklahoma Withholding (Admin Asst)	- 480.00
Sterling Credit Card Fees	775.42
Travel (Exec Off, Admin Asst)	2,196.86
Travel, Bayer	5,554.94
TOTAL EXPENDITURES	**$102,650.03**

EXCESS RECEIPTS OVER EXPENDITURES		**$ 12,335.82**
Cost of Books sold	**$1,694.00**	
Write Down of Books	**5,138.00**	
Depreciation of Assets	**432.82**	
		7,264.82
2009 TOTAL NET INCREASE		**$5,071.00**

STATEMENT OF ACTIVITIY FOR YEAR ENDING 06/30/10

Receipts	
Advances Book	$ 47.00
Ann Mtg Reg	45,547.05
Contributions	25,537.00
Dow - $7,000/Syngenta - $5,000/Bayer - $2,960/ IC Social - $8,000/Joe Sugg - $750/General - $800/ 2009 - $1,000/$27 - Member donation	
Dues	33,348.00
Interest	3,278.94
Peanut Science	80.95
Peanut Science Page Charges	17,865.00
PS Income – Legacy Project	3,000.00
TOTAL RECEIPTS	**$128,703.94**
Expenditures	
Annual Meeting	$25,241.00
(Program-1,037.17/Reg-355.94/Awards-3,796.07/ Breaks/Meals-18,986.82/Entertainment-700.00/ Supplies-equip-365.00)	
Ann Mtg Advance Hotel pymt – Florida	5,000.00
Bank Charges	33.00
CAST Membership	750.00
Corporation Registration	30.00
Legal Fees	861.00
Misc. (gift for Jane Dove Long – help with 2009 Ann Mtg)	75.00
Office Expenses	2,431.28
Peanut Science	10,040.49
Postage	524.94
(Publications=40.19/General=453.76/Ann Mtg Pkt=30.99)	
Salary – Exec Off	18,021.00
(FICA=1,117.32/Medicare=261.36/FWT=3,400.00.00)	
Salary – Admin Assist	20,889.00
(FICA=1,295.16/Med=302.88/FWT=900.00/SWT=540.00)	
FICA – APRES portion	2,412.48
Medicare – APRES portion	564.24
Oklahoma Withholding	120.00
OK Sales Tax Permit	20.00
Sterling Credit Card Fees	1,934.45
(American Express - $73.16/All other cards - 1,861.29)	
Travel (Exec Off, Admin Asst)	2,842.88
Travel, Bayer	3,010.90
TOTAL EXPENDITURES	**$94,801.66**
EXCESS RECEIPTS OVER EXPENDITURES	**$33,902.28**
Write Down of Books $1,608.00	
Depreciation of Assets 331.65	
	$ 1,939.65
TOTAL NET INCREASE FY 09/10	**$31,962.63**

ADVANCES IN PEANUT SCIENCE SALES REPORT 2009-10

Fiscal Year	Books Sold
1995-96	140
1996-97	99
1997-98	66
1998-99	34
1999-00	45
2000-01	33
2001-02	27
2002-03	35
2003-04	37
2004-05	69
2005-06	8
2006-07	0
2007-08	3
2008-09	166
2009-10	3

PEANUT SCIENCE AND TECHNOLOGY
SALES REPORT 2009-10

Fiscal Year	Books Sold
1985-86	102
1986-87	77
1987-88	204
1988-89	136
1989-90	112
1990-91	70
1991-92	119
1992-93	187
1993-94	85
1994-95	91
1995-96	50
1996-97	33
1997-98	49
1998-99	37
1999-00	30
2000-01	22
2001-02	7
2002-03	26
2003-04	33
2004-05	53
2005-06	31
2006-07	0
2007-08	0
2008-09	142

PUBLIC RELATIONS COMMITTEE REPORT

The Public Relations Committee of the American Peanut Research and Education Society met via e-mail prior to the 2010 annual meeting. Members of the Public Relations committee for 2010 are: John Erickson, Ryan Lepicier (Chair), Sandy Newell, Shelly Nutt, Betsy Owens and Barry Tillman.

News releases were sent to several states from the Executive Officer of APRES to publicize this meeting. In addition to those releases, information was disseminated to research and extension offices and county agents.

The committee recommends that all members encourage scientists and county agents working in peanut to join the society. Photographic records of recognized significant achievements of members are to be made at the meeting.

Another role of the committee is to recognize members or prominent individuals in the peanut industry that have deceased with resolutions that honor their contributions. There was one individual this year in that category we felt should be remembered. A resolution for Dr. Michael Schubert is included below.

Michael Schubert, Ph.D.
Whereas, Michael Schubert, Ph.D., 63, of Slaton, Texas, formerly of Longworth and Yoakum, Texas, was born March 9, 1946, in Sweetwater, Texas, graduated from Sweetwater High School in 1964, earned his bachelor's and master's degrees from Texas Tech in agronomy and his doctorate from Texas A&M in plant physiology, and

Whereas, he was employed by the Texas A&M Experiment Station as a research scientist working primarily with peanuts in Yoakum (1976-1993) and Lubbock (1993 to 2009) , and

Whereas, he was coordinator of the Peanut Precision Agriculture group and the Western Peanut Growers Research Farm; he incorporated global positioning satellite-referenced peanut yield mapping into peanut field research in West Texas; he collaborated with peanut breeders on adaptation and performance of germplasm and advanced lines to the West Texas environment and on genetic alteration of peanut fatty acid profiles, and

Whereas, he was an elder and active member in the Westminster Presbyterian Church in Lubbock and Palo Duro Presbyterian Church., and

Whereas, he died Monday, November 9, 2009 in San Antonio, Texas, be it resolved that the American Peanut Research and Education Society remembers and honors Michael Schubert's life and contributions to the peanut industry.

Respectively submitted,
Ryan Lepicier, chair

PUBLICATIONS AND EDITORIAL COMMITTEE REPORT

The Publication and Editorial committee met Tuesday afternoon in Clearwater, FL. Members present were Chris Butts, Jason Woodward, Naveen Puppala, and Tim Brenneman. Chris Butts presented the Peanut Science Editors report, including the budget which was accepted by the committee (see attached). The highlights of the year were a successful transition to electronic publishing, which has gone very smoothly, and completion of the scanning and on line publishing of the legacy issues of Peanut Science. All current and previous issues of the journal are now available and searchable in electronic format. This is a major achievement and will help insure that this wealth of information will be readily available to future generations.

One pending item not addressed by the committee this year was whether to accept "Notes" or "Short communications" in Peanut Science, and if so what the guidelines should be for those. A set of guidelines for such abbreviated publications used by other journals has been collected, and this can be addressed further by the current committee.

Respectfully submitted,
Tim Brenneman

PEANUT SCIENCE EDITOR'S REPORT

The two primary goals set forth for **Peanut Science** by the editor and the Publications and Editorial Committee were achieved during the 2009-2010 fiscal year. Article submission and tracking went online (www.editorialmanager.com/peanutscience) in mid-January 2010. Through June 30, 2010, a total of eight manuscripts have been submitted through the interactive website. Table 1 below shows an overview of the manuscript status since January 2009.

Table 1. Report of status of manuscripts submitted to Peanut Science between 01 January 2009 and 30 June 2010.

Manuscript Action	01 Jan 2009 to 30 June 2009	01 Jul 2009 to 30 Dec 2009	01 Jan 2010 to 30 June 2010
Submitted	16	12	8
Accepted	12	3	0
Rejected	2	3	1
In Review	2	5	7
Awaiting Decision	0	1	0

Secondly, associate editors and reviewers performed reasonably well with an average of approximately 90 days to return the first manuscript review to the authors (Table 2). Opportunity to improve exists and should be improved to achieve the goal of 60 d required for the first review to be returned to the corresponding author.

Table 2. Performance of Peanut Science Associate Editors and Reviewers

Manuscript Submission Date	01 Jan 2009 to 30 June 2009	01 Jul 2009 to 30 Dec 2009	01 Jan 2010 to 30 June 2010
	----------Time Required (d) ----------		
First Review	85	93	92
Decision	159	163	92
Publish	318	---	---

The second major goal of the journal was to get some of the legacy issues (prior to Vol 32) scanned and published on line. The Editor and APRES Executive Director submitted proposals to approximately 13 peanut organizations to provide $600 each to assist in funding the legacy project. To date, the American Peanut Shellers Association, Georgia Peanut Commission, National Peanut Buying Points Association, National Peanut Board, Peanut Foundation, and the South Carolina Peanut Producers Board have provided or pledged to provide the $600 requested. Every article published in Peanut Science beginning with Volume 1, originally published in 1974, has been scanned and available on-line in pdf format for viewing and download (www.PeanutScience.com). Total cost for the legacy project was $12,817.44

The following Peanut Science associate editors' terms have been completed: Dr. John Damicone (Plant Pathology, 3 years), Dr. Barry Tillman (Breeding/Genetics, 6 years), Dr. Maria Gallo (Biotechnology/Genetics, 6 years). The following persons have agreed to serve three-year terms as associate editors ending in 2013: Dr. Diane Rowland (Plant Physiology), Dr. Ames Herbert (Entomology), Dr. Naveen Puppala (Breeding/Genetics), Dr. Jason Woodward (Plant Pathology), and Tom Stalker (Biotechnology/Genetics). Drs. Rowland and Herbert are volunteering for a second three year term while Drs. Puppala, Woodward, and Tom Stalker are being submitted for endorsement by the Publications and Editorial Committee and approval by the APRES Board of

Directors.

The Peanut Science Financial Report and Budget is shown in Table 3.

Table 3. Budget for Peanut Science FY 2010 and 2011.

	2009 2010 (Actual)	2010 - 2011 (Proposed)
Income		
Page Charges	$ 17,865.00	$ 18,000.00
Pay per View	$ 80.95	$ 100.00
Donations - Legacy Project	$ 3,000.00	$ 0.00
Institutional Subscriptions	$ 2,200.00	$ 2,200.00
Total Income	**$ 23,145.95**	**$ 20,300.00**
Expenses		
Manuscript Submission	$ 740.00	$ 900.00
Journal Publication (2 iss.)*	$ 13,797.49	$ 14,350.00
CrossRef	$ 303.00	$ 300.00
Editor Travel Expenses		$ 800.00
Legacy Project (invoiced in 2010-11)		$ 12,850.00
Total Expenses	**$ 14,840.49**	**$ 29,200.00**
Net Operating	**$ 8305.46**	**($ 8,900.00)**

*Volume 37(1) published 01 June 2010 invoiced in FY2011 estimated @ $4,800 ± 200 but included in FY 2010 expenses

Respectfully submitted by:
Chris Butts, Peanut Science Editor

NOMINATING COMMITTEE REPORT

Nominating Committee - The Nominating Committee offered the following persons for office in the Society.

President-Elect – Todd Baughman
Board of Directors, Industry rep – Julie Marshall
Board of Directors, VC region – Tom Isleib
Board of Directors, SE region – Scott Tubbs
Board of Directors, USDA rep – Jack Davis

The Board agreed to present this list of nominees to the membership for consideration at the Business meeting.

Respectfully submitted by:
Kelly Chamberlin, chair

FELLOWS COMMITTEE REPORT

The committee received only a few nominations but was able to select Christopher Butts as a Fellow for 2010.

Respectfully submitted by:
Todd Baughman, chair

BIOGRAPHICAL SUMMARIES OF FELLOWS RECIPIENTS

Dr. Christopher L. Butts is an ARS research scientist in the field of Agricultural Engineering. His original home was Knoxville, TN. Dr. Butts earned his BS and MS degrees in Ag Engineering from Virginia Tech University and was granted the PH D from the University of Florida in 1988. Additionally, he is a licensed professional engineer. Dr. Butts has worked as an agricultural engineer for the USDA-ARS since 1985.

Dr. Butts has many notable achievements. He is widely known and respected for his work in instrumentation, controls and machine design as related to peanut drying. His developments are being used commercially. His engineering expertise also extends into the areas of irrigation systems, software development, and information technology. In addition to his work in the United States, Dr. Butts has been involved in projects in Australia, South Africa, and South America. His research has resulted in 50 journal papers, 2 book chapters and numberous miscellaneous publications.

Dr. Butts has served APRES in many capacities, with service on numerous committees, including service as a member of the Board of Directors. Of course, probably his most significant contribution is his current role as the Editor of Peanut Science. Under his leadership, the journal has regained its footing with timely publication of the last several issues. Peanut Science has completed the transition to a totally electronic publication, and most recently Dr. Butts has completed the Legacy Project in which all of the back issues of the journal were digitized and are now available online.

In recognition of his many achievements, Dr. Butts has previously received the:

Georgia Research and Education Award – Georgia Peanut Commission

Engineer of the Year Award – Georgia Section of the American Society Agricultural and Biological Engineers

A Presidential Citation – American Society Agricultural and Biological Engineers

Outstanding Service Award – APRES

Coyt T. Wilson Distinguished Service Award – APRES

Thus it is with great pleasure that we also recognize Dr. Christopher L. Butts for his scientific achievements and his service to APRES by naming him a Fellow of our Society.

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 except members of the Fellows Committee and the APRES Board of Directors. 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 and voting members of the APRES Board of Directors 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. Members of the Fellows Committee, the APRES Board of Directors, and the nominator are not eligible to write supporting letters.

