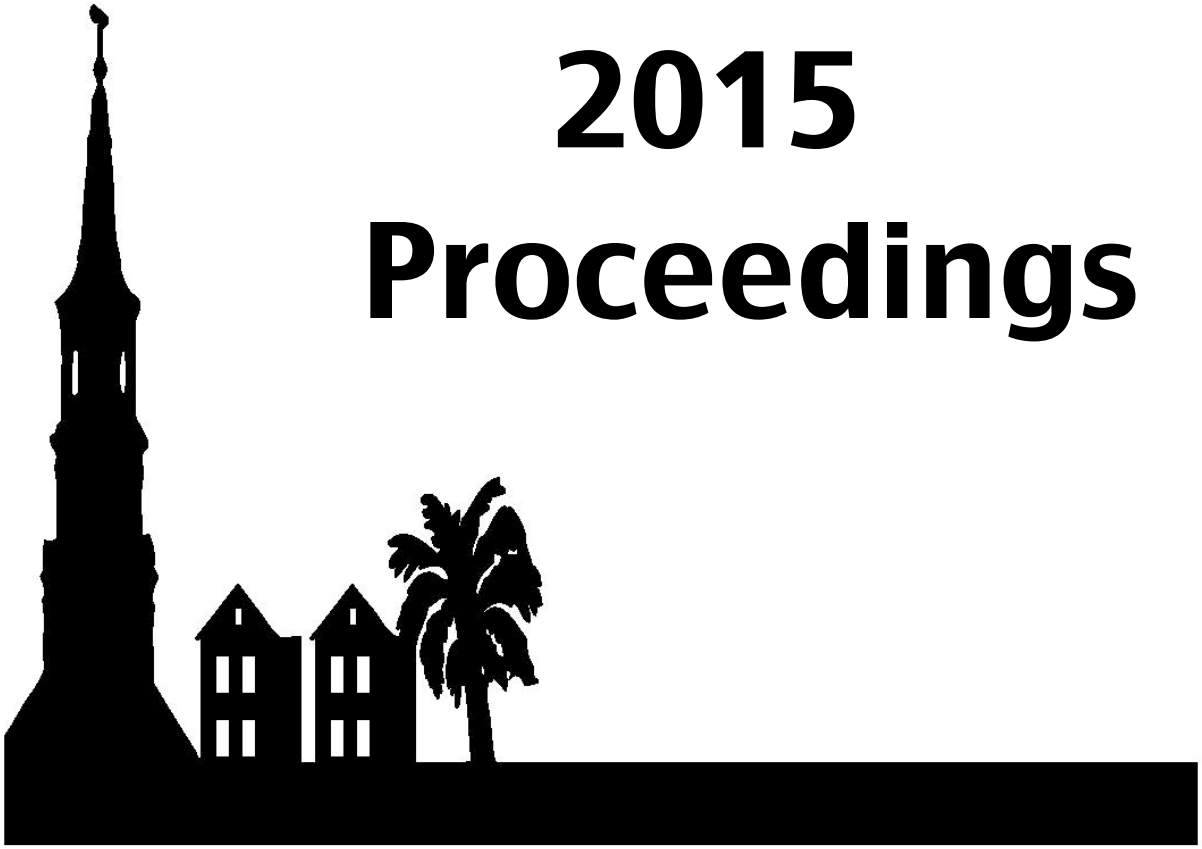
American Peanut Research & Education Society, Inc.

47th Annual Meeting
July 14–16, 2015
Francis Marion Hotel
Charleston, SC



2015 Proceedings

47th PROCEEDINGS

Of The

AMERICAN PEANUT RESEARCH AND EDUCATION SOCIETY, INC.

Meeting

July 14-16, 2015
Charleston, SC

Publication Date
November 2015

Editors: Ames Herbert and Kimberly Cutchins

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2015-16

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1970 - San Antonio, TX
1971 - Raleigh, NC
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Dr. Donald H. Smith	1988
Dr. James L. Steele	1988
Mr. Joe S. Sugg	1988
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Dr. Clyde T. Young	1986
Mr. Allen H. Allison	1985
Dr. Thurman Boswell	1985
Mr. J. W. Dickens	1985
Dr. William V. Campbell	1984
Dr. Allen J. Norden	1984
Dr. Harold Pattee	1983

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2015	J. Clevenger, Yufang Guo, and P. Ozias-Akins
2014	R. Srinivasan, A. Culbreath, R. Kemerait, and S. Tubbs
2013	A.M. Stephens and T.H. Sanders
2012	D.L. Rowland, B. Colvin. W.H. Faircloth, and J.A. Ferrell
2011	T.G. Isleib, C.E. Rowe, V.J. Vontimitta and S.R. Milla-Lewis
2010	T.B. Brenneman and J. Augusto
2009	1975S.R. Milla-Lewis and T.G. Isleib
2008	Y. Chu, L. Ramos, P. Ozias-Akins, and C.C. Holbrook
2007	D.E. Partridge, P.M. Phipps, D.L. Coker, and E.A. Grabau
2006	J.W. Chapin and J.S. Thomas
2005	J.W. Wilcut, A.J. Price, S.B. Clewis, and J.R. Cranmer
2004	R.W. Mozingo, S.F. O'Keefe, T.H. Sanders and K.W. Hendrix
2003	T.H. Sanders, K.W. Hendrix, T.D. Rausch, T.A. Katz and J.M. Drozd
2002	M. Gallo-Meagher, K. Chengalrayan, J.M. Davis and G.G. MacDonald
2001	J.W. Dorner and R.J. Cole
2000	G.T. Church, C.E. Simpson and J.L. Starr
1999	J.L. Starr, C.E. Simpson and T.A. Lee, Jr.
1998	J.W. Dorner, R.J. Cole and P.D. Blankenship
1997	H.T. Stalker, B.B. Shew, G.M. Garcia, M.K. Beute, K.R. Barker, C.C. Holbrook, J.P. Noe and G.A. Kochert
1996	J.S. Richburg and J.W. Wilcut
1995	T.B. Brenneman and A.K. Culbreath
1994	A.K. Culbreath, J.W. Todd and J.W. Demski
1993	T.B. Whitaker, F.E. Dowell, W.M. Hagler, F.G. Giesbrecht and J. Wu
1992	P.M. Phipps, D.A. Herbert, J.W. Wilcut, C.W. Swann, G.G. Gallimore and T.B. Taylor
1991	J.M. Bennett, P.J. Sexton and K.J. Boote
1990	D.L. Ketring and T.G. Wheless
1989	A.K. Culbreath and M.K. Beute
1988	J.H. Young and L.J. Rainey
1987	T.B. Brenneman, P.M. Phipps and R.J. Stipes
1986	K.V. Pixley, K.J. Boote, F.M. Shokes and D.W. Gorbet
1985	C.S. Kvien, R.J. Henning, J.E. Pallas and W.D. Branch
1984	C.S. Kvien, J.E. Pallas, D.W. Maxey and J. Evans
1983	E.J. Williams and J.S. Drexler
1982	N.A. deRivero and S.L. Poe
1981	J.S. Drexler and E.J. Williams
1980	D.A. Nickle and D.W. Hagstrum
1979	J.M. Troeger and J.L. Butler
1978	J.C. Wynne
1977	J.W. Dickens and T.B. Whitaker
1976	R.E. Pettit, F.M. Shokes and R.A. Taber

JOE SUGG GRADUATE STUDENT AWARD RECIPIENTS

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

Dr.

COYT T. WILSON DISTINGUISHED SERVICE AWARD

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

DOW AGROSCIENCES AWARD FOR EXCELLENCE IN RESEARCH

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

*1998 Changed to DowAgroSciences Award for Excellence in Research

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

1992-1996 DowElanco Award for Excellence in Extension

1997 Changed to DowElanco Award for Excellence in Education

1998 Changed to Dow AgroSciences Award for Excellence in Education

PEANUT RESEARCH AND EDUCATION AWARD RECIPIENTS

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

2015 ABSTRACTS

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Peanut Post Harvest Quality Symposium

Moderator: Jack Davis, JLA International

Thinking Beyond The Moment

Jim Leek, Chairman, JLA International

Abstract:

.... In recent years, the Peanut Industry has come a long way.

Celebrate!!!!

.... Now let's keep moving forward. We've a lot of work to do.

U.S. Shelling Industry Best Practices: Food Safety and Quality.

D. M. COWART*, Corporate Food Safety Director, Birdsong Peanuts, Suffolk, VA 23434

The peanut shelling industry is committed to food safety and quality throughout the supply chain. The interaction of regulatory agencies and industry to promote food safety and quality utilizing the latest research is critical to the overall success of the peanut shelling industry to deliver safe, nutritious products to the consumer. The peanut shelling industry looks very different today than it did even 10 years ago. The peanut industry has consolidated its overall shelling capacity to a smaller number of shellers with more capacity to shell the peanut crop. Peanut yields have seen considerable growth in the past 10 years as well, and the overall supply chain has made improvements in harvesting, drying, storing, and shelling to accommodate the increased yields. Today, there is much more emphasis on food safety, quality, and long term viability of the peanut industry. The industry has refocused its efforts on food safety risk factors to reduce the amount of incidents associated with food safety at the consumer level. Shellers today have food safety plans in place known as HACCP (Hazard Analysis and Critical Control Point) that assess the types of risks and the ability of the shelling plant to remove that risk from the supply chain. All U.S. shelling plants today have a GFSI (Global Food Safety Initiative) certification that is based on annual assessments of the food safety systems. The GFSI standard is internationally recognized by manufacturers to meet rigorous food safety guidelines. The shelling industry is committed to food safety, quality, and sustainability by working with regulatory agencies and industry associations to deliver a safe food product for the consumer.

Toll Processing & Peanut Ingredient Processing.

J. Fenn, Olam Edible Nuts, Blakely, GA 39823 and R. Moore, Olam Edible Nuts, Edenton, NC 27932.

Olam Edible Nuts is the largest custom peanut processor in the US providing both toll processing and peanut ingredient processing services to the snack food and confectionary industries. Preparing high quality toll processed raw peanuts and/or peanut ingredients is influenced by many factors before the peanuts ever arrive at our plants such as cultivar genetics, agricultural practices, shelling operations, etc, and once we initiate processing, our focus is on insuring that we are following best practices in terms of foreign material removal, drying/roasting, blanching/further processing, packaging, transportation, storage, food safety/quality systems, etc. Effectively communicating experience, expertise, and lessons learned with Breeders, Growers, Sheller's, and Manufacturers aids in creating a knowledge matrix that can improve on the industry's ability to deliver the highest quality peanuts into the consumer marketplace.

High Oleic Peanut Chemistry & Finished Product Quality

D. S. SWEIGART*, M. A. KLINE, J. A. COTTONARO, Chocolate Research,
The Hershey Company, 1025 Reese Avenue, Hershey, PA 17033

Peanuts and other nut meats limit the stability of confectionery and snack products and the shelf life can be as short as four months. Stale or rancid peanuts is the single largest category of consumer complaints for products containing whole, split or chopped peanuts. Providing consumers with consistently fresh tasting peanut products will help to drive sales growth of peanut products, which will benefit not only snack and confectionery manufacturers, but the entire peanut industry. Hershey was one of the first companies to commercialize high oleic peanuts in 1997, which resulted in a dramatic decrease in consumer complaints for stale and rancid peanuts. About four years ago, a significant deterioration in high oleic Spanish peanut quality was seen in commercial lots and in the Certified, Registered and Foundation seed. Over the past two crop years, there has been a reversal in this downward trend. The high oleic oil quality is impacted by both the single kernel high oleic purity in addition to environmental factors that affect the expression of the high oleic trait. Many peanut containing confectionery brands require a 95% minimum purity to maintain product freshness and achieve the shelf life benefits of high oleic peanuts. Bulk O/L ratio is also an important measure of high oleic oil quality and a bulk O/L of 11 or higher is required for optimal peanut oil stability. Data will be presented that differentiate between low O/Ls caused by contamination with low oleic peanuts and less than optimal O/Ls caused by environmental factors. Accurately determining the % purity of high oleic certified seed or commercial lots can be a challenge due to the time and cost of current analytical methods. The pros and cons of current methods for determining % purity will be discussed.

Roasted Peanut Flavor...limited characteristic or a broad opportunity?

T. H. Sanders, USDA ARS Market Quality and Handling Research Unit (retired), Raleigh NC 27695

Peanut flavor is composed of many sensory characteristics as described in the peanut lexicon. Factors such as cultivar (genotypic potential), production environment, crop maturity, maturity distribution in grade sized lots, windrow and artificial curing, warehouse storage and handling and roast processing have all been shown to affect peanut flavor. Inappropriate practices often lead to negative flavor characteristics and these can reduce roasted peanut flavor intensity. The above facts suggest that roasted peanut flavor is a variable characteristic with limited potential for improvement. However, the recent identification of compounds important to and apparently responsible for roasted peanut flavor suggest that identification of precursors of those compounds is highly likely. Knowledge of important roasted peanut flavor precursors may lead to phenotypic validation of higher levels of these compounds in peanuts with higher roasted peanut flavor intensity. Validation of phenotypic diversity, determined with all pertinent growth and handling factors controlled, offers the potential to relate roasted peanut flavor to specific genotypic profiles which suggests a potential broad opportunity in roasted peanut flavor.

Peanut Product Innovation and Some Surprising and Useful Characteristics

R. Dixon (Dick) Phillips (and a host of others.) Department of Food Science and Technology, University of Georgia, Griffin, GA 30113

Peanuts form the basis of many traditional foods from their origin in South America to West Africa, to the US. However, as is the case for most major foods and ingredients, innovation continues, both in discovering new and useful properties and in developing novel food products. While the industry continues to introduce new products, few groups have contributed more new knowledge to value added science and products than the Department of Food Science and Technology at the University of Georgia. These include snack foods, such as cracker-coated peanuts and second and third generation extruded snacks; nutritional intervention foods including weaning foods and ready-to-use therapeutic and supplementary foods; composite-flour baked goods; fermented products; flavored and nutrient-supplemented peanut spreads; and peanut-based beverages. More basic research has shown that partial digestion of peanut protein produces ACE-inhibitory peptides that could reduce blood pressure and that peanut allergenicity may be reduced by the extreme denaturation experienced during extrusion. Heart health promoting resveratrol in peanut may be increased by post-harvest processing, and the natural high levels of arginine in peanut protein suggest a positive impact on cardiovascular health.

Entomology, Weed Science & Mycotoxins

Moderator: Eric Prostko, University of Georgia

A Very Buggy Year: Insect Pests in Georgia Peanut in 2014.

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Many arthropods utilize peanut as a host, but only a few species are considered economically important pests in the Southeast US. Of these, most occur sporadically and require active management only on limited peanut acreage in a given year. Nevertheless, outbreaks can occur in which heavy pest pressure is widespread across many acres. Insect and mite pest pressure was abnormally high in Georgia's peanut crop in 2014. Tobacco thrips, *Frankliniella fusca*, were abundant in seedling peanut for the second year in a row, and economically damaging populations of lesser cornstalk borer, *Elasmopalpus lignosellus*, and two spotted spider mite, *Tetranychus urticae*, were prevalent in non-irrigated fields. The peanut burrower bug, *Pangaeus bilineatus*, caused significant losses in 2014 after two years of relative obscurity. Hot, dry conditions favored the development of pest populations, and the use of broad spectrum insecticides such as organophosphates and pyrethroids contributed to the overall severity of pest pressure by flaring two spotted spider mite infestations. While the increased populations of certain pests in peanut in 2014 were unavoidable, inadequate scouting probably resulted in preventable losses.

Aflatoxin Assessment in Peanut in the Ghana PMIL Value Chain: Preliminary Findings. W.O. APPAW*, W.O. ELLIS, and R. AKROMAH, Kwame Nkrumah University of Science and Technology, Kumasi, Ghana; M. MOCHIAH, I ADAMA, and M. OWUSU-AKYAW, Crops Research Institute, Council for Scientific and Industrial Research, Kumasi, Ghana; M. ABUDULAI, J. NAAB, and Y. MOHAMMED, Savannah Agricultural Research Institute, Council for Scientific and Industrial Research, Tamle and Wa, Ghana; A. BUDU, University of Legon, Ghana; K. MALLIKARJUNAN and M. BALOTA, Virginia Tech, Blacksburg, VA 24601; J. CHEN, R. PHILLIPS, and M. CHINNAN, University of Georgia, Griffin, GA 30223; B. BRAVO-URETA, University of Connecticut, Stors, CN 06269; K. BOOTE and G. MACDONALD, University of Florida, Gainesville, FL 32611; and R.L. BRANDENBURG and D.L JORDAN, North Carolina State University, Raleigh, NC 27695.

Food supply in Ghana is largely dependent on grains and legumes. Peanut (*Arachis hypogeae L.*) is considered highly nutritious and forms a significant part of the communities' diets in Ghana. Although nutritious, high levels of malnutrition and nutritional disorders have been linked to high aflatoxin exposure due to high aflatoxin infestation along the value chain especially in areas where consumption is high. This has been attributed to poor pre and postharvest handling of peanut during processing and sale due to inadequate Good Agriculture Practices by farmers and inappropriate non-conformities in observation of quality management systems such as Good Manufacturing Practices. Smallholder farmers who produce peanuts in Ghana lose out on potential industrial market opportunities as their produce remains un-purchased by processing firms due to the uncertainty regarding aflatoxin levels. An intervention at each step of the value chain is necessary to minimize aflatoxin contamination and as such the need for a multidisciplinary approach in aflatoxin mitigating along the peanut value chain. The Ghana PMIL Value Chain Project conducted comparative studies of current farmer's practices and researchers managed intervention practices on aflatoxin contamination through production, drying and storage amongst 44 farmers in 5 villages in Ghana during the 2014 planting season. Initial results from the study will be presented and discussed to determine steps in the value chain that is most vulnerable to development of aflatoxin and practice(s) that influence aflatoxin contamination in peanut. Findings from the study will help improved productivity, quality of peanut coupled with acceptable levels of aflatoxin in peanut products and improve access to markets leading to enhanced economic viability of farmers and their communities.

Evaluation of Insecticide Efficacy Against Lesser Cornstalk Borer in Peanut .

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Lesser cornstalk borer (LCB), *Elasmopalpus lignosellus* (Zeller), is one of the most economically important pests of peanut in southwest Georgia, but there are few effective control options available to producers. Granular chlorpyrifos, a broad spectrum organophosphate, is currently the only insecticide recommended for use against LCB by the University of Georgia. Nevertheless, growers commonly target LCB with foliar insecticide applications. The effectiveness of these applications has not been proven in university research trials. This study was designed to evaluate the efficacy of seven commercially available insecticides against LCB in peanut. A study was initiated in a non-irrigated, commercial peanut field with an active LCB infestation in Grady County, GA in July 2014. Treatments were arranged in a randomized complete block design with 15 treatments and four replications. Plots were six rows wide and 80 feet long. Treatments were applied on 7 and 23 July and 6 August with a CO_2 powered, research plot sprayer delivering 15 gallons of finished spray solution per acre. An evaluation was made prior the initial application and every seven days thereafter through 13 August. Plants in each plot were examined for LCB feeding damage and larval presence. Peanut yields and grades were determined for the middle two rows of each plot. All data were subjected to analysis of variance to identify significant treatment effects. Treatment means were separated using LSD where appropriate.

Determining the Best Alternatives for Controlling Thrips in Peanut.

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Tobacco thrips, *Frankliniella fusca*, is a predominant insect pest of peanut throughout much of the Southeastern US. Without protection from injury with insecticides, crop losses can be significant, exceeding 25%. Current control options include insecticides in the organophosphate and neonicotinoid classes. Recent research efforts have determined that *F. fusca* populations have developed varying levels of resistance to neonicotinoid insecticides across the region. Although local thrips populations did not test positive for resistance, 2014 field trials in Virginia using both virginia-type and runner-type peanut varieties showed that the neonicotinoid seed treatment, thiamethoxam, did not perform well with higher plant injury and lower yields compared with other insecticide treatments. Over three field trials in Virginia, the best control and yields were achieved with insecticide combinations that included the thiamethoxam seed treatment in addition to applications of either imidacloprid delivered into the seed furrow at planting (IF), the organophosphate, phorate (IF), or postemergence over the top (POT) applications of the organophosphate, acephate. Eight field trials in North Carolina in 2012, 2013 and 2014 showed that treatments with imidacloprid (IF), and imidacloprid (IF) plus acephate (POT) had the least injury from thrips and the highest yields. Ten trials during the same time period showed that imidacloprid (IF) tank mixed with Optimize Lift resulted in the highest yields compared with either product applied alone. An insecticide in the anthranilic diamide class, cyazypyr, will be labeled for use in peanuts in 2015. Field trials in Virginia showed when applied either IF or POT it was effective in reducing thrips injury to plants and resulted in high yields compared with other insecticides.

Insights on Macro- and Micro-level Interactions between Thrips and Tomato Spotted Wilt Virus.

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Tomato spotted wilt virus (TSWV) is a RNA virus (Family *Bunyaviridae*; Genus *Tospovirus)* that affects peanut production. Thrips vectors transmit TSWV in a persistent and propagative manner. A number of studies have evaluated the effects of TSWV on thrips. Evidences exist for both positive and negative effects on thrips fitness following TSWV infection. A majority of such studies were conducted using Western flower thrips (*Frankliniella occidentalis* Pergande). Our research using tobacco thrips (*Frankliniella fusca* Hinds) also provides evidence for such interactions. However, molecular bases for such interactions have not been elucidated or understood. We attempted to characterize the transcriptional changes in thrips following TSWV infection. First, transcriptomes of TSWV-infected and non-infected *F. fusca* were developed using Illumina paired-end sequencing. Then, unique transcripts and differentially expressed transcripts were functionally annotated. Differential expression analyses provided evidence for upregulation of transcripts associated with virus-vector interactions such as virus entry, virus replication, and subsequent immune responses. Also, upregulation and downregulation of certain transcripts associated with biological and developmental processes in TSWV-infected adults provided molecular evidence for positive and negative fitness effects in thrips observed earlier through macro-level or organismal-level studies. Consequently, this study enhances our understanding of thrips and TSWV interactions, and it lays a foundation for evaluating the feasibility of non-traditional pest management strategies.

Peanut Response to 3-Way Tank-Mixtures of Cadre, Cobra, Ultra Blazer, 2,4-DB, Dual Magnum, and Warrant. E.P. PROSTKO*, O.W. CARTER, Department of Crop and Soil Sciences, University of Georgia, Tifton, GA 31794.

Many peanut growers prefer to use tank-mixtures that contain multiple pesticides with the goal of reducing input costs. However, the multitude of possible tank-mixtures has not been adequately tested for crop response and efficacy. Therefore, research was conducted in Georgia during in 2014 to assess the impact of adding 2,4-DB to currently recommended postemergence tank-mixtures of Cadre (imazapic) + Dual Magnum (*s*-metolachlor) or Warrant (acetochlor) and Cobra (lactofen) + Dual Magnum or Warrant, Replicated, small-plot, weed-free field trials were established in Tifton and Attapulgus to evaluate potential peanut yield losses associated with these tank-mixtures. At both locations, plots were arranged in a factorial design with 2 applications timings (24-29 DAP and 44 DAP) and 5 herbicide treatments (NTC, Cadre 2AS @ 4 oz/A + Dual Magnum 7.62EC @ 21 oz/A + 2,4-DB 1.75SL @ 18 oz/A, Cadre 2AS @ 4 oz/A + Warrant 3ME @ 48 oz/A + 2,4-DB 1.75SL @ 18 oz/A + NIS @ 0.25% v/v, Cobra 2EC @ 12.5 oz/A + Dual Magnum 7.62EC @ 21 oz/A + 2,4-DB 1.75SL @ 18 oz/A, and Cobra 2EC @ 12.5 oz/A + Warrant 3ME @ 48 oz/A + 2,4-DB 1.75SL @ 18 oz/A + NIS @ 0.25% v/v. No interaction between timing and treatment was observed. Neither timing nor herbicide treatment had a significant effect on peanut yield ($P > 0.15$). Generally, Dual tank-mixtures were slightly more injurious (cosmetic) than Warrant tank-mixtures. In an additional replicated, small-plot weed control trial conducted in Tifton, herbicide programs that included 3-way tank-mixtures of Cobra 2EC @ 12.5 oz/A or Ultra Blazer 2AS @ 24 oz/A (acifluorfen) + Dual Magnum 7.62EC @ 16 oz/A + 2,4-DB 1.75SL @ 18 oz/A provided excellent control (>97%) of Palmer amaranth (*Amaranthus palmeri*) and peanut yields equivalent to current standards.

Using Herbicides to Reduce Purple Nutsedge (Cyperus rotundus) Tuber Production.

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Purple nutsedge is considered the world's worst weed due its global distribution and ability to resist control tactics in numerous crops. In the Southern US, it is among the most troublesome weeds in fruiting vegetables and cucurbits (#1 in GA and FL), cole crops (#4 in GA and FL), and across the region is (ranked #6 and #8 in peanut and cotton, respectively). Purple nutsedge is a clonal species that relies on tubers for reproduction. Studies have found that there are more than four tubers for every emerged foliar shoot, and single tubers reproduced into 530 tubers in a three-month period. The persistence of purple nutsedge tubers in the soil was found to have a half-life of 17 months, with 99% mortality within 36 months. These tubers pose a contamination risk with harvested peanut, due to their similar size. In order to effectively manage purple nutsedge populations, practices should control vegetation and minimize production of new tubers. However, the influence of herbicides on purple nutsedge tubers has not been extensively evaluated. The objectives of this experiment were to evaluate the effectiveness of imazapic, a herbicide commonly used in peanut, on purple nutsedge foliar growth and tuber production, and compare to previous studies involving purple nutsedge and glyphosate (commonly used in cotton, corn, and soybean) and halosulfuron (commonly used in cucumber, tomato, and watermelon). Studies were conducted in Tifton, GA in 2013 and 2014 in outdoor microplots. Purple nutsedge tubers were pre-sprouted in the greenhouse and transplanted into microplots, a single tuber with emerged shoot per experimental unit. After six weeks of growth, purple nutsedge plants were treated with imazapic, ranging from 1/16X- to 2X, using six rates with a common multiplier of 2. The 1X rate of imazapic was 72 g ai/ha. A nontreated control was included in the treatment structure. Purple nutsedge plants were harvested seven weeks after herbicide application. Shoot and tuber data were regressed on rate of imazapic and fit to log-logistic models. The experiment had five replications in a RCBD, with blocking based on the number of shoots emerged at time of application, and the experiment was repeated in time. The rate of imazapic that reduced foliar and tuber biomass 50% (I_{50}) was 25.8 and 25.6 g/ha. The ratio of 1X rate to I_{50} was 2.7 and 2.73. Comparison of these ratios with those for glyphosate (1.50 to 1.58) and halosulfuron (17.30) suggest that imazapic is between these compounds in the relative efficiency of the herbicide. Effective management requires reduction in both tuber production and tuber persistence; future studies should address how tuber persistence is affected by herbicides.

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

Moderator: Lisa Dean, USDA-ARS

Intensities of Sensory Attributes in High- and Normal-Oleic Cultivards in the Uniform Peanut Performance Test. H.E. PATTEE, T.G. ISLEIB*, Department of Crop Science, North Carolina State University, Raleigh, NC 27695-7629; R.S. TUBBS, Department of Crop and Soil Sciences, 2360 Rainwater Rd., University of Georgia Coastal Plain Exp. Sta., Tifton, GA 31793; and T.H. SANDERS, L.O. DEAN, and K.W. HENDRIX, USDA-ARS Market Quality and Handling Research Unit, Raleigh, NC 27695-7624.

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

In order to ascertain whether or not flavor differed between high- and normal-oleic peanuts, data from the quality assessment phase of the Uniform Peanut Performance Test (UPPT) were used to compare the means of 22 high-oleic cultivars and 37 normal-oleic cultivars and registered germplasm lines. Roast color (linear and quadratic effects) was examined for potential use as a covariate in analyzing flavor components in order to account for variation in degree of roast that might occur in sample preparation. Likewise, intensity of the fruity / fermented attribute was examined for use as a covariate in analysis of other sensory attributes. Fruity / fermented can be more intense when peanuts are harvested too early or if they are improperly cured. High levels of fruity / fermented attribute can mask panelists' perception of other flavor attributes.

No difference between high- and normal-oleics was detected for any sensory attribute intensity except stale / cardboardy. That difference was very small (0.16 vs. 0.28 flavor intensity units, P=0.0008) and favored high-oleics. Although there was no detectable difference between high- and normal-oleic lines, there was variation among individual lines within oleic acid types for oil content, roast color, and several sensory attributes (dark roasted, raw / beany, roasted peanutty, sweet aromatic, sweet, bitter, wood-hulls-skins, and "off flavors" stale / cardboard, fruity / fermented, and plastic / chemical). No variation at all was detected among lines for astringent, earthy, painty, metallic, or sour. The absence of large differences between the two major oleic acid types and the presence of variation among lines within types for key attributes suggests that it is possible to identify high-oleic cultivars with superior flavor profiles just as it is to identify superior flavor profiles among normal-oleic cultivars. However, it is to be hoped that the US peanut crop eventually will be all high-oleic. This study indicates that such a shift to high-oleics will not result in a decrease in flavor.

Moisture Determination of Nuts and Dry Fruits using a Capacitance Sensor. C.V. KANDALA*, National Peanut Research Laboratory, USDA, ARS, Dawson, GA 39842; and R. HOLSER, USDA, ARS, Athens, GA 30605.

Impedance (Z), and phase angle (θ) of a cylindrical parallel-plate capacitor with in-shell peanuts between the plates was measured earlier, using a CI meter (Chari's Impedance meter), at 1 and 5 MHz . Capacitance C, was derived from Z and θ, and using the C, θ, and Z values of a set of peanuts whose moisture content (MC) values were later determined by hot air-oven method, a calibration equation was developed. Using this equation, and their measured C, θ, and Z values, the MC of a group of peanuts, not used in the calibration, was predicted. The predicted values were compared with their air-oven values. The method worked well. The measured moisture range was between 5% and 25%.

Similarly, impedance (Z), and phase angle (θ) of a cylindrical parallel-plate capacitor with dry fruits between the plates was measured using the CI meter, at the two frequencies. Capacitance C, was derived from Z and θ, as before, and using the C, θ, and Z values of a set of blew berries whose moisture content (MC) values were later determined by the vacuum hot air-oven method, a calibration equation was developed. Using this equation, and their measured C, θ, and Z values, the MC of a group of blue berries, not used in the calibration, was predicted. The predicted values were compared with their air-oven values. The method worked well with a good R^2 value and a low standard error of prediction (SEP) in the measured moisture range between 5% and 20%.

Leathery Hull Peanuts – Effect on Shelling Performance. C.L. BUTTS*, M.C. LAMB, USDA-ARS, National Peanut Research Laboratory, Dawson, GA 39842; and G.H. HARRIS, Crop and Soil Sciences Department, University of Georgia, Tifton, GA 31793.

When shelling peanuts from the 2012 peanut crop, various shellers experienced diminished shelling plant throughput when shelling peanuts harvested from isolated geographical regions. Shellers reported a reduction of 25-30% throughput of the first stage sheller bank with significant increases in splits and broken kernels. Anecdotal observations by shelling plant staff was that the hulls seemed to be more "leathery" than the hulls from other locations. Elemental tissue analysis of the peanut kernels and hulls harvested from one of the affected areas in 2013 showed some significant differences in some of the minor nutrients when compared to samples from NPRL research plots. Prior to planting the 2014 crop, soil samples were obtained from one field in Georgia and five fields in Florida identified by the shellers as historically producing the "leathery" hull peanuts and from the Hooks Hanner Environmental Resource Center (HHERC) plots near Dawson, GA. When the fields were harvested, and delivered to the buying point, the FSIS check sample was retained and delivered to the NPRL for shelling and analysis. Samples were shelled in the Model 4 sample sheller using the optimum sheller grate size for the 1st and 2nd stages for each sample. The shelling grate for the 3rd stage was 7.1 mm (18/64") for all samples. The fraction of peanuts shelled in each stage and the mass flow rate through the first and second stage shelling process was calculated for each sample. Approximately 74, 19, and 7% of the Florida "leathery hull" samples were shelled in the first, second and third stages. Six samples from Georgia fields identified as usually having leathery hulls, had 85% shelled in the first stage, 13% shelled in the second stage, and 2% shelled in the third stage. The fraction of peanuts from HHERC that were shelled in the first, second, and third stages were 81, 11, and 8%, respectively. Throughput of the first stage shelling for the HHERC, Florida, and Georgia samples was 148, 78, and 98 kg/h, respectively. Similarly, the throughput for the second stage sheller was 47, 28, 29 kg/h, respectively. Data regarding the soil nutrient analysis, minor nutrient analysis of the hulls and kernels, and some physical characteristics will be discussed in relation to the shelling characteristics.

The Challenges of Peanut Skins as Functional Food Ingredients. L.L. DEAN*, Market Quality and Handling Research Unit, USDA-ARS, Raleigh, NC 27695-7624.

Peanut skins are a by-product of the blanching industry that have not been utilized to their full potential. They have been found to contain significant quantities of compounds containing phenolic moieties such as catechins, procyanidins, and other polyphenols that have positive associations with human health. Peanut skins are an ideal candidate to be a low cost starting material to produce functional food ingredients. These compounds can be captured and isolated which overcomes issues of using intact peanut skins directly to food products. Extraction with food grade solvents and subsequent spray drying to produce free flowing powders has proven effective. These powders have antioxidant activity as measured by chemical assays such as ORAC and DPPH. They have also demonstrated anti-inflammatory effects on living cells. Undesirable components such as metal ions are concentrated in the extracts and can be removed by treatment with pulverized peanut hull material. Modulation of the bitter and astringent properties with the addition of maltodextrin during the production of the peanut skin extract powders has allowed for the successful incorporation of the extracts from peanut skins into food products such as peanut butter and milk chocolate to produce products with added health properties and little negative flavor impacts that are acceptable to consumers. Bitter and astringency descriptors were not increased more than 0.5 intensity units above the products without added peanut skin extracts while the antioxidant levels measured in Trolox units by the DPPH assay were increased to levels equal to high antioxidant foods such as dark berries and cocoa.

An Economic Analysis of Herbicide Control of Purple Nutsedge in Peanut. O.D. WILLIAMS*, University of Georgia, Athens, GA 30602; N.B. SMITH, T. GREY, R.S. TUBBS, Department of Crop and Soil Science, University of Georgia, Tifton, GA 31793; and T. WEBSTER, USDA/ARS, Crop Protection and Management Research Unit, Tifton, GA 31793.

Many states over the past decade (Alabama, Florida, Georgia, Oklahoma, North Carolina, South Carolina) identify nutsedge species as being one of the 10 most common and troublesome weeds (Webster, 2013). Nutsedge tubers are a major contributor to foreign material found in harvested peanut after shelling and at processing (for oil, peanut butter, or candies) and represent a significant expense to remove. Contamination by nutsedge tubers will vary depending on environmental conditions and crop rotations, but once established in a field, tubers will be a persistent and difficult to battle. When Cadre is applied up to 30 days after planting, it provides season long weed control of many species however the effects of reduced rates of Cadre on purple nutsedge control have not been evaluated in peanut. Common weed control practices currently recommended by University of Georgia Extension specialist were used to produce peanut in field experiments with known nutsedge infestations. Cadre is applied at ¼, ½, and 1x (4 oz/acre) recommended rates in order to evaluate the effects on nutsedge control as compared to a non-treated control. The economic effects are analyzed by using UGA crop enterprise cost estimates for peanut production and grade results including SMK and foreign material to determine costs and returns. Cost associated with cleaning due to foreign material will be estimated at the buying point level as well as the processing level to determine the total cost of potential savings benefit of nutsedge control.

Economics of Fungal Disease Programs for Peanut in Eastern Georgia. A. SMITH*, N. SMITH, Department of Agricultural and Applied Economics, University of Georgia, Tifton, GA 31793; R. KEMERAIT, Department of Plant Pathology, University of Georgia, Tifton, GA 31793; P. CROSBY, University of Georgia Cooperative Extension, Swainsboro, GA 30401; W. PARKER, University of Georgia Cooperative Extension, Millen, GA 30401; and W. TYSON, University of Georgia Cooperative Extension, Statesboro, GA 30401.

Peanut farmers have a variety of fungicide programs available to treat a myriad of disease problems. Costs of fungicide programs also vary significantly, especially with the introduction of new fungicides in the market and the entrance of generic formulations of more established fungicides. Farmers see effectiveness of these fungicides through improved yields, but need to understand the impact of these programs on profitability. An economic analysis was conducted on two fungicide treatment studies located in East Georgia during 2014; one in Burke County and the other in Effingham County. The study in Burke County consisted of 10 treatment programs with 6 replications each in a randomized complete block design using the variety GA-06G. The Effingham County study consisted of 7 treatment programs with 3 replications in a randomized complete block design using the variety GA-07W.

Yield data were collected to determine revenue. Revenue was calculated using the $355/ton loan rate. Costs were calculated on fungicide spray (type, volume and frequency of spray) as well as fungicide application method (tractor fuel, lube, repairs and maintenance, and labor). All other inputs were held constant across all replications and were therefore not considered as part of the economic analysis. Profitability was measured using adjusted revenue, defined as revenue adjusted for fungicide and application costs.

An Economic Comparison of Three Irrigation Systems in a Crop Rotation including Peanuts.

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Efficient irrigation systems are important for conserving water resources and ensuring profitability. Three irrigation systems on South Georgia farms were compared over a 15-year planning horizon – shallow subsurface drip irrigation (S3DI) placed 2 inches below soil surface, deep subsurface drip irrigation (SSDI) placed 10 inches ± 2 inches below soil surface, and center pivot irrigation (CPI). Over a 15-year simulation period, a 5-year crop rotation of cotton, corn, corn, corn, and peanuts was repeated three times on a 30 acre field, common in South Georgia due to terrain constraints. A comparative investment analysis was conducted. The revenue stream for the 5-year rotation, repeated three times (i.e., 15-year planning horizon), was calculated using a 15, 10, 5-year moving average of cotton, corn and peanut prices collected from USDA-NASS and each commodity's expected yield from historical data and expert opinion. All costs of operations were assumed to be constant except for the irrigation conveyance system, and annual irrigation repairs and maintenance. All revenue and investment costs were discounted at a 3% rate to account for the time value of money. The use of personally held capital was compared to borrowed capital at a 6% and at a 9% interest rate. Results indicated that though returns were slightly lower for S3DI compared to CPI, the present value (PV) of the returns above irrigation system costs was greatest for S3DI regardless of capital expenditure scenario. Therefore, farmers may want to consider S3DI when updating irrigation systems.

Generic Base and Market Loan Gains Implications on Peanut Payment Limits. N.B. SMITH*, University of Georgia, Tifton, GA 31793; S.M. Fletcher, University of Georgia, Griffin, GA 30223.

The Agricultural Adjustment Act of 2014 allowed owners of farms a one-time opportunity to reallocate base acres and update payment yields for the Price Loss Coverage program. These changes have the potential to increase the total peanut base acres and raise the payment yields for peanuts across the peanut belt. The establishment of generic base (old cotton base) in the 2014 Farm Bill allows peanut base to be temporarily assigned in the year planted on a farm with generic base. The 2015 outlook for peanuts projects low prices for peanuts due to low prices for competing crops of cotton, corn and soybeans. The 2014 national average price for peanuts is expected to be $430 per ton and 2015 could be lower. If a producer elected the Price Loss Coverage (PCL) program for peanuts, a $100 per ton payment rate could be possible for the 2014 and 2015 crops. Peanuts have a $125,000 payment limitation per entity that includes PLC and ARC payments, market loan gains (MLG) and loan deficiency payments (LDPs). The prospects of producers hitting the payment limitation in 2015 are shown given alternative farm size, base acreage and payment yields. The uncertainty of potential market loan gains could change producer decisions related to crop mix and the organization of legal entities on a farm.

Breeding, Biotechnology and Genetics I

Moderator: Tom Isleib, North Carolina State University

Breeding, Biotechnology and Genetics I *(Continued)*

Moderator: Tom Isleib, North Carolina State University

Evidence for a Second RKN Resistance Gene in Peanut. W.D. BRANCH*, Department of Crop and Soil Sciences, University of Georgia, Tifton, GA; T.B. BRENNEMAN, and J.P. NOE, Department of Plant Pathology, University of Georgia, Tifton and Athens Campuses, GA, respectively.

Root-knot nematode (RKN) caused by *Meloidogyne arenaria* (Neal) Chitwood race 1 can result in highly significant yield losses in peanut (*Arachis hypogaea* L.) production. Fortunately, very high levels of RKN nematode resistance have been identified and incorporated from wild species into newly developed peanut cultivars. In 2011-12 at Tifton, GA, a field site was artificially inoculated with *M. arenaria* race 1. The susceptible cv. 'Georgia-10T' was used to uniformly increase the peanut-specific egg mass and juvenile nematode populations during the summer and fall; whereas, hairy vetch (*Vicia villosa* Roth) was used for the same purpose each winter as a susceptible cover-crop. During 2013 and 2014, space-planted F_2 and F_3 populations from cross combinations involving *A. hypogaea* susceptible x resistant parental lines were evaluated, respectively. Past inheritance data had suggested a single dominant gene, R*MA*, controlling the resistance. However in this study, the occurrence of a second gene was also found to be involved in peanut RKN resistance, and its implication in cultivar development will be discussed.

Identification of Rare Recombinants Leads to Tightly Linked Markers for Nematode Restance in Peanut. Y. CHU*, R. GILL, J. CLEVENGER, P. OZIAS AKINS, Department of Horticulture, University of Georgia Tifton Campus, Tifton, GA 31793-5766; P. TIMPER and C.C HOLBROOK, USDA-Agricultural Research Service, Tifton, GA 31793.

Strong host resistance to root-knot nematode was introgressed from wild diploid species *A. cardenasii* to cultivated peanut. The introgressed region was previously identified as a large chromosomal region on linkage group A09. Lack of recombination in mapping populations has prevented further refined mapping of the disease resistance genes. In order to further define the introgressed region, additional polymorphic markers were added to the linkage group A09 using a recombinant inbred line population developed from Gregory x Tifguard in which Gregory is the susceptible parent and Tifguard is the resistant parent derived through the *A. cardenasii* introgression pathway. Map distance increased to 8 cM compared to zero recombination in the previous publication. QTL mapping of egg mass index and gall rating detected two regions on the linkage group A09 contributing to nematode resistance. Rare recombinants of these two regions were discovered in the population. Additional phenotyping of the recombinants demonstrated that one introgressed region confers moderate resistance while the other introgressed region confers strong resistance to nematodes. Molecular markers associated with the introgressed region carrying strong resistance can be deployed in peanut breeding programs to improve selection for nematode resistance. RNAseq analysis with these recombinants revealed differential gene regulation upon nematode challenge. A candidate nematode resistance gene discovered from RNAseq is under functional analysis.

Identification of QTLs for Use in Marker Assisted Selection. C.C. HOLBROOK*, USDA-Agricultural Research Service, Tifton, GA 31793; P. OZIAS-AKINS, Y. CHU, University of Georgia, Tifton, GA; T.G. ISLEIB, Department of Crop Science, North Carolina State University, Raleigh, NC 27615; A.K CULBREATH, T.B. BRENNEMAN, University of Georgia; C.Y. CHEN, Auburn University; J.P. CLEVENGER, C. CHAVARRO, S.A. JACKSON, University of Georgia; C. BUTTS, M. LAMB, USDA-ARS; C.K. KVIEN, University of Georgia; T.R. SINCLAIR, A. SHEKOOFA, North Carolina State University; B.L. TILLMAN, University of Florida; M.D. BUROW, Texas A&M University; and B. GUO, Z. ABDO, and S. KIM, USDA-Agricultural Research Service.

Phenotyping of structured populations, along with molecular genotyping is needed for marker development in peanut. This research is essential for making the peanut genome sequence useful to breeders because it will make the connection between genes, gene markers, genetic maps, and agronomic traits in peanut. Several structured populations are available, and phenotyping efforts are ongoing. The "CAP" populations consist of sixteen inbred mapping populations that were created using parents that maximize genetic diversity for practical breeding objectives. Several research groups have selected specific populations to phenotype for biotic and abiotic stresses. Two of these population have also been extensively phenotypes for seed and pod characteristics, and yield. Data analysis has resulted in the identification of QTLs for resistance to several important diseases. QTLs have also been identified for yield and grade characteristics. Studies are ongoing in 2015 to confirm these results and to test the applicability of these QTLs in maker assisted selection.

Genotypic and Phenotypic Variation in Disease Reaction in the University of Florida Peanut Breeding Program. B.L. TILLMAN*, University of Florida, Agronomy Department, North Florida REC, Marianna, FL, 32446; T.B. BRENNEMAN, University of Georgia, Department of Plant Pathology, Tifton, GA 31793.

Selecting for disease resistance is a major component of the University of Florida peanut breeding program. Each year, dozens of advanced breeding lines are evaluated for reaction to three major peanut diseases that affect peanut production in the southeastern USA, leaf spot (mostly late leaf spot; *Cercosporidium personatum* Berk. & M.A. Curtis), spotted wilt (*Tomato Spotted Wilt Virus*), and white mold (*Sclerotium rolfsii* Sacc.). Repeatability of results is relatively high for both leaf spot and white mold, but not for tomato spotted wilt. For example, narrow sense heritability of reaction to late leaf spot based on the Florida 1-10 scale was shown to be around 66% when planted in early June and when no fungicides are applied. Repeatability of white mold ratings is aided by inoculation with *S. rolfsii,* management of irrigation water and by planting in mid- May. Regression analysis over four years (2010-2014) showed that yield potential (y- intercept) and yield loss (slope of the regression line) were similar. Pod yield loss per point of increase in white mold disease rating on a 1-10 scale averaged 593 lbs./A. Average pod yield with minimal white mold disease was 6321 lbs./A. However, repeatability of tomato spotted wilt symptoms has been very low over the past four to five years. Inoculation with TSWV in a field setting is not feasible and early planting, reduced seeding density and avoidance of in-furrow phorate application have not improved symptom development. Heritability estimates for spotted wilt symptoms were 23% using a 1-10 rating scale and 58% using Immunostrip testing of 10 plants per plot. Implementing Immunostrip testing in a breeding program is impractical due to cost of the tests and the labor (time) involved. The practical implications are
1) the relative resistance of new cultivars to both leaf spot and white mold can be well documented, 2) information on the relative resistance of new cultivars to tomato spotted wilt is tenuous, and
3) breeding for resistance to tomato spotted wilt would benefit from molecular marker technology.

Association Mapping of SSR Markers to Leaf Spot Disease Resistance in Cultivated Peanut.

Y.Y. TANG*, C.Y. CHEN, Department of Crop, Soils and Environmental Sciences, Auburn University, Auburn, AL 36849; P.M. DANG, USDA-ARS National Peanut Research Lab, Dawson, GA 39842; A. HAGAN and K. BOWEN, Department of Plant Pathology, Auburn University, Auburn, AL 36849.

Leaf spot is one of the most serious foliar disease in peanut (Arachis hypogaea L.). It poses a great threat to production in the absence of fungicide applications. Screening for peanut genotypes with leaf spot disease resistance and identification of valuable simple sequence repeat (SSR) markers are of great significance to the development of leaf spot disease resistant peanut cultivars with high and stable yields. In this study, 120 accessions were evaluated for resistance to leaf spot (early leaf spot and late leaf spot) in field under two treatments: 1) none fungicide treated and 2) a standard seven application chlorothalonil program for a three-year test. Great variation was observed in the resistant performance among the 120 accessions. A set of 192 primers from peanut genetic linkage maps were utilized to genotype the 120 accessions. Polymorphisms were detected in the SSR amplification of the tested peanut accessions. Genetic polymorphisms were associated with phenotypic diversity to identify candidate markers for leaf spot disease resistance in peanut. These markers will be applied in marker-assisted selection (MAS).

Characterization of the U.S. Peanut Core Collection - Phenotypic, Biochemical, and Genetic Evaluations. G.E. MacDONALD*, Agronomy Department University of Florida, Gainesville, FL 32611; N.A. BARKLEY, CIP, Lima, Peru; B.L. TILLMAN, Agronomy Department, University of Florida Marianna, FL 32446; and C.C. HOLBROOK, USDA-ARS Crop Genetics and Breeding, Tifton, GA 31793.

The US peanut core collection represents a valuable germplasm resource for the U.S. and global peanut community. This collection was constructed in 1993 to minimize genetic redundancy, provide a smaller subset for peanut breeders to identify important agronomic traits for improvement, and reveal other accessions across the entire germplasm collection for particular traits of interest. The composition of this collection reveals the major genetic diversity for each of the 4 peanut market types – Valencia, Spanish, Virginia, and Runner. Since the development of the core, few studies have attempted to fully characterize the lines within the entire collection; therefore, the aim of this on-going study was to evaluate critically important traits to breeders and growers. The entire core collection along with commercial standards of each market type (runner, Spanish, Valencia, and Virginia) were planted in 2013 and 2014 at Plant Science Research and Education Unit in Citra, FL for a total of 1098 plots each year. An augmented design was employed with replications of the commercial standards and the U.S. mini core in order to evaluate block variability. Phenotypic traits were collected at mid-season which included the U.S. standard descriptors, height and width of the canopy of each plot, stem pigmentation, and leaf length and width. In addition, when the plots were harvested mainstem height, disease prevalence, and presence or absence of flower or pegs on the mainstem in order to distinguish subspecies was also collected. Total yield and grade on the entire core, mini core, and the commercial standards has been completed for 2013. Yield and grade ranged from 500 -5300 lbs/acre and TSMK ranged from 69 to 81%, respectively. Digital images were collected of all the plots including flowers (1098), a single plant post digging (1097), and pod and seed images. All of these images plus the characterization data will be submitted to GRIN for the peanut community to access. Genotyping to assess genetic diversity using a set of 30 SSR markers revealed 22 of these markers were successful in distinguishing variability among accessions. The majority of the core has now been assessed with these 22 SSR markers with alleles ranging from two to 14 per marker. The core collection was also evaluated for variability of the *ahFAD2* alleles which control the high oleic trait (G448A in *ahFAD2A* and Ains442 in *ahFAD2B*). No high oleic lines were detected in the germplasm; however, 36% of the lines are fixed for the *ahFAD2A* mutation which has been known to occur fairly frequently in runner and Virginia type peanuts. Biochemical parameters including total oil, total protein, and fatty acid profiling were performed for the core collection and commercial standard lines grown in 2013. Total protein collected ranged from 25-35% and total oil from 50-61%. High oleic fatty acid was only detected in high OL commercial lines, which was in agreement with the molecular data. Initial studies on blanching were also conducted and a high degree of variability (7-99%) was observed. The entire set of measurements was to be repeated in 2014, but unforeseen issues with planting, cold weather and herbicide damage resulted in stunting, poor stands and variable growth across the field, precluding any meaningful data collection. Therefore, the entire experiment is being repeated in 2015. We are in the process of compiling and organizing this massive amount of data in a logical and usable form for the peanut community and the GRIN database. This study shows the value of large, side by side comparative field experiments. It has also been an invaluable resource for teaching, extension and other venues to showcase the diversity and benefits of peanut.

Differential Expression of MicroRNAs or Small Nuclear (sn)RNAs and the Corresponding Drought Regulated Genes in Peanut (Arachis hypogaea). P.M. DANG*, R.S. ARIAS, M.C. LAMB, USDA-ARS, National Peanut Research Laboratory, Dawson, GA 39842; C.Y. CHEN, Department of Crop, Soil and Environmental Sciences, Auburn University, 201 Funchess Hall, Auburn, AL 36849.

Drought can significantly reduce yield and/or quality of peanut production, and microRNAs or snRNAs play an important role in the determination of drought tolerance in many crops. The objectives of this study are to: 1) isolate and sequence microRNAs from drought treated and fully-irrigated peanut plants; 2) identify differentially expressed microRNAs using bioinformatics; 3) associate and verify up- or down-regulated peanut genes. A drought tolerant line 'C76-16' and a susceptible line 'AP-3' were subjected to progressive drought for three weeks during mid-growing season. RNAs were extracted from leaves and subjected to microRNA sequencing resulting in the identification of 21 differentially expressed microRNAs that matched to different plant genes, including a chlorophyll a-b binding protein, F-box repeat protein, monodehydroascorbate reductase (NADH), and peroxisomal membrane protein. Real time PCR will be performed on these candidate peanut genes to verify drought regulated gene-expression. Validated drought regulated genes can be utilized in breeding programs to produce drought tolerant peanut varieties.

Transcriptome Profiling of Developing Peanut Seed with a Focus on Oil Related Expression Networks. K. GUPTA, G. KAYAM, A. DORON, Dagan, Israel; and P. OZIAS-AKINS, J.P. CLEVENGER, Department of Horticulture and Institute of Plant Breeding, Genetics & Genomics, University of Georgia, Tifton, GA 31793.

Peanut ranks among the world's most important oilseed crops, yet relative to other oilseeds there are fewer studies of oil-related biosynthetic and regulatory pathways. We used the UGA tetraploid transcript assembly to perform RNA-seq analyses of seeds during development. Four developmental stages of seeds (R4-R7) were sampled from two peanut lines (Hanoch and PI338338) that vary in oil content and fatty acid profile. Transcriptome data were explored with respect to genic and sub-genomic patterns of expression, globally and with respect to oil pathways. The most dynamic change in the expression was from R5 to R6 developmental stages, with 8.4% of the genes differentially expressed. The expression is significantly biased towards the A-genome in seed transcriptome, particularly at the initial pod developmental stage (R4). Functional enrichment tests showed that lipid related genes were significantly represented early in seed developmental stages with an expression bias towards the B-genome. Focused analysis on a set of 584 oil related genes revealed several unique features in the oil biosynthesis pathway in both peanut lines, like the contribution of the mitochondrial *Pyruvate Dehydrogenase E1* to the total pyruvate dehydrogenase expression pool and the evident contribution of the phosphatidylcholine pathway to the TAG assembly process. Clusters and co-expression analyses found significant differences in expression profiles of oil related genes between the two lines. For example, up-regulated expression level of oil storage genes and transcription factors were found in the Hanoch line relative to PI338338. Also, a complete 100% bias in expression of the *Acyl-ACP Thioesterase A* (*FATA*) gene towards the A-genome was found in PI338338 that may explain its lower pod-filling potential. This bias may result from deletion of this gene from the genome of PI338338. This study provides the first temporal analysis of duplicated gene expression in peanut seed and will help understanding of new aspects of oil biosynthesis in peanut.

Identification of QTLs for Rust Resistance in the Wild Peanut Relative Arachis magna and the Development Markers for Introgression of this Resistance into Cultivated Peanut. S.C.M. LEAL-BERTIOLI*, M.C. MORETZSOHN, U. CAVALCANTE, E. GOUVEA, P. GUIMARAES, Embrapa Genetic Resources and Biotechnology, Brasília, DF, 70770-917, Brazil; C. BALLEN, S.A. JACKSON, Center for Applied Genetic Technologies, University of Georgia, Athens, GA, 30602-6810; K. SHIRASAWA, Kazusa DNA Research Institute, Kisarazu, Chiba, 292-0818, Japan; and D.J. BERTIOLI, University of Brasília, Institute of Biological Sciences, Campus Darcy Ribeiro, 70910-900. Brasília, DF, Brazil.

Rust is a major pathogen of the peanut crop. Development and adoption of rust-resistant varieties is the most cost efficient and effective way to control the spread of the disease and reduce yield losses. Some cultivated peanut germplasm accessions have a degree of resistance, but the secondary gene pool is a source of much stronger resistance alleles. Wild species, however, have undesirable agronomic traits that are a disincentive to their use in breeding. The identification of genomic regions that harbor disease resistance in wild species is the first step in the implementation of marker assisted selection that can speed the introgression of wild disease resistances and the elimination of linkage drag. In this work we identify genome regions that control different components of rust resistance in a RIL population developed from a cross between two *Arachis* species, the susceptible most probable B genome ancestor of cultivated peanut, *A. ipaënsis,* and an accession of its closest relative *A. magna* that is resistant to rust. Quantitiative trait loci for several components of resistance were placed in the same position on linkage group B08. Single nucleotide polymorphism (SNP) KASPar markers for rust resistance region were designed and validated for marker function in both diploid and tetraploid contexts.

The Genome Sequences of A. duranensis and A. ipaënsis Provide New Insights into the Genetics and Genome of Cultivated Peanut. D.J. BERTIOLI*, University of Brasília, Institute of Biological Sciences, Campus Darcy Ribeiro, 70910-900. Brasília, DF, Brazil; S. LEAL-BERTIOLI, M. MORETZSOHN, Embrapa Genetic Resources and Biotechnology, Brasília, DF, 70770-917, Brazil; K. SHIRASAWA, Kazusa DNA Research Institute, Kisarazu, Chiba, 292-0818, Japan; L. FROENICKE, R. MICHELMORE, The Genome Center, University of California Davis, CA; and B. ABERNATHY, S. JACKSON, Center for Applied Genetic Technologies, University of Georgia, Athens, GA, 30602-6810.

Cultivated peanut (*Arachis hypogaea* L.) is an allotetraploid with closely related component genomes that diverged only about 3 million years ago. Together with its large size, ~2.7 Gbp, this makes the assembly of the *A. hypogaea* genome very challenging. Here we report the use the genomes of the two most probable diploid ancestors of peanut (*A. duranensis* and *A. ipaënsis*, sequences produced by the Peanut Genome Consortium) as a "prototype" or "scaffold" onto which sequence reads of cultivated peanut can be overlaid. We show that most of the cultivated peanut genome closely approximates the addition of the *A. duranensis* and *A. ipaënsis* genomes, with a genome composition that can be expressed as "AABB". However, some genome regions have suffered deletions and have genome compositions that can be expressed as "AA--", "--BB", and even "----". Furthermore, in other regions of the genome there has been autotetraploid-like tetrasomic recombination between the A- and B-genomes resulting in genome compositions that can be expressed as "AAAA" or "BBBB". These deletion and recombination events vary slightly in different cultivated peanut genotypes, meaning that, in certain regions, the cultivated peanut genome is composed of genotype-dependant distinct mosaics of the A- and B-genomes at different dosages ("AABB", "AA--", "--BB", "AAAA", "BBBB", "----"). These findings provide important new insights into the structure, diversity and genetic behaviour of cultivated peanut genomes.

Bayer Excellence in Extension/ Extension Techniques & Technology

Moderator: Keith Rucker, Bayer CropSciences

Sowing A Bountiful Harvest: The Methods Of Cooperative Extension Service Promotion In Georgia, 1914-1924. K.L. BEASLEY*, Department Of History, Florida State University, Tallahassee, FL 32306; J.P. BEASLEY, JR., Department of Crop, Soil and Environmental Sciences, Auburn University, Auburn, AL 36849.

When the Smith-Lever Act passed in 1914, the Cooperative Extension Service focused on convincing the public of its necessity and usefulness in improving farming practices and agriculture. In Georgia, the different "marketing" methods used by the Extension Service in its first decade highlights how farmers and rural families were encouraged to take advantage of the County Agent's expertise. The challenge for the Extension Service, when illiteracy rates were high and no organized advertising campaign was apparent, is how they could foster trust in scientific farming and convinced Georgians that the benefits offered to farmers and rural homes were crucial to improving agriculture. Research reveals direct, face-to-face contact, in addition to printed material, were the most effective of promotional methods.

Peanut Response to Inoculation and Ammonium Sulfate Rate in NC

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Adequate nitrogen (N) fixation by peanut is essential for optimum yield. Approximately 75% of growers apply *Bradyrhizobia* inoculant to peanut. In 35 replicated trials in North Carolina from 1999-2014, applying in-furrow liquid or granular inoculant increased yield from 3,507 lbs/acre to 5,072 lbs/acre in new peanut fields and 4,256 lbs/acre to 4,454 lbs/acre in fields with a previous history of peanut. Economic return was determined as the product of pod yield and price less a production cost of $916/acre without inoculant and $924/acre with inoculant. The increase in economic value from inoculation ($8/acre) in new ground at peanut prices of $355/ton, $425/ton, and $535/ton was $269/acre, $324/acre, and $410/acre, respectively. In rotated ground with a previous history of peanut, the increase in economic value from inoculation was $27/acre, $34/acre, and $45/acre at these respective peanut prices. In a second experiment, ten replicated trials were conducted from 2007-2014 in fields without a history of peanut production or fields not rotated to peanut in recent memory to determine peanut response to N rate. Economic return based on peanut prices described previously was determined to reflect cost of ammonium sulfate (AMS) priced at $0.28/lb. Ammonium sulfate was applied at rates of 285, 428, 571, and 714 lbs/acre corresponding to N rates of 60, 90, 120, and 150 lbs/acre in one application 45-60 days after planting when canopy foliage began to express N deficiency. A no-inoculant/no-AMS control was included along with in-furrow application of inoculant without AMS. In 5 of 10 trials, AMS applied did not increase pod yield or affect economic return compared with non-treated peanut regardless of peanut price ($p > 0.05$). In these fields N deficiency was observed but was not extensive based on visible assessments of the canopy compared with inoculated peanut. In 3 trials a linear increase in yield and a linear increase in economic return for the 3 pricing structures were observed as the rate of AMS was increased. In 2 additional trials a linear increase in yield was observed across AMS rates for yield while a quadratic response was noted for economic return across pricing structures. Peanut yield following inoculation in absence of AMS equaled or exceeded yield when inoculant was not included regardless of AMS rate. In the trials where a significant increase in yield was noted as AMS rate increased, visible symptoms of N deficiency were severe early in the season and in some cases excessive rainfall occurred during the month following application. Collectively, results from these experiments demonstrate the economic value of inoculation in both new ground and fields with a previous history of peanut. In these respective types of fields, at $535/ton increases in economic return were approximately 50-fold and 5-fold over inoculation cost of $8/acre. Determining the most effective rate of AMS to correct a visible N deficiency was more difficult. Due to variation in response and unknowns relative to rainfall after application and plant available N in soil, the current recommendation in North Carolina is to apply AMS at 500 lbs/acre when peanut foliage expresses N deficiency and nodulation is non-existent or very poor. This recommendation is conservative in most instances but may be excessive or limiting under some conditions.