Deadline. Six (6) copies of the nomination are to be received by the

chairman of the Fellows Committee by March 1 each year.

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 Fellows Committee.

Distribution of Guidelines

These guidelines and the format are to be published in the APRES PROCEEDINGS and again whenever changes are made. Nominations should be solicited by an announcement published in "APRES Peanut Research."

FORMAT for AMERICAN PEANUT RESEARCH AND EDUCATION SOCIETY FELLOW NOMINATIONS

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

DATE SUBMITTED:

NOMINEE: Name, date and place of birth, mailing address, and Telephone number.

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

BASIS OF NOMINATION: Primary area: designate Research, Extension, Service to Industry, or Administration.

Secondary areas: designate contributions in areas other than the nominee's primary area of activity.

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

I. Personal Achievements And Recognition (10 points)

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

II. Achievement in Primary (50 Points) And Secondary (10 Points) Fields of Activity

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

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

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

D. Administration or Business

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

III. Service to The Profession (30 Points)

A. Service to APRES including length, quality, and significance of service.
   1. List appointed positions.
   2. List elected positions.
   3. Briefly describe other service to the Society.

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

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

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

BAILEY AWARD COMMITTEE REPORT

The committee's business related to the 2010 Bailey Award winner was conducted by email, prior to the annual meeting. Nominations were received from all eleven eligible sessions of the 2009 annual meeting, and nominees were notified shortly after the meeting. Nine manuscripts were received and accepted for final evaluation by the committee. The winning paper is to be presented the Bailey Award at the Thursday afternoon awards ceremony.

The winning paper is from presentation titled "Control of Foliar and Soilborne Peanut Pathogens with Morning, Evening or Daytime Applications of Fungicide." by T.B. BRENNEMAN* and J. AUGUSTO, Department of Plant Pathology, The University of Georgia, Tifton, GA 31793-0748. Tim Brenneman was the presenter.

The chair would like to thank the committee for serving as reviewers and for their timely responses. Special appreciation is expressed to committee members Peggy Ozias-Akins and Kris Balkam who complete their three year terms.

2009-10 Bailey Award Committee:
Albert Culbreath, Chair (2010)
Peggy Ozias-Akins (2010)
Kris Balkcom (2010)
Emily Cantonwine (2011)
Tom Stalker (2012)
David Jordan (2012)

Respectfully Submitted by:
Albert Culbreath, Chair

GUIDELINES for AMERICAN PEANUT RESEARCH AND 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 bookends will be made to the speaker and other authors appropriately recognized.

JOE SUGG GRADUATE STUDENT AWARD REPORT

The Joe Sugg Graduate Student Award Committee met from 2:30 to 3:15 PM on Tuesday, 13 July in Salon C of the Clearwater Beach Hotel. Present were committee chair Bob Kemerait and members Tom Isleib, Pat Phipps, Jason Woodward and additional judge Roy Pittman. During the meeting the committee members reviewed the score sheets to be used during the paper competition and also reviewed the names and titles of the authors and papers to be presented. Bob Kemerait noted that prior to the 2010 APRES meeting he had e-mailed a copy of the score sheet to all students participating in the session.

The 2010 Joe Sugg Graduate Competition was held on Wednesday July 14th beginning at 1:00 PM in Salon E. Nine papers were presented; four from the University of Florida, three from North Carolina State University, one from the University of Georgia and one from Virginia Tech. First place in the Joe Sugg Graduate Student Competition was awarded to the paper titled “Preliminary results from seed production in rhizome peanut and tissue culture regeneration from the seed-derived explants” presented by O. Aina and co-authored by K.H. Quesenberry. Second place in the Joe Sugg Graduate Student Competition was awarded to the paper entitled “Cultivation duration and frequency effects on two peanut cultivars under organic management” presented by D.Q. Wann and co-authored by R.S. Tubbs and A.K. Culbreath.

Respectfully submitted by:
Robert Kemerait, chair

COYT T. WILSON DISTINGUISHED SERVICE AWARD REPORT

Coyt T Wilson Award Committee:
The committee received two nominations for the award, materials were distributed electronically to all committee members for review. Chris Butts replaced Joe Dorner as a committee member. Based on committee vote, Albert Culbreath was selected as this year's awardee.

Respectfully submitted by:
Elizabeth Grabau, chair

BIOGRAPHICAL SUMMARY OF COYT T. WILSON DISTINGUISHED SERVICE AWARD RECIPIENT

The Coyt T. Wilson Distinguished Service Award was established to recognize those persons within APRES who have provided outstanding service to the society for a long period of time, and deserve special

recognition. **Dr. Albert K. Culbreath** is the recipient of the 2010 Coyt T. Wilson Award.

Dr. Culbreath was born in Hartselle Alabama. He earned a B.S. degree (1982) in Botany, and an M.S. degree (1985) in Plant Pathology from Auburn University. He earned a Ph.D degree (1989) in Plant Pathology from North Carolina State University. In 1989 he moved to Tifton, Georgia and began his career as a Plant Pathologist on the faculty of the University of Georgia.

Dr. Albert Culbreath has been an active member of APRES since 1987. He has made presentations at each of the 23 annual meetings since 1987. He has served on many committees including serving twice on the technical committee, and twice on the local arrangement committee. He has served on all the awards committee that are associated with APRES and accepted the responsibilities of Presidency during a very challenging time for our society. The steady leadership that he provided when he served as President elect, President, and past President was crucial for maintaining APRES during that time. As President he also oversaw the transition of *Peanut Science* from a print journal to an electronic journal, and the search for a new Executive Officer.

Dr. Culbreath has also had a truly distinguished career as a plant pathologist focusing on foliar disease of peanut. His productivity is documented by his authorship on over 125 refereed journal articles and book chapters and 180 abstracts and proceedings. He and his students have conducted several cutting edge studies on leaf spot control, and he is the leading World authority on tomato spotted wilt virus (TSWV) in peanut. Research conducted by Dr. Culbreath and his cooperators laid the foundation for the development of the TSWV risk index. Use of this index has saved peanut growers throughout the Southeast millions of dollars of losses to tomato spotted wilt. He was also a co-developer for three cultivars with virus resistance.

Dr. Culbreath's international stature in the area of TSWV of peanut is clearly evidenced by the invitations that he has received to write and speak about his results. Recognition of his expertise includes his being invited to write the 2003 Annual Review of Phytopathology article on Epidemiology and Management of Tomato Spotted Wilt of Peanut, and invited to give a plenary presentation at the Eighth International Symposium on Thysanoptera and Tospoviruses in 2005. He has received several significant awards, including the Dow AgroSciences Award for Excellence in Research and Wallace K. Bailey Award (twice) from APRES, the American Peanut Council Research and Education Award, and the American Phytopathological Society's Novartis Award for Outstanding Contributions to Agriculture. In 2009, he was inducted as a

Fellow of APRES.

Dr. Culbreath has served on 22 graduate student committees including being major professor for five M.S. students and three Ph.D. students.

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

GUIDELINES for AMERICAN PEANUT RESEARCH AND EDUCATION SOCIETY 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 Nominee

I. Personal Achievements and Recognition:
   A. Education and degrees received: Give field, date and institution.
   B. Membership in professional organizations
   C. Honors and awards
   D. Employment: Give years, locations and organizations

II. Service to the Society:
   A. Number of years membership in APRES
   B. Number of APRES annual meetings attended
   C. List all appointed or elected positions held
   D. Basis for nomination
   E. Significance of service including changes which took place in the Society as a result of this work and date it occurred.

III. 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.

IV. 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.

DOW AGROSCIENCES AWARDS COMMITTEE REPORT

The Dow AgroSciences Award Committee did not meet at the APRES meetings in 2010 because committee business was taken care of prior to the APRES annual meeting. In 2010 the committee received two nominations for the Dow AgroSciences Award for Excellence in Research and two nominations for the Award for Excellence in Education. Nomination packets were distributed to committee members electronically, and the vote on the nominations was conducted electronically. Dr. David Jordan is this year's recipient of the Dow AgroSciences Award for Excellence in Education and Dr. Peter Dotray is this year's recipient of the Dow AgroSciences Award for Excellence in Research.

Respectfully submitted by:
C. Corley Holbrook, chair

BIOGRAPHICAL SUMMARY OF DOW AGROSCIENCES AWARD FOR EXCELLENCE IN RESEARCH RECIPIENT

Dr. Peter A. Dotray has a highly productive research program on the applied aspects of managing weeds in peanut. Tremendous advances have been made in the past seven to ten years in our ability to control and manage difficult weeds in peanut. This has been due to the introduction of several highly effective herbicides that have saved Texas peanut growers literally millions of dollars each year. Dr. Dotray has worked extensively in developing these peanut herbicides for the past 15 years evaluating application methods, timings, formulations, and interaction with other pesticides for answers to the many questions posed by growers. His demonstration and delivery of new technology in coordination with county agents and people in industry have greatly improved weed management in peanut. Impacts have included: 1) rapid acceptance of new technology, 2) greater cooperation between extension, growers, industry, and government, and 3) improved profitability and competitiveness for producers. Dr. Dotray participates in developing and conducting programs for in-service training of county agents and IPM personnel in the High Plains area of Texas. Since joining the Research Center at Lubbock in 1993, Dr. Dotray has served as principal investigator for projects that have been awarded over $1.9 million from sources outside the University. His productivity is well-known and documented by the fact that he has produced 2 book chapters, 41 refereed journal articles, 149 technical publications and popular articles, 282 abstracts and proceedings, and 523 seminars and presentations.

Graduate student programs have been an integral part of the research

and extension programs under the direction of Dr. Dotray. He has served on 24 graduate student committees and has served as advisor and mentor for the graduate student weed team for the weed contest sponsored by the Southern Weed Science Society.

Dr. Dotray has also been active in various aspects of APRES; most notably, he served as chairperson for the Technical Program for the 2004 APRES meeting held in San Antonio. This meeting was a hugh success with new technologies being incorporated into the meeting sessions and Dr. Dotray was instrumental in this undertaking.

His research on peanut has helped shape peanut production weed control methods in the High Plains area of Texas and has laid the foundation for future improvements. Dr. Dotray has built an impressive program over the past 15 years based on his hard work, honesty and integrity and is most deserving of this prestigious award.

BIOGRAPHICAL SUMMARY OF DOW AGROSCIENCES AWARD FOR EXCELLENCE IN EDUCATION RECIPIENT

Dr. David L. Jordan has been highly innovative in his extension and research and has published 156 peer-reviewed journal articles and chapters, 95 extension publications, 39 bulletins, and has more than 100 popular articles in the press. In addition to writing results and extension information, he has conducted 49 field tours and led 30 training sessions for county agents. To support this work, Dr. Jordan has received nearly $3.5 million in grant support. His investigations related to peanut production methodologies include economical use of herbicides, rotation systems, planting dates, and other cultivation variables for economical and sustainable peanut production. He has worked with both traditional and non-traditional systems to grow peanuts and cooperates with numerous faculty at NC State University and other states. He is a dedicated extension specialist who always puts his clientele at the forefront and has played a critical role in sustaining economical peanut production in the NC-VC region. His international work in West Africa, Malawi, Mozambique, the Caribbean, and Latin America has extended knowledge of peanut production regions where increased food production is critical for their survival. David has developed, and now leads, one of the best extension programs at NC State University.

To aid the extension program, Dr. Jordan also has developed an outstanding research program to answer production oriented questions related to tillage, varieties, irrigation, digging and harvesting, and integrated pest management. David's research has solved many producer-related problems, for example, research with plant growth

regulators have led to higher peanut yields; research with compatibility of agrichemicals have led to practical recommendations to growers for application types and rates; seeding rate and row width studies indicated that narrower rows reduce tomato spotted wilt virus; and digging and harvesting experiments have led to a new peanut profile chart specifically for large-seeded Virginia market types.

In the classroom, Dr. Jordan has taught both undergraduate and graduate level classes in peanut production, weed management, and cropping systems. He is a gifted instructor who is able to motivate students to learn. David has served as advisor to numerous graduate students who are now making an impact in the agriculture sector. In the American Peanut Research and Education Association, he served on the Board of Directors and has been an active leader on committees. He has attended all of the annual meetings, consistently makes high-quality presentations, and his leadership has been critical for organizing two annual meetings. He has received several national and state awards, and Dr. Jordan was nominated for the Bailey Award three times, which attests to his high-quality research and extension programs. Dr. Jordan served as associate editor of *Peanut Science* for six years and he did an outstanding job as a reviewer, not only reading for grammatical errors, but also assuring that the experimental designs and methodologies were performed correctly. Dr. Jordan is an effective leader in the agricultural community and he works very closely with commodity leaders.

Based on his accomplishments in extension, education, research, impacts on the peanut industry, and service to the American Peanut Research and Education Society, Dr. David Jordan is highly deserving of receiving the 2010 Dow AgroSciences Award for Excellence in Education.

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.

NOMINATION FORM FOR DOW AGROSCIENCES AWARDS

General Instructions: Listed below is the information to be included in the nomination for individuals or teams for the Dow AgroSciences Award. Ensure that all information is included. Complete Section VI, Professional Achievements, on the back of this form. Attach additional sheets as required.

****

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

___ Dow AgroSciences Award for Excellence in Education

___ Dow AgroSciences Award for Excellence in Research

****

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

DATE:

Nominee(s): _____

Address _____

Title _____ Tel No. _____

II. Nominator:

Name _____ Signature_____

Address _____

Title _____Tel No._____

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

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

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

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

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

PEANUT QUALITY COMMITTEE REPORT

1. The meeting was called to order by Chairman Victor Nwosu at 3:30 pm. Those in attendance were the following: *V. Nwosu, M. Kline, K. Moore, T. Isleib, *J. Elder, *P. Donahue, C. Holbrook, P. Harden, T. Sanders, D. Cowart, H. Valentine, L. Dean, L. Gilliam, J. Davis, E. Murphy, H. Pattee, C. Simpson, W. Branch, M. Burow, R. Wilson, D. Smyth, C. Panchapakesan.
2. Review of 2009 minutes: The membership was asked to adopt the 2009 meeting minutes. The meeting minutes were adopted.
3. Appointment of Secretary: M. Kline was appointed as secretary.
4. Seed Purity Discussion: From a manufacturers' standpoint, there is an issue of paying a premium for HOA but not getting the desired purity. The purity levels are currently at 87% but Mars will begin measuring purity and expect >90% with a target of 95%. The question was raised as to where do we put emphasis to improve purity? A good discussion ensued as to the source of contamination, methods of evaluation and whether other traits should be evaluated as well for purity. Foundation seed is considered to be a minimum of 95% purity however the assurance of purity relies on sheller's to guarantee it is checked. Darlene Cowart will coordinate a trial in which foundation seed will be tested for purity prior to field planting and rechecked before and after shelling. The emphasis of this trial will be on West Texas since the majority is high oleic, however it will also be completed on SE.
5. Essentially Derived Variety Discussion: Awareness was raised as to how essentially derived varieties may impact the peanut industry and new varieties released. Breeders are aware of the issue and have systems in place to not get into EDV issues. The question was raised if any external group has patented any genes for disease resistance? To ensure that cases can be made against these patents, presentations or reports given at annual meetings need to be well documented and published.
6. Quality traits other than HOA: Howard brought up the point that the industry has not moved forward on looking at quality traits other than high oleic via marker assisted selection. Attributes that are measurable, easy to communicate should be investigated. Examples given were: resveratrol, folate, protein quality improvements, tocopherol and polyphenol levels.
7. Meeting was adjourned at 4:30 pm.

* Denotes Committee members

Respectfully submitted by:
Victor Nwosu, chair

PROGRAM COMMITTEE REPORT

Members:
Maria Gallo, Chair
Barry Tillman (Chair, Technical Program)
Greg MacDonald (Chair, Local Arrangements)
Daniel Gorbet
David Wright
Barry Brecke
Ken Quesenberry
John Erickson
Jason Ferrell

The 2010 APRES Annual Meeting was held in Clearwater Beach Florida at the Clearwater Beach Hilton. Over 100 talks and posters were submitted and accepted for presentation. There were 334 attendees at the meeting broken down as follows: 181 registered members, 25 late registrants and 128 spouses and children.

On Tuesday July 13, 2010 at 3:30 pm, the Program Committee met and Maria Gallo and Barry Tillman were in attendance. Suggestions for improvement of the program that were discussed included changing poster presentation times to coincide with the breaks on Wednesday and to include a scale on the review sheets for speaker evaluations of the best paper presentation.

Our keynote speaker on Wednesday July 14, 2010, invited by Dr. Barry Tillman, was Dr. Karen McGinnis, Assistant Professor at Florida State University. She spoke about the epigenetic regulation of gene expression in plants.

Attendance at all sessions were excellent.

Contributors to 2010 APRES 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

Bayer CropScience – Wednesday Dinner on the Beach
Dow AgroSciences – Thursday Awards Reception
Syngenta Crop Protection – Daily Breaks

Ice Cream Social

Becker Underwood
Birdsong Peanuts
Cheminova
DuPont
EMD Crop BioScience
Farm Press Publications
Farm Progress Publications
Golden Peanut Company, LLC
Helena Chemical Company
National Peanut Buying Points
Nichino America, Inc.
Southeast AgNet
Triangle Chemical Company
United Phosphorus
Universal Blanchers
Valent USA
Albauch, Inc.
J. Leek Associates, Inc.
Amvac Chemical Company
SipcamAdvan

Product Contributors

Alabama Peanut Producers Association
Birdsong Peanuts
Florida Peanut Producers Association
Georgia Peanut Commission
Kraft Foods
Lance
North Carolina Peanut Growers
Oklahoma Peanut Commission
Texas Peanut Producers Board
Virginia Peanut Growers Association
National Peanut Board

General Contributors

Romer Labs
Severn Peanut Company
National Peanut Board

42nd ANNUAL MEETING of the
AMERICAN PEANUT RESEARCH AND EDUCATION SOCIETY
Clearwater Beach, Florida
July 12-15, 2010

BOARD OF DIRECTORS

President ..... Barbara B. Shew
Past President ..... Kelly D. Chamberlin
President-Elect ..... Maria Gallo
Executive Officer ..... James L. Starr
State Employee Representatives:
  Virginia-Carolina ..... Jay W. Chapin
  Southeast ..... Eric P. Prostko
  Southwest ..... Jason Woodward
USDA Representative ..... W. Carroll Johnson
Industry Representatives:
  Production ..... Bob Sutter
  Shelling, Marketing, Storage ..... Emory Murphy
  Manufactured Products ..... Victor Nwosu
American Peanut Council ..... Howard Valentine
National Peanut Board ..... Michael Davis

PROGRAM COMMITTEE

Maria Gallo, Chair

Local Arrangements
Greg MacDonald, Chair
Barry Tillman
Ken Quesenberry
John Erickson
Jason Ferrell

Technical Program
Barry Tillman, Chair
Daniel Gorbet
David Wright
Barry Brecke

Spouses' Program
Jennifer Tillman

Monday, July 12

5:00-7:00 pm Peanut Genomics Initiative ..... **Executive Conference/Mandalay**

Tuesday, July 13

Committee and Other Meetings

8:00-10:00	Seed Summit	**Salon D**
10:00-Noon	Crop Germplasm Committee	**Mandalay**
Noon-6:00	APRES Registration	**Grand Ballroom Foyer**
1:30-2:30	Site Selection Committee	**Salon A**
1:30-2:30	Nominating Committee	**Salon A**
1:30-2:30	Publications and Editorials Committee	**Salon B**
1:30-2:30	Membership *Ad hoc* Committee	**Salon B**
1:30-2:30	Fellows Committee	**Salon C**
1:30-2:30	Associate Editors, *Peanut Science*	**Salon C**
2:30-3:30	Public Relations Committee	**Salon A**
2:30-3:30	Grower Advisory Committee	**Salon A**
2:30-3:30	Bailey Award Committee	**Salon B**
2:30-3:30	Dow AgroSciences Awards Committee	**Salon B**
2:30-3:30	Coyt T. Wilson Distinguished Service Award	**Salon C**
2:30-3:30	Joe Sugg Graduate Student Award Committee	**Salon C**
3:30-4:30	Program Committee (Local Arr. & Technical)	**Salon A**
3:30-4:30	Finance Committee	**Salon A**
3:30-4:30	Peanut Quality Committee	**Salon B**
3:30-4:30	By-Laws *Ad hoc* Committee	**Salon C**
3:00-6:00	Presentation Loading	**Tarpon**
7:00-9:00	**"Welcome to Florida" Ice Cream Social**	**Sandpiper/ Blue Heron Decks**

Wednesday, July 14

Morning

8:00-4:00	APRES Registration	**Grand Ballroom Foyer**
8:00-9:30	Spouses' Hospitality Room (Staffed)	**Marlin**
9:30-4:00	Spouses' Hospitality Room (Open)	**Marlin**
7:00-8:00	Poster setup	**Grand Ballroom Foyer**
8:00-9:45	General Session	**Salons E & F**
9:45-10:00	**BREAK**	**Grand Ballroom Foyer**
10:00-12:00	Breeding, Biotechnology and Genetics I	**Salon F**
10:00-11:30	Bayer Excellence in Extension	**Salon G**
10:30-Noon	Poster Session (with authors)	**Grand Ballroom Foyer**
10:45-Noon	Weed Science	**Mangrove**

Afternoon and Evening

1:00-3:15	Joe Sugg Graduate Student Competition	**Salon E**
3:15-3:30	**BREAK**	**Grand Ballroom Foyer**
3:30-5:00	Poster Session (displayed)	**Grand Ballroom Foyer**
3:45-4:45	Physiology and Seed Technology	**Salon E**
5:00-6:30	Board of Directors	**Executive Conference**
5:00-6:00	Peanut CRSP	**Mandalay**
7:00-9:00	Bayer CropScience- Cookout	**Sandpiper-Blue Heron Decks, Beach Side**

Thursday, July 15

Morning

8:00-Noon	APRES Registration	**Grand Ballroom Foyer**
8:00-9:30	Spouses' Hospitality Room (Staffed)	**Marlin**
9:30-3:00	Spouses' Hospitality Room (Open)	**Marlin**
8:00-11:00	Plant Pathology, Nematology & Entomology I&II	**Salon E**
8:00-11:45	Breeding, Biotechnology and Genetics II-IV	**Salon F**
8:00-10:30	Processing and Utilization I & II	**Salon G**
9:15-9:30	**BREAK**	**Grand Ballroom Foyer**

Afternoon and Evening

1:00-2:00	Breeding, Biotechnology and Genetics V	**Salon F**
1:00-2:15	Production Technology	**Salon G**
2:00-2:15	**BREAK**	**Grand Ballroom Foyer**
2:15-3:00	Economics	**Salon F**
4:00-5:00	APRES Business Meeting	**Salons D&E**
5:00-6:00	Dow AgroSciences Awards Reception	**Salons D&E**

Wednesday, July 14 – Morning

GENERAL SESSION

Moderator: ***Maria Gallo, APRES President Elect***
Meeting Room: ***Salons E & F***

8:00 Call to Order..... **Barbara Shew**
APRES President

8:05 Welcome to Florida!..... **Adam Basford**
National Affairs Coordinator, Ag Policy
Florida Farm Bureau

8:20 National Peanut Board Update..... **Raffaela Marie Fenn**
President and Managing Director
National Peanut Board

8:35 NPB George Washington Carver..... **Michael Davis**
Award Presentation Research Committee Chairman
National Peanut Board

8:40 Peanut Sustainability Report..... **Stewart Ramsey**
IHS Global Insights

9:00 Epigenetic Regulation of Gene Expression..... **Karen McGinnis**
In Crop Plants Assistant Professor,
Florida State University

9:40 Announcements..... **Barry L. Tillman**
Chair, Technical Program

9:45 **BREAK**

Morning

BREEDING, BIOTECHNOLOGY AND GENETICS I

Moderator: ***Dr. Peggy Ozias-Akins, University of Georgia***
Meeting Room: ***Salon F***

10:00 (1) **Assessment of Genetic Diversity Changes in U.S. Runner-type peanut cultivars Released between 1943 and 2009 Using Simple Sequence Repeat (SSR) Markers.** S.R. MILLA-LEWIS*, M.C. ZULETA, and T.G. ISLEIB, Department of Crop Science, North Carolina State University, Raleigh, NC 27695-7629.

10:15 (2) **Utilizing Real-Time PCR to Reveal *ahFAD2* Genotypes in Segregating Peanut Populations.** N.A. BARKLEY*, M.L. WANG, R.N. PITTMAN, USDA-ARS Plant Genetic Resources Conservation Unit, Griffin, GA 30223.

10:30 (3) **First Insight into Population Structure and Linkage Disequilibrium in Peanut, and Association Mapping of Drought Tolerance-Related Traits in the US Peanut Minicore Collection.** V. BELAMKAR, Department of Plant and Soil Science and Center for Biotechnology and Genomics, Texas Tech University, Lubbock, TX 79409; M. GOMEZ and J.L. AYERS, Texas AgriLife Research, Texas A&M System, Lubbock, TX 79403; P.R. PAYTON, Plant Stress Germplasm Development Unit, USDA-ARS, Lubbock, TX 79415; N. PUPPALA, Agricultural Sciences Center, New Mexico State University, Clovis, NM 88001; and M.D. BUROW*, Texas AgriLife Research, Texas A&M System, Lubbock, TX 79403 and Department of Plant and Soil Science, Texas Tech University, Lubbock, TX 79409.

10:45 (4) **Development and Characterization of Two Peanut RIL Mapping Populations.** C.Y. CHEN*, USDA-ARS National Peanut Research Laboratory, Dawson, GA 39842; B.Z. GUO, USDA-ARS Crop Protection and Management Research Unit, Tifton, GA 31793; C.C. HOLBROOK, USDA-ARS Crop Genetics and Breeding Research Unit, Tifton, GA 31793; M.L. WANG, USDA-ARS Plant Genetic Resources Conservation Unit, Griffin, GA 30223; and A.K. CULBREATH, Department of Plant Pathology, The University of Georgia, Tifton, GA 31793.

11:00 (5) **Species and Genome Relationships in *Arachis*: A Molecular Phylogeny.** S.A. FRIEND, Department of Biological Science, Virginia Tech, Blacksburg, VA, 24061-0406; D. QUANDT, Rheinische Friedrich-Wilhelms-Universität, Nees-Institut für Biodiversität der Pflanzen, Meckenheimer Allee 170, D-53115, Bonn, Germany; S.P. TALLURY* and H.T. STALKER,

Department of Crop Science, North Carolina State University, Raleigh, NC 27695-7629,and K.W. HILU, Department of Biological Science, Virginia Tech, Blacksburg, VA 24061-040.