Response of the Virginia Market Type Cultivar Bailey to Prohexadione Calcium in North Carolina

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The Virginia market type cultivar Bailey has become the dominant cultivar in North Carolina because of high yield potential and resistance to several economically important diseases. This cultivar often produces excessive vine growth that can make digging and vine inversion challenging for farmers. Three experiments were conducted from 2012-2014 to determine response of this cultivar to the plant growth regulator prohexadione calcium (PC) marketed as Apogee. In one experiment from 2012-2014 at Lewiston-Woodville, PC (7.2 oz/acre) was applied at 50% row closure followed by a second application 2 weeks later with peanut dug at weekly intervals beginning in early September through mid-October. In a second experiment from 2013-2014 at Lewiston-Woodville, prohexadione calcium was applied as described previously to peanut planted May 2, May 16-19, and May 28 with four digging dates including September 10 and 24 and October 5 and 20. In a final experiment conducted during 2013 and 2014 (7 site/year combinations), peanut yield following 1, 2, or 3 applications of prohexadione calcium was compared with non-treated peanut with only one digging date. Crop oil concentrate and nitrogen solution were applied with PC. In all experiments PC increased row visibility, with an increase in visibility when the number of applications was increased. However, in the first 2 experiments with multiple digging dates, PC did not affect peanut yield regardless of planting or digging date. In 2 of 7 trials in the experiment with a single digging date, PC increased yield, although response was inconsistent in terms of the number of applications required for the increase in yield. While PC increased row visibility in a consistent manner, yield increases for the cultivar Bailey have been limited. Although not substantiated in these trials or in other research, it is suspected that the generally good plant health due to disease resistance of the cultivar Bailey and the smaller seed size of this cultivar may have minimized benefits of PC in improving pod retention. Historically, cultivars that were larger seeded than Bailey or were more prone to disease often responded more favorably to PC, with improved pod retention suggested as a key mechanism of the increase in yield following PC. Additional research is needed to refute or support this hypothesis.

Assessment of Innovations for Management of Soilborne Diseases in Peanuts

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Farmers in Southeastern Georgia are faced with environmental conditions, such as high temperatures, high humidity and variable rainfall patterns that, when coupled with heavier soils and historic peanut-soybean crop rotations, create disease problems different than in most other areas of the state. Peanut growers here face severe outbreaks of Southern stem rot and Cylindrocladium black rot (CBR). It is critical for growers in Southeastern Georgia that research be conducted locally to enhance the effectiveness of general statewide fungicide programs. Since 2007, twenty separate research trials were conducted by the Agent at the Southeast Georgia Research and Education Center in Midville, Ga. to evaluate Southern Stem rot and CBR management programs. These trials included Evaluation of New and Emerging Chemistries, Early Emergent Fungicide Applications, In-Furrow Fungicide Applications and Night Application of Fungicides.

Each trial was evaluated using randomized, complete block design with a minimum of four replications of each treatment. Plots (with exception of Early Emergence applications) were sprayed using a tractor mounted sprayer that covered 4 rows. Plots were 2 rows wide by 40 feet long. Peanuts were evaluated prior to inversion for leafspot disease using the Florida 1-10 scale and evaluate following inversion for White Mold and CBR in hits per 80 ft of row.

Summary of Production and Pest Management Practices by Top Growers in North Carolina from 2010-2013

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The North Carolina Peanut Growers Association and the North Carolina Extensive Service recognizes the highest yielding peanut producers each year at annual county production meetings. A total of 74 of these farmers were surveyed to determine their pest management and production practices during 2010-2013. The percentage of peanut yields among farmers in various yield categories (lbs/acre) included: 2,500-3,000 (2%), 3,001-3,500 (2%), 3,501-4,000 (5%), 4,001-4,500 (15%), 4,501-5,000 (24%), 5,001-5,500 (27%), 5,501-6,000 (18%), 6,001-6,500 (5%), and 6,501-7,000 (2%). Fifty-eight percent of farmers planted before May 15 with 42% planting after this date. Several farmers planted both prior to and following May 15. Although seeding rates varied for some farmers, 30% planted between 100-120 lbs seed/acre, 45% planted between 121-140 lbs seed/acre, and 25% planted 140 lbs seed/acre or more. Eighty-seven percent of farmers reported planting in in single rows while 13% reported planting in twin rows. Twenty-two percent of farmers planted in rows spaced 38 inches apart with the balance of producers planting in rows spaced 36 inches apart (78%). Twenty percent of farmers irrigated. Seventy-five farmers disked, 47% field cultivated, 43% bedded, and 34% ripped and bedded. Only 18% of farmers chisel plowed or mold board plowed. One farmer no tilled while 27% of farmers strip tilled. All farmers had at least two crops between peanut plantings. Ten percent of farmers had 2 crops while 41% had 3 crops, and 49% planted at least 4 crops between peanut plantings. Boron was applied by 97% of farmers while 76% and 77% of farmers applied manganese and *Bradyrhizobia* inoculant, respectively. Forty-seven percent of farmers applied the plant growth regulator prohexadione calcium (Apogee). Twenty-eight percent of growers planted one cultivar, 30% planted two cultivars, 24% planted three cultivars, and 18% planted four or more cultivars. Popular cultivars included CHAMPS (42%), Bailey (41%), Phillips (39%), Sugg (27%), and Perry (27%). Less frequently planted cultivars included NC-V 11 (20%), Gregory (16%), VA 98R (15%), Wilson (4%), Brantley (4%), and NC 12C (3%). Farmers treating peanut with in-furrow insecticides applied Temik (57%), Thimet or Phorate (10%), and Orthene or Acephate (14%). The primary postemergence applications of insecticides included Asana XL (34%), Karate Z (19%), and Lorsban (38%). The percentage of farmers spraying less than 3, 4, 5, 6, or greater than 6 times for leaf spot/stem rot were 7%, 25%, 48%, 15% and 5%, respectively. Thirty-eight percent of farmers fumigated with metam sodium for CBR while 12% treated peanut to control spider mites.

Plant Pathology and Nematology I

Moderator: Hilary Mehl, Virginia Tech University

Developing a Rapid Assay for Quantifying Populations of Sclerotia of Sclerotinia minor in Soil.

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Sclerotinia blight caused by *Sclerotinia minor* can build up over time to damaging levels in peanut fields, reducing yield. Weather based advisories currently are used to predict outbreaks of Sclerotinia blight, but field histories often are uncertain. Predictions could be improved by a better understanding of the quantitative relationships among the number of sclerotia of *S. minor* in soil, the amount of disease that develops and yield. However, current soil assay methods are too labor intensive and time consuming to routinely identify problem fields. The overall objective of this research is to develop a rapid soil assay for *S. minor* to quantify the relationship between populations of sclerotia and disease development. Remoistened dried peanut leaves, remoistened dried lettuce leaves and methanol were tested as germination stimulants that could be used to assay soil for sclerotia of *S. minor.* Ten sclerotia were placed on moistened field soil in an airtight box with a test volatile and water for humidity. Germination was recorded at 24 hr intervals for 72 hrs. Analysis of preliminary data showed that germination varied among treatments ($P \leq 0.01$). A significantly greater proportion of sclerotia germinated in the lettuce treatment (37.5%) than in the water control (15%). Contrary to previous reports, germination with remoistened peanut leaves (10%) did not improve germination over the water control. Methanol stimulates germination of sclerotia in *Sclerotium rolfsii*, but was not stimulatory to *S. minor* (0% germination) at the rate tested. Additional stimulants and methods will be tested to quantify populations of *S. minor* in peanut soils.

A Candidate Causal Agent for Irregular Leaf Spot of Peanut

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Irregular leaf spot (ILS) of peanut, also known as funky leaf spot, occurs on leaves of runner-type peanuts grown in the Southeast. Incidence of ILS is common in greenhouse-grown plants and varies in the field among peanut cultivar and tillage practices. Applications of fungicides, bactericides, or herbicides have not been shown to affect incidence. Because traditional diagnostic methods have yet to provide a cause for ILS, a genetic screen was conducted to assist with the search. Genomic DNA extracted from the margins of ILS lesions of greenhouse-grown plants was sequenced using high-throughput sequencing with Roche 454. Contigs were assembled and compared to fungal and bacterial databases using BLAST analysis before and after peanut genome sequences were removed. No causal agent candidates were found using the data set without the peanut genome sequences, but analysis of the full data set showed >80% identity to fungi for 55 of the long contigs. The longest contig (5583 bp long) had a 99.95% identity (64% query) with the rRNA genes with ITS regions of *Cercospora sojina*. This contig was similar (98-99% identify) for other closely related species, including *C. zebrine*, *C. beticola*, *Septoria dysenteracae*, and *S. cucubali*. Less gene similarity (90 and 88% identity) was found for *C. arachidicola* and *Cercosporidium personatum*, respectively. These results suggest that a *Cercospora* related organism, different from *C. arachidicola* and *C. personatum*, may be associated with ILS.

Effect of In-Furrow Application of Fluopyram on Early Leaf Spot

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In-furrow (IF) applications of the pre-mix combination of the fungicide/nematicide, fluopyram, and the insecticide, imidacloprid (Velum Total) show promise for management of nematode pests of peanut (*Arachis hypogaea*) and for preventing feeding damage on foliage caused by tobacco thrips (*Frankliniella fusca*). However, effects of IF application this product on early-season incidence of early leaf spot, caused by *Cercospora arachidicola*, have not been thoroughly characterized. The purpose of this study was to compare the effects of IF applications of fluopyram plus imidacloprid to similar applications of prothioconazole (Proline 480 SC) on early season leaf spot development in peanut plants exposed to heavy levels of natural inoculum. Field experiments were conducted in Tifton, GA in 2013 and 2014 using the cultivar Georgia-09B. Plots were 1.8 m wide by 10 m long and were bordered on each side by nonsprayed rows of Georgia-09B. Border beds were planted on 27 May in both years. Plots were planted on 10 Sep 2013 and 17 Aug 2014 after severe epidemics of early leaf spot were evident in the border rows. Treatments consisted of: 1) nontreated control; 2) IF at planting application of 0.10 kg ai/ha of prothioconazole; 3) IF at planting application of 0.20 kg ai/ha of prothioconazole; and 4) IF at planting application of 0.24 kg ai/ha of fluopyram plus 0.36 kg ai/ha of imidacloprid. Leaf spot incidence (percentage of leaflets with early leaf spot lesions) was evaluated 17, 20, 24, 28, 35, 37, 41, 48, 53, and 57 days after planting (DAP) in 2013, and 19, 28, 33, 36, 40, 43, 47, and 54 DAP in 2014. In 2013, incidence of leaf spot for the four respective treatments was 55.0, 23.8, 5.8, and 7.5% (LSD = 9.4) for the 28 DAP evaluation, and 55.0, 41.3, 27.5 and 32.5% (LSD = 5.2) for the 41 DAP evaluation. In 2014, incidence of leaf spot for the four respective treatments was 41.3, 13.3, 3.3, and 3.8% (LSD = 12.1) for the 28 DAP evaluation, and 78.8, 67.5, 46.3, and 21.3% (LSD = 9.3) for the 36 DAP evaluation. In-furrow applications of fluopyram provided control of early leaf spot under intense disease pressure in both years. However the relative efficacy compared to 0.20 kg ai/ha of prothioconazole and the duration of control varied across years. Studies are planned to determine whether in-furrow application of fluopyram would allow reducing the number of subsequent applications of fungicides needed for leaf spot control.

Efficacy of Priaxor Fungicide on Peanut Foliar and Soilborne Diseases in Georgia

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Headline fungicide (pyraclostrobin) is commonly used on peanut and is considered to be one of the most effective products available for early and late leaf spot (*Cercospora arachidicola* and *Cercosporidium personatum,* respectively). It is now being replaced with Priaxor, a 2:1 mix of pyraclostrobin and fluxapyroxad, a new Group 7 fungicide. Trials in 2014 compared the efficacy of these two products. Priaxor at 4.0-8.0 fl oz was very effective on leaf spot (primarily early leaf spot) when applied either mid-season, or with a 1-week delayed first spray followed by a 3-week interval until the second application. The 6.0-8.0 fl oz rates also had activity on stem rot (white mold) caused by *Sclerotium rolfsii*. This was evident from reduced disease levels seen when Priaxor was applied early season prior to traditional mid-season products for stem rot, as well as from mid-season sprays with no other fungicides applied for soilborne diseases. The consistency of these applications for stem rot control needs to be evaluated further, but overall Priaxor appears to have very good activity on a wide range of peanut diseases.

Integrated Management of Leaf Spot and Stem Rot with Partial Resistance and Applications of Foliar and In-furrow Fungicides. B.B. SHEW*, Department of Plant Pathology, North Carolina State University, Raleigh, NC 27695; and T.G. ISLEIB and D.L. JORDAN, Department of Crop Science, North Carolina State University, Raleigh, NC 27695.

The multiple-disease resistant cultivar Bailey was planted at the Peanut Belt Research Station in Lewiston-Woodville NC in 2011, 2012 and 2013, along with the susceptible cultivars Phillips (2011, 2012) or CHAMPS (2013). In each year, the susceptible cultivar was sprayed according to a five-spray calendar program starting at R3 (spray 1) and Bailey was sprayed according to a four-spray program, which was initiated two weeks later (spray 2). Different sequences of specific fungicides were sprayed to establish six treatments. These sequences consisted of the soil fungicide Provost applied on spray 2 only, spray 3 only, sprays 2 + 4, 2 + 3, or 3 + 4, or no Provost application, with Tilt/Bravo applied for the remaining scheduled sprays. The fungicide and cultivar treatments were tested in all combinations with or without application of the in-furrow fungicide Proline for a total of 24 treatments, with four replications in a split-split plot design. Stem rot data were collected by counting symptomatic plants immediately after digging. Incidence of leaf spot and defoliation were recorded in early September and just prior to digging. Incidence of CBR, spotted wilt and Sclerotinia blight was determined just prior to harvest if those diseases were present. In 2011, stem rot incidence was low and leaf spot incidence was moderate, whereas very high levels of Sclerotinia blight developed after Hurricane Irene. Stem rot incidence was high in 2012, leaf spot incidence was moderate, and Sclerotinia pressure was minimal. Stem rot incidence was low and leaf spot incidence was moderate in 2013. Incidence of all diseases generally was higher on Phillips or CHAMPS than on Bailey in all three years. On the susceptible cultivars, the in-furrow fungicide Provost reduced the incidence of stem rot compared to treatments without an in-furrow treatment in all three years of the study. All of the foliar fungicide programs were equally effective against stem rot and defoliation, indicating that only the choice of cultivar and/or in-furrow treatment was important. Yield of Phillips was 85% of that in Bailey in 2011, regardless of in-furrow treatment. Yield differences depended on the in-furrow treatment in 2012. Yield of Phillips with in-furrow fungicide was nearly equal to Bailey, but was reduced when grown without the in-furrow treatment. CHAMPS yielded slightly but significantly less than Bailey in 2013, but in-furrow treatment did not affect yield. Using an in-furrow fungicide did not affect disease control or yield on Bailey.

Resistance to Sclerotinia Blight in the U.S. Peanut Mini-Core Collection

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Seventy-one of the 112 accessions comprising the U.S. Peanut Mini-Core Collection were evaluated in 2013 and 2014 for resistance to Sclerotinia blight, caused by *Sclerotinia minor*. Susceptible cultivar Okrun, and resistant cultivars Southwest Runner, Tamnut OL06, and Tamspan 90, were included for reference. Entries were grown in two-row plots, each 1.8-m wide and 4.6-m long, using a randomized complete block design with three replications. Moderate to low levels of Sclerotinia blight were observed in 2013, with 12% disease incidence in Okrun, and 1% or less in Southwest Runner, Tamnut OL06, and Tamspan 90. More disease was observed in 2014, with 69% disease incidence in Okrun, and 6-7% in Southwest Runner, Tamnut OL06, and Tamspan 90. Five mini-core accessions (Core Collection/PI nos.: 227/290566; 233/290536; 246/343398; 287/355271; 342/298854) were highly susceptible to Sclerotinia blight and exhibited 41-64% disease incidence in 2013, and 68-96% in 2014. Significant resistance to Sclerotinia blight (<10% disease incidence) was observed in 13 accessions in 2014. This information will be useful to peanut breeders seeking sources of Sclerotinia blight resistance to introgress into elite lines.

Physiology and Seed Technology

Moderator: Henry McLean, Syngenta Crop Protection

Pixe Analysis of Groundnut Genotypes for Toxic Elements

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Concentrations of Elements in nine selected groundnut genotypes have been analyzed by means of PIXE (Particle Induced X-ray Emission) practice with an interior standard method to search traces of remaining agricultural chemicals or toxic elements in selected groundnut genotypes in Accelerator lab National Center for Physics Islamabad. We arranged the samples by separating seed of the groundnut into two cotyledons (seed leaves). The cotyledon recorded many elements but recorded none of the toxic element such that Pb, Hg, As and Cd. The peanut seeds used in the present amount are concerned.

Genotype-by-Environment Interaction Effects on Germination of Runner-Type Peanut Cultivars.

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Experiments were conducted from 2007 to 2012 to evaluate the genotype-by-environment effects on germination and vigor of eight peanut (*Arachis hypogaea L.)* runner-type cultivars from University of Georgia research trials conducted under the same production practices each year. Irrigated experiments were established in fields with a three year rotation with all other variables (fertility, management, and pesticides) kept consistent each growing season. Peanut seed germination and vigor by plot replication were evaluated in Petri-dishes incubated over a thermal gradient ranging from 14 to 32 C at approximately 0.75 C increments. Peanut seed were counted daily up to 7 consecutive days after initial germination and considered germinated when the radicle was greater than 5 mm long, at which time seed was removed from the dish. Growing degree day (GDD) accumulation for each temperature increment was calculated based on daily mean temperature for that Petri dish as measured by thermocouples. A Lorentizian distribution model was used to establish the temperature and time (hours) to maximum germination. With respect to maximum germination and temperature; Georgia-07W (23.9 C) < Florida-07 (25.0 C) < Georgia Greener (25.2 C) < Georgia-06G (25.3 C) = Tifguard < Georgia Green (26.4) < Georgia-09B (27.1) = Georgia-02C. Non-linear regression indices from logistic growth curves with three parameters were used to elucidate seed germination by cultivar. These data included maximum indices of germination for each cultivar by year, GDD value at 80% germination ($Germ_{80}$), and temperature required by each cultivar for optimum germination. Peanut cultivar vigor varied by year with respect to overall GDDs to reach 80% germination ($Germ_{80}$) and maximum germination (*b0*). Ranking of cultivars by GDD to reach $Germ_{80}$ were: Georgia Green < Georgia-02C < Georgia-06G = Georgia Greener < Georgia-09B < Georgia-07W < Tifguard < Florida-07. This indicates that Georgia Green, a small seeded cultivar, had much greater vigor than Florida-07, a larger seeded cultivar, over the course of the experiments. Georgia-06G peanut seed were consistent with respect to germination, $Germ_{80}$, and *b0* among the eight evaluated cultivars over the six years of testing. All cultivars exhibited phenotypic variation by year, and genotypic stability across years.

Phenotyping Tifrunner×NC3033 RILs Population for the Transpiration Response Using Silver Ion

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Drought is a critical limitation on peanut yield. One trait that may help to ameliorate drought is limited-transpiration (TR_{limit}), defined as a limitation on further increases in transpiration rate under high vapor pressure deficit (VPD) conditions. The advantage of the TR_{limit} trait is that it allows soil water conservation for use during late-season drought to complete seed fill. However, direct measure of the TR_{limit} trait to identify superior genotypes is very laborious, so an approach to phenotype lines using a surrogate measure has been developed. This approach is related to plant hydraulic conductance, which appears to be associated with the activity of intrinsic plasma-membrane proteins, called aquaporins (AQPs). A tool for studying AQP activity has been exposure of plant tissue to AQP inhibitors. In the current study, de-rooted peanut shoots were exposed to silver nitrate and the change in transpiration rate was measured. The normalized decrease in transpiration rate (DTR) of the two extreme ends of 88 RILs were wide apart, from the least sensitive genotype (#626) to the most sensitive genotype (#647) to the silver inhibitor. A QTL was done for the 88 RIL based on the response to silver exposure. Four QTLs were identified based on the response of transpiration to silver nitrate (normalized DTR) only with F-Statistic but there wasn't association with permutations. The results with de-rooted shoots indicated the silver inhibitor test could be effective as a positive screen for peanut lines that potentially express the limited-transpiration trait.

Furthermore, based on the response of de-rooted peanut shoots transpiration (i.e., DTR) to silver fifteen peanut lines were selected to test directly the transpiration rate of whole plants with increasing vapor pressure deficit. Six out of 15 lines had a linear increase in transpiration rate with increasing vapor pressure deficit and 9 lines expressed the limited-transpiration trait. In particular, genotypes #604 and 730, which were insensitive to silver had breakpoints at vapor pressure deficit of 2.84 and 2.16 kPa, respectively. On the other hand, genotypes #647 and 681 were sensitive to silver and showed a linear increase in transpiration over the whole range of tested vapor pressure deficit.

High Throughput Single Kernel Near Infrared Prediction and Sorting for Oleic Content

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The discovery of high oleic peanut cultivars in the late 1980s offered peanut breeders the opportunity to develop a value added product with benefits to both commercial processors and consumers. Testing for this trait on single peanut kernels has traditionally been done via gas chromatography (GC), which is time consuming, expensive and requires removal of part of the seed, which can reduce seed germination. Near-infrared reflectance spectroscopy (NIRS) has been shown to successfully predict oleic content and linoleic content of both single kernels and bulk kernel lots. However, this process can still be time consuming and sorting of peanuts into separate high and normal oleic lots has to be done manually. In order for this technology to be successfully applied in breeding programs and commercial seed companies, a high throughput system for single kernel oleic prediction and sorting is required. Using the Brimrose Luminar 3076 Seedmeister NIR analyzer, absorbance spectra from 300 single kernels was collected from 1100nm to 2300nm. Several modifications had to be made to software and hardware components of the Seedmeister to enable accurate prediction and sorting, especially for larger Virginia size kernels. A partial least squared regression model was developed from the first derivative transformation of the raw spectra and 100 independent samples were then validated. This model successfully predicted and sorted between high oleic and normal oleic kernels based on oleic content. The model has been applied in the Australian Peanut Genetic Improvement Program to ensure high oleic purity in commercial seed lots .

Examination of the Impact of Peanut Maturity on Emergence, Vigor, and Subsequent Life History Traits. D.L. ROWLAND*, E.T. CARTER, Agronomy Department, University of Florida, Gainesville, FL 32611; B.L. TILLMAN, North Florida Research and Education Center, Marianna, FL 32446; T.L. GREY, Crop and Soil Science Department, University of Georgia, Tifton, GA 31794.

While germination percentages of peanut seed are typically in the 80-90% range, emergence rate can be drastically different. Of all germinable seed, approximately 50% will normally emerge in the field, leading to agronomic recommendations for planting densities in the range of 6 seed per foot to assure an emerged and established plant population of 4 plants per foot. This translates into significant seed cost to the grower, so that if emergence could be improved, a dramatic impact on economic return could be realized. In addition, characteristics of truly mature seed may also impact adult plant life history, including reproduction and eventual yield, beyond the effects attributed to germination and emergence alone. Therefore, it is important to determine how emergence, seedling vigor, in-season phenology and performance, and eventual yield and quality differ among mature (black/brown pods) and immature (yellow1/yellow2 pods) seed. To address these issues, research was performed in 2014 to quantify the impacts and interactions among genotype and maturity groups on peanut yield and quality, as well as important performance characteristics including time to emergence, seedling vigor, flowering, pegging, and physiological responses in the field. The field trial was conducted in Gainesville, FL and the design consisted of a randomized complete block design with four replications. Seed from the cultivars TufRunner™ '727' and FloRun™ '107' were separated into yellow (immature) and brown/black (mature) classes and planted on 30 May. Emergence quickly reached peak levels (approximately 90-95%) for the mature seed in both cultivars by 8 days after planting (DAP); while maximum emergence for the immature seed was delayed to 17 DAP and only reached a maximum of 75 and 50% for FloRun™ '107' and TufRunner™ '727', respectively. While emergence was expected to be impacted, other season long traits were clearly different among maturity classes including leaf area index and reflectance indices (NDVI). Photosynthetic rates and chlorophyll fluorescence was also monitored between the mature and immature seed classes. These results clearly document the critical impact maturity has on seed peanut and that the level of maturity in commercial seed has lifelong impacts on plant performance long after simple germination effects have "worn off". Information in this study can be used to identify cultivars that are more highly impacted by immaturity, and by improving maturity in seed peanut overall, could ultimately decrease seed costs in production.

Identification of Peanut Lines with Superior Root Growth

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Root growth is closely linked to shoot growth, and varieties with superior root growth are better able to explore the soil for water and nutrients and yield more. Superior root growth benefits irrigated and non-irrigated growers as it improves both nutrient and water use efficiencies. Many studies have documented genetic, seed size, and maturity effects on peanut root growth. Yet, the number and control of the genes responsible for root growth is not well understood. Our goal is to study root growth characteristics using 20 peanut lines that included peanut lines known for either superior or poor root development. We believe these lines will help breeders and molecular biologists better define the number and location of the genes that control root characteristics, and expedite variety development with improved rooting characteristics.

We followed the movement of roots across the bed at 3 depths (18 cm, 36 cm, and 54 cm) using the carotene-inhibiting herbicide, fluridone. This herbicide does not move in the soil, or have any direct effect on root growth. We placed underground bands of the herbicide at different depths using a subsoil shank with a nozzle at at the base of the shank, and then worked the soil above to prevent roots from following a channel. When active peanut roots reach those depths the herbicide was absorbed and translocated to the leaves leaves, bleaching them. Results from our 2013 and 2014 field studies show root growth occurring throughout the growing season, significant differences in root growth between peanut lines, and significant differences due to seed size. Lines resulting from crosses of a similar genetic background showed separation in root growth that was reasonably stable over years,

Effect of Soil Moisture on Peanut Yield and Quality

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In the Virginia-Carolina (VC) peanut production region of the USA, distribution and amount of precipitation is often deficient during June, July, and August leading to recurrent droughts in many years. Most peanut production in the VC region and throughout the USA is rainfed; therefore the lack of precipitation during these months may have significant impact on yield and quality. Improving our understanding of how plants respond to water deficit stress and identifying drought tolerant genotypes is important for development of more tolerant cultivars. The objective of this study was to evaluate yield, grading characteristics, and oil profile of twelve peanut cultivars and breeding lines grown in the field with soil moisture conditions controlled by rainout shelters. Small 1.68 long by 1.82 m wide two-row plots were planted in mid-May in 2013 and 2014 at the Tidewater Agricultural Research Center and Extension Center in Suffolk, VA, in replicated experiments. Each block had 12 genotypes replicated three times in a RCB design. In mid-June at the beginning pod developmental stage, blocks were covered with three rainout shelters designated as well-watered, intermediate stress, and severe drought stress; the rainout shelters were removed in early September. During this time, each water regime was maintained by irrigation every week with a total of 172, 89, 246, and 104 mm for the watered and intermediate stress in 2013 and 2014, respectively. The shelter designated for severe drought stress was irrigated once with 36 mm in 2013 and 40 mm in 2014. From the well- watered regime (5062 kg ha^{-1} in 2013 and 6580 kg ha^{-1} in 2014), yield was reduced in average by 63% in 2013 and 48% in 2014 by the severe drought. The peanut growing season (May through October) in 2014 was 332 degree days less than in 2013, which probably influenced the difference in yield decrease among years at similar soil water content. Similarly, ELK, SMK, meat, fancy pod content and brightness decreased with decreased soil moisture in both years while the OK and DK content increased. It was speculated that the large-kernelled virginia-type is more drought-sensitive than small runners because large kernels require more water to fill. Indeed, each year Spain and Wynne, two large-kernelled virginia-type cultivars showed the biggest drop in yield due to severe drought. Those least affected by drought each year were the small seeded runner GP-NC WS 17 (tested as experimental line SPT 06-07) and large-seeded virginia-type N05006. Due to drought, oleic fatty acid decreased and linoleic fatty acid increased, but levels still varied significantly among cultivars. For example, the O/L ratio decreased from 17.3 under well watered status to 5.8 under drought for Spain; and only from 16.8 to 15.5 for Wynne. The drop in ELK content for Spain due to severe drought was 69% and that for Wynne 76%. This implies a direct effect of drought on oil accumulation beyond the possible effect due to drought-induced kernel immaturity. This work provided clarification of the drought effect on peanut yield and quality by using controlled water regimes at the field scale, and identified two breeding lines with improved drought tolerance, GP-NC WS 17 and N05006.

Joe Sugg Graduate Student Competition

Sponsored by North Carolina Peanut Growers Association

Moderator: Bob Kemerait, University of Georgia

Joe Sugg Graduate Student Competition *(Continued)*

Moderator: Bob Kemerait, University of Georgia

Joe Sugg Graduate Student Competition *(Continued)*

Moderator: Bob Kemerait, University of Georgia

Effectiveness of Current Boron Application Recommendations and Practices on Peanuts

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Boron (B) deficiency in peanuts has been shown to cause major problems in peanut plant growth and production. Deficiency of this micronutrient can cause hollow heart in seeds, splitting of branches, stunted growth, and increased flowering time. Toxicity can also cause reduced vegetative growth, and yield loss. Common practice of most producers in the Virginia-Carolina region is to apply boron every year with the second or third leaf spot application at the early or mid-bloom stages. Current recommendations in Virginia-Carolina is not more than 0.5 lb B/acre in one or two applications before August 15 if the soil B level is below 0.4 lb/acre. These recommendations are based on research done around the 1970's and do not take into account new cultivars with higher biomass, yield, and larger kernels. There have also been changes in common tillage and rotation practices since this research was completed. The objective of this study is to examine the suitability of recommended boron application rates and times on current peanut cultivars through their effect on yield, grading factors, and seed quality through germination.