11:15 (6) **A Novel Set of SSRs Developed from BAC-end Sequences and Its Application in Construction of Genetic Linkage Map.** G.H. HE*, Tuskegee University, Tuskegee, AL 36088; V. PENMETSA, University of California, Davis, CA 95616; M. YUAN, Shandong Peanut Research Institute, Qingdao, Shandong 266100, China; H. WANG, Shandong Peanut Research Institute, Qingdao, Shandong 266100, China; B.Z. GUO, USDA, ARS, Crop Protection and Management Unit, Tifton, GA 31793; R.K. VARSHNEY, International Crops Research Institute for the Semi-Arid Tropics, Patancheru, India. D.R. COOK; University of California, Davis, CA 95616.

11:30 (7) **Developing a High-Density Molecular Map of the A-Genome Species *A. duranensis***. E. NAGY, Y. GUO, S. KHANAL, and C. TAYLOR, Institute of Plant Breeding, Genetics, and Genomics, University of Georgia, Athens, GA 30602; S. KNAPP, Monsanto Inc., Woodland, CA 95696, P. OZIAS-AKINS, Department of Horticulture, The University of Georgia, Tifton Campus, Tifton, GA 31793-0748; H.T. STALKER* and N. NIELSEN, Department of Crop Science, North Carolina State University, Raleigh, NC 27695-7629.

11:45 (8) **Construction of a Genetic Linkage Map and Identification of QTLs for Resistance to TSWV in Cultivated Peanut (*Arachis hypogaea* L.).** H. QIN* USDA-ARS, Crop Protection and Management Research Unit, Tifton, GA; Y. LI, Department of Plant Pathology, The University of Georgia, Tifton, GA; Y. GUO, Center for Applied Genetic Technologies, The University of Georgia, Athens, GA; G. HE, Center for Plant Biotechnology, Tuskegee University, Tuskegee, AL; C. CHEN, USDA-ARS, National Peanut Research Laboratory, Dawson, GA; A. CULBREATH, Department of Plant Pathology, the University of Georgia, Tifton, GA; S. KNAPP, Center for Applied Genetic Technologies, the University of Georgia, Athens, GA; D. COOK, Department of Plant Pathology, the University of California-Davis, CA; C.C. HOLBROOK, USDA-ARS, Crop Genetics and Breeding Research Unit, Tifton, GA; M.L. WANG, USDA-ARS, Plant Genetic Resources Conservation Unit, Griffin, GA; B.L. TILLMAN, North Florida Research and Education Center, the University of Florida, Marianna, FL; T. ISLEIB, Dept. of Crop Sci., North Carolina State University, Raleigh, NC; B. GUO, USDA-ARS, Crop Protection and Management Research Unit, Tifton, GA.

BAYER EXCELLENCE IN EXTENSION

Moderator: ***Keith Rucker, Bayer Crop Science***
Meeting Room: ***Salon G***

10:00 **(9)** **Peanut Production and Extension Programs in Northampton County North Carolina**. C. ELLISON*, D.L. JORDAN, B.B. SHEW, and R.L. BRANDENBURG, North Carolina Cooperative Extension Service, Raleigh, NC 27695.

10:15 **(10)** **Tillage Systems with Peanut in Halifax County, North Carolina: An Historical Perspective**. A. WHITEHEAD, JR.* and D.L. JORDAN, North Carolina Cooperative Extension Service, Raleigh, NC 27695.

10:30 **(11)** **Evaluation of Georgia-02C Peanut for Maximum Maturity and Potential Value Enhancement Following Significant Cold Stress**. P.M. CROSBY*, Emanuel County Extension, University of Georgia, Swainsboro, GA 30401; R. MCWILLIAMS, Burke County Extension, University of Georgia, Waynesboro, GA 30830; J.P. BEASLEY, Department of Crop and Soil Science, University of Georgia, Tifton, GA 31793; and E.J. WILLIAMS, Department of Biological & Agricultural Engineering, University of Georgia, Tifton, GA 31793, Retired.

10:45 **(12)** **Randolph County Nighttime Peanut Fungicide Study: Year Two**. V.S. HADDOCK*, Randolph County Extension, The University of Georgia, Cuthbert, GA 39840; T. BRENNEMAN, Department of Plant Pathology, The University of Georgia, Tifton, GA 31793; and J.L. RIGSBY, Randolph County Peanut Producer, Cuthbert, GA 39840.

11:00 **(13)** **Deer and Hog Mega Fence on Peanuts**. R.I. PETCHER*, Regional Extension Agent in Agronomy for Southwest Alabama, Washington Co. Extension Office, Chatom, AL. 36518; A. THORNBURG, Grower in Mobile, Al.; and S. SMITH, Extension Wildlife Specialist, Auburn University, Al 36849.

11:15 **(14)** **A Study of The Effects of Certain Fungicides & Combinations of Fungicides on the Incidence of Disease in Peanut.** P.D. WIGLEY*, Calhoun County Extension, University of Georgia, Morgan, GA 39866; and R.C. KEMERAIT, Department of Plant Pathology, University of Georgia, Tifton, GA 31793-0748.

WEED SCIENCE

Moderator: ***Dr. Barry Brecke, University of Florida***
Meeting Room: ***Mangrove***

10:45 (15) **Peanut Tolerance and Weed Control Following Fomesafen Applied at Different Rates and Timings in Texas.** P.A. DOTRAY*, Texas Tech University, Texas *Agri*Life Research, and Texas *Agri*Life Extension Service, Lubbock, TX 79409-2122; W.J. GRICHAR, Texas *Agri*Life Research, Beeville, TX 78102; and L.V. GILBERT, Texas *Agri*Life Research, Lubbock, TX 79403.

11:00 (16) **Influence of Tillage, Herbicide Programs and Cropping Systems on the Management of Bengal Dayflower.** D.E. PARTRIDGE TELENKO* and B.J. BRECKE, West Florida Research and Education Center, University of Florida, Jay, FL 32565.

11:15 (17) **Weed Management in Narrow- vs. Wide-Row Peanut**. B. BRECKE*, West Florida Research and Education Center, University of Florida, Jay, FL 32565; and D. STEPHENSON, Dean Lee Research and Extension Center, Louisiana State University, Alexandria, LA 71302.

11:30 (18) **The Art and the Science of Cultivation for Weed Control in Organic Peanut.** W.C. JOHNSON, III*, USDA-ARS, Coastal Plain Experiment Station, Tifton, GA 31793-0748.

11:45 (19) **Weed Control Programs in Peanut with Reflex, Sharpen, and Spartan**. E.P. PROSTKO* and T.L. GREY, Department of Crop & Soil Sciences, The University of Georgia, Tifton, GA 31793.

POSTER SESSIONS

Facilitator: ***Mr. Justin McKinney, University of Florida***
Meeting Room: ***Grand Ballroom Foyer***

Wednesday 10:00-5:00, Thursday 8:00-3:00.
Authors Present Wednesday from 10:30-12:00.

(20) **Yield and 100-Seed Weight of Improved Mexican Peanut Breeding Lines with Bunch and Spreading Growth Habits**. S. SANCHEZ-DOMINGUEZ*, Departamento de Fitotecnia, Universidad Autónoma Chapingo, Chapingo, México C.P. 56230; and T.G. ISLEIB, Department of Crop Science, North Carolina State University, Raleigh, NC 27695-7629.

(21) **Attempt to Remove Peanut Allergens from Peanut Extracts Using IgE-Attached Magnetic Beads**. S.-Y. CHUNG* and E.T. CHAMPAGNE, Southern Regional Research Center, USDA-ARS, New Orleans, LA 70124.

(22) **Expansion of a Direct Shoot Organogenesis System in Peanut to include U.S. Varieties**. S. BURNS* and M. GALLO, Agronomy Department, The University of Florida, Gainesville, FL 32611-0300; and B.L. TILLMAN, Agronomy Department, North Florida Research and Education Center, The University of Florida, Marianna, FL 32446-8091.

(23) **Relative Interference of Eight Palmer Amaranth Populations with Peanut and Other Crops.** A. CHANDI*, D.L. JORDAN, J.D. BURTON, A.C. YORK, and S. MILA-LEWIS, North Carolina State University, Raleigh, NC; and A.S. CULPEPPER and J. WHITAKER, University of Georgia, Tifton and Statesboro, GA.

(24) **Peanut Response to Simulated Drift Rates of Dicamba, Glufosinate, and 2,4-D.** J. JOHNSON*, D.L. JORDAN, L.R. FISHER, J. PRIEST, and P.M. EURE, North Carolina State University, Raleigh, NC.

(25) **Summary of Peanut Response to Tillage in North Carolina from 1997-2009**. D.L. JORDAN* and P.D. JOHNSON, North Carolina Cooperative Extension Service, Raleigh, NC.

(26) **Growth and Yield of Valencia, Spanish, Virginia and Runner Market Type Peanuts in Various Row Spacings.** S. MAAS and N. RAJAN, Department of Plant and Soil Science, Texas Tech University, Lubbock, TX; R. NUTI and R. SORENSEN, USDA-ARS, National Peanut Research Lab, Dawson, GA 39842; P. PAYTON, USDA-ARS, Cropping System Research Lab and N. PUPPALA*, New Mexico State University, Agricultural Science Center at Clovis, NM 88101.

(27) **Use of Aerial Remote Sensing Imagery for Estimating Peanut Ground Cover and Leaf Area Index**. N. RAJAN, and S. MAAS, Department of Plant and Soil Science, Texas Tech University, Lubbock, TX; R. NUTI, USDA-ARS, National Peanut Research Lab, Dawson, GA 39842; P. PAYTON, USDA-ARS, Cropping System Research Lab, Lubbock, TX; and N. PUPPALA*, New Mexico State University, Agricultural Science Center, Clovis, NM 88101.

(28) **Utility of Flumioxazin in Texas Peanut**. P.A. DOTRAY*, Texas Tech University, Texas *Agri*Life Research, and Texas *Agri*Life Extension Service, Lubbock, TX 79409-2122; W.J. GRICHAR, Texas *Agri*Life Research, Beeville, TX 78102; and L.V. GILBERT, Texas *Agri*Life Research, Lubbock, TX 79403.

(29) **Assessment of Oil Content and Fatty Acid Variability in Peanut Wild Relatives.** M.L. WANG, USDA-ARS, PGRCU, 1109 Experiment Street, Griffin, GA 20223; H.T. STALKER, Department of Crop Science, North Carolina State University, Raleigh, NC 27695; and R.N. PITTMAN*, USDA-ARS, PGRCU, 1109 Experiment Street, Griffin, GA 20223.

(30) **Helping Producers Adjust to Management of Large-Seeded Runner-Type Peanut Cultivars**. J.P. BEASLEY, JR*, R.S. TUBBS, G.H. HARRIS, JR., and J.E. PAULK, III, Crop and Soil Sciences Department, University of Georgia, Tifton, GA 31793; and N.B. SMITH and A.R. SMITH, Agricultural and Applied Economics Department, University of Georgia, Tifton, GA 31793.

(31) **Effect of Peanut Cultivars Selection and Soil-insecticide Treatments on Disease, Insect Pests, and Yield in Alabama**. H.L. CAMPBELL*, A.K. HAGAN, and K.L. BOWEN, Dept of Entomology and Plant Pathology, Auburn University, AL 36849; L. WELLS, Wiregrass Research and Extension Center, Headland, AL 36345; and M. PEGUES, Gulf Coast Research and Extension Center, Fairhope, AL 36532.

(32) **Electronic Ag News for Farmers, Agribusiness and Community Leaders**. W.J. ETHREDGE, JR*, Seminole County Extension, The University of Georgia, Donalsonville, GA 39845.

(33) **Effect of Storage Environment on Seed Viability of Runner Cultivars.** M.W. GOMILLION*, B.L. TILLMAN, and G. PERSON, University of Florida, Agronomy Department, NFREC, Marianna, FL 32446.

(34) **Effect of Herbicide and Fungicide Tank-mixes on Disease and Weed Control in Peanut**. W.J. GRICHAR*, Texas AgriLife Research, Beeville, TX 78102; P.A. DOTRAY, Texas AgriLife Research, Lubbock, TX 79403; A.J. JAKS, Texas AgriLife Research, Beeville, TX 78102; and J. WOODWARD, Texas AgriLife Extension Service, Lubbock, TX 78102.

(35) **Thrips Management in Peanut: Evaluation of New Insecticides and Peanut Varieties.** D.A. HERBERT, JR.*, S. MALONE, Department of Entomology, Virginia Tech Tidewater Agricultural Research and Extension Center, Suffolk, VA 23437; M. BALOTA, Department of Plant Pathology, Physiology, and Weed Science, Virginia Tech Tidewater Agricultural Research and Extension Center, Suffolk, VA 23437; R. BRANDENBURG and B. ROYALS, Department of Entomology, North Carolina State University, Raleigh, NC, 27695; V. MASCARENHAS, Syngenta Crop Protection, Inc., Nashville, NC 27856; and R. WILLIAMS, E.I. DuPont de Nemours and Company, Raleigh, NC 27613.

(36) **Development of a Low-cost and High-throughput Polyacrylamide Gel System for Peanut Genotyping with Simple Sequence Repeat (SSR) Markers**. J. FOUNTAIN, USDA-ARS, Crop Protection and Management Research Unit, Tifton, GA; H. QIN, USDA-ARS, Crop Protection and Management Research Unit, Tifton, GA and University of Georgia Department of Plant Pathology, Tifton, GA; P. DANG, and C. CHEN, USDA-ARS, National Peanut Research Laboratory, Dawson, GA; M. WANG, USDA-ARS, Plant Genetic Resources Conservation Unit, Griffin, GA; B. GUO, USDA-ARS, Crop Protection and Management Research Unit, Tifton, GA.

(37) **Application of the CSM–CROPGRO–Peanut Model in Assisting with the Performance Evaluation of Peanut Lines at the Early Stage of Yield Testing**, J. ANOTHAI*, A. PATANOTHAI, K. PANNANGPETCH, S. JOGLOY, Department of Plant Science and Agricultural Resources, Faculty of Agriculture, Khon Kaen University, Khon Kaen 40002, Thailand; K.J. BOOTE, Agronomy Department, University of Florida, Gainesville, FL 32611-0500; and G. HOOGENBOOM, Department of Biological and Agricultural Engineering, The University of Georgia Griffin, GA 30223-1797.

(38) **Variability of Total Oil Content in Peanut Across the State of Texas**. M.R. BARING*, J.N. WILSON, Soil and Crop Sciences Dept., Texas AgriLIFE Research, College Station, TX 77843-2474; C.E. SIMPSON and J. CASON, Soil and Crop Sciences Dept. Texas AgriLIFE Research, Stephenville, TX 76401-0004; M.D. BUROW and J. AYERS, Texas AgriLife REC, Lubbock, TX 79403.

(39) **Herbicide and Application Timing Influence Cutleaf Groundcherry Biomass and Seed Production**. A.J. PRICE* and C.D. MONKS, USDA-ARS National Soil Dynamics Laboratory, Auburn, AL 36832 and Agronomy and Soils Department, Auburn University, Auburn, AL 36849.

(40) **Root Distribution Patterns of Peanut Genotypes under Mid-Season Drought**. N. JONGRUNGKLANG*, B. TOOMSAN, N. VORASOOT, S. JOGLOY, A. PATANOTHAI, Department of Plant Science and Agricultural Resources, Khon Kaen University, Khon Kaen 40002, Thailand; K.J. BOOTE, Agronomy Department, University of Florida, Gainesville, FL 32611-0500; and G. HOOGENBOOM, Department of Biological and Agricultural Engineering, The University of Georgia, Griffin, GA 30223-1797.

(41) **Simple Sequence Repeat Marker Variability Among *Arachis* Species**. E. JONES*, H.T. STALKER, S. TALLURY, S. MILLA-LEWIS, and D. PETRIK, Department of Crop Science, North Carolina State University, Raleigh, NC 27695-7629; and S. KNAPP, Monsanto Inc., Woodland, CA 95696.

(42) **Use of Single Sequence Repeat (SSR) Markers for Mapping Quantitative Trait Loci (QTL) Influencing Early Maturity in Peanut (*Arachis hypogaea* L.).** F. VILLEGAS CHIRINOS*, S.R. MILLA-LEWIS, and T.G. ISLEIB, Dept. of Crop Science, North Carolina State Univ., Raleigh, NC 27695-7629; and S.J. KNAPP, Monsanto Inc., Woodland, CA 95696.

(43) **Cultivating Leaf Spot Resistant Peanuts and the Next Generation of Plant Breeders.** H.C. KENT, Specialized 4-H, Science, Engineering and Technology, University of Florida, Marianna, Florida, 32446; J. VENN*, M. GALLO, Agronomy Department, University of Florida, Gainesville, Florida 32611; and B.L. TILLMAN, NFREC, University of Florida, Marianna, FL 32446.

(44) **High Oleic Peanut Update.** D.W. GORBET, B.L. TILLMAN, and G. PERSON, University of Florida, North Florida Research and Education Center, Marianna, FL 32446.

(44a) **Identification and Characterization of Multi-gene Family Encoding Germin-like Proteins in Cultivated Peanut (*Arachis hypogaea* L.)**. X. CHEN, T. BRENNEMAN, A. CULBREATH, Department of Plant Pathology, the University of Georgia, Tifton, GA; M.L. WANG, USDA-ARS, Plant Genetic Resources Conservation Unit, Griffin, GA; C.C. HOLBROOK, USDA-ARS, Crop Genetics and Breeding Research Unit, Tifton, GA; and B.Z. GUO*, USDA-ARS, Crop Protection and Management Research Unit, Tifton, GA.

(44b) **2009 Dry Land Evaluation of Seven Peanut Varieties in Irwin County, Georgia.** P. EDWARDS*, Cooperative Extension, University of Georgia, Ocilla, GA 31774; J.P. BEASLEY, J.E. PAULK, Department of Crop and Soil Science, University of Georgia, Tifton, GA 31793; T.B. BRENNEMAN, A.K. CULBREATH, R.C. KEMERAIT, Department of Pathology, University of Georgia, Tifton, GA 31793; D.S. CARLSON, Cooperative Extension, University of Georgia, Fitzgerald, GA 31750

Afternoon

JOE SUGG GRADUATE STUDENT COMPETITION

Moderator: ***Dr. Bob Kemerait, University of Georgia***
Meeting Room: ***Salon E***

1:00 **(45)** **Evaluating Florida-07 for Leaf Spot Tolerance**. S. BURNS* and M. GALLO, Agronomy Department, The University of Florida, Gainesville, FL 32611-0300; and B. TILLMAN, Agronomy Department, North Florida Research and Education Center, The University of Florida, Marianna, FL 32446-8091.

1:15 **(46)** **Summary of Compatibility Trials With Agrochemicals Applied to Peanut**. G.B.S. CHAHAL*, D.L. JORDAN, J.D. BURTON, B.B. SHEW, R.L. BRANDENBURG, and D. DANEHOWER, North Carolina State University, Raleigh, NC 27695.

1:30 **(47)** **Influence of Sod-Based Rotation on Peanut Yield and Pest Development**. W.L. DRAKE*, D.L. JORDAN, J.L. HEITMAN, M. SCHROEDER-MORENO, Y. CARDOZA, R.L. BRANDENBURG, and B.B. SHEW, North Carolina State University, Raleigh, NC 27695; and T. CORBETT, C. BOGLE, W. YE, and D. HARDY, North Carolina Department of Agriculture and Consumer Services, Raleigh, NC.

1:45 **(48)** **Evaluation of Pesticide Efficacy in Situations where Spray Application is Delayed**. P.M. EURE*, D.L. JORDAN, G.S. CHAHAL, J.S. BACHELER, A.C. YORK, R. SEAGROVES, and J. HINTON, North Carolina State University, Raleigh, NC 27695.

2:00 **(49)** **Effect of Soil Calcium Levels on Peanut Fruit and Seed Development.** B.P. PATHAK*, M. JAIN and M. GALLO, Agronomy Department, The University of Florida, Gainesville, FL 32611-0300; B.L. TILLMAN, North Florida Education and Research Center, University of Florida, Marianna, FL 32446-7906; A.C. HARMON, Biology Department, The University of Florida, Gainesville, FL 32611-8256; M.A. GRUSAK, USDA-ARS Children's Nutrition Research Center, Houston, TX 77030-2600; and J. McKINNEY, Agronomy Department, The University of Florida, Gainesville, FL 32611-0300.

2:15 **(50)** **Cultivation Duration and Frequency Effects on Two Peanut Cultivars Under Organic Management**. D.Q. WANN* and R.S. TUBBS, Department of Crop and Soil Sciences, University of Georgia, Tifton, GA 31793; W.C. JOHNSON, III, USDA-ARS, Coastal Plain Experiment Station, Tifton, GA 31793; and A.K. CULBREATH, Department of Plant Pathology, University of Georgia, Tifton, GA 31793.

2:30 **(51)** **Enhancement of Folate in Virginia and Runner Type Peanuts Through Biofortification**. N. JUBA*, E. GRABAU, Department of Plant Pathology Physiology and Weed Science, Virginia Tech, Blacksburg, VA 24061; and K. HARICH, Department of Biochemistry, Virginia Tech, Blacksburg, VA 24061.

2:45 **(52)** **Preliminary Results from Seed Production in Rhizoma Peanut and Tissue Culture Regeneration from the Seed-derived Explants**. O. AINA*, and K.H. QUESENBERRY, Agronomy Department, The University of Florida, Gainesville, FL 32611-0300.

3:00 **(53)** **Evaluation of Genetic Variability of Seed Calcium Concentration in Peanut (*Arachis hypogaea* L.).** S. THORNTON*, M. GALLO, Agronomy Department, The University of Florida, Gainesville, FL 32611-0300; B. TILLMAN, Agronomy Department, North Florida Research and Education Center, University of Florida, Marianna FL, 32446-8091.

3:15 **BREAK**

PHYSIOLOGY AND SEED TECHNOLOGY

Moderator: ***Dr. John Erikson, University of Florida***
Meeting Room: ***Salon E***

3:45 **(54)** **Evaluation of Virginia-type Peanuts for Gas exchange and Transpiration Ratio**. M. BALOTA *, Tidewater Agricultural Research & Extension Center, Virginia Tech, Suffolk, VA 23437; and T. ISLEIB, North Carolina State University, Raleigh, NC 27695-7629.

4:00 **(55)** **Oil Content of Commercial Peanut Varieties Grown Under Reduced Irrigation and Seeding Rate in West Texas.** J.L. AYERS* and M.D. BUROW, Texas AgriLife Research, Lubbock, TX 79403, and Texas Tech University, Department of Plant and Soil Science, Lubbock, TX 79409.

4:15 **(56)** **Peanut Physiological Response to Late Leaf Spot**. J.E. ERICKSON*, M.P. SINGH, K.J. BOOTE, B.L. TILLMAN, and S. BURNS, Agronomy Department, University of Florida, Gainesville, FL 32611.

4:30 **(57)** **Simulating Weather Effects on Yield of Different Peanut Cultivars in the Georgia Variety Performance Trials with the CSM-CROPGRO-Peanut Model**. K. J. BOOTE*, Agronomy Department, University of Florida, Gainesville, FL 32611-0500; and G. HOOGENBOOM, Agricultural and Biological Engineering Department, Griffin, GA 30223-1797.

Morning

PLANT PATHOLOGY, NEMATOLOGY, AND ENTOMOLOGY I

Moderator: ***Dr. Austin Hagan, Auburn University***
Meeting Room: ***Salon E***

8:00 **(58)** **Assessment of 'Tifguard' Cultivar for Disease and Nematode Management of Peanut.** R.C. KEMERAIT*, A.K. CULBREATH, T.B. BRENNEMAN, H. SANDERS, and G. JAGDALE, Department of Plant Pathology, The University of Georgia; C.C. HOLBROOK and P. TIMPER, USDA-ARS; and R. BARENTINE and M. MAY, University of Georgia Cooperative Extension, GA.

(59) **WITHDRAWN**

8:15 **(60)** **Variation Among *Botrytis cinerea* Isolates Obtained from Peanut Fields in West Texas**. J.E. WOODWARD* and L.D. KAHLER, Texas AgriLife Extension Service, Lubbock TX 79403; J.L. STARR, M.A. GREGORY, and C.M. KENERLEY, Department of Plant Pathology and Microbiology, Texas A&M University, College Station, TX 77843.

8:30 **(61)** **Response of Nematode Resistant (Tifguard) and Susceptible (C724-19-25) Peanut to Fungicides and Fumigants in a Field with *Meloidogyne arenaria* and *Cylindrocladium parasiticum*.** T.B. BRENNEMAN*, Department of Plant Pathology, The University of Georgia, Tifton, GA 31793-0748; and P. TIMPER and C. HOLBROOK, USDA/ARS, Tifton, GA 31794.

8:45 **(62)** **Comparison of Fungicides and Fungicide Mixtures for Post-Infection Efficacy Against Early Leaf Spot**. A.K. CULBREATH*, T.B. BRENNEMAN, and R.C. KEMERAIT. Dept. of Plant Pathology, University of Georgia, Tifton, GA 31793-0748.

9:00 **(63)** **How Good is Bailey? – Exploiting Disease Resistance Through Earlier Planting and Reduced Fungicide Inputs.** J.W. CHAPIN* and J.S. THOMAS, Department of Entomology, Soils, and Plant Sciences, Clemson University, Edisto REC, 64 Research Road, Blackville, SC 29817.

9:15 **BREAK**

PLANT PATHOLOGY, NEMATOLOGY, AND ENTOMOLOGY II

Moderator: ***Dr. Tim Brenneman, University of Georgia***
Meeting Room: ***Salon E***

9:30 **(64)** **Occurrence of Sclerotinia blight on Peanut in Lee County, Texas**. H.A. MELOUK, USDA-ARS, Wheat, Peanut and other Field Crops Research Unit, Department of Entomology and Plant Pathology, Oklahoma State University, Stillwater, OK 74078; W.J. GRICHAR, Texas AgriLife Research, Beeville, TX 78102; and K.D. CHAMBERLIN, USDA-ARS, Wheat, Peanut and other Field Crops Research Unit, 1301 N. Western, Stillwater, OK 74075.