Test plots of peanuts were planted at the Virginia Tech Agricultural Research Center in Suffolk Virginia in mid-May 2014. Plots were two rows of 1.68m long, and 1.82m wide, each. Liquid boron containing 9% elemental boron, and Solubor containing 21% elemental boron, were applied at planting, early bloom, mid bloom, and split applications between these times. Two rates were used, 0.3 lb/acre and 0.5 lb/acre elemental boron. Two peanut cultivars were used in this test, large-seeded Spain, and small-seeded Bailey. This was a split-plot design, replicated three times. The main plot was application time, with randomized rate, cultivar, and boron product within the plot.

There was a significant difference in boron content in new leaves and pegs and pods five days after foliar application of boron. There were no statistically significant yield differences for any of the treatments. There was a significant difference in boron content of harvested seed based on application time, even though yield was not affected. For plants that received boron at mid-bloom, kernel boron content was 18.8 mg kg^{-1}; or split applications including planting with mid- and early-bloom, kernel boron content was 18.0 mg kg^{-1} and 17.6 mg kg^{-1} respectively, these treatments had significantly higher boron concentrations in the seed. Those that only received boron as a split application at early and mid-bloom 16.1 mg kg^{-1}, or no boron at all 14.5 mg kg^{-1}, had a significantly lower boron concentration in the seed. This may have implications for postharvest seed quality. In addition, this suggests that current boron application practices on peanuts should be re-evaluated for optimization of peanut production and profit. Further research includes comparison of old and new peanut cultivars of both Virginia and runner types under current boron recommendations, as well as evaluation of multiple rates and times of boron application to identify optimum practices for current varieties for best yield, grading characteristics, and seed quality.

Determining Pest Status of Threecornered Alfalfa Hopper (Membracidae: Spissistilus festinus) in Peanut. B. BEYER*, M. ABNEY, and R. SRINIVASAN, Entomology Department, University of Georgia, Tifton, GA 31793.

Threecornered alfalfa hopper (TCAH), *Spissistilus festinus* (Say) (Homoptera: Membracidae), has long been an economic pest of soybean and alfalfa and has recently become common in peanut. *Spissistilus festinus* feeds by forming girdles, caused by a series of lateral punctures around the stem. These girdles can result in galls and the eventual pooling of photosynthates and nutrients that the insect feeds upon. Though *S. festinus* is currently being treated as a pest in peanut, no economic thresholds are available for the insect in this crop. The purpose of this study was to generate data needed to establish an economic threshold for TCAH in peanut. *Spissistilus festinus* were placed on caged peanut plants in field and greenhouse trials; treatment variables consisted of insect density and plant age. The number of stem girdles and pods was quantified and seed quality was measured in each treatment.

Middle-Season Drought Tolerance in a RIL Population of Cultivated Peanut

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A RIL population of 150 runner peanut genotypes, resulting from the cross of "Tifrunner" and "C76-16," was examined for middle-season drought tolerance over two different growing seasons, using an augmented experimental design. Plants were grown in environmentally-controlled rainout shelters and phenotyped using specific leaf area (SLA), visual ratings, and infrared photography. SLA measurements were taken before drought, after drought, and after recovery. Of these three times, it was determined that SLA measurements taken after recovery demonstrated the strongest correlation with yield for this population ($r = -0.23$, $p = 0.0027$). Additionally, heritability estimations were calculated for all traits studied, and the top and bottom bulks from the population were identified for the highest and lowest yielding genotypes across both years and treatments.

Pod Maturity in the Shelling Process

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Determining an optimum harvest date for indeterminate crops such as peanut is critical because it directly affects yield and grade. Historically, the assumption has been that growers will harvest at optimum maturity due to the positive impact on these two characteristics. The impact of peanut maturity on seed production may not be fully understood by producers, where immature seed may have reduced emergence and vigor. The goal of this study was to quantify the maturity of seed peanuts received by the Florida Foundation Seed Producers, Inc. (FFSP) at various stages of the shelling process: samples received from the field; after the in-shell samples were cleaned; after in-shell pre-sizing into two size classes; and after separation of in-shell samples at the gravity deck. Samples collected at each stage were blasted and separated into yellow and brown/black classes. Pods within each class were counted, dried, weighed, and graded. Maturity at each stage was assessed for four peanut genotypes: TUFRunner™ '727', TUFRunner™ '511', TUFRunner™ '297' and FloRun™ '107.' Preliminary results for TUFRunner™ '511' showed 62% mature and 38% immature pods directly from the field. After cleaning, there was no impact on maturity of the sample with 63% mature and 37% immature pods. However, in the pre-shelling sizing process where pods are sorted into "lead" (larger pods) and "small" (smaller pods) baskets, the lead basket contained 73% mature and 27% immature pods indicating a critical improvement in maturity level from the field samples. These results raise concerns about the potential impact of immaturity on seed peanut crops. However they show that improvements could clearly be made by modifying the shelling process and by singling out lead basket samples after the sizing process and by more accurate determination of maturity. These results also suggest that seed peanut lots are unlikely to be composed entirely of mature pods, and that perhaps large numbers of immature pods make it through the shelling process and that immature seed are planted by farmers.

Evaluating Sicklepod (Senna obtusifolia) Resistance to Imazapic

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The first herbicide resistant weed was documented in Georgia in 1992 (trifluralin-resistant goosegrass). Since then, four additional weed species have been confirmed to be resistant to four additional mechanisms of action. The occurrence and severity of weeds with resistance to glyphosate and ALS herbicides has increased scrutinyof escaped weeds following herbicide applications. Consequently, lack of weed control leads many to conclude that herbicide resistance has occurred, ignoring other potential causes. Imazapic has been used on a significant number of peanut acres in Georgia since 1996. Imazapic has a mechanism of action (ALS-inhibitor) to which weeds have previously developed resistance in Georgia. As a result, a reduction in the performance of imazapic on sicklepod has led some growers to believe that sicklepod may have evolved resistance to imazapic. Thus, populations of sicklepod seed were collected from 29 peanut fields during 2014 to screen for potential imazapic resistance in greenhouse studies. An imazapic-susceptible population, with no prior history of peanut production or imazapic use was acquired from Azlin Seed Company in Leland, Mississippi (AZ1).

The AZ1 seed was mechanically scarified, planted 15 seeds per flat, and grown under greenhouse conditions. The flats were thinned to 10 sicklepod plants per flat prior to treatment. The AZ1 plants were treated with seven rates (17, 35, 70, 140, 280, 560, and 1120 g ai/ha) of imazapic, with inclusion of nontreated control. The treatment was applied when the plants reached at uniform height of 5-8 cm. The registered use rate of imazapic is 70 g ai/ha. At twenty-one days after treatment, all plants were harvested at the soil surface, fresh weight measured, and a reduction calculated as a percent of the nontreated control. Data were fit to a log-logistic regression model, where one of the parameters is the I_{50} , which is the herbicide dose that provides 50% reduction in biomass. The I_{50} is useful for comparing herbicide susceptibility among populations.

The I_{50} of the AZ1 population was estimated to be 43.4 g ai/ha. At the registered use rate of 70 g ai/ha imazapic, AZ1 biomass was reduced 62% biomass. Eight of the where herbicide failure occurred were evaluated for their response to 70 g/ha imazapic and compared to the nontreated control for each population. All of these populations responded to 70 g/ha imazapic in a similar manner to that of the known imazapic-susceptible population (AZ1). However, one population (DC1) had 53% biomass reduction to 70 g/ha imazapic. Further testing was conducted on this population following the methods use with AZ1. Results indicated that the DC1 population had an I_{50} value of 9 g/ha imazapic, suggesting that like the other populations, it was susceptible to imazapic. For these eight populations, it does not appear that ALS resistance is an issue.

Worm Killer: Genetic Regulation of Nematode Resistance in Peanut

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Resistance to root-knot nematode was first introduced into *Arachis hypogaea* from diploid *A. cardenasii* resulting in the release of 'COAN' 2001. This resistance was paired with TSWV resistance in the cultivar Tifguard, released in 2007. This resistance is still the main source of root-knot nematode resistance for growers in the United States and has been transmitted within a large chromosomal block in many breeding programs. We identified two recombinants in a RIL population developed from a cross between Tifguard and nematode-susceptible Gregory that break the historical resistance introgression on chromosome A09. One recombinant exhibits COAN and Tifguard's near immunity to root-knot nematode and the other expresses an intermediate quantitative resistance. We carried out RNA sequencing analysis of infected and non-infected roots using Tifguard, Gregory, and the two recombinant plants. These data allowed us to fine map the introgression and narrow down the region containing the underlying molecular basis of resistance. Within this region, we identified a candidate gene that is only expressed in Tifguard and the recombinant with resistance like Tifguard. We also carried out differential expression using factorial linear modelling and identified sets of differentially expressed genes that describe the resistance and susceptible responses to nematode infection. In addition, we describe the differentially expressed genes that delineate the different resistances the two recombinants express. In all, our data present a window into the genetic regulation of nematode resistance, and offer a candidate gene for resistance along with new markers more tightly linked to that resistance. These data will be of great benefit to breeding programs using this source of nematode resistance.

Prescription Programs via Peanut Rx: Reassessing Application Timings for Late Leaf Spot of Peanut. A. FULMER*, A. CULBREATH, and R. KEMERAIT, JR., Department of Plant Pathology, University of Georgia, Tifton, GA 31793.

The initiation and subsequent application interval of prescription fungicide programs are directly related to the expected onset, and final intensity of leaf spot for a given risk level predicted by Peanut Rx. However, recent epidemiological studies on early (ELS) and late leaf spot (LLS) of peanut, caused by *Cercospora arachidicola* and *Cercosporidium personatum*, respectively, have demonstrated consistent differences in their development. As the onset of LLS was observed to be > 90 days after planting (DAP) across risk levels in 2011 and 2012, field trials were conducted in 2013 and 2014 to determine if its control could be enhanced by delaying fungicide timings. Each year, conventional and/or strip-tilled plots at the Coastal Plain Experiment Station's moderate risk RDC Pivot field were planted to the runner 'Georgia-06G'. Applications of azoxystrobin, propiconazole, or chlorothalonil were made for normal or delayed high, moderate, and low risk programs. In 2013 and 2014, the average onset of LLS in untreated plots was 90 and 100 DAP, respectively. Statistically, there was no difference in the normal and delayed high risk programs, but both had significantly lower LLS severity than all other treatments. The delayed moderate and low risk programs provided statistically better LLS control than their normal counterparts. However, for white mold (Sclerotium rolfsii) and yield, there were no significant differences between fungicide treatments, but all were better than the untreated check. This research demonstrates that late season applications are more effective than early season applications for control of LLS; however, the resulting gain in yield may be negligible.

Influence of Planting Date on Peanut Response to Injury from Thrips and Herbicides

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Early season control of weeds and thrips (*Frankliniella* spp.) is important to maximize yield of peanut in North Carolina. In one experiment conducted during 2013 and 2014, the influence of planting date (the cultivar Bailey planted approximately May 4, May 18, and May 28) on peanut injury from thrips feeding and pod yield following in-furrow and foliar application of insecticides (phorate and acephate, respectively) was determined. In a second experiment during these years with the same cultivar and planting dates, treatments included non-treated seed and seed treated with standard fungicide both with and without phorate applied in the seed furrow. Peanut stand, thrips injury, and pod yield were recorded. In a final experiment during 2013 and 2014 with the planting dates and cultivar described above, visible peanut injury and pod yield were determined when flumioxazin (107 and 214 g ai/ha) and flumioxazin plus pyroxasulfone (70 plus 89 g ai/ha and 140 plus 179 g/ha) were applied immediately after planting when either no insecticide was applied at planting or phorate (1.1 kg ai/ha) was applied in the seed furrow. In this experiment, visible estimates of percent injury were recorded 2, 3, and 4 weeks after peanut emergence.

A range of main affects and interactions were noted in all three experiments. Thrips injury was higher during 2013 than 2014 in most instances. When comparing thrips injury in absence of insecticide during 2013, higher injury was noted with early and late-planted peanut compared with peanut planted in mid-May. During 2014, injury was similar for early and mid-May plantings with injury during these dates higher than planting in late-May. Acephate increased yield regardless of phorate application or planting date during 2013 but not during 2014. Phorate increased yield during both years regardless of acephate application or planting date. Less peanut stand and more injury from thrips was noted when the fungicide seed treatment was not included. Yield was higher when phorate was applied regardless of seed treatment. Irrespective of phorate application, yield increased when seed was treated regardless of planting date. Visible injury and pod yield were affected by the interaction of year and herbicide. Response to herbicides and phorate was independent. Injury was affected by planting date with increased injury across all evaluations observed when rainfall occurred within 7 days after application. During these years significant rainfall occurred shortly after planting on May 28 as peanut emerged but was minimal following the first two planting dates. Regardless of herbicide or herbicide rate, greater injury associated with herbicide effects and stunting from thrips feeding was noted in absence of phorate compared with phorate applied in the seed furrow. Injury varied across years for herbicide treatments but was generally greater when higher rates of herbicides were applied. The higher rates of herbicides reduced yield compared with the standard rate but there was no difference in yield when comparing flumioxazin or flumioxazin plus pyroxasulfone. Although these data suggest that flumioxazin plus pyroxasulfone could be an effective alternative to flumiozaxin alone based on peanut response, other research has shown elevated injury from flumioxazin plus pyroxasulfone compared with flumioxazin and may limit the possibility of use in peanut.

Results from these experiments indicate that peanut response to pesticides used to control thrips, seedling disease, and weeds will generally be the same irrespective of planting date. While there were some interactions of treatment factors with planting date, the magnitude of these interactions was relatively minor compared with response due to main affects. The planting dates evaluated in these experiments are within the recommended timings for peanut grown in North Carolina.

An Assessment of Groundnut Aflatoxin Contamination Awareness and Mitigation Practices in Rural Uganda. J. JELLIFFE*, B. BRAVO-URETA, Department of Agricultural and Resource Economics, University of Connecticut, Storrs, CT 06269-4021; and C. DEOM, Department of Plant Pathology, University of Georgia, Athens, GA 30602-7274.

A major concern for groundnut producers is mold contamination, which can release toxic compounds known as mycotoxins into the pods. Aflatoxin, a particularly problematic mycotoxin produced by the mold *Aspergillus flavus,* negatively impacts the health of humans and livestock when consumed. It is a carcinogen and is known to cause birth defects when eaten regularly during pregnancy. Thus, Governmental agencies and non-governmental organizations alike, have made significant efforts to increase awareness and to mitigate the presence of aflatoxin in the groundnut supply chain.

The preponderance of aflatoxin contamination throughout groundnut producing regions in Africa is of particular concern as many households (HH) rely on subsistence-level farming for their nutritional needs. African groundnut farmers face many challenges in coping with significant in-field pressures in addition to the risk of aflatoxin contamination during post harvest and storage. The primary strategy to mitigate these pressures is through the use of improved technologies. At the field level, mitigation has been done through the adoption of best practices and dissemination of disease and drought resistant seed varieties. Similarly, adoption of best practices for harvest and storage may be implemented. Low yields from non-adoption leads to immediate adverse health effects through food insecurity. On the other hand, aflatoxin poses adverse health effects that accrue over longer periods of time from consuming contaminated groundnuts. This lack of immediacy presents itself as a particular challenge to the adoption of post-harvest handling and storage practices. Given the risks to rural HHs and communities there is growing attention in generating and disseminating information, particularly at the farm level, to increase the capability of effectively diminishing aflatoxin contamination in groundnuts in Africa.

This paper provides an analysis of aflatoxin awareness and the use of methods to avoid contamination in rural Uganda. Data from a survey of groundnut producing HHs conducted in 2014 is utilized in the analysis to determine the nature and scope of Aflatoxin awareness in the region. Statistical methods are used in order to determine the particular HH features related to aflatoxin awareness and prevention. Our preliminary results indicate that aflatoxin awareness as well as the use of best handling and storage methods is correlated with the proximity of the region and road access to well-established markets. Evidently, farmers that interact with larger markets appear to be better informed of aflatoxin and thus are more likely to implement prevention practices than those living in more remote areas. This finding is of particular relevance as it suggests that remote communities should be targeted for additional efforts to raise aflatoxin awareness.

Variation in O/L Ratio Demonstrated among High-Oleic Spanish-type Peanuts

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The prevalence of high-oleic (HO) Spanish-type peanuts has grown in recent years as HO cultivars are planted on a majority of the acreage in the states in the USA with the highest production of this market type. The widespread use of the HO Tamnut OL06 variety and the recent release of the HO Schubert and OLé varieties demonstrate the industry-wide incentive for HO production. Spanish-type peanuts are widely used in confectionary products due to their flavor profile. HO Spanish seed are valued for the increased shelf-life and stability they impart to value-added peanut products. However, HO seed are only able to increase stability if they have oleic- to linoleic- acid ratios (O/L) greater than 9. Previous work with other market types indicated that the development of O/L ratio is closely related to seed maturity; Spanish-type peanuts are regarded as maturing more rapidly than other market types. Due to their more rapid maturing and the dominance of planting of HO Spanish varieties it is believed that fewer challenges exist in producing HO lots which are free from normal-oleic (NO) seed. This study determined that the same challenges, which are present in runner- and Virginia-type, exist with ensuring the purity of HO lots of Spanish-type peanuts. Nine plants of Spanish-type peanuts planted from seeds which were genotyped for the HO trait were harvested and their pods removed by hand. The maturity of each of the pods was determined using the hull-scrape method. After maturity determination, individual seeds were removed from the pods and sized. The fatty acid profile of each individual seed (n=200) was elucidated and the O/L ratio determined. Twenty-five percent of the seed analyzed had O/L ratios below the threshold of 9. Additionally, genotypic analysis of the planting seed for this study showed that one of the nine plants did not have the HO genotype. These results have illustrated that Spanish-type peanuts are not free from the presence of NO seed among HO varieties. As all of the NO seed were not from the plant which did not have the HO genotype, it is apparent that seed maturity contributed to the presence of NO seed observed.

The Peanut Lipoxygenase Gene Family

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Lipoxygenases play critical roles in the development of peanut and its response to pathogens, especially nematode and *Aspergillus*. We designed a comprehensive study to characterize LOX genes in cultivated tetraploid peanut (*Arachis hypogaea*) utilizing the published whole genome sequence of the wild diploid progenitors (*A. duranensis* and *A. ipaensis*). LOX genes were assigned to functional classes and their differential expression across 22 different tissues was estimated using RNA-seq analysis. 24 and 25 LOX genes were identified in *A. duranensis and A. ipaensis*, respectively. Reciprocal BLAST, dot plot and adjacent genes provided evidence that 20 genes of one parent have orthologous counterparts in the other parent. In addition, we found that some genes are located in regions with inversions (chromosomes 6 and 9), intra-chromosomal translocation (chromosome 8) and inter-chromosomal translocation (chromosomes 6 and 9). All genes, except one pair, were placed in three classes, i.e., 13S_legumes, 13S_type_II and 9S_type_I. Differential expression analysis showed three prominent patterns; one group of genes is highly expressed in seed tissues (different stages), another group is highly active in tissues other than seeds and the third group expresses ubiquitously across all tissues. In addition, the analysis showed that all orthologous genes, except one pair, have the same expression patterns. These results were confirmed with southern and northern blot data (one and/or two probes for every expression group were used). Both results matched except for two probes, which showed a high expression for their genes in leaves, root and pericarp tissues in RNA-seq analysis; however, they showed a high expression in leaves and root tissues only in northern blot analysis. This discrepancy may result from cultivar differences since RNA-seq data comes from Tifrunner and RNAs for northerns were extracted from GTC-20.

Investigating the Biology, Epidemiology and Management of Neocosmospora Root Rot of Peanut in Australia. K.M. WENHAM*, V.J. GALEA, W. BRYDEN, School of Agriculture and Food Science, The University of Queensland, Gatton, Queensland, 4343; M.J. RYLEY, Centre for Crop Health, University of Southern Queensland, Toowoomba, Queensland, 4350; and G. WRIGHT, Peanut Company of Australia, Kingaroy, Queensland, 4610.

Fusarium neocosmosporiellum is considered an emerging soilborne disease of peanut (*Arachis hypogea*) crops that is increasing in importance in Australia. The root and crown rot pathogen has been identified in peanut growing areas in Queensland following the initial report of the disease in an irrigated peanut crop in 2005. Yield losses from disease outbreaks are estimated to be between 30-100% for commercial and trial crops with an annual economic value of up to $5.4 million. It appears that a combination of prolonged high soil moisture and high temperatures are conducive to severe outbreaks of the disease. Limited research has previously been conducted on *F. neocosmosporiellum* therefore the aims of the present investigation are to fully understand the biology and epidemiology of *F. neocosmosporiellum* and to develop disease management strategies. Evidence suggests that the pathogen can invade and survive saprophytically in plant residues of other leguminous species such as soybeans (*Glycine max*) and chickpeas (*Cicer arietinum*), as well as other non-leguminous species such as cotton (*Gossypium hirsutum*) and sorghum (*Sorghum bicolor*). It is likely that infected residues of these crops contribute to the survival of the pathogen and the build-up of inocula leading to disease epidemics when conditions become favourable. Findings to date suggest that the identification of effective management practices will be challenging.

Investigate the Heratibility of TSWV in Florida-EPTM'113'

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Spotted wilt caused by tomato spotted wilt virus (TSWV) is one of the major diseases affecting peanut (*Arachis hypogaea* L.) production in the Southeastern USA. Heritability expresses the proportion of the total variance that is attributable to differences of breeding value. Heritability helps breeders to predict breeding values for future generations, because it represents the potential of a population responding to selection. However, the occurrence, severity, and symptoms of spotted wilt disease are highly variable from season to season making it difficult to efficiently evaluate breeding populations for resistance. Baldessari's (2008) research showed the individual-basis heritability estimations by visual rating were between a wide range (0.01-0.71) and the values most frequently were in the low-medium range. The visual rating for TSWV is not accurate enough for estimating heritability. The absence of visual symptom doesn't always mean no virus infection and the wrong diagnosis will cause misjudgments and diminish the accuracy of heritability. We hypothesized *Immunostrip method instead of visual rating because it is a more promising alternative for detecting the virus and accurately estimate heritability of TSWV resistance.*

A $F_{2:3}$ and $F_{2:4}$ populations derived from a cross between Florida-EP^{TM}'113', a TSWV resistant cultivar and Georgia Valencia, a highly susceptible cultivar, were evaluated by both immunostrip testing and visual 1 to 10 scale rating for the detection of TSWV incidence. The Immunostrip results confirmed that symptomatic plants were infected by TSWV and many asymptomatic plants exhibited a positive immunostrip reaction. This result indicates that immunostrip testing is a more sensitive method for TSWV phenotyping, but infected plants can be identified. Linear mixed model was used to calculate the variance component in order to estimate the narrow sense heritability. The pedigree information was incorporated into the estimation. Our results show the heritability estimated by immunostrip data is higher than visual rating data, which means the selection based on the immunostrip can be more efficient regardless of the seasonal impacts (years, locations, high/low disease pressure).

Analysis of Genetic Diversity and Population Structure of Peanut Cultivars and Breeding Lines from China, India and USA. H.WANG*, P. KHERA, A. CULBREATH, University of Georgia, Department of Plant Pathology, Tifton, GA 31793; B. HUANG, X. ZHANG, Henan Academy of Agricultural Sciences, Cash Crops Research Institute, Zhengzhou, China 450002; M. YUAN, Shandong Peanut Research Institute, Qingdao, China 266100; R. KATAM, Florida A&M University, Department of Biological Sciences, Tallahassee, FL 32307; K. MOORE, AgResearch Consultants Inc., Shingler Little River Road, Sumner, GA 31789; R. VARSHNEY, International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), Patancheru, India 502324; L. XIE, Fujian Agricultural and Forestry University, College of Plant Protection, Fuzhou, China 350002; and B. GUO, USDA-ARS, Crop Protection and Management Research Unit, Tifton, GA 31793

Peanut (*Arachis hypogaea* L.) is an important source for edible oil and protein. It is important to identify genetic diversity of peanut for cultivar development. In this study, 111 SSR markers with high polymorphic information content (PIC) were used to assess the genetic variation of 79 peanut cultivars and breeding lines from different breeding programs in China, India and the US. These SSR markers amplified 472 polymorphic bands with an average of 4.25, and the average gene diversity and PIC were 0.480 and 0.429, respectively. The average gene diversity in the U.S., China and India peanut lines was 0.363, 0.489 and 0.47, respectively, whereas the average PIC values were 0.323, 0.43 and 0.412. The genetic diversity of the lines from China and India was higher than that of the U.S. lines, while within a country the genetic diversity of peanut lines from HAAS in China was the highest. A dendrogram based on neighbor-joining was created, which divided the 79 peanut lines into two major groups (G1 and G2). G2 group was further divided into five subgroups, G2a, G2b, G2c, G2d and G2e. Interestingly, all of the peanut lines from G1 were Spanish marker type. The grouping was generally related to the geographic origin and the peanut market types. The STRUCTURE analysis and the clustering using principal component analysis were basically consistent to the dendrogram. The genetic relationships reported in this study might be useful for selection of diverse parents for developing peanut cultivars with a broad genetic base. These SSR markers used in this study could be used for other molecular genetics and breeding studies in peanuts.

Integration of a Risk Index and Weather-Based Predictive Model to Better Manage Spotted Wilt in Peanut in the Southeast United States. B.W. WILLIAMS*, R.C. KEMERAIT, A.K. CULBREATH, Department of Plant Pathology, University of Georgia, Tifton, GA 31793; R.S. TUBBS, Department of Crop and Soil Science, University of Georgia, Tifton, GA 31793; R. SRINIVASAN, M. ABNEY, Department of Entomology, University of Georgia, Tifton, GA 31793; T.M. CHAPPELL and G.G. KENNEDY, Department of Entomology, North Carolina State University, Raleigh, NC 27695.

Plant viruses can cause serious production constraints and financial losses annually. The most effective management techniques require consideration of the vector populations and virus spread. Through an integrated approach, the contribution of a multi-model method to manage spotted wilt disease in cultivated peanut was investigated. Spotted wilt, caused by thrips-vectored *Tomato spotted wilt virus* (TSWV), is an important viral disease affecting peanut production in the southeastern United States. Current management tactics focus on minimizing spotted wilt severity by modification of production practices such as varietal selection, planting date, tillage, plant population and others. These factors are included in a risk index (Peanut Rx) and have been used effectively to account for and mitigate exposure to spotted wilt in peanut. However, this method fails to consider the importance of vector populations and virus intensity. Through the introduction of a spotted wilt forecasting model which accounts for these factors, disease pressure can be predicted. Such a predictive model was developed at North Carolina State University and is based upon multiple weather components. In this study, weather and spotted wilt incidence data were collected from peanut (2007-2014) and tobacco (2005-2014) trials. Final disease incidence in plots planted to tobacco ranged from 3.8 to 87.1 % and the spotted wilt forecasting model was effective at predicting disease severity in the southeast (observed versus predicted) (ME = 0.1083). Spotted wilt incidence data were collected in peanut trials conducted at multiple locations in southern Georgia and north Florida. Plots considered low, medium, and high risk to spotted wilt (Peanut Rx) were established in each trial. The relationship between the magnitude of risk (Peanut Rx values) and observed spotted wilt severity varied between years and locations. Based upon data collected, final spotted wilt incidence in peanut ranged from 0 to 98% over the course of this study. Additional analyses will be required to introduce a multi-model strategy where both disease pressure (weather-based model) and exposure (Peanut Rx) coincide. Such will provide options for better management of spotted wilt disease.

The Interaction Effects of Herbicide and Temperature on Peanut Germination

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Experiments were conducted in 2014 in field and laboratory to evaluate the effects of herbicides by temperatures on peanut germination and emergence. The interaction of temperature and herbicide effects on peanut seed germination and vigor were evaluated in Petri-dishes incubated over a thermal gradient at 21, 23, 27, and 30 C. Solutions containing flumioxazin at 0.01, 0.1, 1.0, and 10 ppm along with a nontreated control were added to the Petri dishes. All seed were allowed to incubate at the specified temperature and flumioxazin concentration for 5 consecutive days in total darkness. After 5 days, lights were turned on in the thermogradient to activate flumioxazin. Peanut seed were then counted for germination and radicle length was measured. Peanut germination was affected by temperature; however, it was not impacted by flumioxazin rate. In contrast, radicle lengths at all temperatures were reduced linearly with an increase in flumioxazin rate. Average kernel biomass was negatively impacted by temperature and flumioxazin rate: with an inverse relationship for each. With increasing temperature kernel biomass increased, but with increasing flumioxazin rate kernel biomass decreased. In field experiments, early season planting reduced initial plant size when used in combination with flumioxazin, but this was transient.

Yield and Physiological Response of Different Peanut Genotype Under Water-limited Conditions

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Water deficit and high temperature are serious threats to peanut production in the Southwestern U.S. Peanut (*Arachis hypogaea* L.) is the second most important legume in the world, with U.S. being the third largest producer. The annual worth of peanut production exceeds $1 billion to farmer and $6 billion to U.S economy. Decreased availability of irrigation water in major production regions in Texas, Oklahoma, and New Mexico require the development of a sustainable method for crop production under water-limited conditions. We are investigating the combined effects of heat and water deficit on physiological traits, yield, and quality attributes in peanut grown under a scheduled deficit irrigation scheme. Ten genotypes selected for heat and water deficit stress tolerance in our earlier experiments were evaluated under field conditions at Brownfield and Lubbock, Texas. In addition to yield and quality assessment, leaf-level gas-exchange was used to characterize plant response to abiotic stress (heat and water-deficit) that occurred between irrigation events. Genotype X treatment X environment X year, will give an analysis of the physiological and morphological response of each germplasm. As an outcome best performer (cultivar) under water-limited conditions, will be presented along with potential irrigation schemes for peanut production in water-limited environments. Experiment conducted during cropping season of 2014 revealed with high yield under high water treatment as ICGS-76 (3618 kg/ha) and C76-16 (3613 kg/ha), combined average from Lubbock and Brownfield yield. ICGS-76 under low water conditions did not perform well, it yielded an average of 1992 kg/ha which is 45% reduction from the high irrigation; making it an unsuitable candidate under water limited conditions. Whereas, C76-16 yield was about 2741 kg/ha under low water conditions, which is about 24% reduction compared to that of high water treatment; thus C76-16 is the best performer of the ten genotypes which were evaluated for the experiment under water-limited conditions.

Peanut Genotypic Root Architecture in Response to Irrigation

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Irrigated acreage in Florida accounts for about 47% of the total acreage used for crop production which has contributed to agriculture being the largest fresh water use sector in Florida (Marella, 2014). Increasing the water use efficiency of Florida's agronomic production is necessary to reduce the increase of freshwater withdrawal that is likely to occur as the number of harvested acres of irrigated land increases (NASS, 2012). The objectives of this study are to: (i) quantify early season peanut genotype root morphology in response to different deficit irrigation, (ii) determine the total sound mature kernel (TSMK) grade and pod yield for peanut genotypes treated with different irrigation rates. In 2014, peanut genotypes FloRun 107, TUFRunner 511 (*Arachis hypogea*), New Mexico Valencia C, and COC 41(*Arachis fastigiata*) were planted in a field trial on a well-drained loamy sand in North-Central Florida. Irrigation treatments were a rain-fed control, 60 and 100% ET_c replacement. Early season root development was assessed using mini-rhizotrons for quantifying early season root morphology. No differences were reported for total sound mature kernel grade (TSMK) when comparing the 60 and 100% ET_c replacement among each peanut genotype. FloRun 107 and TUFRuner 511 genotypes had greater yields when comparing the rain-fed and 60% ETc replacement to100% ET_c replacement. No difference in yields occurred when with COC 41 and New Mexico Valencia C. This data suggests that peanut yields of valencia type are more stable than runner peanut type when subjected to different water regimes.

Potential Roles of Environmental Oxidative Stress in Aflatoxin Production Revealed in the Aspergillus flavus Transcriptome.

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The contamination of crops with aflatoxins during *Aspergillus flavus* infection is exacerbated by the presence of abiotic stresses such as drought and heat stress. These stresses result in the accumulation of reactive oxygen species (ROS) in the host tissues which may function in signaling between *A. flavus* and the host plant, and may regulate aflatoxin production. In order to determine the specific mechanisms stimulated under oxidative stress in *A. flavus* and their relationship to aflatoxin production, we examined the complete transcriptomes of three toxigenic (AF13, NRRL3357, and Tox4) and three atoxigenic (Aflaguard, AF36, and K54) isolates which possess different degrees of oxidative stress tolerance. The isolates were cultures in aflatoxin conducive (yeast extract-sucrose; YES) and non-conducive (yeast extract-peptone; YEP) media supplemented with hydrogen peroxide ranging in concentration from 0 – 25mM. Total RNA was extracted and used in the construction of cDNA libraries for use in RNA sequencing. Initial quality determinations were determined on an Illumina MiSeq platform resulting in the generation of ~2.1 x 10^6 paired-end reads per sample with an average read length of 74.45bp, and an average GC content of 52.21%. In total >70% of reads mapped to the *A. flavus* reference genome, representing ____ unique transcript sequences (___% of known *A. flavus* transcripts). Further sequencing of the libraries is currently being performed on an Illumina HiSeq platform. By identifying the specific pathways regulated under oxidative stress in these isolates, the specific signaling molecules involved in promoting aflatoxin production will be better understood allowing for focused efforts in resistance breeding efforts.

Breeding, Biotechnology and Genetics II

Moderator: Shyam Tallury, Clemson University

Breeding, Biotechnology and Genetics II (Continued)

Moderator: Shyam Tallury, Clemson University

Phenotyping a RIL Population for Middle-Season Drought Resistance in Cultivated Peanut

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A RIL population of 150 genotypes, resulting from the cross of "Tifrunner" and "C76-16," was examined for middle-season drought tolerance over two different growing seasons, using an augmented experimental design. Plants were grown in environmentally-controlled rainout shelters and phenotyped using yield specific leaf area (SLA), visual ratings, and infrared photography. SLA measurements were taken before drought, after drought, and after recovery. Of these three times, it was determined that SLA measurements taken after recovery demonstrated the strongest correlation with yield for this population ($r = -0.23$, $p = 0.0027$). Heritability estimations were calculated for yield under drought stress ($h=0.20$) and irrigation condition ($h=0.32$), respectively. The top tolerance and susceptible lines from the population were identified for the highest and lowest yielding genotypes across both years and treatments, which will be critical genotypes for further genomic research on drought tolerance in peanuts.

Screening of the U.S. Peanut Minicore Collection for Tolerance to Drought and Heat Stress

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The U.S. peanut minicore collection was screened over two years at two locations in West Texas, the J. Leek Farm at Brownfield and the Texas Tech Experimental Farm at Lubbock under three water treatments, 75% evapotranspiration (ET) replacement (full irrigation), 50% ET replacement (mild drought) and 25% ET replacement (severe drought) based on the cotton model, with three replications in each treatment. Field measurements were taken at biweekly intervals during mid-season drought, extending approx. 42 to 105 DAP. Significant differences were found among accessions for SPAD chlorophyll, flowering, paraheliotropism, and canopy temperature, as well as plot height and width near the end of the growing season. Several runner accessions possessed high values for the first three measures. Pod yield demonstrated that several runner accessions performed better in field response measurements in West Texas than standard cultivars, with repeated yield improvements of 15%-20% over standard cultivars and ICRISAT drought tolerant germplasm accessions under water deficit stress. The minicore collection has also been evaluated at Pobé, Burkina Faso for tolerance to drought stress. At Pobé, Spanish accessions tended to perform the best in terms of yield; this may be due to the shorter growing season. In addition to consideration of yield, studies have identified accessions as having improved water use efficiency and heat stress tolerance. All the minicore accessions lack one or more needed agronomic or quality characteristics (particularly high oleic oil composition, good shellout, early maturity) needed for a successful variety, but we propose to use several accessions as parents to donate tolerance to water deficit or heat stress to commercial materials.

Performance of Genotypes Selected in Burkina Faso for their Resistance to Leaf Spots, and Drought Tolerance in the U.S. Minicore Collection. P. SANKARA*, Université de Ouagadougou, BP 7021, Ouagadougou 03, Burkina Faso; B. ZAGRÉ, M'BI BERTIN, Institut de l'Environnement et de Recherches Agricoles/Centre National de la Recherche Scientifique et Technologique, Kamboinsé, BP 476, Burkina Faso; M. BUROW, Texas A&M AgriLife Research, Lubbock, TX 79403; and A.T. NANA, Université de Ouagadougou, BP 7021, Ouagadougou 03, Burkina Faso.

Burkina Faso is a Sahelian country situated in the center of West Africa. Its population is estimated at 17 million inhabitants with 90% working in agriculture. The main crops are sorghum, millet, maize, rice, peanuts and cowpeas. In 2013-2014, Burkina Faso produced 348,688 tons of peanuts for a total area of 448,767 ha with an average yield of 718 kg/ha. This important cash crop is ravaged by foliar diseases including leaf spots, and also drought, which severely limit yields. As part of the Peanut CRSP and PMIL projects, a local variety, NAMA (a Virginia type, with long cycle but resistant to leaf spot) has been crossed with high yielding, short cycle American genotypes. The progeny genotypes which were tested in Burkina Faso since 2010 enabled isolation of the best ones in order to evaluate their performance in two localities in Burkina Faso- Gampéla in the center and Bobo in the southwest. Successive farming tests conducted under the supervision of women groups helped reveal medium cycle leaf spot–resistant genotypes with yields over 1 ton per hectare compared to the national yield of 750 kg/ha. These varieties have been proposed to womens' groups to improve groundnut production.

In parallel to this study and in collaboration with Texas A&M AgriLife Research, the U.S. peanut minicore plus checks have been tested in two localities in Burkina Faso for drought tolerance. These localities are Gampéla and Pobé, where drought pockets constitute an obstacle to peanut production. Vigor and withering caused by drought pockets have been observed on these genotypes. Several of the 112 genotypes tested proved tolerant to drought with satisfactory yields. Testing of these genotypes will continue in order identify potential varieties that can be proposed for release.

Genotypic variation for oil quality traits in groundnut (Arachis hypogaea L.) grown under intermittent drought. H.L. NADAF*, UAS, Dharwad, Karnataka, India; P.SRIVALLI, Ph.D Scholar, Department of GPB, UAS, Dharwad, Karnataka, India.

Drought is by far the most important abiotic stress contributing to crop yield loss in the semi-arid tropics (SAT) characterized by low and erratic rainfall. More than half of the production area, that accounts for 70% of the groundnut growing area fall under arid and semi-arid regions, where crop is frequently subjected to drought stresses for different duration and intensities. Very few efforts have been made to improve the nutritional quality of groundnut under drought stress conditions.
To investigate the genetic variability for the oil quality traits in RIL population developed out of the cross TMV-2 x 6-1, a factorial design considering two water regimes (well watered and water stress) as Factor A, while 299RILS+2parents+ 8CHECKS as Factor B was conducted during summer seasons of 2013 and 2014 at the UAS, Dharwad.

Phenotypic co-efficient of variation (PCV) was higher than genotypic co-efficient of variation (GCV) for all the characters studied indicating the influence of environment on the characters. Both GCV and PCV were low for oil content, protein content, eicosenoic acid, lignoceric acid, calculated iodine value, total polyunsaturated and saturated fatty acids during both the seasons. Medium GCV and PCV was observed for oleic acid, linoleic acid, palmitic acid, oleic to linoleic ratio, Linoleic to saturated fatty acids ratio and oleic acid desaturation during both the seasons.
All the oil quality characteristics have shown high heritability (h^2) values and low values of expected genetic advance indicating the preponderance of non-additive gene effects. This preliminary information on the genetic variability for oil quality traits is needed for further progress on the selection and breeding for oil quality under drought stress conditions in groundnut.

Progress in the Breeding of High Oleic, Early Maturing Peanut Varieties in Australia

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Dryland peanut production in SE Queensland, Australia has a high frequency (>70%) of severe end-of-season droughts which limit pod yields and leads to high aflatoxin risk. The Australian peanut breeding program has been developing new early maturing types that can escape severe drought stress and aflatoxin risk by maturing up to 30 days quicker compared to the traditionally grown full season Virginia/runner type varieties of 140+ days duration. These genetics can also be planted much later (e.g. mid January) and still mature before frost risk in May, and are also finding application in irrigated sugar cane farming systems where irrigation water is limited and return per Mega-litre is a key driver of productivity. Major breeding aims in our early maturity program over the past 15 years have been high kernel yield and relevant quality traits for our snackfood and manufacturing markets, including high oleic oil, large kernel size, good blanchability and great taste. As well, we have incorporated high levels of soil borne and foliar disease tolerance to significantly reduce input costs for growers. The program has released 4 early maturing varieties since 2007, including Walter (2007), Tingoora (2010), Redvale (2013) and Taabinga (proposed for release in 2016). Substantial genetic improvement has been achieved in the past 8 years, with mean kernel yield performance of the most recent release (Taabinga) being 50% greater than Walter, when averaged over 15 multi-year/location trials. Kernel size has also been significantly increased, with Taabinga averaging 51% v's 28% jumbo kernel grade (% of kernels riding over a 25/64" screen) compared to Walter. Foliar disease tolerance has also been enhanced with Taabinga being highly resistant to late leaf spot, leaf rust and web blotch relative to the highly susceptible Walter. The most significant advancement has been the lifting of overall kernel yield potential such that our new early maturity lines are now highly competitive with currently grown full season maturity varieties. For example, while Walter has a relative kernel yield of only 58% compared to Holt (full season runner check), Taabinga is achieving a relative kernel yield of over 90%. With quicker maturity, our early maturing genetics offers peanut growers' significant savings in input costs, including water and fungicides, and hence increased overall profitability. They also potentially offer improved yield and quality for peanut production systems in higher latitudes (e.g. Argentina, South Africa, Europe), where currently grown full season maturing genetics is often too long for maximum yield and quality performance.

Genetic Gain in Reduction of Four Peanut Diseases in the North Carolina State University Peanut Breeding Program. W.G. HANCOCK*, T.G. ISLEIB, S.C. COPELAND, J.W. HOLLOWELL, S.R. MILLA-LEWIS, Department of Crop Science, North Carolina State University, Raleigh, NC 27695-7629; B.B. SHEW, Department of Plant Pathology, North Carolina State University, Raleigh, NC 27695-7616.

The peanut (*Arachis hypogaea* L.) crop in North Carolina is subject to yield and quality loss from a number of diseases. Four that regularly cause crop loss and cost growers to manage are leaf spots caused by *Cercospora arachidicola* Hori and *Cercosporidium personatum* (Berk. & M.A. Curtis) Deighton, Cylindrocladium black rot (CBR) caused by *C. parasiticum* Crous, M.J. Wingfield, & Alfenas, Sclerotinia blight (SB) caused by *S. minor* Jagger, and tomato spotted wilt (TSW) caused by *Tomato spotted wilt tospovirus*. The N.C. State Univ. peanut breeding program has conducted replicated field tests to measure lines' reactions to these diseases for years, leaf spots longest and TSW shortest. Each year the test entry means are entered into databases for the different diseases. Even though it is the least tested disease, the database of TSW field results still extends back to 1996. Release of cultivars with even partial resistance to these diseases would save area growers substantial sums in management costs and might result in greater yield as well as improved pod and seed quality.

The databases of field reactions were subset to include data on any lines that were included in the trials for at least three years and tested since 2000 when TSW became an economic issue in the area. Line means were adjusted to a common environmental effect, and disease reaction was used as a dependent variable in a linear regression with the independent variable being the year of "numbering," *i.e.*, the year an accession number was assigned to the line and it was entered in an advanced test of some sort, generally five years before release if the line was released. Genetic gain was observed for all disease reactions. Decline in defoliation due to leaf spots, scored on a proportional scale of 1 (no defoliation) to 9 (complete defoliation) in plots grown without leaf spot fungicide, occurred at a rate of -0.0488 units yr^{-1} for cultivars, and -0.0160 units yr^{-1} for breeding lines. Over the same period, pod yield increased at a rate of 38.3 lb A^{-1} for released cultivars and 29.8 lb A^{-1} for lines. This indicates only a 0.32 unit decrease in leaf spot score for lines over a 20-year period, but an increase of nearly 600 to 760 lb A^{-1} in yield of unsprayed plots. Incidence of CBR-symptomatic plants measured in plots with no soil fumigant to control CBR declined about half as quickly in cultivars (b = -0.0076) as in lines (b = -0.051). The anticipated 20-year declines would be 0.30 for lines and 0.14 for cultivars. SB measured in plots on infested soil with no application of fluazinam or boscalid to control SB declined at approximately the same rate in both lines (b = -.0070) and released cultivars (b = -0.0067). Estimated disease reduction over 20 years was about 0.14. Although selection has been effective, SB can have such a severe effect on yield, and its control is so costly that efforts to breed for resistance must be increased. Similar rates of decline were also found for TSWV incidence (b = -0.0089 for cultivars versus b = -0.0121 for lines) in plots with seeds planted 20 in (50 cm) apart and with no insecticide applied to control the tobacco thrips (*Frankliniella fusca* Hinds) that vector TSWV. TSW cannot be controlled with chemical applications. The main methods of disease management have been to increase plant populations, a costly method because of increased seed cost, or to identify resistant cultivars. It is evident that phenotypic selection for resistance to these four diseases has been effective.

Breeding Adapted and High-Yielding Peanuts With Enhanced Market Qualities

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Under the Peanut Mycotoxin Innovation Laboratory (PMIL) project, SARI is carrying out a number of activities in direct collaboration with Texas A&M University and the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT). Activities include breeding for aflatoxin and leaf spot resistance, drought tolerance, confectionery type peanut and the up-scaling of breeder seed to satisfy a growing demand for peanut in the local and international markets. Previously under the Peanut CRSP, leaf spot resistance was successfully introgressed from interspecific hybrid lines and other donors into commercial cultivars from West Africa. In a participatory variety selection (PVS) activity in 2014 in Nyankpala, Ghana, one of such hybrid lines (GAF 1723) was the most selected on the basis of yield (2.2 t/ha) and resistance to leaf spot diseases. To facilitate widespread dissemination of new peanut varieties, demonstration plots are established at various locations and farmer field days are organized to introduce and educate farmers to improved peanut varieties and good agronomic practices. In collaboration with ICRISAT in 2014, pod yield of drought tolerant lines of over 2.0t/ha was realized in lines ICGV 13866 and ICGV 13830 compared to the check variety Nkatiesari with a yield of 1.2 t/ha. Yield levels of aflatoxin-tolerant varieties averaged above 1.1 t/ha. Progress has been made in the crossing program with crosses among various lines advanced to the third generation. Large seed size, leaf spot resistance, high oleic and aflatoxin resistance are some of the key traits introgressed. A program was also initiated to educate farmers on the dangers of aflatoxin to human and animal health and management practices to minimize contamination in the field and in storage.

Release of Four Virginia and Three Spanish Groundnut Genotypes in Malawi

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The goal of the Groundnut Improvement Program in Malawi is to exploit the potential of groundnut to contribute to national development by developing and deploying high yielding and stress resilient groundnut varieties with end-user preferred traits. The program collaborates with several partners including the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT). Recently, a variety release proposal was presented to the Malawi's Agricultural Technology Clearing Committee (ATCC) on seven new groundnut varieties that were generated by the program through research collaboration as well as farmer participatory variety processes over an 8 year period. From an initial entry of 20 genotypes each for the Spanish and Virginia botanical groups, six elite materials for each botanical group were selected for on-station and on-farm trials. The trials were conducted in all major groundnut growing agro-ecologies from 2007/08 to 2012/13 cropping seasons. Two released Virginia groundnut varieties (Chalimbana 2005 and Nsinjiro) and two released Spanish groundnut varieties (Chitala and Kakoma) were included as checks. The objective of the trials was to evaluate the genotypes for agronomic performance and elicit feedback from farmers regarding preferences in a participatory variety selection approach. The trials were laid out using a randomized complete block design with two replications. Data were collected on yield and other yield components and several other agronomic traits and disease incidences. The data was analysed by using Genstat 15th Edition statistical package.

Based on three season data, the Virginia types ICGV-SM 01731, ICGV-SM 01724, ICGV-SM 08501 and ICGV-SM 08503 had a yield advantage over the best check Nsinjiro ranging from 14 to 20 %. These genotypes were also ranked by farmers as the most preferred genotypes in comparison to the local checks. For the Spanish types, ICGV-SM 01514, ICGV-SM 99551 and ICGV-SM 99556 consistently performed well across sites and registered highest mean kernel yield than the checks Kakoma and Chitala. These Spanish genotypes were also rated as the top 3 most preferred genotypes by farmers regardless of gender. Because of the excellent performance of the stated Virginia and Spanish genotypes, they were cleared by the ATCC in August 2014 to be released for use by farmers in Malawi.

Comparison of Bailey Virginia-Type Cultivar with High-Oleic Backcross Derivatives

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Since its release on 2008, the virginia-type peanut (*Arachis hypogaea* L.) cultivar 'Bailey' has become very popular among growers in the Virginia-Carolina production area due to its high yield potential and array of disease resistances. Nevertheless, Bailey has been criticized by area shellers because it is relatively small-seeded and does not deliver all the jumbo pods and super-extra large and extra large kernels they need for their customers. In addition, Bailey is normal-oleic while the NCSU peanut breeding project has adopted the objective of making the VC area all high-oleic. A backcrossing program was undertaken to develop a high-oleic version of Bailey. Seven BC_3F_6-derived lines are currently in the project's testing program. Six of those are in the Peanut Variety and Quality Evaluation program, the area's official variety test. Sufficient data has been collected within the state of North Carolina to make a statistical comparison of the yield, grade, disease reactions, and flavor of the backcross-derived lines with Bailey.

Databases maintained by the breeding program were subset to include only test-by-test means for Bailey and breeding lines N12006ol, N12007ol, N12008olCLSmT, N12009olCLT, N12010ol, N12014ol, and N12015ol. Some of the breeding lines are still segregating for the high-oleic trait and are under purification. Databases included: agronomic trials (yield and grade), disease trials [leaf spots caused by Cercospora arachidicola Hori and Cercosporidium personatum (Berk. & M.A. Curtis) Deighton, Cylindrocladium black rot (CBR) caused by *C. parasiticum* Crous, M.J. Wingfield, & Alfenas, Sclerotinia blight (SB) caused by *S. minor* Jagger, and tomato spotted wilt (TSW) caused by *Tomato spotted wilt tospovirus*], and flavor evaluations of sound mature kernel (SMK) samples from NCSU agronomic trials, conducted by a trained descriptive sensory panel in NCSU's Dept. of Food, Bioprocessing, and Nutrition Sciences and supervised by Dr. H.E. Pattee. Bailey was contrasted with the mean of the high-oleic lines, and variation among high-oleic lines was tested.

No variation at all was found for flavor attributes roasted peanut, sweet, bitter, astringent, fruity / fermented, wood-hulls-skins, nutty aftertaste, stale, or rancid, disease traits CBR and SB incidence, or agronomic traits jumbo pods, fancy pod brightness, weight of 100 pods, jumbo-to-fancy pod ratio, SMK, sound splits, total SMK, other kernels, meat content, support price or pod yield. Bailey differed from the mean of high-oleic lines for agronomic traits foreign material (0.3 vs. 0.8%, P=0.0006), loose shelled kernels (0.3 vs. 0.6%, P=0.0046), farmer stock fancy pods (62.9 vs. 70.1%, P<0.0001), weighted mean pod brightness (45.5 vs. 46.2 Hunter L score, P=0.0232), jumbo pod brightness (41.6 vs. 43.2, P=0.0188), fancy pods (43.3 vs. 48.6, P<0.0001), weight of 100 SMK (89.2 vs. 92.4 g, P=0.0057), super-ELK (11.3 vs. 13.3%, P=0.0084), ELK (41.5 vs. 45.8, P<0.0001), and crop value (649 vs. 765, P=0.0008). Variation among high-oleic lines was found for leaf spot defoliation (no line better than Bailey), yield of plots without leaf spot spray (one line better), and TSWV incidence (two lines better), and agronomic traits fancy pod brightness (all lines better), super-ELK (five lines better) and ELK (six lines better). Clearly, the high-oleic Bailey backcross derivatives have slightly larger pods and seeds and increased value per acre although yield was not increased. Flavor was not significantly affected, and disease reactions of the high-oleic lines were similar to those of Bailey. Additional testing will reveal whether or not one of the high-oleic lines would be a suitable replacement for Bailey.

Release of 'Emery' High-Oleic Large-Seeded Virginia-Type Peanut

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'Emery' is a high-oleic large-seeded virginia-type peanut breeding line selected in a conventional breeding program at North Carolina State Univ. (NCSU). It was released in the spring of 2015. This program was funded by grower check-off dollars from the National Peanut Board and the North Carolina Peanut Growers Association. Additional support for the project came from the North Carolina Crop Improvement Association, the North Carolina Foundation Seed Producers, Inc., and the Peanut Foundation. Emery was tested in the NCSU peanut breeding program's series of trials at three NCDA research stations in North Carolina from 2009-2014 (Peanut Belt Research Station at Lewiston, Upper Coastal Plain Research Station at Rocky Mount, and Border Belt Research Station at Whiteville), in the Peanut Variety and Quality Evaluation program coordinated by Dr. Maria Balota and run at five sites in Virginia, North and South Carolina, by Dr. Jay Chapin at the Edisto Research and Educ. Ctr. in Blackville, SC, and in the Uniform Peanut Performance Test in 2013 and 2014.

Emery has alternate branching pattern, intermediate runner growth habit, and medium green foliage. Emery has approximately 68% jumbo pods and 24% fancy pods, seeds with tan seed coat averaging 936 mg seed^{-1}, and extra large kernel content of approximately 47%. Emery has the high-oleic trait patented by the University of Florida. This trait includes modified fatty acid content of the seed oil with elevated oleic fatty acid content and depressed linoleic acid content that increases the shelf life of the seeds and products made from them. Emery is partially resistant or tolerant to three of the four most common diseases in the Virginia-Carolina peanut production area: early leaf spot caused by *Cercospora arachidicola* Hori, Sclerotinia blight (SB) caused by *S. minor* Jagger, and tomato spotted wilt caused by *Tomato spotted wilt tospovirus* (TSWV). Emery should be considered susceptible to Cylindrocladium black rot (CBR) caused by *C. parasiticum* Crous, Wingfield & Alfenas.

Emery is named in honor of Dr. Donald A. Emery, formerly the peanut breeder at NCSU.

Plant Pathology and Nematology II

Moderator: Barbara Shew, North Carolina State University

Chemical Control of Sclerotium rolfsii Incidence in Peanut Cultivars in the Hula Valley in Israel. M. DAFNY YELIN*, Northern Research & Development, P.O.B. 831 Kiryat Shemona Israel 11016; S. DOR, Golan Research Institute P.O.B. 97 Qatzrin Israel 12900; R. DAHAR, Ohalo College, Katsrin Israel 12900; O. RABINOVICH, Extension Service, Ministry of Agriculture, Kiryat Shemona Israel 10200; and Y. BEN-YEPHET, Department of Plant Pathology and Weed Research, Plant Protection Institute, the Volcani Center ARO, Bet-Dagan Israel 50250

Stem rot (white mold) caused by *Sclerotium rolfsii* has caused severe losses in several crops, including peanuts, in the Hula Valley, Israel. Fungicides that efficiently reduce damage caused by *S. rolfsii* in the USA are not satisfactory in the Hula Valley. **The goal of this research:** (i) to screen several fungicides in PDA plates, (ii) to examine the mobility of the fungicides in soil columns, (iii) to screen fungicide activity in Hula Valley peanut fields. **Results**: (i) The active ingredients (a.i.): 1.92 ppm prothioconazole, 2.5 ppm tebuconazole, 0.6 ppm azoxystrobin+1.0 ppm tebuconazole, 720 ppm hymexazol, and 2.5 ppm tebuconazole+1.25 ppm trifloxystrobin significantly inhibited mycelial growth in PDA plates. Thiophanate-methyl did not inhibit mycelial growth at a concentration of 3500 ppm a.i. Tebuconazole (250 ppm)+trifloxystrobin (125 ppm) inhibited sclerotium germination even after removal of the fungicide, whereas 60 ppm azoxystrobin+100 ppm tebuconazole or 720 ppm hymexazol did not. (ii) Tebuconazole (500 g a.i./ha)+trifloxystrobin (250 g a.i./ha) applied in 10 ml on top of a soil column followed by wetting the entire soil volume showed that the fungicide's inhibition of sclerotium germination on sand was significantly more efficient than on the local heavy and organic soils collected from the experimental site. (iii) In field tests with virginia type variety Harari (organic soil) using 4 applications of (a) 384 ml prothioconazole, (b) 700 g thiophanate-methyl, (c) 192 ml prothioconazole+350 ml tebuconazole, (d) 120 ml azoxystrobin+200 ml tebuconazole, (e) 500 g tebuconazole+250 g trifloxystrobin, and (f) 900 ml hymexazol+200 g/ha *Trichoderma* spp., but not (g) 1800 ml hymexazol alone, significantly reduced the number of disease loci in the experimental plot (1.93x12 m). The best treatment was the tank mix of tebuconazole+trifloxystrobin which increased the pod yield compared to the control by 730 kg/ha (8530 and 7800 kg/ha, respectively). However, none of the fungicides that were screened in the field raised the crop yield significantly due to the low disease incidence. **In conclusion**, chemical treatment of peanut crops in the Hula Valley does not afford a satisfactory solution for the *Sclerotium rolfsii* problem, probably due to partial adsorption of the chemicals to the soil.

Preliminary Examination of thePotential Risk for Qol Fungicide Resistance in Cercosporidium personatum, the Late Leaf Spot Pathogen of Peanut. W.M. ELWAKIL*, Doctor of Plant Medicine Program, University of Florida, Gainesville, FL 32611; and N.S. DUFAULT, Department of Plant Pathology, University of Florida, Gainesville, FL 32611.

Preliminary studies were conducted at the University of Florida (UF) in 2014 to assess the impacts that an increased usage of Qol fungicides might have on peanut leaf spot diseases control. Replicated field trials using cultivar Georgia-06G were established at three UF research stations located in Citra, Mariana, and Quincy, FL. Fungicide treatments in these field trials consisted of a single fungicide product sprayed 7 times for the compounds chlorothalonil (Echo 720®), tebuconazole (TebuStar®), azoxystrobin (Abound®) and pyraclostrobin (Headline ®) as well as an untreated check. Disease was assessed biweekly using the Florida 1 to 10 scale and by collecting 10 leaflets from each plot for severity and incidence. It was observed that the products had varying effects on the leaf spot pathogens. Early leaf spot incidence was significantly reduced by chlorothalonil and tebuconazole. Late leaf spot incidence was significantly reduced by chlorothalonil and pyraclostrobin. Both azoxystrobin and pyraclostrobin were observed to limit rust infections. However, yield increases compared to the untreated was about 3,500 lbs/A for chlorothalonil, and roughly 1,000 lbs/A for tebuconazole, azoxystrobin and pyraclostrobin.

Leaflets were also sampled from each site for a bulk *Cercosporidium personatum* spore germination test in-vitro on amended media with the compounds azoxystrobin and pyraclostrobin at 10 ppm. Relative spore germination on the fungicide amended media compared to the control were calculated for samples collected from each field site. The results from this in-vitro assay showed that bulk spore samples were sensitive to both Qol fungicides. Despite an apparent efficacy reduction of these fungicides in a field setting, no resistant isolates were observed in laboratory assays indicating that complete resistance is not currently present in Florida's late leaf spot pathogen populations. Further population surveys and investigations for the resistance gene G143A in *C. personatum* are currently in progress to provide more definitive evidence for potential development or occurrence of complete resistance to Qol group fungicides.

Multi-state Assessment of Elatus TM Peanut Disease Management Programs

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Elatus™ is a new broad spectrum foliar fungicide mixture of Solatenol ™ Fungicide and azoxystrobin. Elatus is a powerful new tool for management of foliar and soil borne peanut diseases. Elatus combines a new mode of action with proven chemistry to deliver complementary, consistently excellent, control of Southern stem rot (*Sclerotium rolfsii*), Rhizoctonia limb rot (*Rhizoctonia solani*), peanut leafspots (*Cercospora arachidicola and Cercosporidium personatum*), and peanut rust (*Puccinia arachidis).* Solatenol provides long residual control and application flexibility that results in outstanding disease control and while preserving peanut yield potential across a variety of pest pressures and conditions. Elatus is formulated as a 45% WG (wettable granule) containing 15% Solatenol and 30% azoxystrobin and is typically applied as part of a disease management programs that incorporates built in resistance management strategies while delivering optimum disease control. Elatus has been tested across the peanut belt for a number of years and results comparing Elatus programs to current and new disease management program has been summarized across locations to provide insights into best use practices and future research. Peanut fungicide programs including Elatus have shown excellent seasonal control of peanut diseases and resulted in improved yield compared to the best disease control programs currently available. Future programs may offer the potential to reduce the number of fungicide applications needed as well as expanding the window of control afforded by peanut disease management program.