9:45 **(65)** **New Sources of CBR Resistance Among Runner-Type Peanut Cultivars**. W.D. BRANCH* and T.B. BRENNEMAN. Dept. of Crop and Soil Sciences and Dept. of Plant Pathology, respectively, University of Georgia, Coastal Plain Expt. Station, Tifton, GA 31793-0748.

10:00 **(66)** **New In-Furrow Fungicide Options Provide Control of Cylindrocladium Black Rot of Peanut in Virginia and Runner Cultivars.** P.M. PHIPPS* and D.E. PARTRIDGE TELENKO, Tidewater Agricultural Research and Extension Center, Virginia Tech, Suffolk, VA 23437; and G.H. MUSSON, Bayer CropScience, Research Triangle Park, NC 27709.

10:15 **(67)** **Multiple Disease Resistance in High O/L Peanut**. J.L. STARR*, Department of Plant Pathology and Microbiology, Texas AgriLife Research, College Station, TX 77843; M.R. BARING, Department of Soil and Crop Sciences, Texas AgriLife Research, College Station, TX 77843; and C.E. SIMPSON and J. CASON, Texas AgriLife Research, Stephenville, TX 76401.

10:30 **(68)** **Tillage, Planting Date, Cultivar, and Row Pattern impacts Diseases and Yield of Peanut**. A.K. HAGAN*, C.H. CAMPBELL, K.L. BOWEN. Auburn University, AL 36849; L. WELLS. Wiregrass Research and Extension Center, Headland, AL 36849.

BREEDING, BIOTECHNOLOGY AND GENETICS II

Moderator: ***Dr. Corley Holbrook, USDA, Tifton, GA***
Meeting Room: ***Salon F***

8:00 **(69)** **Comparison of Varietal Grade and Yield Performance in Florida (USA) versus Queensland (Australia).** G.C. WRIGHT*, Peanut Company of Australia, Kingaroy, Queensland, Australia, 4610; Y.S. CHAUHAN and D. FLEISCHFRESSER, AgriSciences Queensland, Department of Employment, Economic Development and Innovation, Kingaroy, Queensland, Australia, 4610; and B.L. TILLMAN, University of Florida, Marianna, FL 32446.

8:15 **(70)** **Characterization of Early-Maturing Peanut Breeding Lines.** M.D. BUROW* and J.L. AYERS, Texas AgriLife Research, Texas A&M System, Lubbock, TX 79403, and Texas Tech University, Department of Plant and Soil Science, Lubbock, TX, 79409; A.M. SCHUBERT, Texas AgriLife Research, Texas A&M System, Lubbock, TX 79403; C.E. SIMPSON, Texas AgriLife Research, Texas A&M System, Stephenville, TX 79403; and M.R. BARING, Texas AgriLife Research, Texas A&M System, College Station, TX 77843.

8:30 **(71)** **Genotypic Variation in the Antioxidant Activity of Peanuts**. K.-Y. PHAN-THIEN*, H.N. WONG, N.A. LEE, School of Chemical Engineering, University of New South Wales, Sydney, NSW 2052, Australia; G.C. WRIGHT, Peanut Company of Australia, Kingaroy, QLD 4610 and D. FLEISCHFRESSER, AgriSciences Queensland, Department of Employment, Economic Development and Innovation, Kingaroy, QLD 4610, Australia.

8:45 **(72)** **Genetic Gain for Pod Yield in the North Carolina State University Peanut Breeding Project.** T.G. ISLEIB*, S.C. COPELAND, and S.R. MILLA-LEWIS, Dept. of Crop Science, N.C. State Univ., Raleigh, NC 27695-7629; and M. BALOTA, Va. Polytechnic Inst. & State Univ. Tidewater Agric. Res. & Ext. Ctr., Suffolk, VA 23437.

9:00 **(73)** **Status of the Core and the Mini Core Collections for the U.S. Germplasm Collection of Peanut.** C.C. HOLBROOK*, USDA-ARS, Tifton, GA 31793; M.D. BUROW, Texas AgriLIFE Research, Lubbock, TX 79403; T.G. ISLEIB, Department of Crop Science, N.C. State University, Raleigh, NC 27695; and R.N. PITTMAN, USDA-ARS, Griffin, GA 30223.

9:15 **BREAK**

BREEDING, BIOTECHNOLOGY AND GENETICS III

Moderator: ***Dr. Tom Isleib, North Carolina State University***
Meeting Room: ***Salon F***

9:30 (74) **Determining the Oleic/linoleic acid Ratio in a Single Peanut Seed: A Comparison of Two Methods.** K.D. CHAMBERLIN* and H.A. MELOUK, USDA-ARS, Wheat, Peanut and other Field Crops Research Unit, 1301 N. Western, Stillwater, OK 74075; R. MADDEN and J. DILLWITH, Department of Entomology and Plant Pathology, Oklahoma State University, Stillwater, OK 74078; Y. BANNORE and Z. EL RASSI, Department of Entomology and Plant Pathology, Oklahoma State University, Stillwater, OK 74078; and M. PAYTON, Department of Statistics, Oklahoma State University, Stillwater, OK 74078.

9:45 (75) **Release of 'Sugg' Virginia-Type Peanut Cultivar.** S.C. COPELAND*, T.G. ISLEIB, and S.R. MILLA-LEWIS, Dept. of Crop Science, N.C. State Univ., Raleigh, NC 27695-7629; B.B. SHEW and J.E. HOLLOWELL, Dept. of Plant Pathology, N.C. State Univ., Raleigh, NC 27695-7903; H.E. PATTEE, Dept. of Biological and Agricultural Engineering, N.C. State Univ., Raleigh, NC 27695-7625; T.H. SANDERS, L.L. DEAN, and K.W. HENDRIX, USDA-ARS Market Quality and Handling Res. Unit., Raleigh, NC 27695-7624; M. BALOTA, Va. Polytech. Inst. & State Univ. Tidewater Agric. Res. & Ext. Ctr., Suffolk, VA 23437; and J.W. CHAPIN, Clemson Univ. Edisto Agric. Res. & Educ. Ctr., Blackville, SC 29817.

10:00 (76) **Characterization of a TILLING Resource for Peanut Mutants**. J.E. KNOLL, M.L. RAMOS, Y. ZENG, Y. CHU, and P. OZIAS-AKINS*, Department of Horticulture and NESPAL, The University of Georgia Tifton Campus, Tifton, GA 31793-0748; and C.C. HOLBROOK, USDA-ARS, Coastal Plain Experiment Station, Tifton, GA 31793.

10:15 (77) **Studying Nodulation Signaling using Non-nodulating Peanut Lines: Determining if the Constraint in Peanut Nodule Formation is Due to a Local or Systemic Signal.** Y. LOPEZ*, M. GALLO, Agronomy Department, The University of Florida, Gainesville, FL 32611-0300; B. TILLMAN, North Florida Education and Research Center, University of Florida, Marianna, FL 32446-7906; and D.H. POWELL, Department of Chemistry, University of Florida, Gainesville, FL 32611.

10:30 BREAK

BREEDING, BIOTECHNOLOGY AND GENETICS IV

Moderator: ***Dr. Kelly Chamberlin, USDA, Stillwater, Oklahoma***
Meeting Room: ***Salon F***

10:45 (78) **Systematic Identification of 2S, 7S and 11S Seed Storage Proteins of Cultivated Peanut**. R. CALBRIX*, H.T. STALKER and N. NIELSEN, Department of Crop Science, North Carolina State University, Raleigh, NC 27695-7620.

11:00 (79) **Update on the Long Term Storage of *Arachis* Seeds**. C.E. SIMPSON*, J.M. CASON, and B.D. BENNETT, Texas AgriLife Research, Stephenville, TX 76401-0004.

11:15 (80) **Screening for Drought Tolerance in Valencia Mini Core Collection**. N. PUPPALA*,New Mexico State University Agricultural Science Center, Clovis, NM 88101; P. PAYTON and K.R. KOTTAPALLI, USDA-ARS Cropping Systems Research Laboratory, Lubbock, TX 79415.

11:30 (81) **Identification of a QTL Associated with Reduced Post-Harvest Aflatoxin Accumulation in Peanut (*Arachis hypogaea* L.).** C.E. ROWE, V.J. VONTIMITTA, T.G. ISLEIB, and S.R. MILLA-LEWIS*, Department of Crop Science, North Carolina State University, Raleigh, NC 27695-7629.

11:45 – 1:00 LUNCH

Afternoon

BREEDING, BIOTECHNOLOGY AND GENETICS V

Moderator: ***Dr. Naveen Puppala, New Mexico State University***
Meeting Room: ***Salon F***

1:00 (82) **Physiological and Molecular Response to Mid- and Late-Season Water Deficit in Five Runner Peanut Genotypes.** P.M. DANG*, C.Y. CHEN, R.B. SORENSEN and M.C. LAMB, USDA-ARS, National Peanut Research Laboratory (NPRL), Dawson, GA 39842; C.C. HOLBROOK, USDA-ARS, Crop Genetics and Breeding Research, Tifton, GA 31793; and B.Z. GUO, USDA-ARS, Crop Protection and Management Research Unit, Tifton, GA31793.

1:15 (83) **Progress in Breeding Peanut for Resistance to Leaf Spot Diseases.** B.L. TILLMAN*, S. THORNTON, D.W. GORBET, NFREC, University of Florida, Marianna, FL 32446; B. MORTON, S. BURNS, and M. GALLO, Agronomy Department, University of Florida, Gainesville, FL. 32611.

1:30 **(84)** **Evaluating Peanut Seed and Leaf Proteome for Use in Drought Tolerance Screening**. R. KATAM and S.M. BASHA*, Plant Biotechnology Lab, Florida A&M University, Tallahassee, FL 32317-7900.

1:45 **(85)** **Systems Approach to Study the Response of Peanuts to Abiotic Stresses**. K.R. KOTTAPALLI *, P. PAYTON, USDA-ARS Cropping Systems Research Laboratory, Lubbock, TX 79415; N. PUPPALA , New Mexico State University Agricultural Science Center, Clovis, NM 88101; and M. BUROW, Department of Plant and Soil Science, Texas Tech University, Lubbock, TX 79409; and R. RAKWAL, National Institute of Advanced Industrial Science and Technology (AIST), Tsukuba West, 16-1 Onogawa, Tsukuba 305-8569, Ibaraki, Japan.

2:00 **BREAK**

PROCESSING AND UTILIZATION I

Moderator: ***Dr. Jack Davis, USDA, Raleigh, North Carolina***
Meeting Room: ***Salon G***

8:00 **(86)** **Peanut Roaster Temperatures Relative to Salmonella Kill**. T. SANDERS* and K. HENDRIX USDA, ARS, Market Quality and Handling Research Unit, Raleigh NC 27695.

8:15 **(87)** **An ELISA as a Quality Control Tool for Peanut Allergens in Processed Foods.** E. YUSNAWAN, V. WONG, and N.A LEE*, School of Chemical Engineering, Food Science and Technology, University of New South Wales, Sydney, NSW 2052, Australia

8:30 **(88)** **Characterization of Folates in Peanuts.** L.L. DEAN* and T.H. SANDERS, Market Quality and Handling Research Unit, USDA, ARS, SAA, Raleigh, NC 27695-7624; and M.L. WHITLEY, Department of Food, Bioprocessing, and Nutritional Sciences, North Carolina State University, Raleigh, NC 27695-7624.

8:45 **(89)** **Genetic Gain for Flavor in the North Carolina State University Peanut Breeding Project.** H.E. PATTEE, Dept. of Biological and Agricultural Engineering, N.C. State Univ., Raleigh, NC 27695-7629; T.G. ISLEIB*, S.C. COPELAND, and S.R. MILLA-LEWIS, Dept. of Crop Science, N.C. State Univ., Raleigh, NC 27695-7629.

9:00 **(90)** **Physico-chemical Properties of Peanut Pancakes Made from an Instant Mix.** VEERA C.K. YEMMIREDDY, YEN-CON HUNG*, Department of Food Science and Technology, The University of Georgia, Griffin, GA 30223.

9:15 **BREAK**

PROCESSING AND UTILIZATION II

Moderator: ***Dr. Timothy Sanders, USDA, Raleigh, North Carolina***
Meeting Room: ***Salon G***

9:30 **(91)** **Chemical and Bioactivities Characterization of Peanut Skin Phytochemicals**. J.-T. CHEN, C.-H. YU, S.-M. LIN, and R.Y.-Y. CHIOU*, Department of Food Science, National Chiayi University, Chiayi, Taiwan; and L.S. KAN, Institute of Chemistry, Academia Sinica and Department of Bioengineering, Tatung University, Taipei, Taiwan.

9:45 **(92)** **Peanut roots as a Potent source of Bioactive Compounds in Inhibition of Advanced Glycation End Products (AGEs) Formation.** S.-H. WANG, J.-C. CHANG, and R.Y.-Y. CHIOU*, Department of Food Science, National Chiayi University, Chiayi, Taiwan.

10:00 **(93)** **Sensory Quality of Peanut Products Using an E-Nose**. X. BREDZINSKI and F. PEDRETTI, Alpha M.O.S. America Inc., Hanover, MD 21076-1705; and J.A. MARSHALL*, JLA Global, Lubbock, TX 79407.

10:15 **(94)** **Quantification of Peanut and Oilseed Texture as a Function of Processing.** J.P. DAVIS*, K.M. PRICE, and L.L. DEAN, USDA ARS Market Quality and Handling Research, Raleigh NC 27695; D. SMYTH, Kraft Foods East Hanover, NJ, 07936; M.A. DRAKE, North Carolina State University, Dept. of Food, Bioprocessing & Nutrition Sciences, Raleigh NC 27695; and T.H. SANDERS, USDA ARS Market Quality and Handling Research, Raleigh NC 27695.

PRODUCTION TECHNOLOGY

Moderator: ***Dr. Wilson Faircloth, USDA, Dawson, Georgia***
Meeting Room: ***Salon G***

1:00 **(95)** **Eliminating TSW Impact on Peanut with Rotation**. D.L. WRIGHT, J.J. MAROIS, and G. ANGUELOV*, NFREC, University of Florida, Quincy, FL 32351.

1:15 **(96)** **Evaluating Inoculation of Two Peanut Cultivars after Long-Term Continuous Corn Production**. R.S. TUBBS*, G.H. HARRIS, and J.P. BEASLEY, JR., Department of Crop and Soil Sciences, University of Georgia, Tifton, GA 31793-0748.

1:30 **(97)** **Peanut Peg Strength and Post Harvest Pod Scavenging for Full Phenotypic Yield over Digging Date and Variety**. R.C. NUTI, USDA-ARS National Peanut Research Laboratory, Dawson, GA 39842; C.C. HOLBROOK, USDA-ARS Crop Genetics and Breeding Research, Tifton, GA 31793; and A. CULBREATH, Department of Plant Pathology, University of Georgia, Tifton, GA 31794.

1:45 **(98)** **Conservation Tillage as a Solution to Drought in Both the Southeastern and Western Peanut Growing Regions.** W.H. FAIRCLOTH*, USDA-ARS, National Peanut Research Laboratory, Dawson, GA 39842; D.L. ROWLAND, Texas A&M University, Uvalde, TX 78801; and P.P. PAYTON, USDA-ARS, Plant Stress and Germplasm Development Unit, Lubbock, TX 79415.

2:00 **(99)** **Evaluating the Potential of Variable Rate Fungicide Application to control Sclerotinia blight**. C.B. GODSEY*, Plant and Soil Sciences, Oklahoma State University, Stillwater, OK 74078; J.P. DAMICONE, Entomology and Plant Pathology, Oklahoma State University, Stillwater, OK 74078; and R.K. TAYLOR, Biosystems and Ag Engineering, Oklahoma State University, Stillwater, OK 74078.

ECONOMICS

Moderator: ***Dr. Nathan Smith, University of Georgia***
Meeting Room: ***Salon F***

2:15 **(100)** **Investment Analysis of Conventional vs Conservation Tillage Equipment for Peanut**. A.R. SMITH* and N.B. SMITH, Department of Agricultural and Applied Economics, The University of Georgia, Tifton, GA 31793-1209.

2:30 **(101)** **Potential Economic Impact of the Conservation Stewardship Program on U.S. Peanut Farms**. A. McCORVEY* and S.M. FLETCHER, National Center for Peanut Competitiveness, Agriculture and Applied Economics Department, The University of Georgia, Griffin, GA 30223-1797.

2:45 **(102)** **Economic Viability of U.S. Peanut Farms: 2010-2015**. S.M. FLETCHER* and A. McCORVEY, National Center for Peanut Competitiveness, Agriculture and Applied Economics Department, The University of Georgia, Griffin, GA 30223-1797.

SITE SELECTION COMMITTEE REPORT

Members: Barry Tillman, Chair, Jack Davis, Ames Herbert, Jay Chapin, John Beasley, Peter Dotray, Jason Woodward, Peggy Ozias-Akins and Maria Gallo

The 2012 APRES Annual Meeting will be held in Raleigh, NC on July 10-12, 2012 (week of July 9-13).

The Site Selection Committee met by email and phone conference (Tillman, and V-C group of Herbert, Chapin and Davis) to discuss a site for the 2012 APRES Meeting in the Virginia- Carolina Region. Based on a list provided by Helms- Briscoe and previous experience, the V-C group recommended returning to the Down Town Marriott Raleigh City Center in Raleigh, NC for the 2012 Meeting. Reasons included a good experience in 2009 and the fact that NC State has a much larger group of people to plan and organize the meeting than in South Carolina and Virginia.

During the Site Selection Meeting in Clearwater, Dr. Starr pointed out that the Marriott contract requires upfront payment of $6250 for meeting space which may be undesirable to APRES. We contacted Helms Briscoe and asked them to call the Sheraton in Downtown Raleigh (a short distance from the Marriott). The Sheraton offered a lower room rate ($135 vs. $149) than the Marriott and no fees for meeting space if we meet 350 room nights (versus 325 for the Marriott). The Marriott countered with the following through our Helms Briscoe representative Colette Moore: “If you are able to change your general session set-up to theater style (no tables), your total meeting room rental can be reduced to $5750 (from $6250). If you can change both your General Session space and all of your break-out rooms to theater style, then the meeting room rental can be reduced to $4250. This new offer requires that the contract still be signed by July 21.” Ms. Moore also investigated the Sheraton facilities and one of her associates who has stayed in both properties in the past 6 months reported that “…. she likes both hotels, but notes that the Marriott is definitely the "new" hotel. Overall, she said the Sheraton sleeping room were nice and the "sweet sleeper" beds very comfortable. She said the meeting space was a bit dated but she did not think it would be viewed as negative by your attendees.”

Summary of 2012 options

The Marriott is a much newer property than the Sheraton, so the decision is based on cost versus quality (or perceived quality). The cost of the meeting will be about $5000 cheaper in the Sheraton vs. Marriott. Sheraton is offering free meeting space if the room block of 325 is met

and a 4% rebate on the master account of APRES on whatever the society spends (if we spend $20000, then APRES will get a discount of $800).

The Site Selection Committee recommends that we return to the Marriott if cost is not prohibitive. If cost is prohibitive, then the Site Selection Committee recommends the Sheraton in Downtown Raleigh.

Tentative plans for 2013

John Beasley and Peggy Ozias-Akins will discuss a site in Georgia for the 2013 Annual Meeting.

General Comments

We discussed the idea of rotating the APRES Annual Meeting among the three regions (Virginia-Carolina, Southeast, and Southwest) by selection 1 or 2 sites in each region to rotate. The committee preferred identifying 2 sites in each region and possibly identifying properties to return to every 6 years. These ideas are in their infancy and need more discussion which will occur over the next year.

Respectfully submitted by,
Barry Tillman, chair

CAST REPORT

No report given. APRES is no longer a full member of CAST with voting previliges but is now an Associate Member with an annual cost of $750.

AD-HOC COMMITTEE REPORT
2009 Survey Results

A six-question survey was prepared by the APRES Ad-Hoc Committee and submitted to the membership in November 2009. The survey was sent to 251 members and 67 responded; 27% participation.

Attached to this report are the results of the survey and all comments provided by the respondents. None of the data or individual responses was edited, other than to correct for misspelling.

Four conclusions can be reached from the survey and are the basis on which courses of action be directed:

5. 90% of respondents viewed the historic meeting time of APRES (first full week after Independence Day) to be either the best time for the annual conference or an acceptable time.

6. It was the opinion of 50% of the respondents that APRES meeting sites rotate among the three peanut producing regions and not linked to individual states in each region on a rotating basis.

7. 83% of respondents would be in favor of considering periodic combined conferences with groups of complementary mission, including the Southern Peanut Growers Conference.

8. There was no clear preference among survey respondents regarding future APRES administration, although comments were made to base related decisions on reducing costs of operation.

The APRES Ad-Hoc Committee recommends that the Board of Directors consider the results of this survey and integrate these results into future actions to ensure continued viability of APRES. Furthermore, the Ad-Hoc Committee encourages the APRES Board of Directors to consider the survey results in the global sense and not solely on the individual conclusions listed above.

Respectively Submitted;

APRES Ad-Hoc Committee
W. Carroll Johnson, III – chairman
Albert Culbreath
Barbara Shew
Tom Isleib
Howard Valentine
Kelly Chamberlin
Jim Starr – Ex Officio

Question 1: Please rate the acceptability of the following times during the calendar year for scheduling of the APRES annual meeting.				
	Best (1)	Acceptable (2)	Inconvenient (3)	Worst Time (4)
Historic Time	36	21	6	0
Early July	5	24	13	14
Later July	11	25	14	6
Late June	10	16	13	18
A different date	13	10	7	9

Respondents' suggested meeting date:

1. February
2. March
3. Feb - Mar
4. August
5. mid or late February
6. Depends on Partner
7. Early December
8. present schedule
9. Feb or March
10. November
11. Jan, Feb
12. November/December
13. February
14. February or March
15. Same

16. Late January to mid-Feb
17. SAME FORMAT AND TIME
18. December
19. January or February
20. keep as is

Comments for Question 1

1. Current Time is fine and preferred
2. Be flexible so that we can meet at the same time with other groups.
3. I have three other meetings that I regularly try to attend that take place the last two weeks of July. Traveling up to three consecutive weeks most years can not be sustained.
4. Conflicts with NACAA meeting for some County Agents
5. We have a hard time getting membership to attend when they are already present for the meeting. I do not think that scheduling the meeting at a separate time where members will have to travel again will promote attendance.
6. I believe that we should consider trying to schedule a meeting in conjunction with another scientific society(s).
7. Need to account for planting and harvesting seasons.
8. Meeting is mid season and data generated was from previous year. To maximize meeting benefit, schedule during trial work planning phase to incorporate latest information into current year testing
9. need to avoid conflict with Southern Peanut Growers Mtg. - They meet on 2nd Sunday after July 4th
10. I like the current schedule of meeting the first full week following the week of July 4. We need to consider placing a full week between the week of July 4 and the meeting when July 4 falls on a Thursday - Sunday.
11. Choose a meeting time that is easier to predict than what we

currently use. The current formula is confusing and difficult to predict. APRES needs to announce and publish future meeting dates several years in advance.

12. If moved back 1 wk would never conflict with SPG meeting in PC Beach

13. The ASABE annual meetings are usually in the last week of June. Having APRES a week later would give us a little more breathing time.

14. I always have APRES meeting on its current schedule. My research covers peanut, corn, soybean, cotton and wheat which also involve meetings. Changes may result in conflicts.

15. Week earlier could conflict with Southern Peanut Growers and the international Annual Meeting of the ASABE (Ag. Engineers)

16. Eliminate conflicts with the grower meeting held in Florida

Question 2: APRES rotates the location of annual meeting among the three peanut producing regions, with each state in a region hosting the meeting on a rotating basis. Which statement reflects your opinion of the current system of choosing a location of the annual meeting?

	Existing formula	Regional rotation, but not linked to each state in a region	Competitive proposals submitted by potential hosts	One Location
	23	33	9	1

Comments for Question 2

1. I realize states are getting short of help, but that's life. Otherwise, we will be working on hosting a meeting every 3 years instead of every 7 years. Put NM and SC in the rotation as well.

2. We need to meet at cheaper locations; USDA for one does not pay above per diem! Consider University sites.

3. I like visiting different locations, but understand the value of getting deals with a consistent location every third year, so I like both of the top two options

4. Unfortunately, not every state is equally appreciated by the membership and their families. This combined with budget constraints reduces conference attendance numbers when locations are less appealing at some states.

5. The APRES at-large should set guidelines for the local committee to function but be in control of what is expected.

6. Have the region host the meeting (i.e.) the VC (VA, NC, SC), the Southeast (GA, FL, AL, MS) the West (TX, OK, and any others)

7. committee membership should not depend on hosting state or region

8. I like the option of rotating among the three regions but having 1-2 cities in each region as rotational host cities. For example, rotate between Oklahoma City and San Antonio when we go to SW region. Each city would host every 6 years.

9. Local Arrangements needs to be chosen from the society at-large. Some states are short-handed and cannot adequately staff Local Arrangements if they are hosting the annual meeting.

10. Select top 3 most well-attended locations/venues over past few years and simply rotate among those.

11. This could allow sight selection to have more options and secure the better price.

12. Having a host state and the members from that host state is important because it keeps members working and involved.

Question 3: Should APRES consider periodic combined meetings with similar groups of common interest? (An example, but not limited to: the Southern Peanut Growers Conference)			
	Consider combined meetings as opportunities exist that are mutually beneficial.	Keep the APRES annual meeting independent of other organizations.	Not sure or no opinion
	55	6	5

Comments for Question 3

1. Southern Conservation Agricultural Systems Conference takes place in late July usually and has a similar rotation schedule - may consider combining with this group on occasion (which would help travel and attendance of both for those involved)

2. The APRES needs to expand its valuable resources and expertise of it member scientists to other peanut groups. The collaborations and info is important to strengthening the entire peanut industry, farm to fork.

3. only if mid-summer meeting time can be maintained

4. Combine with other meetings only if convenient for APRES, i.e., location of meeting. The model of the cotton group could be beneficial were we could combine the APRES and Amer. Peanut Council meetings. We need to address industry issues.

5. If it would help to reduce hotel, registration and other costs but also attract more attendees, then it could be considered

6. Only occasionally

7. The SPGC will probably always continue to meet at Panama City Beach, FL so we may want to consider meeting with SPGC once every 6 years.