[*Solatenol™ is a registered trademark for the active ingredient and not the tradename]

Yield Response, as well as Disease and Nematode Control with Velum Total on Peanut

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Impact of Velum Total on yield, as well as on the control of the peanut root knot and other diseases, were evaluated in 2013 and 2014 in an irrigated field infested with the peanut root knot nematode, *Meloidogyne arenaria* Race 2, at the Wiregrass Research and Extension Center. A randomized complete block design with 4 replications was used. Each plot consisted of four 30-ft rows on 36-inch centers. Plots were irrigated as needed. Velum Total at 18 fl oz/A in 2013 and 2014 was applied in-furrow over the seed in 5 gal/A spray volume. Propulse at 13.7 fl oz/A was applied approximately 60 days after planting (DAP) behind an in-furrow application of Velum Total or non-nematicide-treated plots and immediately watered in with 0.6 acre inches of water. Temik 15G at 10 lb/A applied in-furrow was included as a standard. Leaf spot control was obtained with seven applications of 1.5 pt/A Bravo Weather Stik 6F made at 2-wk intervals starting 40 DAP. Top growth vigor was rated just prior to plot inversion on a 1 to 5 scale, with 5 being best vigor. Leaf spot intensity was assessed using the Florida 1 to 10 rating scale just prior to plot inversion, while stem rot incidence (1 locus was defined as $\leq$ 1 ft of consecutive stem rot-damaged plants per row) and root knot damage to the pods and roots, which was visually rated on a 1 to 5 scale, was determined immediately after plot inversion. Soil samples for a nematode assay were taken immediately after harvest. Plant vigor, leaf spot intensity, and yield differed by year and nematicide treatment but stem rot incidence, the level of galling on the roots and pods, and final *M. arenaria* larval counts did not. In both years, similarly higher vigor ratings were noted for the Velum Total + Propulse and Propulse-treated peanuts than for the non-treated control, while Velum Total- and Temik 15G-treated peanuts had higher vigor ratings in one of two years. Higher leaf spot intensity ratings were recorded across all programs in 2013 than 2014. In 2013, all Velum Total and Propulse programs reduced leaf spot intensity with the former providing the best control. In 2014, Temik 15G-treated peanuts had highest leaf spot intensity ratings, while all programs had similarly low ratings for this disease. Over both study years, stem rot incidence was higher in the Temik 15G-treated peanuts as compared with Velum Total, Propulse, and non-treated control. The level of galling on the roots and pods was reduced when compared with the non-treated control with Temik 15G, and Propulse alone or in combination with Velum Total, but not with Velum Total alone. The lowest levels of root and pod galling were noted on the Temik 15G-treated peanuts. While final larval counts were higher in 2013 than 2014, similar larval counts were noted for all programs including the non-treated control. When compared with the non-treated control, yield gains were obtained with Velum Total in 2013 but not 2014, while higher yields were obtained with Propulse and Velum Total + Propulse in 2014. Yields recorded for the Temik 15G-treated peanuts and the non-treated control were similar in both study years. Similar yields were posted for Velum Total alone or in combination with Propulse, Propulse alone, and Temik 15G in both study years. Yields were lower in 2014 than 2013 for the non-treated control, Temik 15G- and Velum Total- but not Propulse- and Velum Total + Propulse-treated peanuts.

Assessment of Chemical Control for Management of Peanut Root-Knot Nematodes

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The peanut root-knot nematode, *Meloidogyne arenaria* race 1, is a serious pest in some fields in Georgia and elsewhere in the southeastern US where peanuts are produced. Since aldicarb (Temik 15G) is no longer available, producers have relied upon fumigation with 1,3-dichloropropene (Telone II) and the resistant variety 'Tifguard' to minimize losses to *M. arenaria*. In February 2015, Velum Total (fluopyram + imidacloprid) was labeled for management of nematodes and thrips affecting peanut production in Georgia. Field trials were conducted in 2014 to further assess the efficacy of Velum Total in the management of *M. arenaria* as compared to aldicarb (Temik 15G, 10 lb/A in-furrow at plant, with and without an application at pegging time) and 1,3-dichloropropene (Telone II, 4.5 gal/A) + phorate (Thimet 20G, 5 lb/A). Peanut, 'Georgia-06G', was planted at the Gibbs Farm and the Black Shank Farm to field with substantial populations of *M. arenaria*. The experimental design was a randomized complete block with at least four replications per study. Treatments included Velum Total (14 and 18 fl oz/A, in-furrow at-plant), Propulse (flupyram + prothioconazole, 13.69 fl oz/A, in-furrow or at pegging time following Velum total), Telone II (4.5 gla/A) + Temik 15G or Thimet 20G (5 lb/A) and Temik 15G (10 lb/A). Final nematode counts (juveniles/100 cc soil) varied between 54.3 and 603.8 at the Gibbs Farm and between 75.8 and 400.5 at the Black Shank Farm. Season-long suppression of root-knot nematode populations was only observed in plots fumigated with Telone II. End-of-season root-gall ratings (0-10) were low and not different among treatments at the Gibbs Farm. Root-gall ratings at the Black shank Farm were lowest where Telone II was applied. Ratings for Velum Total, 14 fl oz/A, were not different from Temik 15G, 10 lb/A. However, final root ratings for Velum Total, 18 fl oz/A, were less than Temik 15G.Yield at the Black Shank Farm were not significantly different among treatments. At the Gibbs farm, plots treated with Telone II, Velum Total, and Temik 15G (10 lb/A in-furrow + 10 lb/A pegging time) were statistically better than the lowest yielding treatments in each study. From the studies conducted in 2014, use of Telone II or Velum total (18 fl oz/A) can provide increased yield and reduced damage from the root-knot nematode in peanut production.

Recent Occurrence of Peanut Diseases in Arkansas

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In 2010, there was a renewed interest in peanut production in Arkansas and by 2014; Arkansas was recognized as a primary peanut-producing state by the USDA, Agricultural Marketing Service. Given the recent renewed interest in peanut, disease pressure is relatively low, but each year since 2012 new peanut diseases have been identified. In 2012, Rhizoctonia foliar blight of peanut is caused by *Rhizoctonia solani* AG1-IA was identified in a commercial peanut field near Biggers. Although this pathogen was recently detected on peanut, *R. solani* AG1-IA is a common and important pathogen of rice and soybean, causing sheath blight and aerial blight, respectively. In 2013, Sclerotinia blight of peanut caused by *Sclerotinia minor* was found in a commercial peanut field near Pocahontas. This was the first time *S. minor* has been detected on any crop in the state and possibly the Mid-South. In 2014, three new peanut diseases were detected; Sclerotinia blight (*S. sclerotiorum*), Early leaf spot (*Cercospora arachidicola*), and Late leaf spot (*Cercosporidium personatum*). *Sclerotinia sclerotiorum* has been previously observed on winter brassica cover crops, but this was the first time it was detected on peanut in Arkansas. Both leaf spot diseases were detected in research peanut plots near Newport and have yet to be confirmed in a commercial production field. Based on these observations, the number and diversity of peanut diseases has increased with all of these diseases occurring in the peanut growing area located in the northeast corner of the state. The occurrence and importance of these and other new diseases will be monitored to develop disease management strategies for the Arkansas peanut grower.

An Evaluation of Cercospora arachidicola Monocyclic Components of Three Newly Released Peanut Cultivars. L. GONG, H.L. CAMPBELL, K.L. BOWEN*, Entomology and Plant Pathology Department, Auburn University, Auburn, AL 36849.

Cultivated peanut (*Arachis hypogaea* L.) is an economically important crop that is produced in the United States and all over the world. *Cercospora arachidicola* (*C.a.*) is a major fungal disease of peanuts, which causes early leaf spot on the cultivated peanut, and threatens the yield with up to 50% losses. There is a need to evaluate recently released peanut cultivars, including Georgia-06G, Georgia-09B, and Georgia-12Y, for their varying levels of resistance to *C.a.* This study examines the monocyclic components (incubation period, number and size of lesions, and proportion of defoliation) of early leaf spot on these three cultivars using whole plants in a greenhouse under intermittent mist to simulate dew. The experiment used a randomized complete block design, with thirteen replications of each treatment. Five leaves of each plant were examined daily after inoculation.

Both incubation period as well as the number and size of leaf spots were significantly different between these three cultivars. Georgia-09B had the shortest incubation period of 7.5 days, while the incubation period for Georgia-06G and Georgia-12Y was 17.5 and 14.8 days, respectively. At 30 days after inoculation (DAI), Georgia-09B had the highest lesion counts of 139.6, while Georgia-06G and Georgia-12Y had 19.2 and 15.1, respectively. Georgia-09B also had the largest lesions at 2.0 mm diameter, while Georgia-06G and Georgia-12Y had 1.1 and 1.3 mm diameter lesions, respectively. In these three cultivars, Georgia-12Y had no defoliation at 30 DAI, while both Georgia-06G and Georgia-09B had about 1 defoliated leaflet. Georgia-09B had a significantly shorter incubation period, higher lesion count, and larger lesion size than other cultivars which suggests it is the most susceptible cultivar of the three evaluated.

Effects of Cultivar, Fungicide Frequency and Seeding Rate on Foliar Diseases of Peanut: Small Plot Trial Data from 2010 to 2013 in Citra, FL. N.S. DUFAULT*, Department of Plant Pathology, University of Florida, Gainesville, FL 32611-0680.

A 4 year study was conducted at the Plant Science Research and Education Unit in Citra, FL that examined the effects of cultivar, seeding rate and fungicide frequency on foliar disease development. Five cultivars (Georgia-06G, Florida-07, Tifguard, York and Georgia Greener) were planted at 3 seeding ratings (3, 4 and 6 seed per ft) and disease was managed with 3 varying frequency fungicide spray programs (3, 4 and 6 sprays) for a total of 45 treatments per year. In general, seeding rate did not affect disease intensity, but cultivar and fungicide spray frequency were observed to vary in their disease response. As the fungicide number increased the amount of disease decreased, however the magnitude of this effect was highly dependent upon cultivar. More susceptible cultivars (e.g. Georgia-06G) had higher yield increases from the 6 spray program than the less susceptible cultivars (i.e. York). The data collected from this trial indicates the importance of cultivar selection in determining the minimum number of sprays needed to manage foliar diseases and attain optimum yields.

Evaluation of New High Oleic Virginia-Type Peanut Cultivars for Disease Tolerance, Yield, and Quality. H.L. MEHL*, Virginia Tech Tidewater Agricultural Research and Extension Center, Suffolk, VA 23437-9588.

Virginia-type peanut cultivars were evaluated for disease resistance/tolerance, yield, and quality when grown under different fungicide programs and in locations varying in disease pressure. Cultivars included a disease susceptible (CHAMPS) and tolerant (Bailey) variety and two new high oleic cultivars, Sullivan and Wynne. Fungicide programs consisted of a foliar program only (Provost 433 SC and Bravo 720), a foliar plus Cylindrocladium black rot (CBR) program (Proline 480 SC in-furrow), a foliar plus Sclerotinia blight program (Omega 500F), or an untreated check. Cultivars and fungicide programs were arranged in a randomized split-plot design with fungicide treatments in 16-row main plots and cultivars in 4-row subplots. Disease incidence and severity varied among the three Virginia test locations, with high levels of leaf spot and moderate levels of CBR at Suffolk location 1, moderate leaf spot and high CBR and Sclerotinia at Suffolk location 2, and low levels of disease at the Carson, VA location. Overall, Sullivan had good leaf spot tolerance and both Sullivan and Bailey had good Sclerotinia and CBR tolerance. All varieties yielded well in the absence of disease pressure (Carson location), but Sullivan was consistently the highest yielding variety. Grade characteristics varied among cultivars, but while fungicide treatments impacted yield, they had no effect on grade. The calculated commercial value on a per pound basis did not vary among cultivars or fungicide treatments, so only differences in yield impacted total value of the crop. Similar trials will be conducted in 2015 to further evaluate the performance of peanut cultivars and the value of fungicide applications.

Production Technology

Moderator: David Jordan, North Carolina State University

Production Technology (Continued)

Moderator: David Jordan, North Carolina State University

Effect of Rotation Length and Crop Species Between Peanuts on Agronomic and Pathogenic Variables. R.S. TUBBS*, Crop and Soil Sciences Department, University of Georgia, Tifton, GA 31793; T.B. BRENNEMAN, R.C. KEMERAIT, A.K. CULBREATH, Department of Plant Pathology, University of Georgia, Tifton, GA 31793; and J.P. BEASLEY, Department of Crop, Soil and Environmental Sciences, Auburn University, Auburn, AL 36849.

Incidence of numerous pests increase drastically when peanut (*Arachis hypogaea* L.) is grown in a short rotation. Comparisons of 1-, 2-, 3-, and 4-yr rotations with cotton (*Gossypium hirsutum* L.) and corn (*Zea mays* L.) were completed in 2013 and 2014. Results showed that leaf spot incidences (*Cercospora arachidicola* and *Cercosporidium personatum*) were highest in continuous peanut. Also, peanut root-knot nematode (*Meloidogyne arenaria*) populations increased at least five-fold for each year removed from the rotation when going from a 4-yr, to a 3-yr, to a 2-yr rotation. Populations were 70 times higher in continuous peanut compared to a 4-yr rotation. Average yield reduction from a 3- to a 2-yr rotation was a 5 to 11% drop, and reducing a 2-yr rotation to continuous peanut decreased yield by 34 to 42%. To ensure maximized production with minimized pest problems, great care needs to be taken with respect to crop rotation for peanut, and maintaining at least a 3-yr rotation (two full summer crops between peanut plantings) is necessary to keep peanut competitive in the commodity marketplace.

Effects of Herbicide and Fungicide Applications on Leaf Spot Diseases and Peanut Yield in Ghana

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Field experiments were conducted during the rainy seasons of 2009 and 2010 in Ghana at the research farm of CSIR-Savanna Research Institute at Nyankpala and on-farm at Bagurugu to determine the effects of herbicide and fungicide applications on leaf spot diseases in peanut. Herbicide and manual weed controls with or without foliar fungicide sprays were evaluated. A combination of two hand weedings or application of the pre-emergent herbicide Pendimethalin with one supplementary hand weeding and fungicide sprays with Triadimefon and chlorothalonil resulted in the lowest weed density and severity of both early and late leaf spot diseases, and the highest number of pods, plant biomass and pod yield. Weed management or fungicide sprays alone also lowered weed density and leaf spot severity and increased yield compared to untreated plots. The predominant weed flora at time of harvest was broad leaves followed by grasses and sedges. The study showed the importance of proper weed management and fungicide treatments for increased peanut yield.

Historical Contribution of the Peanut CRSP and PMIL to Peanut Growers in Ghana

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Peanut is an important crop in Ghana and in sub-Saharan Africa, contributing significantly to agricultural GDP. Peanut is cultivated for both subsistence purposes as well as local and regional export markets. Production of peanut is constrained by several factors. Yield can be reduced by competition for resources and injury from insects, diseases, nematodes, and weeds. Integrated Pest Management (IPM) programs initiated by Crops Research Institute (CRI) and Savannah Agricultural Research Institute (SARI) under the Council for Scientific and Industrial Research (CSIR) in collaboration with North Carolina State University (NCSU) have been developed to assist resource-limited peanut farmers in Ghana to increase production and profitability of peanut. Historically (from 1997 to date) several interventions have been developed and incorporated into production systems through the Peanut Collaborative Research Support Program (CRSP) and more recently Peanut Mycotoxin Innovation Lab (PMIL). Development and transfer of peanut IPM and production technologies through Farmer Field Schools (FFS) in collaboration with Ministry of Food and Agriculture (MOFA) extension staff have been widespread. For example, peanut farmers have been introduced to locally-available fungicidal soaps to manage aphids and other foliar diseases. These projects have also organized training programs to build capacity of CSIR-CRI technicians allowing fabrication of peanut and sheanut shellers and subsequent distribution to farmers. Two peanut varieties were endorsed by the national variety release committee in Ghana and were officially released in August 2012 (Yenyawoso, line ICG (X) SM 87057 and Otuhia, line ICGV 88709). Multi-location variety trials over 2 years at 4 sites in Northern Ghana and Burkina Faso identified released cultivar Nkatesari and ICGR-IS 96814 as high yielding cultivars with leafspot resistance and 80% higher yield than farmer-check cultivar Chinese. Application of fungicide and phosphorus fertilization was observed to increase yields twofold in on-farm trials in Northern Ghana. Under the PMIL, application of local soap (Alata) to manage aphids (vector of rosette virus disease) has been adopted by farmers. Oyster shells (calcium source) applied at flowering of peanut improved pod and kernel nutrition. For training, awareness creation and outreach programs, a production guide entitled *Integrated Practices to Manage Diseases, Nematodes, Weeds and Arthropod Pests of Peanut in Ghana* has been published. This manual is intended to serve as a source of reference for students, teachers, research scientists, farmers and agricultural managers to identify and manage the constraints to increase productivity and income from peanuts. Copies of these manuals have been distributed to Farmers, MOFA, NCSU, CRI, SARI, Kwame Nkrumah University of Science and Technology (KNUST), University of Development Studies (UDS) and scientists under the two projects.

Chemical Interruption of Flowering to Improve Harvested Peanut Maturity.

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Peanut (*Arachis hypogaea*) is a botanically indeterminate plant where flowering, fruit initiation, and pod maturity occurs over an extended time period during the growing season. As a result, the maturity and size of individual peanut pods varies considerably at harvest. Immature kernels that meet commercial edible size specifications negatively affect quality during processing due to their increased propensity for off flavors, higher moisture and water activity, and variable roasting properties. As peanuts progress toward maturation, late season flowering and subsequent pod development result in immature pods that will not have sufficient time to mature prior to harvest. Research was conducted from 2012 to 2014 at six irrigated and non-irrigated locations in the Southeastern peanut belt to determine the effect of late season flower termination on peanut yield, grade, and post-harvest processing characteristics. Cultivar was Georgia-06G. Two pesticides, (Diflufenzopyr-Na (D-Na) (BASF Biosciences)) and Glyphosate, were applied at three lower than normal rates and at two timings and compared with a "hand removal" and a non-treated control. When pooled across locations, application rates, and years, pod yield with D-Na and Glyphosate treatments were 9% and 4% greater than the untreated control, respectively. Sound Mature Kernels and Sound Splits were increased 1.5 percent. Specific rates and application timings within D-Na showed the highest and most consistent improvement on peanut yield, grade, and post-harvest processing characteristics.

Measurements of Oleic Acid among Individual Kernels Harvested from Test Plots of Purified Runner and Spanish High Oleic Seed.

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Normal oleic peanuts are often found within commercial lots of high oleic peanuts when sampling among individual kernels. Kernels not meeting high oleic threshold could be true contamination with normal oleic peanuts introduced via poor handling, or they could be immature and not fully expressing the high oleic trait. Beyond unintentional mixing, factors contributing to variation in oleic acid concentration in peanut kernels include market type, environment, maturity and/or kernel size; however, the relative influence of these factors, and their interactions, is not quantitatively well understood on the single kernel level. To better understand these factors while simultaneously excluding variation from unintentional mixing, seed from a high oleic Spanish cultivar and seed from a high oleic runner cultivar were carefully purified via NIR technology and subsequently planted in environmentally controlled test plots to analyze progeny for oleic acid chemistry. Post flowering, the soil in the pod zone in plot sections were either chilled (5-7°F below ambient), maintained at ambient or heated (7-10°F above ambient) to characterize soil temperature effects on oleic acid chemistry development. Fully randomized (4 reps) plots included the purified high oleic Spanish and runner cultivars, three soil temperatures, seed maturity (profile board), commercial kernel size classifications, and a late season flower termination protocol. At harvest, the oleic acid concentration of approximately 20,000 individual kernels were measured via NIR technology. Significant market type, temperature, maturity and size effects on high oleic chemistry among kernels were observed. Implementation of a late season flower termination protocol significantly, and positively, influenced high oleic chemistry of runner peanuts, minimized immature kernels not meeting high oleic threshold, and resulted in elevated and more consistent distributions in this key chemistry. Late season flower termination resulted in distributions within the runner peanut market type that were similar to those of the more botanically determinate, but lower yielding, Spanish market type. Data from this study improves understandings of expected natural variation in high oleic chemistry and suggests late season flower termination of runner peanuts as a viable strategy to maximize high oleic chemistry of individual kernels.

Validation of Adjusted Growing Degree Day (aGDD) Maturity Model for Predicting Optimum Maturity in Runner Peanut. W.S. MONFORT*, R.S. TUBBS, Crop and Soil Science Department, University of Georgia, Tifton, GA 31793; and D. ROWLAND, Agronomy Department, University of Florida, Gainesville, FL 32611.

Peanut cultivar and planting/harvest date studies were conducted to evaluate the utility of the adjusted growing degree day (aGDD) maturity model for predicting optimum maturity in peanut. Four peanut cultivars (Georgia-06G, Georgia-09B, Georgia -12Y, and Florun-107) were evaluated at the Ponder Farm on the Coastal Plains Experiment Station, Tifton, GA. Cultivars were planted on April 28 and May 12 at a seeding rate of 6 seed per foot. Peanut were managed using the University of Georgia peanut production recommendations. Adjusted degree day hours were calculated and each cultivar assessed for maturity as compared to the currently used maturity profile board. Cultivars were dug based on 2400, 2500, 2600, 2700 accumulated degree day hours. Digging dates for the April 28 and May 12 plantings were Sept 15 (2400), Sept 19 (2500), Sept 30 (2600), and Oct 10 (2700) and Sept 25 (2400), Oct 7 (2500), Oct 16 (2600), and Oct 30 (2700), respectively. Optimum maturity was achieved at 2500 aGDD hours for most cultivars for both planting dates except for Georgia-12Y. Optimum maturity based the maturity profile board was at the Sept 9 and Oct 7 digging dates which correlated with the 2500 aGDD hours. Cultivar yields for all cultivars except Georgia-12Y also supported the maturity profile board and the aGDD model assessment at 2500 aGDD hours.

Pest Management Strategies in Peanut in Northern Ghana

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This paper highlights peanut (*Arachis hypogaea* L.) as an important grain legume in the farming systems of northern Ghana (Northern, Upper East and Upper West Regions) due to its multiple benefits in providing food and cash and maintenance of soil fertility to support food security of rural livelihood. However, peanut is vulnerable to infestations of weeds and insects as well as pathogens causing disease.Slow initial growth of peanut during the first month after sowing and limited ability to compete with weeds requires timely and effective early season weed management.Sustainable weed management throughout the remainder of the season is also required to facilitate adequate pegging and overall protection of yield. Common weed control methods in peanut include stale seedbed production; hand hoeing 2 and 6 weeks after sowing, hand pulling, and crop rotation. Although limited in scope, some farmers are incorporating preemergence and postemergence herbicides into their weed management programs. The primary preemergence herbicide with residual activity against weeds includes pendimethalin (Stomp). Haloxyfop(Gallant Super), propaquizafob (Agil), and bentazon (Basagran) are applied to control emerged grasses. The most difficult-to-control weeds include grasses and sedges, although broadleaf are often more abundant in peanut. The parasitic weed *Strigagesneroides* is a serious pest of peanut, especially in fields with relatively low soil fertility. Termites are the most damaging insectpestin peanut under dry conditions that are common northern Ghana.White grub and millipedestend to be present at economically-damaging levels when fields have excessive soil moisture.In a relatively small number of fields termites can be controlled by chlorpyrifos applied prior to sowing. Scarification of pods by termites and other soil pests predisposes groundnut seed to mycotoxins including aflatoxin. Rosette disease, vectored by aphids, can reduce pod yield, although prevalence is sporadic in northern Ghana. Availability of resistance cultivars combined with cultural practices such as higher plant populations can minimize impact of rosette. Late leaf spot (*Cercospora personatum*), rust (*Puccinia arachidis*) and southern stem rot (*Sclerotium rolfsii*) are also prevalent in peanut and the use of local soaps such as 'Alata Samina' and 'Black Soap' can reduce some of the negative impact of these pathogens as well as incidence of rosette. Availability and costs of current peanut pest management practices on peanut productivity for small household farmers relative to food security will be discussed.

Effects of Planting Date on Yield of Five Peanut Varieties in Northern Mozambique

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Peanut (Arachis hypogaea L.) is one of the most important legume crops grown as food as well as cash crop in Mozambique. However, yields obtained by peanut producers are still very low, in part due to use of inappropriate agronomic practices (e.g. late planting, low plant density, etc.). The objective of this study was to evaluate the effect of different planting dates on yield of peanut varieties. The study was conducted in three consecutive growing seasons (2011/2012, 2012/2013 and 2013/2014) in different locations (3 seasons in Nampula Research Station, 2 seasons in Namapa Research Station, 1 season in Ancuabe district, and 3 seasons in Mapupulo Research Station). Nampula Research Station is located about 7 km from Nampula city. Namapa Research Station is located about 250 km north of Nampula city. Ancuabe district is about 120 km south of Pemba and Mapupulo Research Station is about 220 km South of Pemba. The treatments included two factors: planting date with 4 levels (December 15, December 24, January 3 and January 13), and variety with 5 levels (JL-24, ICGV 12991, ICGV-SM 01513, ICGV-SM 01524 and ICGV-SM 99568). The experimental design used was randomized complete block (DBCC) in a split-plot arrangement with four replicates. Planting date was assigned to the main plot and variety to sub-plot. The variables evaluated included: maturity, shelling percentage, 100 seed weight and yield. Data were submitted to analysis of variance where year x location was called environment. The results showed significant difference ($p<0.001$) for all traits, except for maturity where it was significant different ($p<0.05$) for the interaction between planting date and variety, and environment and planting date. In the case of yield, the December planting dates (15th and 24th) did not show any significant different and the highest yields (1013.8 kg/ha and 1029.7 kg/ha, respectively), and the January planting dates (3rd and 13th) did not show significant difference as well and had the lowest yield (650.7 kg/ha and 687.1 kg/ha). These results suggest that yields are increase I northern Mozambique if peanut planting is done before January

Evaluating Replant Options in Peanut at Multiple Planting Dates and Multiple Durations between Planting and Replanting. J.M. SARVER*, Department of Plant and Soil Sciences, Mississippi State University, Mississippi State, MS 39762; and R.S. TUBBS, Crop and Soil Science Department, University of Georgia, Tifton, GA 31793.

Plant stand establishment is a major consideration when making planting and early season management decisions in peanut (*Arachis hypogaea* L.). The unpredictable and often extreme weather and the ubiquity of pathogens in the southeastern United States often contribute to poor emergence and resultant plant stands below optimum. If plant stands are low enough, peanut may benefit from replanting via either supplementation of the original stand or by destroying the original plant stand and completely replanting. Planting date has also shown to be a major factor determining yield potential in peanut. A grower must consider original and potential plant stand from replanting, as well as yield potential of the original planting date when compared to potential at the replanting date. Field trials were completed in Tifton, GA and Attapulgus, GA in 2012 and 2013 to determine the effects of replanting on pod yield, market grade, and disease incidence at three time durations following two initial planting dates. Yield from replanting was greater than yield of the non-replanted, reduced plant stand treatment in two of eight site-year X initial planting date interactions. When replanting was beneficial, it was always at either the early or middle replanting date. In general, replanting via supplemental addition of seed yielded greater than destroying the initial stand and completely replanting. At the early initial planting date, market grade was lowest at the latest replant date. A grower considering replanting should make the decision as quickly after initial planting as possible in order to achieve the maximum yield enhancement possible.

Irrigation Scheduling Methods for Peanuts in the Southeast

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Five irrigation scheduling treatments along with a rain fed treatment were tested in 2014 at the Stripling Irrigation Research Park near Camilla, GA to determine the best option for producers in the Southeast, specifically Georgia and Alabama. The five methods tested were a UGA developed soil moisture system which consisted of three Watermark® sensors, called the UGA Smart Sensor Array (SSA), a SmartCrop© canopy temperature sensor, the UGA EasyPan, the UGA Peanut Checkbook Method, and University of Florida's PeanutFarm.

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

Four cultivars commonly planted in the region were selected and planted in two row plots within each irrigation treatment zone. The four cultivars were GA-06G, GA-12Y, TUFRunner 511, and TUFRunner 727. Variety differences were observed with the GA-06G generally being the highest yielding variety in each case. During the production season 12.33 inches of rainfall were received. The mean data show that the utilization of a soil moisture sensor is the best option for irrigation scheduling currently available. The applied irrigation amounts and corresponding mean yields can be viewed in table 1 below for each of the treatments.

Treatment	Irrigation Applied (in)	Total Water (in)	Yield (lb/ac)
Rain Fed	0.40	12.73	465.2
UGA SSA	9.40	21.73	6052.3
SmartCrop®	6.40	18.73	5642.0
UGA EasyPan	11.65	23.98	5725.0
UGA Checkbook	15.02	27.35	5025.5
UF Peanut Farm	7.90	20.23	4802.5

Poster Session

Organizer: Shyam Tallury, Clemson University

Poster Session (Continued)

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Field Performance of New Peanut Genotypes in Texas

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Cultivar selection is one of the most important decisions a peanut producer can make. Texas is unique in that all four peanut market-types (Runner, Spanish, Virginia and Valencia) can be grown. Production in the state is concentrated in the High Plains region, where several factors can influence which market-type(s) may be grown. Declining irrigation capacity and quality has increased the need for earlier maturing, high yielding cultivars. Recently, an emphasis has been placed on cultivar performance under varying field conditions. The objective of this research was to evaluate newly released peanut cultivars in production areas throughout the High Plains and Rolling Plains regions. Field studies were conducted in Gaines (2), Terry, Wilbarger, and Collingsworth counties during the 2014 growing season. While numerous cultivars were included at each location, emphasis was placed on the cultivars ACI 236, ACI 240 and ACI 243, which are being marketed as a "Running-Spanish" type. The Spanish cultivar AT 9899 and Runner cultivars AT 215 and Tamrun OL11 were included for comparison purposes. Production practices at each location were at the discretion of the collaborating producer, but followed local extension recommendations. Yield and grade parameters were used in the comparison of cultivars. A weakening in the integrity of vines occurred in one of the trials conducted in Gaines County. Attempts at identifying the cause were unsuccessful; however, differences in reaction among genotypes were observed. Overall, vine decline (on a scale of 1-10) was more severe for ACI 243 (7.8), ACI 240 (7.3) and ACI 236 (6.5) and intermediate for AT 215 (5.8) and AT 9899 (5.0) compared to Tamrun OL11 (3.5). A negative relationship was observed between vine decline and yield ($P<0.0001$; $R^2=0.7191$) and grade ($P<0.0001$; $R^2=0.5849$) for these genotypes. When combined across the three High Plains trials, pod yields for the three "Running-Spanish" lines were 1,122 and 838 lb/A lower than the commercial Runner and Spanish cultivars, respectively. Although maturity varied by location, trends in grades (SMK+SS) among the cultivars were similar with grades of ACI 236, ACI 240 and ACI 243 being similar to those of AT 9899, but 1.6 to 8.8% lower than Tamrun OL11 or AT 215. Similar trends for yield and grade were observed for the three cultivars compared to AT 215 and Tamrun OL11 in the Wilbarger County trial, whereas yields were not different among any of the cultivars in Collingsworth County. Trial averages for yield and grade at this location equaled 3,792 lb/A and 70.1% SMK+SS, respectively. Results from these studies corroborate previous findings as it relates to the high yield potential and grades associated with Tamrun OL11 and AT 215. The performance of the new "Running-Spanish" lines was poor in the High Plains, with mixed results being observed in the Rolling Plains. Additional studies comparing the agronomic aspects and disease reactions of these and new cultivars are needed. Further information on the cause and overall effect of the premature vine decline observed in this study is also warranted.

Irrigated Evaluation of Peanut Varieties

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Peanut variety selection is an on-going production issue in Jenkins County and the entire state. Three variety trials were conducted for crop years 2013 and 2014; two sites were conducted on-farm in Jenkins County and one site conducted at the Southeast Georgia Research and Education Center (SEREC) in Midville. The trial conducted at SEREC was conducted in collaboration with Clemson University. The experimental design for all three trials was a randomized complete block. The Jenkins and Midville sites were replicated three and five times respectively and were planted in an irrigated environment. Yield and grade (total sound mature kernels {TSMK}) were determined, and each plot was rated for tomato spotted wilt virus (TSWV). Varieties assessed included: Georgia Greener, Florida-07, Georgia-09B, FloRun 107, Georgia-06G, Georgia-07W, ASUS 6, ASUS 18, MRS 35, TUFRunner 727, Tifguard, Tufrunner 511, Georgia-12Y, Georgia-13M, and Georgia-07W. The highest yields were obtained at Midville, where the maximum and minimum yields were Florida-07 5942 lbs/A and ASUS-6 4297 lbs/A respectively. Data from the Midville trial suggests planting Florida-07 bested ASUS-6 by 1645lbs/A generating an adjusted net revenue of $329/A. Incidence of Tomato Spotted Wilt Virus (TSWV) did not significantly impact yield or grade.

Effect of Calcium Timing on Runner-type Peanut Yield, Grade, Seed Calcium, and Germination. R. YANG*, J.A. HOWE, Department of Crop, Soil and Environmental Sciences, Auburn University, AL 36849; G. HARRIS, Department of Crop and Soil Sciences, University of Georgia, Tifton, GA 31793; and K.B. BALKCOM, Department of Crop, Soil and Environmental Sciences, Auburn University, AL 36849.

Peanuts require sufficient Ca in the pegging zone for proper development. Timing of Ca fertilizer application to obtain the optimum yield and grade is therefore important for peanut producers. The objective of this study was to evaluate the effectiveness of timing of Ca fertilizer applications on peanut yield, grade, seed Ca, and germination. This study was conducted under non-irrigated and irrigated conditions at the Wiregrass Research and Extension Center (WREC) in Headland, AL, and Tifton, GA, and under non-irrigated conditions at the Gulf Coast Research and Extension Center (GCREC) in Fairhope, AL, in 2012, 2013, and 2014. Timing of Ca treatments included application of 1120 kg ha^{-1} gypsum at planting and early bloom, split application of gypsum at planting/early bloom and early/mid bloom, and combined application of lime at planting and gypsum at early bloom. Results showed that addition of gypsum and lime did not significantly increased peanut yield in either 2013 or 2014. Application of gypsum at planting and early bloom were equally effective on improving peanut grade and seed quality. Split application of 1120 kg ha^{-1} gypsum equally at early/mid bloom significantly increased peanut seed Ca and warm and cold germination in 2013, and peanut grade in 2014, compared to untreated control. Combined application of gypsum and lime did not significantly improve peanut yield and grade compare to plots receiving only lime at planting.

Effect of Calcareous Soils on the Productivity Parameters in Groundnut RIL Population

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The commonly observed iron deficiency chlorosis grown on calcareous soils is most prevalent in major groundnut (Arachis hypogaea L.) growing states of India causing considerable yield reduction. Alleviation of chlorosis in commercial fields in affected areas through soil/ foliar application of iron have inherent problems including lack of economic feasibility. Development of iron absorption efficient cultivars with higher productivity is the best economical and durable approach. In this regard, an effort has been made to quantify the effect of calcareous soils on various productivity parameters in iron absorption efficient and inefficient lines.

A recombinant inbred line population with 318 individuals from the cross TAG 24 (iron absorption inefficient) × ICGV 86031 (iron absorption efficient) were studied both under normal and iron deficient calcareous soils (Fe < 4 ppm) during the rainy season at College of Agriculture, Vijayapur, Karnataka, India. The phenotypic observations were recorded for VCR (1-5 scale: 1-highly efficient, 5-highly inefficient) and SCMR at 30, 60 and 90 days after sowing (DAS) for assessing the iron absorption efficiency and on various productivity parameters. In the study 146 recombinant inbred lines were found efficient. These lines have shown differential response for various productivity parameters under normal and calcareous soils. Further evaluation of these lines would help in isolating iron absorption efficient and productive lines for use under farmers fields.

Genetic Differences for Iron Absorption Efficiency Related Traits in Groundnut

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Iron deficiency chlorosis (IDC) is of common occurrence in groundnut growing areas with calcareous, alkaline and black soils which accounts to one-third of the Indian soils. Groundnut is sensitive to iron deficiency, but shows genotypic differences for iron absorption efficiency (IAE) response. A pot experiment was conducted using five genotypes with varying degree of IAE [ICGV 86031, A30b (efficient), TG 26 (moderately efficient), TAG 24, TMV 2 (inefficient)] in normal and deficit Fe soil types to determine underlying mechanisms. They were assessed for IAE related traits like visual chlorotic rating (VCR), SPAD chlorophyll meter reading (SCMR), chlorophyll (a, b and total) content, active iron (Fe^{2+}) content, and peroxidase activity in initial expanded leaves across five crop growth stages (20, 40, 60, 80, 100 days) and also for productivity traits.

Iron absorption efficient groundnut genotypes recorded significantly lower VCR, higher SCMR, higher active iron, chlorophyll (a, b and total) and peroxidase activity across all five crop growth stages compared to inefficient genotypes. Severity of chlorosis was highest at 60 days during which significant negative correlation was observed between VCR and IAE related traits like SCMR, chlorophyll (a, b and total) content, active iron content, and peroxidase activity indicating their utility as surrogate traits in screening for IAE in groundnut. IAE related traits showed significant positive association with productivity traits like pod yield, 100 seed weight, number of pods and primary branches. Pod yield reduction due to iron chlorosis in efficient genotypes was very less compared to inefficient genotypes.

Genetic Variability for Root Traits in Groundnut (Arachis hypogaea L.) Grown under Intermittent Drought. P. SRIVALLI* Ph.D Scholar, Department of GPB, UAS, Dharwad, Karnataka, India; and H.L. NADAF, Principal scientist, oil seed scheme, UAS, Dharwad, Karnataka, India.

Roots are expected to play an important role in adaptation to drought in groundnut where relation between root depth and pod yield under drought condition has been established. However, available information on the range of variation for root traits at population is still limited. To investigate the genetic variability for the root traits in RIL population developed out of the cross TMV-2 x 6-1, raised bed experiments were conducted during summer seasons of 2013 and 2014 at the UAS, Dharwad.

Significant genetic variation was observed amongst the RIL population for root length, root/shoot ratio, root dry weight and shoot dry weight after intermittent drought stress. Phenotypic co-efficient of variation (PCV) was higher than genotypic co-efficient of variation (GCV) for all the characters studied indicating the influence of environment on the characters. High genotypic coefficient of variation was observed for all the traits except shoot dry weight during summer 2013. Similarly, moderate GCV was observed for root length and shoot dry weight while root/shoot ratio and root dry weight exhibited high GCV during summer 2014. High heritability and high GAM was recorded for all the traits in both the seasons except for shoot dry weight in the water stress block during summer 2013. This information on the genetic variability for root traits provides valuable baseline knowledge for further progress on the selection and breeding for drought avoidance root traits in groundnut.

Adaptation of Peanut Varieties and Their Yield and Quality Under Osmaniye Conditions

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In this study, we compared the yield and end-use quality of the most cultivated NC-7 peanut and other 12 different peanut varieties alternatives (Halisbey, Sultan, Arıoğlu-2003, Ç-1, Osmaniye-2005, Bradley, Wilson, Batem-5025, Batem-Cihangir, Georgiya Green, Florispan ve NC-V 11) under Osmaniye conditions. Field research was conducted at Oil Seeds Research Institute in randomized blocks design with 4 replication. Flowering days, maturity days, Pod number per plant, pod yield per plant, pod yield per ha, 100 pod weight, 100 seed weight, seed/pod ratio, first classpod weight ratio, first class pod number ratio, second class pod weight ratio, second class pod number ratio, oil ratio, oil yield, protein ratio and fatty acid antayses were taken and analyzed.

We will discus the best performance of varieties under this contitions. The findings will be used for marketing of peanuts.

Source-Sink Ratio Among Different Branches Categories in Peanut

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In numerous studies peanut has been described as a crop which yield is mainly limited by sinks, resulting from analyzing different sowing dates, genotypes and environments. However, they have not included evaluations on genotypes with different growth habit and branching pattern, and the different branch categories of these genotypes. We found that there are differences among peanut botanical types in the distribution of dry matter both branches of different categories. Under the hypothesis that different branching patterns characteristic of the peanut types (Valencia, Spanish or runner), determine the categories of branches which can behave as sources or sinks; the aim of this study was to analyze, using different methodologies, the variability of the source-sink at plant level and among branch categories of genotypes with different branching pattern. The source–sink ratio (SSR) was estimated: (i) as crop growth per seed, and computed as the quotient between total biomass production during the effective seed-filling period and final pod numbers, and (ii) by analyzing the relationship between the pod number and weight at harvest. In all cases, the peanut crop yield was limited by reproductive sinks under prevailing conditions analyzed in this study. Could not find differences given by the different growth habit and branching pattern in the genotypes analyzed. Contrary to what was expected, all branch categories showed a sink limitation during the formation of yield numerical components, pods number and weight. The SSR of runner genotype ranged from 1.60 to 1.73 g pod^{-1} and an individual pod weight between 1.07 and 1.09 g in the main branches type. Similarly the spanish genotype had values from 1.77 to 2.24 g pod^{-1} and pod weight between 1.10 and 1.12 g. Furthermore there no was trade-off effect among the number and weight of pods which indicate that there was source in excess in main branches. According to the literature, the results for a wide range of genotypes indicate the possibility to achieve yield gains by improving the sink size, i.e. the fixation of harvestable structures and reproductive efficiency, even at the expense of a decreased ability of the assimilates source. Future research could analyze the dynamics of translocation of photosynthate between different branch types.

Shade Effects on Growth and Pod Yield of Different Branch Categories in Peanut

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In our previous study we showed that there were differences in the times of start, ending and duration of pods number and weight periods definition for each branch categories caused by a spatial and temporal variability. These changes were according to the growth habit and branching pattern of peanut genotypes. Therefore, the branch categories have different importance with respect to the contribution to pod yield. The aim was to evaluate the shade effect during definition periods of pods number and weight, on growth and yield of each branch type in peanut. A field study was carried out under none limiting conditions (2010/11) with two peanut genotypes Granoleico (runner type) and Utre (Spanish type), sown in Oct-08 and Dec-10. After R3 stage, shade was applied using a mesh with 85% of light exclusion for 10-day periods. Growth decreased under shade in both cultivars and sowing date, but after stress it continued with similar or somewhat lower growth rates than the control, so total biomass accumulated at harvest was lower in all shading treatments. Light stress affected all categories of branches in both cultivars without a differential effect on some particular branch type. Also, the hierarchy of each branch type contribution remained stable according to the growth habit and branching pattern.

Influence of Glyphosate + Dicamba Drift on Peanut Growth and Development

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Cotton (*Gossypium hirsutum*) varieties will be planted on limited acres in 2015 that are tolerant to glyphosate, glufosinate, and dicamba, but no dicamba will be sprayed until as early as 2016. There is concern that physical drift of dicamba may affect the growth and development of non-target crops such as peanut (*Arachis hypogaea*). Field studies were conducted in the Texas Southern High Plains (Seagraves), South Texas (Yoakum), and in Oklahoma (Fort Cobb) in 2014 and 2015 to evaluate peanut response to glyphosate plus dicamba when applied at three peanut growth stages (30, 60, and 90 days after planting (DAP)). Glyphosate plus dicamba at 1.5 lb ae/A (1X), 0.5X, 0.25X, 0.125X, and 0.0625X was applied using water as a carrier at 10 to 20 GPA. Visible injury was recorded throughout the growing season and peanut yield and grade determined. In 2014, both time of application and herbicide rate influenced peanut injury at Seagraves 28 days after each application timing. Injury decreased as applications were made further from planting and with decreasing herbicide rate. Across herbicide rates, approximately 80% injury was observed 28 days after the 30 DAP treatments, whereas approximately 60 and 15% injury was recorded following the 60 and 90 DAP applications, respectively. Both application timing and herbicide rate influenced peanut yield. The greatest peanut yield (6432 kg/ha) was observed in plots that received treatments at 90 DAP while yield was less for treatments made at 30 and 60 DAP (4955 kg/ha) when averaged across herbicide rates. At Yoakum in 2014, both time of application and herbicide rate influenced peanut injury when evaluated 28 days after each application timing. Across herbicide rates, the greatest level of injury (60%) was noted following the 30 DAP treatments while injury was similar following the 60 and 90 DAP treatments (26%). Peanut injury increased as herbicide rate increased. Herbicide rate influenced peanut yield at Yoakum. Yield from plots treated with the 0.0625X and 0.125X rates were similar to the non-treated plot yield; however, yields decreased following rates as low at as 0.25X. At Fort Cobb in 2014, an application timing and herbicide rate interaction was observed for peanut injury 28 days after each application timing. The greatest level of injury (>75%) was observed following the 1X rate applied at 30 DAP, whereas the 0.5X treatment caused only 10% injury at this application timing. Peanut injury was minimal and similar for all other rate by timing interactions. Yields at Fort Cobb decreased following all herbicide rates relative to the non-treated control plots. In summary, peanut injury and yield is influenced by both herbicide rate and application timing. These studies are being repeated in 2015.

Peanut Response to Aim and ET Applied as Harvest Aides

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Research was conducted from 2012-2014 to determine peanut and weed response to the herbicides Aim (carfentrazone ethyl) and ET (pyraflufen ethyl) applied at 1 or 2 oz formulated product/acre at 1 or 2 weeks prior to digging peanut pods and inverting vines. Peanut injury was higher when these herbicides were applied at 2 oz/acre compared with injury from 1 oz/acre. Injury caused by ET was higher than injury caused by Aim. However, yield was not affected by these herbicides regardless of rate applied or time between application and digging pods and inverting vines. In studies with weeds present, Aim desiccated morningglory but had a minimal impact on common lambsquarters, common ragweed, eclipta, and spurge compared with non-treated peanut. Although not compared directly in these experiments, greater injury was observed when herbicides were applied when temperature was higher. Results from these experiments suggest that Aim and ET can be applied to desiccate morningglories without injuring peanut enough to adversely affect peanut yield when applied 1 or 2 weeks prior to digging.

Possible Yellow Nutsedge Resistance to Cadre Found in a South Texas Peanut Field

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During the 2013 growing season, a grower called saying that Cadre was not controlling yellow nutsedge (*Cyperus esculentus* L.) in his irrigated south Texas peanut field. Cadre had been used in this field for the previous five growing seasons but prior to that time no Cadre or Pursuit had been used. After observing the nutsedge present in the field, the conclusion was that this herbicide had provided little or no yellow nutsedge control. It was decided to initiate a postemergence study comparing Cadre and Pursuit with Basagran or Zidua alone and in combination with Dual Magnum to determine if Cadre or Pursuit was the issue or if other factors such as coverage, spray equipment malfunctions, environmental conditions or other factors were the problem. When rated 6 weeks after application, Cadre or Pursuit provided only 20% control while Basagran alone or Basagran plus Dual Magnum provided $\geq$ 95% control. Zidua alone provided 70% control while Zidua plus Dual Magnum controlled yellow nutsedge 90%. Nutsedge tubers were collected and in greenhouse studies with Cadre or Pursuit applied up to an 8X rate, little or no control of yellow nutsedge was noted when compared with the untreated check. This field was planted to sesame (*Sesamum indicum* L.) during the 2014 growing season, therefore, no additional field studies have yet to be completed. Greenhouse studies are continuing.

At-Plant Fluridone Based Herbicide Programs in Peanut

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Herbicide-resistant weeds, including Palmer amaranth, have growers and industry searching for additional herbicide mode-of-action alternatives for use in agronomic crops in the southeastern US. Previous research studies have shown fluridone, a mode of action not utilized in peanut production, is highly efficacious on ALS-resistant Palmer amaranth and other economically important weed species. Therefore, the objective of this study was to examine at-plant fluridone combinations on weed control and crop response in peanuts. Field studies were conducted at Edisto Research and Education Center near Blackville, SC in 2014. Experimental design was a randomized complete block with 4 replications with individual plot sizes of 3.9 by 12 m. Virginia type peanut 'Bailey' was seeded at 15.2 seeds/cm on May 30, 2014. In the peanut study, PRE herbicides were applied in water on May 30, 2014 followed by early POST at 2-3 trifoliate stage and mid-POST at 30 days after planting. Soil residual treatment included fluridone at 0.11 and 0.17 kg/ha + flumioxazin at 0.11 kg/ha, fluridone at 0.17 kg/ha + fomesafen at 0.14 kg/ha, and flumioxazin alone at 0.11 kg/ha. Early POST treatment was paraquat at 0.18 kg/ha + bentazon at 0.56 kg/ha + acifluorfen at 0.28 kg/ha + s-metolachlor at 1.06 kg/ha followed by a mid-POST treatment was imazapic at 0.07 kg/ha + acetochlor at 1.26 kg/ha across all plots except the untreated. Percent weed control and peanut injury ratings were collected at early POST and mid-POST timings. Weed control data and cotton and peanut crop injury were analyzed using ANOVA and means separated at the P = 0.05 level. Overall, no significant crop response to fluridone was observed in peanut during the growing season. Fluridone plus flumioxazin and fluridone plus fomesafen provided 90% or better control at 30 days after planting (at the mid-POST application timing). At the use rates tested, the Virginia market type peanuts seemed to tolerate fluridone; however in previous studies, we have observed a temporary crop response in runner market type peanuts. Overall, fluridone as part of an intensive management program, provided good to excellent control of Palmer amaranth, pitted morningglory, and large crabgrass in peanuts. Fluridone, as part of an integrated program, would reduce the selection pressure on the PPO inhibitors, such as flumioxazin alone, in peanut production systems.

Developing an Economic Decision Aid for Replanting Peanut

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Georgia peanut producers often face environmental stresses that can negatively affect crop performance including poor plant emergence or sparse stand. One of the more difficult decisions producers encounter is deciding whether or not to replant a sparse stand. This study investigates the replant decision and develops a decision aid tool for peanut producers in South Georgia based on OLS and GLS regression models. The analysis estimates the economic feasibility of the replant option via supplemental addition of seed using partial budgeting analysis. The decision aid provides a yield estimate and calculates the expected gross revenue from a sparse stand. Then, it estimates the potential yield for replanting subject to the replanting date and seed rate selected, its expected gross revenue associated and the operational costs linked to this decision. Finally, the user can make the decision of whether or not to replant a sparse stand based on the comparison of the net benefit from the replant option and the expected gross revenue from retaining the initial sparse stand.

Assessment of Replant Options for Reduced Plant Stands in Peanut Planted in Strip Tillage

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Reduced tillage in crop production has several beneficial impacts including a reduction in soil erosion, higher accumulations of soil organic matter, and enhanced soil moisture and hydraulic conductivity. While peanut has traditionally been a tillage-intensive crop, growers have begun to experiment with, and accept conservation tillage as a legitimate option in peanut production. Strip tillage is a conservation tillage practice commonly used in peanut that uses a specialized subsoil shank pulled through crop reside to bust compacted soil and create a strip of bare ground in which seeds can be planted without disturbing row middles. Replanting peanuts may be agronomically beneficial when plant stands are below optimum. This study was designed to explore the optimum system for replanting peanuts planted in strip tillage which experienced below- optimum plant stands. Field trials took place in Tifton, GA and Citra, FL in 2012 and 2013 to determine the effects of replant treatments on pod yield, market grade (total sound mature kernels [TSMK]), and incidence of TSWV (Tifton 2012 and 2013; Citra 2012) and southern blight (Tifton 2012 and 2013). In Tifton 2012 and 2013, no replant treatments resulted in significantly higher yields than the below-optimum 5.9 plants m^{-1} treatment that was not replanted. Pod yield was increased by 24.5% by supplemental addition of seed within the original seedbed in Citra in 2012, while yield was increased by 16% by destroying the initial stand and completely replanting in Citra in 2013.Market grade, tomato spotted wilt virus incidence, and southern blight incidence were variable and were unaffected by replant treatment, indicating that Pod yield, and ultimately profitability, should be the major factors considered when deciding when and how to replant a peanut field with a below-optimum plant stand under strip-till management.

Disease Occurrence and Yield Response of Ten Peanut Cultivars at Three Alabama Locations

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Two Virginia type and 8 runner type peanut cultivars were evaluated for their reaction to early leaf spot caused by Cercospora personatum and late leaf spot caused by Cercosporidium arachidicola along with stem rot caused by Sclerotium rolfsii in south Alabama at the Brewton Agricultural Research Unit (BARU) in Brewton, AL; in central Alabama at the Chilton Research and Extension Center (CRES) in Clanton, AL; and in north Alabama at the North Alabama Horticulture Research Center (NAHRC) in Cullman, AL. The experimental design was a randomized complete block with 4-6 replications with 2-4 row plots 20 -30 ft in length on 36-42 centers. Chlorothalonil at 1.5 pt/A was applied for foliar leaf spot control. Leaf spot intensity was evaluated just prior to plot inversion using the Florida leaf spot scoring system and stem rot incidence was assessed immediately after plot inversion by counting the number of disease loci per row. At BARU, late leaf spot intensity and stem rot incidence was significantly higher for Flavorunner 458 than the remaining cultivars which had similar ratings for both diseases. While lowest yields were noted for Flavorunner 458, Georgia-06G and Tifguard yielded less than FlorRun 107, Georgia-07W,and Georgia-12Y. At CRES, early leaf spot was the primary foliar disease observed. Among the cultivars evaluated, the lowest leaf spot ratings were observed by Florida Fancy, FloRun 107, Tifguard, and Georgia-12Y. Leaf spot rating among the remaining cultivars was similar. While Flavorunner 458 had the highest incidence of stem rot, the lowest disease incidence was observed with Sugg and Georgia-12Y. Incidence among the remaining cultivars was similar. Green peanut yield weights were recorded for the CRES study. Among the cultivars evaluated, Flavorunner 458 had the lowest yield. Among the Virginia market type cultivars, Sugg yielded higher than Florida Fancy while Georgia-12Y yielded highest among the runner market-type cultivars, which had similar yields. At NAHRC, early leaf spot was the primary disease observed. Disease progressed throughout the growing season and intensified prior to inversion, where leaf spot induced defoliation the highest leaf spot induced defoliation was observed on Georgia-09B, FloRun 107, and Georgia-06G. The least leaf spotting and premature defoliation was noted on Sugg with the remaining cultivars having similar leaf spot ratings. Stem rot was absent so no counts were made. Yield was obtained from both green peanuts and again after they were dried to a moisture content of <10%. High yields recorded for Florida-07 were matched by the two Virginia market-type cultivars along with Georgia-07W and Georgia-12Y. Lowest yield was recorded for Georgia-09B and Flavorunner 458.

On-Farm Evaluation of a Seed Treatment and In-Furrow Granular Insecticide for Thrips and TSWV Management in Virginia Type Peanuts. J.K. CROFT*, Clemson University Extension Service, Orangeburg, SC 29115; and W.S. MONFORT, Associate Professor, Crop & Soil Science, University of Georgia, Tifton, GA 31793.

Thrips species and the disease they transmit, Tomato Spotted Wilt Virus (TSWV), comprise one of the major economically important pest – pathogen complexes throughout the eastern peanut belt in the United States. With the loss of aldicarb for use in peanuts, there is a need to evaluate alternatives for both efficacy against thrips and the effects on incidence of TSWV. For the first time, an insecticide seed treatment, Cruiser Maxx Peanut (thiamethoxam, Syngenta Crop Protection, Inc.) is now commercially available to peanut growers. In cooperation with the State Peanut Specialist, an on-farm trial, in Orangeburg County was conducted, with the objective of comparing Dynasty PD seed treatment + Thimet vs Cruiser Maxx Peanut seed treatment on three standard peanut varieties for management of thrips, TSWV incidence, and yield response. Plots compared Virginia type peanuts, (Bailey, Champ, and Sugg). Experiment treatments included: 1) Dynasty PD seed treatment + Thimet at 5.5 oz/1000 row feet, 2.) Cruiser Maxx Peanut at 0.318 mg ai/seed.

Plots were established in a randomized complete block design. Data collection included TSWV incidence and yield in pounds/acre. Results showed; 1) Bailey numerically out-yield Sugg and Champs, 2) Bailey numerically had less TSWV than Sugg and Bailey and Sugg had significantly less virus than Champs, 3) Relative to Cruizer Maxx, yield was numerically increased with Thimet in all varieties and more virus symptoms were present in Cruiser Maxx treated plots than Thimet treated plots.

Utilizing Local Research to Enhance Soilborne Disease Control Strategies in Southeast Georgia

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Farmers in southeastern Georgia face conditions common to the upper Coastal Plain coupled with historic peanut-soybean crop rotations that create disease problems distinct from other areas of the state. Peanuts produced here experience severe outbreaks of southern stem rot and Cylindrocladium black rot (CBR). In 2014, field studies were initiated to evaluate effectiveness of 11 fungicide programs for management of diseases of peanut. Research was conducted at the Southeast Georgia Research and Education Center in Midville. The experimental design was a randomized complete block with 6 replications. Peanut, 'Georgia-06G', was planted on May 12 and inverted on Oct 9. Fungicides included Bravo, Muscle ADV, Fontelis, Elatus, Abound + Alto, Priaxor, Convoy, Provost and Proline. Treatments were applied using CO_2-powered backpack and tractor-mounted sprayers. Severities of leaf spot, stem rot and CBR were low in this trial, likely as a result of drought conditions during the season. Severity of stem rot was generally less than 3 hits/plot; severity of CBR was typically less than 6 hits/plot. The highest yielding treatment included Priaxor and it bested the Proline/Provost program by 873 lbs/A with an adjusted increased net revenue of $179/A. In this study, 10 fungicide programs produced a positive return on investment despite low disease. Such information is helpful to growers in southeastern Georgia as they work to improve management of peanut diseases.

Evaluating the Performance of Sclerotinia sclerotiorum under the Effect of Registered Fungicides

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The pathogen *Sclerotinia sclerotiorum* causes sclerotinia blight which is a disease that affects several crops worldwide. This pathogen was reported on peanut and cabbage in New Mexico, and on peanut in West Texas; however, the extent to which the pathogen has spread is still unknown. The most effective control of the pathogen is to use resistant cultivars or apply fungicides to minimize plant infection. The objective of this study was to evaluate the performance (mycelium growth and pigmentation, and sclerotia and oxalic acid production) by *S. sclerotiorum* under the effect of four fungicides (fluopyram, penthiopyrad, fluazinam and boscalid) under laboratory conditions. A suspension of each fungicide was prepared at the recommended field rate, and spread and dried over the surface of solidified potato dextrose agar (PDA) medium. PDA plates with no fungicides were used as control. A 1-cm mycelium plug from one isolate of *Sclerotinia sclerotiorum* from peanut and cabbage was placed centrally onto amended PDA and control PDA plates. Mycelial growth and pigmentation, and sclerotia and oxalic acid production were recorded daily for one week. The study was repeated four times with five replications for each treatment. Results showed that fluopyram and boscalid reduce mycelium growth compared to control, fluazinam, and penthiopyrad. Sclerotia (on both isolates) and mycelium pigmentation (on peanut isolate only) were noticed on control PDA, and PDA amended fluazinam and penthiopyrad. All fungicides did not inhibit oxalic acid production based on the presence of yellow halo on bromophenol blue plates. This in vitro study will be validated with in planta testing of the fungicides.

Identification and Genetic Evaluation of New Resource for Pod Wart Tolerance in Peanut. D. FRAIMAN-MEIR, Y. SHEM-TOV, G. KAYAM, I. HEDVAT, R. HOVAV*, Department of Field Crops, Plant Science Institute, ARO, Bet-Dagan, Israel.

Pod wart disease severely damages the "within-shell" peanut industry in Israel and in several other locations worldwide, where peanut is routinely rotated with potato. The generators of pod wart are soil-borne bacteria from the *Streptomyces* genus that cause unsightly scabs which render the affected pods unmarketable. Since all elite Virginia-type peanut cultivars were reported susceptible, a new genetic resource for resistance for pod wart is required. Here, the identification and evaluation of a new genetic source for pod wart tolerance in peanut is described. The US mini-core peanut collection was evaluated for pod wart in field conditions and the 10% most resistant genotypes were reevaluated for another two years in three locations. This resulted with the identification of two "exotic" genotypes (*A. hypogaea* spp. *fastigiata* var. *peruviana* and *A. hypogaea* spp. *hypogaea* var. *hirsuta*) that were highly tolerant to pod wart with an average of 80% less infections than the control lines. Two genetic populations were prepared from a cross between these genotypes and an elite Virginia-type cultivar (Hanoch). Genetic analysis of segregating F_2 populations showed that pod wart tolerance is polygenic in nature with medium heritability estimates. No significant correlation was found between pod wart occurrence and pod reticulation, indicating that deep reticulation (characterizing the exotic genotypes) does not provide tolerance. In addition, no significant correlation was found between pod wart occurrence and pod yield, seed size, and meat content. However, pod wart was positively correlated with pod size and pod length, indicating that these two traits are genetically linked or that they are pleotropic to pod wart tolerance. This study suggests that pod wart tolerance can be selected in early generations of breeding pedigrees but large populations are needed for optimal pyramiding of other pod and yield related traits. A hypothetical model for resistance through a hypo-sensitivity reaction system is suggested and discussed.

Yield Loss Modeling for Late Leafspot and Rust in Groundnut

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Late leafspot and rust diseases occur together and cause considerable yield loss in groundnut. Cultivation of resistant varieties is the best strategy to stabilize productivity under disease epidemics. Several varieties resistant or moderately resistant to LLS and rust have been developed in groundnut, but most of them differ in yield loss even at the same level of disease due to complex interrelationships between disease and yield loss. Crop loss models have been employed to gain insight into these relations and to plan sound breeding strategies. In the present study, different empirical models were tested for their explanatory value for yield loss among 10 groundnut genotypes with varying level of resistance to late leafspot and/or rust. Towards yield loss modeling, disease severity at different growth stages and physiological traits viz., leaf area index (LAI), harvest index (HI), healthy leaf area duration (HAD), crop and pod growth rates(CGR and PGR) and partitioning coefficient (PC) were considered as independent variables, while yield loss as dependent variable in regression models.