8. Try this on a trial basis and see how it works.

9. In light of this question, my answers to question 1 may be different. Combining meetings and reducing travel is a definite plus

10. This would be a great idea.

11. Combining may increase the attendance or decrease necessary travel for some members, but we should not let a combined meeting reduce the scientific impact of APRES.

12. I think we should always meet with the Southern Peanut Growers and for the most part "only them".

Question 4: What options should APRES consider for Society operations?

	Continue to employ an Executive Secretary and Administrative Assistant.	Have one salaried position that combines duties of Executive Secretary and Administrative Assistant.	Create voluntary elected Secretary and/or Treasurer positions, and employ a management business for APRES operations.	None of the above.
	17	21	21	5

Comments for Question 4

1. Or go back to the volunteer system.
2. Employment of an ES and/or AA should depend on the number of members. If membership costs continue to rise; then membership will most likely drop like a rock.
3. Not really familiar enough with current needs to make a suggestion.
4. look for the most cost effective way to do a good job
5. Cutting costs seems to be what everyone is doing. However, there is a need to be sure the operation of the society is defined and strong. The business management concept is my preference with elected officials for all other positions.
6. Only if more economical than current operations. If Secretary/Treasurer elected, do not limit number of terms, he/she can serve.
7. I feel that the current Exec. Sec. salary is in excess of responsibilities expected/performed.
8. It is hard to say since the duties are not spelled out here. Could a service be used to better mange dues, meetings, etc. and reduce cost and/or better organize APRES? If so, then consider a management service.
9. What about a relationship with Crop Science like the Journal of

Env. Qual. Vadose Zone, and Plant Genome.

10. Not sure how much this would save ($), but we need to staff this appropriately. Consider increasing dues if we need to employ both or hiring 3rd party to do the work.

11. The elected officers and Board of Directors need to be more active in managing the APRES affairs, year-round, rather than solely at the annual meeting. This will be particularly important if we hire a management business.

12. Many functions do need to be brought up to current times and technologies,

13. Management services should include financial and daily business transactions, incl. collecting dues, journal subscriptions, and maintaining membership/subscriber databases. Voluntary secretary would take minutes of BOD and business meeting, etc.

14. I think this system works fine and it gives some flexibility to each to do other things because our jobs are not full time jobs. By no means should we hire another fire to do everything for us.

15. Not sure I know enough of administrative needs to comment.

Question 5: Suggestions or ideas for the Ad-Hoc Committee that will benefit APRES.

1. Small is OK. Let's break away from grower groups such as NPB. If we meet with the southern peanut federation, I will quit.

2. n/a

3. Combine the APRES meetings with other society meetings to save money and time like American Society of Agronomy, Weed Science Society, Plant Pathology Society

4. None

5. Needs to communicate with the members on all developments and needs of the society. Also, solicit input on any questions and concerns of the society as is being done via this e-mail. The e-mail route should be used more often for continued communication.

6. There needs to be more emphasis put on graduate students. Is there anyway to promote graduate education, via undergraduate competition for graduate student awards? It seems the area of genetics breeding are very well promoted, but overall production, soil fertility, pest management, and other agronomic areas are not emphasized.

7. Proposal for APRES meeting program (Tuesday Thursday concept) Monday This could be the arrival day for those serving on committees or those wanting to arrive early. It could also be used for the golf tournament in the PM or pre-arranged field or lab tours Tuesday 9:00 Noon Committee Meetings 1:00 3:00 Committee Meetings and/or other group meetings (Peanut Quality, etc) 4:00 6:30 Board of Directors 7:00 Ice Cream Social Wednesday 8:00 10:00 General Session One option is to present all awards except Graduate Student Competition (family members could attend if a member of their family is receiving an award). The awards could be saved for the latter part of the General Session, i.e., the last 30 minutes 10:30 Noon Graduate Student Competition Noon 2:00 Sponsored Lunch - APRES Business meeting (announcement of award winners to be saved for supper that evening) 2:00 5:00 Concurrent Sessions 6:30 Sponsored Awards Supper another option is to present awards at this supper instead of presenting awards in General Session. There should still be a large crowd for the awards at this time, plus it allows time for the Graduate Student Competition judges to determine the winners Thursday 8:00 Noon Concurrent Sessions Noon 1:30 Lunch on your own (opportunity for company reps to treat members to lunch in small groups). Another option is to switch this lunch with Wednesdays lunch and put the business meeting here 1:30 until Concurrent Sessions the concern here is that there will be a mass exodus after lunch this day and there will be very few participants in the Thursday afternoon sessions, which could lead to folks dreading being assigned to a Thursday afternoon session. There needs to be a hook to keep as many folks as possible around till Thursday afternoon. One would be to wait and have the Awards Supper on Thursday night. Another possible hook for Thursday afternoon would be for another General Session that focused on scientific papers that cut across all disciplines. This could be a session with topics of interest for all that 6:30 Supper could be the Awards Supper or own your own. I would vote for having the Awards Supper on Wednesday night because of the potential of a larger crowd. Friday Departure The problem with my proposed schedule above is that those of us on committees would still have to arrive on Monday. Hopefully, must folks would wait and

depart on Friday, regardless if they arrive on Monday or Tuesday. As always, there would be those that would leave on Thursday afternoon. At least in the proposal above we conduct all of the society's business between Tuesday and Thursday, which saves on paying for the Friday morning session, which is also typically poorly attended. At least the major activities (business meeting and awards) of APRES would occur on Wednesday, with the option of Thursday lunch and supper.

8. no

9. Why not biennial meetings?

10. A compressed meeting format will be used in 2010 and 2011, with the conference ending Thursday p.m. and no Friday a.m. business meeting/awards breakfast. This should be policy for all meetings. In recent years, APRES has been too drawn out with a bunch of dead time in the meeting.

11. The peanut industry is small compared with other crops, but splintered into far too many groups (APRES, South Peanut Growers, NPB, Peanut Inst, Peanut Foundation, state commissions, etc... ad nauseum). APRES should take the lead in bringing everyone to the table in a more cohesive group. Seems as though each has a separate agenda currently and does not support the activities of the others. No more $$ than we have, we need to pool our resources to have better success whether under the umbrella of APRES or some newly created organization.

12. No

13. Ad-Hoc committee needs to communicate their findings to the membership prior to the annual meeting, and their recommendation presented to the membership for discussion at annual meeting.

14. none

15. I think that the best solution is to hire a management firm to provide all business management services including membership/journal subscriptions, send invoices for page charges, receive payments for page charges, bookkeeping, and financial reports. That contractor should provide at least quarterly financial reports to the BOD, annual financial reports at the annual meeting. An Executive Secretary becomes a voluntary position and acts as a liaison between the business

management services and the society. The Executive Secretary would also be the taker/holder of BOD and business meeting minutes, and committee reports. The business management firm would also handle the business end of the annual meeting (receive money/pay bills, handle registration). Would require considerable coordination with volunteers of the Program Committee.

16. I think that APRES should be continued "as is". It is a building community of RESEARCH members that work for the good of the entire organization. You need and must have industry involved to keep applied research in the spotlight. Both your executive secretary and Administrative Assistant must be dedicated to their positions. If they are not, interest in the Association will waiver.

17. none

Question 6: Any suggestions for services that APRES might provide to be more attractive to potential members and address needs of the peanut industry nationwide.

1. Small is OK.

2. n/a

3. none

4. Would it be worthwhile to try to provide continuing education points for any meeting attendees and expand meeting attendance to more than APRES members?

5. Recruit more presentations on peanut molecular biology & physiology to get wider audience

6. Include input from the agricultural community. Also, develop an international connection. The peanut industry is not just U.S., but influenced internationally.

7. There needs to be more communication to the members from the APRES officers. Only communicating for the annual meeting falls short of helping the society to grow. Be active toward getting out information about the organization. What about a quarterly report to all the members in the form of report from each state about that years crop, pest issues, agronomic issues, research

directions, new cultivars, new genetic developments, etc.

8. I would like to propose that APRES consider setting up a program of 1/2 day during the annual meeting where the Board of Directors of each of the peanut producing states' producer organizations are invited for selected presentations from each of the sessions. For example, there could be 3-4 presentations from Breeding and Genetics, Plant Pathology, Production Technology, Ag Economics, etc. to these producers so they could get an idea of the type research presentations at our meeting. It could also be a time when each of the 9-10 producer boards come together for a single meeting in conjunction with APRES. It could also include the NPB Board as well.

9. no

10. Actively recruit guest speakers and do not rely solely on volunteered papers. This is particularly important to the 'newer' peanut producing states like MS, SC, and LA.

11. may want to consider more food safety topics and research

12. Create a tabletop display for APRES that could be exhibited at the various regional tradeshows to promote APRES - this would be especially beneficial to co agents and/or consultants.

13. APRES should further improve the interaction between the education and the industry. This would help in improved funding to support education and research.

14. The matter of services should also be discussed at the next annual meeting.

15. none

16. On-line membership applications/dues payment, on-line (limited access) member roster, timely posting of proceedings/abstracts.

17. I think the mission is to continue GOOD AND APPLIED RESEARCH and do NOT get involved in other facets of anything.

18. none

Total number of responses: 67

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

ARTICLE I. 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, this is considered to be a maximum which can be expected since membership dues are not reimbursed by many academic and government organizations.
   2. Retired, this status would require a letter from the Department Chairman the first year of eligibility to document retired status. 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. Post-Doc and Technical Support, these members would also have full membership privileges to encourage participation. Membership approval will require appropriate documentation from the Department in which the member is working.
   4. Student, it is recommended that Student members have clearly defined rights and privileges and that they be the same as for regular individual members except service on the Board of Directors be restricted to a non-voting capacity. Since these members are the primary candidates for the future membership and leadership of the Society, experience in Society service and decision making will be helpful to them and 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.

c. Student memberships: Full-time students who pay dues at a special rate as fixed by the Board of Directors. Persons presently enrolled as full-time students at any recognized college, university, or technical school are eligible for student membership. Post-doctoral students, employed persons taking refresher courses or special employee training programs are not eligible for student memberships.

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. Forty voting members shall constitute a quorum for the transaction of business at the business meeting held during the annual meeting.

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.

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 BOD resign or become unable or unavailable to complete his or her term, the president shall request that the Nominating Committee nominate a qualified member of the same category to fill the remainder of the term of that individual and submit the nominee's name to the BOD for approval.

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 six members, three representing State employees, one representing USDA, and two representing Private Business segments of the peanut industry. Appointments in all categories shall rotate among the three U.S. peanut production areas. 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 the year's annual meeting. The president then distribute those nominations to the BOD 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.

c. Publications and Editorial Committee: This committee shall consist of six members appointed to three-year terms, three representing State, one USDA, and two Private Business segments of the peanut industry with membership representing the three U.S. production areas. 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 seven members, one each representing the State, USDA, Grower, Sheller, Manufacturer, and Services segments of the peanut industry, and a member from the host state who will serve a one-year term to coincide with the term of the president-elect. The primary purpose of this person 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:

   (1) 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.

(2) 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.

(3) Necrology: Proper recognition of deceased members.

(4) 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 six members, two representing each of the three major geographic areas of U.S. peanut production with balance among State, USDA, and Private Business. 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 eight members, each serving four-year terms. New appointments shall come from the state which will host the meeting four years following the meeting at which they are appointed. The chairperson of the committee shall be from the state which will host the meeting the next year and the vice-chairperson shall be from the state which will host the meeting the second year. The vice-chairperson will automatically move up to chairperson.

The following actions are to be completed two years prior to the annual meeting for which a host city and hotel decision are being made. The Site Selection Committee members representing a host state will recommend a city, solicit hotel contract proposals, and submit proposals with their recommendations for evaluation by the entire committee. The Site Selection Committee will then recommend a host city and hotel to the BOD. The BOD and the Executive Officer will review the recommendation, make the final decision, and direct the Executive Officer to negotiate and sign the contract with the approved hotel.

i. Coyt T. Wilson Distinguished Service Award Committee: This committee shall consist of six members, with two new appointments each year, serving three-year terms. Two committee members will be selected from each of the three main U.S. peanut producing areas. 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. DIVISIONS

Section 1. A Division within the Society may be created upon recommendation of the Board of Directors, or members may petition the Board of Directors for such status, by two-thirds vote of the general membership. Likewise, in a similar manner, a Division may be dissolved.

Section 2. Divisions may establish or dissolve Subdivision upon the approval of the Board of Directors.

Section 3. Division may make By-Laws for their own government, provided they are consistent with the rules and regulations of the Society, but no dues may be assessed. Divisions and Subdivisions may elect officers (chairperson, vice-chairperson, and a secretary) and appoint committees, provided the efforts thereof do not overlap or conflict with those of the officers and committees of the main body of the Society.

ARTICLE XI. AMENDMENTS

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

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

Amended at the Annual Meeting of the
American Peanut Research and Education Society
July 14, 2006, Portsmouth, Virginia

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 (2007-2010)

	2007	2008	2009	2010
Individual, Regular	228	185	184	172
Individual, Retired	13	13	14	13
Individual, Post Doc/Tech Support	6	9	7	11
Individual, Student	20	16	28	22
Sustaining, Silver	7	8	6	9
Sustaining, Gold	1	2	3	5
Sustaining, Platinum	1		1	1
Institutional	6	21	21	19
TOTAL	280	254	264	252

*Totals given as of October 2010

NAME INDEX