Single point models based on disease did not explain the variation in loss completely, but revealed pod filling as the critical stage in determining yield loss. Multiple point models using disease at different stages marginally improved the explanatory value; Inclusion of physiological traits in stepwise regression models improved the R^2 considerably, revealing their relevance to yield loss. Yield loss varied significantly among the genotypes resistant to both LLS and rust (9-17%), moderately resistant to LLS or rust (18-26%) and susceptible to LLS and rust (30-42%). Resistant genotype, GPBD-4 had high yield potential with minimum yield reduction due to its high partitioning efficiency and pod growth rate. Though highly susceptible, TAG-24 showed tolerance by early cessation of vegetative growth and efficient translocation of photosynthates to pods leading to high harvest index.

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

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Sclerotium rolfsii and Rhizoctonia solani are soilborne pathogens that cause white mold and limb rot, major diseases in peanut production. The most effective control of these diseases has been with good crop rotation and fungicides. Fungicides cost Georgia's peanut farmers an estimated $80 to $100 per acre each year. Release of new varieties and promising fungicides could offer growers improved management options for white mold and limb rot. The objective of this research was to compare the economic return when either a reduced cost fungicide program or a premium fungicide program was applied to three different varieties (Georgia-06G, Georgia-07W and Georgia-12Y). The trial was established at the Vidalia Onion and Vegetable Research Center in Lyons, GA. The experimental design was a split-plot and each combination of treatments (fungicide program X variety) was replicated four times. Both programs included seven fungicide applications. The reduced cost treatment was developed around a 4-block tebuconazole (7.2 fl oz/A)/chlorothalonil (1.5 pt/A) program. The premium treatment was developed around a 3-block Fontelis (16 fl oz/A) program with a single application of tebuconazole/chlorothalonil as above. Peanuts were planted on May 28, dug on October7 and harvested on October 13. Plots were rated for leaf spot, TSWV, Rhizoctonia limb rot, and white mold. The most important diseases in the trial were Rhizoctonia limb rot and tomato spotted wilt virus.

Transpiration Efficiency and Association Mapping in the U.S. Peanut Minicore Collection

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Transpiration efficiency (TE) was tested gravimetrically in the U.S. minicore collection in pots at a rain-out shelter at Texas A&M AgriLife Research in Lubbock, TX. Pots were well-watered until 49 days after planting (DAP), after which one plant was harvested to assess pre-stress biomass. Each pot was then placed in a 1.5 mil polyethylene bag and tied at the base of the remaining plant to prevent evaporative water loss. Specific leaf area (SLA), SPAD chlorophyll meter reading (SCMR) and visual wilting ratings were recorded during the experiment. At 91 DAP, more than 50% of the plants had reached their permanent wilting point and the experiment was terminated. Transpiration efficiency was calculated as dry matter accumulation divided by total water loss. Significant differences were observed among genotypes for TE, SLA, SCMR, and wilting. Transpiration efficiency ranged from 0.1 to 4.9 g/kg and was positively correlated with SCMR ($R=0.110$, $p=0.04$). SLA was negatively correlated with SCMR ($R=0.407$, $p<0.001$), but not significantly correlated with TE ($R=0.002$, $p=0.90$). TE and SLA were negatively correlated with wilting ($R=-0.211$, $p<0.001$ and $R=-0.259$, $p<0.001$, respectively). Wilting was not significantly correlated with SCMR ($R=0.083$, $p=0.16$). The data obtained in this experiment were compared to previous SSR marker data for the minicore collection by association mapping using the software TASSEL (Bradbury et al. 2007). Six markers had significant associations with multiple traits in this experiment and could potentially be used for marker-assisted selection of genotypes with high TE.

Identification of SNPs for Arachis hypogaea L. Genotypes using WGS Based on the Two Diploid Reference Genomes. C. CHAVARRO*, B. ABERNATHY, D. BERTIOLI, S. JACKSON, University of Georgia, Institute of Plant Breeding Genetics and Genomics, 111 Riverbend Athens, GA; C.C. HOLBROOK, USDA-ARS 115 Coastal Way Tifton, GA; and J. CLEVENGER and P. OZIAS-AKINS, University of Georgia, Institute of Plant Breeding Genetics and Genomics, 2356 Rainwater Rd., Tifton, GA

Peanut (*Arachis hypogaea* L.) is one of the most important legumes in the world, especially due to high oil and protein content. This allotetraploid specie was originated from a cross between two different diploids *A. duranensis* and *A. ipaensis* with A and B genomes respectively, followed by whole genome duplication. Due to this allopolyploidy, it has been highly challenging finding allelic SNPs and polymorphic markers, especially for breeding purposes. Thus, it has been imperative the development of strategies using high-throughput technologies to identify great amount of markers for genotyping, especially using breeding populations at a big scale. Therefore, a group of 13 genotypes from the USDA-ARS/UGA peanut breeding program on the Tifton Campus, with different trait combinations such as disease resistance, drought tolerance, and pod morphologies were used for whole genome sequencing (WGS) to identify SNPs. Thereby, some of the genotypes are parents of the populations such as Tifrunner, NC3033, Florida 07, C76-16, SPT06-06 and New Mexico Valencia, etc., that were taken in this study and WGS libraries were developed and sequenced to obtain around 10x coverage in average as a source for SNP calling. Thus, an analysis of the SNPs identified was made to obtain polymorphic markers for genotyping especially in biparental breeding populations and the SNPs were classified either in genic and genomic regions based on the two diplod genomes as a reference.

Annotation of Transposable Elements in Peanut for Peanut Improvement and Genome

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Transposons are ubiquitous in all reported plant genomes, especially those with large genomes such as peanut. Once considered 'junk DNA" or "genomic parasites", transposons are now used as genetic tools for many agricultural and biological applications including molecular markers, transgenic vectors and insertional mutagenesis. We developed a bioinformatics pipeline by combining *de novo* annotation and homology-based sequence searches and developed a peanut transposon library consisting of 1,951 reference transposon sequences including both DNA and RNA transposons, all of these but the 3 reported are newly identified transposons. We found that transposons contribute 69% and 74% of the *Arachis duranensis* (AA) and *Arachis ipaensis* (BB) genome. The transposon fractions in peanuts are higher than any sequenced legumes; We revealed that 9.1% and 7.9% of the total transposons in *A. duranensis* and *A. ipaensis* are located in genes or potential promoters; Furthermore, we identified a potential active retrotransposons named AdLINE3 that shows polymorphisms between the two wild peanuts, is highly expressed and may can be used to develop new gene tagging system for peanut.

Identification of Molecular Markers Linked to the Resistance to Bacterial Wilt Disease in Peanut using bulked Segregant Analysis. Y. ZHAO, C.S. PRAKASH, G. HE*, Tuskegee University, Tuskegee, AL 36088; C. ZHANG, H. CHEN, W. ZHUANG, Fujian Agriculture and Forestry University, Fuzhou, China; M. YUAN, Shandong Peanut Research Institute, Qingdao, China; and R. NIPPER, Floragenex Inc., Portland, OR 97239.

Bacterial wilt (BW; *Ralstonia solanacear)* is a peanut disease of considerable importance in China. As conventional strategies for controlling this soil-borne pathogen have had limited success, development of resistant cultivars is being pursued. Molecular markers linked to disease resistance will help facilitate that via genome assisted breeding. Genome-wide SNPs were identified from restriction-site associated DNA sequencing (RAD-seq) tags using next-generation DNA sequencing technology. SNPs linked to BW resistance were determined in two bulks of 30 resistant and 30 susceptible plants along with two parental plants, using bulk segregant analysis (BSA). Polymorphic SSR and SNP markers were utilized for construction of a linkage map and for performing the QTL analysis in the F_2 population. Two QTLs (*qBW*-1 and *qBW*-2) for resistance to BW disease were detected in the linkage groups LG1 and LG10 and account for 21% and 12% of the bacterial wilt phenotypic variance. To confirm these QTLs, the F_8 RIL population with 223 individuals was utilized to obtain resistant data in a separate year and at a different location from the earlier F_2 population study. The QTL *qBW*-1 was confirmed by the interval in the LG1 in the F_8 population though the QTL *qBW*-2 could not be clarified as only fewer markers mapped in LG10. The *qBW*-1 identified related to disease resistance gene homolog (RGH) was considered as a candidate gene for resistance to BW. QTLs identified in this study would be useful to conduct marker-assisted selection and may permit cloning of resistance genes. Our study shows that bulk segregant analysis of genome-wide SNPs is an useful approach to identify molecular genetic markers linked to disease resistance in peanut.

Comparison of Peanut Genetic and Physical Maps Provides Insights on Collinearity, Reversions and Translocations. P. KHERA*, H. WANG, A.K. CULBREATH, University of Georgia, Department of Plant Pathology, Tifton, GA 31793; P. KHERA, S. KALE, M.K. PANDEY, R.K. VARSHNEY, International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), Hyderabad, India; J. WANG, University of Florida, Department of Agronomy, Gainesville, FL 32611; and B. GUO, USDA-ARS, Crop Protection and Management Research Unit, Tifton, GA 31793.

Genetic and physical maps are the valuable resources for peanut research community in understanding genome organization and serving as the basis for map-based cloning and marker-assisted selection. Physical maps of two diploid peanut progenitors, *Arachis duranensis* (A genome) and *A. ipaensis* (B genome), have been released in April 2014. Genetic maps of cultivated tetraploid peanut (*A. hypogaea*)(AABB) have been improved recently. Comparison between the genetic and physical maps, in term of marker positions and orders particularly related to the QTLs, may provide interesting information of the genome structure and marker enrichment in order to produce high-resolution genetic maps. Two genetic maps developed from two recombinant inbred line (RIL) populations, the S population (SunOleic 97R × NC94022) and the T-population (Tifrunner × GT-C20), have been improved with 248 (1425.9 cM) and 426 (1980.8 cM) SSR marker loci. These populations were phenotyped extensively and also were used for detection of quantitative trait loci (QTLs) for disease resistance, oil quality and agronomic traits. Significant collinear relationship was observed in addition to a few reversion and translocations between the genetic and physical maps. For the genetic map generated from S-population, 57% of the markers on the genetic map were mapped on the same pseudomolecules of the physical map (142 out of 248), while for the T-population, 206 of 426 marker loci (48.3%) were mapped on the same pseudomolecules of the diploid peanut. For example, the major QTLs in the S population were mapped on linkage group (LG) a01 and b03 which had 17 and 16 markers on each LG of the genetic map, respectively, but each had only 10 markers mapped on the corresponding pseudomolecules of the physical map. In the T population, the major QTLs were identified on LGa04, 05 and 06 which had 42, 24, 30 markers on each LG of the genetic map, respectively, but only 22, 15, 18 markers were mapped on the corresponding pseudomolecules of the physical map. The comparison will provide valuable information for improving genetic map resolution, fine mapping the QTLs and map-based cloning of the resistance and other important genes.

Transcriptome of Cultivated Peanut (Arachis hypogaea L.) Roots Infected by Bradyrhizobia Revealed Candidate Genes Involved in Nodulation. Z. PENG*, F. LIU, L. WANG, and J. WANG, Agronomy Department, University of Florida, Gainesville, FL 32611.

Biological nitrogen fixation in legume is an important process in supplying nitrogen to plants as well as in protecting the environment due to reduced demand for fertilizers. Nodulation in cultivated peanut remains unexplored compared to model species such as *Medicago truncatula* and *Lotus japonicus*. Bradyrhizobia infect peanut root via crack entry, which does not resemble the infection process in model legume species. Dissecting the genetic components controlling peanut nodulation may discover novel molecular mechanisms of nodulation. In this study, we investigated the transcriptional profiles in peanut roots during bradyrhizobia infection by using RNA-seq technology. Two pairs of inbred sister lines with each pair containing one nodulating line and one non-nodulating line, as well as their nodulating parents were subjected to inoculation with a single bradyrhizobia strain. Roots of 5 days after infection (DAI) of treatment and controls were harvested for RNA sample isolation and deep sequencing. A total of 570 genes were differentially expressed in nodulating lines compared to non-nodulating lines after infection. Five genes, as ortholog nodulation genes in *Medicago truncatula*, including ERN1, NIN, NFR1, NFR5, and NSP2, were all up-regulated. Hundreds of genes involved in peanut nodulation were not reported in other legumes species previously. Gene ontology (GO) enrichment analysis showed that the most significantly enriched GO term was oxidation-reduction process (16.05%), followed by response to stress (9.36%), cytoplasm (9.03%), and metal ion binding (8.36%). Further gene annotation and comparison with genes involved in nodulation of model species will reveal novel nodulation mechanisms and provide the foundation for nitrogen fixation efficiency improvement in legume and non-legume crops.

ISSR Molecular Markers a Good Tool for Characterizing and Classifying Peanuts (Arachis hypogaea L.) Bred lines for Registration. S. SANCHEZ-DOMINGUEZ*, C. SÁNCHEZ-ABARCA, and G. PEÑA-ORTEGA, Professors at Departamento de Fitotecnia, Universidad Autónoma Chapingo, Chapingo, Mexico.

With the objective of characterizing and classifying different bred lines for peanut registration, in this research, five experimental lines and three commercial materials of peanuts of two different growth habits were analyzed. Other interest was to assess the genetic variability among populations. 16 primers ISSR (Inter Simple Sequence Repeats) were used: seven from series number 9, and nine from series LOL, PHV and PIO, from Nucleic Acid and Proteins Unit Service (British Columbia University, Vancouver, Canada). ISSR2 was the primer more amplified and exhibed 17 bands, with a 25% of amplification through the eight materials. According to the Dice similarity coefficient (DS), material 06-06CH and 18-06CH were the most similar genetically, equal to 0.91 (DS). NC-17-UACH and 4-06CH, with only 0.79 (DS) were the less genetically similar materials. The factorial analysis using principal coordinate (PCO) allowed grouping the genotypes of *Arachis hypogaea* L. into four groups: CECH and 4-06CH made up the group I, 18-06CH, 06-06CH and NC-17UACH, were included in group II, Criollo rastrero de Cuauchi, group III, and group IV involved to Río Balsas and Matón Criollo de Cuauchi (controls). ISSR was an economic technique for could reach, our objectives.

Regeneration Procedure for Three Arachis hypogaea L. Botanicals in Uganda through Embryogenesis

D.K. OKELLO*, L.B. AKELLO, National Semi-Arid Resources Research Institute, P.O. Box, Private Bag Soroti, Uganda; P. TUKAMUHABWA, S.M. OCHWO, T.L. ODONG, Department of Crop Production, School of Agricultural Sciences, Makerere University, P.O. Box 7062, Kampala, Uganda; J. ADRIKO, C. MWAMI, National Agricultural Research Laboratories (NARL), Kawanda, P.O. Box 7065 Kampala, Uganda; and C.M. DEOM, Department of Pathology, University of Georgia, Athens, GA 30602.

Aims: A procedure was developed for embryogenesis from embryo explants derived from mature seeds of freshly harvested Serenut 4T, Serenut 1R and Acholi-white groundnut cultivars representing the three broad groundnut botanical classifications.

Methodology: This study explored the use of mature embryo axes as explants for somatic embryogenesis, and determined the factors that affect regeneration of three Ugandan groundnut cultivars. Freshly harvested mature seeds of the three groundnut cultivars were collected and the embryo explants were initiated on 3 media namely; Murashige and Skoog (MS) basal media with varying concentrations of the growth regulator 2,4-Dichlorophenoxy acetic acid (2,4-D); Chu N6 basal medium with vitamins (N6); and Callus Induction Medium (CIM). The shoot formation and elongation medium contained MS basal medium supplemented with indolebutyric acid (IBA) and 6-Benzylamminopurine (BAP) in isolation, and BAP in combination with a-naphthaleneacetic acid (NAA) and indoleacetic acid (IAA). For root induction, elongated shoots were transferred to MS medium supplemented with various combinations of NAA with IBA, BAP and a combination of IBA and Kinetin

Results and Conclusion: Different concentrations of 2,4-D elicited different callogenesis responses in the cultivars with Acholi white (Valencia botanical) and Serenut 4T (Spanish botanical) giving the optimal response at 5mg/l whereas Serenut 1R (Virginia botanical) showed best response at a concentration of 30mg/l. N6 and CIM supported callogenesis in Acholi white (AW) and Serenut 4T only. In all cultivars, maximum root production was gained when using MS medium supplemented with NAA- 1mg/l and IBA -2.0 mg/l. On the other hand, for Serenut 1R and Serenut 4T, BAP 2.5mg/l; NAA 0.5mg/l combination yielded higher shoot regeneration percentage whereas for AW BAP 3mg/l; NAA 0.5mg/l supported maximum shoot production. This is the first ever report of successful regeneration of the three groundnuts botanicals in Uganda. These results are likely to facilitate genetic transformation of three preferred Ugandan groundnut varieties.

Cytological, Molecular and Phenotypic Evaluation of a Peanut Interspecific Hybrid Population Derived from Arachis hypogaea cv. Gregory x A. diogoi (GK 10602; PI 276235). S.S. KANDHOLA, Punjab Agricultural University, Ludhiana, Punjab 141004, India; and S.P. TALLURY*, Clemson University, PDREC, Florence, SC 29506-9727.

Arachis wild species are a fount of useful genes, mostly for disease resistances. *Arachis diogoi* (GK 10602; PI276235) is a diploid ($2n=2x=20$) species with resistance to early- and late leaf spots, *Tomato spotted wilt virus* (TSWV) and rust. However, transfer of resistance genes into *A. hypogaea* is laborious and challenging. Direct crosses with *A. hypogaea* cv. Gregory as the female parent led to the production of a sterile, triploid ($2n=3x=30$) hybrid. Hybrid shoot cuttings were treated with colchicine (0.2%) resulting in the establishment of one hexaploid ($2n=6x=60$) hybrid plant. The hexploid plant was robust with thick stems and leathery leaves, conspicuously different from Gregory. The hexaploid hybrid plants were allowed to self-pollinate for 11 generations without artificial selection, by which time, most plants resembled *A. hypogaea* in plant habit, leaf shape, size, pod shape and size. The objectives of this study were to i) determine the ploidy levels and pollen fertility in the hexaploid hybrid progenies; ii) identification of simple sequence repeat (SSR) markers to monitor *A. diogoi* DNA in the progenies and iii) evaluate hybrid progenies for TSWV resistance in field tests. Cytological analysis of meiotic chromosomes confirmed the triploid and hexaploid hybrids. The triploid hybrids were highly sterile with pollen fertility of <5% and with large variation in pollen size. Initial hexaploid hybrids had pollen fertility of about 80% with mostly large pollen grains. Flow cytometric analysis of a random sample of hybrid progenies along with both parents indicated that the average genome size of the hybrids was 6.67 pg (range 6.51-6.91) versus 6.61 for Gregory and 3.59 for *A. diogoi*, suggesting that the hybrids were tetraploid. Pollen fertility in the progenies varied from 80% to 98%. It is likely that the hexaploid progenies had spontaneously lost chromosomes during the selfing generations and stabilized at teraploidy. Molecular analysis of progenies with SSR markers indicated marker bands unique to *A. diogoi* in the progenies suggesting introgression. Field evaluation of hybrid progenies for TSWV infection showed that about 64% plants had no disease symptoms, whereas, Gregory had 56% TSWV infected plants.

High-Oleic Virginia Peanuts in the Southwestern US: A Summary of Data Supporting the Release of 'VENUS'. K.D. CHAMBERLIN*, R.S. BENNETT, H.A. MELOUK, USDA-ARS, Wheat, Peanut and Other Field Crops Research Unit, Stillwater, OK 74075-2714; J.P. DAMICONE, Department of Entomology and Plant Pathology, Oklahoma State University, Stillwater, OK 74078; and C.B. GODSEY, Department of Plant and Soil Sciences, Oklahoma State University, Stillwater, OK 74078-1056.

'VENUS' is a large-seeded high-oleic Virginia-type peanut (*Arachis hypogaea* L. subsp. *hypogaea* var. *hypogaea*) that has enhanced Sclerotinia blight and pod rot tolerance when compared to the cultivar Jupiter. 'VENUS' is the first high-oleic Virginia peanut developed for and proposed for release in the Southwestern U.S. 'VENUS' (experimental designation ARSOK-V30B) is the result of a cross between the cultivar Jupiter, a non high-oleic Virginia peanut released by the Oklahoma Agricultural Experiment Station in 2000, and ARSOK-R2, a high-oleic advanced breeding line. Tests conducted in three locations across Oklahoma in 2012-2014 showed there was no significant difference between the yields of 'VENUS' and Jupiter. However, 'VENUS' graded significantly higher than Jupiter in two out of three locations. 'VENUS' also exhibited enhanced resistance to Sclerotinia blight (61% less) and pod rot (70% less) when compared to Jupiter. 'VENUS' is also similar to Jupiter in shelling and flavor profiles, but unlike Jupiter, it is high-oleic with an average O/L ratio of 26:1. The purpose for releasing 'VENUS' is to provide peanut producers in the Southwestern U.S. with its first high-oleic Virginia peanut, developed specifically for that region, with enhanced grade and disease resistance when compared to Jupiter.

Peanut Lipid Profile by NIR Correlation Spectroscopy

R.A. HOLSER, C. KANDALA*, USDA-ARS, Athens, GA 30605-2720; and N. PUPPALA, Agricultural Science Center, New Mexico State University, Clovis, NM 88101-1295.

Near infrared reflectance spectra (NIRS) were collected from *Arachis hypogaea* to guide the selection of germplasm and produce higher oleic acid varieties. The application of NIRS for total oil, protein, and moisture is routinely used by the food and feed industries, however, the ability to detect the component fatty acids of seed oils is not firmly established. Spectra of unsaturated C18 fatty acids such as oleic, linoleic, and linolenic acids share common features that pose a challenge for spectroscopic analysis. The standard method to determine lipid profiles is by gas chromatography following extraction and derivatization. A rapid non-destructive spectroscopic method is preferred.

Chemometric methods were used to analyze the NIR spectra of shelled peanuts and develop predictive models. These methods included the partial least squares (PLS) technique. This method is useful for spectra that exhibit significant variation for example with total oil or moisture content. However, due to the weak signals associated with unsaturated fatty acids there are only subtle changes in the spectra. The PLS method was able to quantify the amount of oleic acid within 5%. Correlation spectroscopy was applied to the same set of NIR data. The results of this technique improved the model prediction for oleic acid to within 1%. The correlation technique may be applied to improve the performance of other chemometric models without collecting additional spectra.

Inhibition of Digestion of Peanut Allergens: An Approach to Reducing Peanut Allergy

S.-Y. CHUNG* and S. REED, Southern Regional Research Center, USDA-ARS, New Orleans, LA 70124.

Peanut allergen is a protein that can cause an allergic reaction in peanut-allergic individuals, following ingestion of peanuts. During ingestion, the allergens are digested into small peptide fragments which ultimately are absorbed into the bloodstream and elicit an allergic reaction. We speculated that making peanut allergen resistant to digestion may prevent formation of peptide fragments, and, thereby, an allergic reaction. The objective of this study was to make peanut allergens resistant to digestion by covalently attaching a protease inhibitor to the allergens in a peanut extract. In this case, we used trypsin as the protease and *p*-aminobenzamidine (pABA) as the protease inhibitor (glycine as the control). pABA or glycine was covalently attached to peanut allergens using glutaraldehyde. The resultant conjugates were then subjected to tests for trypsin digestion and inhibition. Digestion profiles and trypsin inhibition were determined by SDS-PAGE and trinitrobenzenesulfonic acid (TNBS), respectively. SDS-PAGE showed that the pABA-allergen conjugates were resistant to trypsin digestion, whereas native peanut allergens (Ara h 1 and Ara h 2) and control conjugates were completely digested into peptide fragments by trypsin in 15 min. Digestion of native allergens was inhibited when the pABA conjugates were present. TNBS assay showed that the degree of trypsin inhibition was dependent on the concentration of pABA conjugates. We concluded that trypsin and digestion of peanut allergens were inhibited by the pABA-allergen conjugates. The conjugates can serve as a model system for making peanut allergens indigestible and feasible to be excreted without causing an allergic reaction.

Application of Some Detoxification Methods to Reduce of Aflatoxin.

O. UÇKUN*, I. VAR, R. YILDIZ, Oilseeds Research Station, Osmaniye, Turkey; and Cukurova University, Faculty of Agriculture, Department of Food Engineering, Adana, Turkey.

Peanut (*Arachis hypogaea* L.) is an important nutrient and energy source due to their high oil, protein and fibre content. These characteristics lead the nuts to become sensitive to fungal contamination, both pre- and post-harvest. Aflatoxin contamination of peanuts is one of the most important factors reducing the quality of products. Hence, elucidation of aflatoxin in peanuts and end-use products are very important. Aflatoxins are a group of secondary metabolites produced mainly by *Aspergillus flavus* and *Aspergillus parasiticus* and they are easily found in fungal contaminated peanuts, corn, rice and so on. The most important types of aflatoxins are AFB_1, AFB_2, AFG_1, AFG_2, AFM_1 and AFM_2. Aflatoxin B_1 (AFB_1) is the most common and toxic among the aflatoxin group.There are many reports on detoxification of aflatoxin involve physical, chemical, and biological methods in peanuts. However, limited research has been performed on detoxification of aflatoxins in peanuts.

In this presentation we will discuss the detoxification methods in order to monitor the reduction of aflatoxin. These methods will also include using nanotechnological product of antimicrobial agent.

Developing A Student Led Peanut Experiment Program under EHELD USAID in Liberia at Cuttington University. J. DIDI, I. SULONTEH, D. GOODLIN, P. NYAHN, J. HOWARD, F. BOUQUET, D. YAHBA, Cuttington University, Suakoko, Bong County, Liberia; **B. THAPA***, D. JORDAN, R. BRANDENBURG, North Carolina State University, Raleigh, NC 27695; C. MULBAH, RTI International, Monrovia, Liberia; and J. SIMON and R. JULIANI, Rutgers University, New Brunswick, NJ 08901.

The USAID project entitled *Excellence in Higher Education for Liberia Development* (EHELD) (2011-2017) includes academic partners from the U.S. (North Carolina State University, Rutgers University, and University of Michigan) and Liberia (University of Liberia and Cuttington University) and is managed by RTI International. The project supports development of Centers of Excellence at University of Liberia (engineering) and Cuttington University (agriculture) through curriculum development and implementation, graduate training, and improvement of instructional facilities. Cuttington University is located at Suakoko in Bong County, approximately 95 miles northeast of Monrovia and 30 miles south of Guinea. Since 2011, visiting and contract faculty have been heavily engaged at Cuttington University formal classroom instruction and experiential learning by students. Research projects have been implemented by students in the Department of Plant and Soil Science with staple crops including peanut (*Arachis hypogaea*), cowpea (*Vigna unguiculata*), soybean (*Glycine max*), corn (*Zea mays*), rice (*Oryza sativa*), and several vegetable crops. Peanut is an important crop in Liberia with climatic conditions favorable for up to three crops within a year. However, farmers are not producing peanut at high levels due to resource constraints including injury and damage from disease, insects, nematodes, and weeds and highly leached and infertile acidic soils in the region. The primary objective of research projects was to introduce undergraduate students to the scientific process associated with agricultural research and to develop a database on response of peanut to amendments and practices that increase yield. Experiments included determining peanut response to liming materials, charcoal, *Rhizobium* bacteria, and NPK fertilizer on a Synyea sandy loam soil (loamy-skeletal, siliceous isohyperthermic, plinthic paleudults) with pH 4 and less than 1% organic matter. The first experiment was conducted in 2011 with five additional experiments conducted from 2012-2014. Peanut growth and yield parameters of local and introduced cultivars from the US were compared. Results indicated that wood ash in combination with NPK fertilizer application increased the *Rhizobium* population, resulting in a subsequent increase in vegetative and reproductive growth of peanut. These parameters were also higher when lime and NPK were applied. The improved cultivar yielded approximately 4 times the yield of the local cultivar. These experiments serve as a teaching tool that will prepare undergraduate students for careers in the agricultural sector in Liberia. They also provide useful information in formal classroom instruction and contribute to the agricultural sector of Liberia.

Overview of Groundnut Research in Zambia

H. CHARLIE, International Crop Research Institute for the Semi Arid Tropics, Box 1096, Lilongwe, Malawi; K. KANENGA and L. MAKWETI*, Crop Improvement and Agronomy, Zambia Agriculture Research Institute, Msekera Research Institute, Box 510089, Chipata, Zambia.

The overall objective of Zambia Agriculture Research Institute (ZARI) is to generate and adapt Crops and Soils technologies in order to increase agricultural productivity and diversify production. The Food Legumes Research Team under the Crop Improvement and Agronomy Division of ZARI and is responsible for all legume research with Groundnuts which is the second most grown crop after maize, been the major crop of interest. The major objective of the team is to breed legume varieties that are high yielding, have high nutritional value and are tolerant to pests, diseases, adverse environmental conditions, development of appropriate agronomic packages and technologies for all farmer categories, germplasm collection, evaluations and characterization. The national average of groundnut stands at slightly above 500kg/ha. This is mainly attributed to the continued use of landraces by most farmers which are low yielding compared to the improved varieties which have shown to have potential of yielding above 1500kg/ha and 2500kg/ha for Spanish and Virginia respectively on on-station plots. Other factors include diseases and pests, non availability of improved seed, the not so formal oil seed industry and small scale farming with no mechanization among others.

ZARI has made great efforts since the 1950s by releasing different varieties of Spanish and Virginia which are high yielding, have good oil and protein content and suitable for use in oil and confectionary industries. Through collaborations with International Crops Research Institute for the Semi Arid Tropics (ICRISAT) varieties like Luena, Katete, MGV 4, MGV 5 and Chishango were released between 2000 and 2005 and six farmer selected and preferred varieties (two Virginias, three Spanish and one Valencia (No Valencia released in Zambia) have since been submitted for official pre-release testing under the USAID Feed The Future project and at least four varieties will be released at the end of the project in September this year. A new partnership has emerged with New Mexico State University under the Peanut Mycotoxin Initiative Lab to ensure more Valencia and Virginia types are released in Zambia.

With these upcoming varieties, there is great potential to increase production for groundnuts. However, the emerging threats in terms of stresses, aflatoxin, pests, diseases and the reducing land for cultivation due to increased population and infrastructure development calls for continued research. Participatory Plant Breeding and modern technology in breeding like molecular breeding need to be incorporated so as to improve the efficiency in variety adoption and development. In addition, there is need to develop a formal seed and grain market system so as to encourage farmers to grow more.

Physical and Storage Properties of Equivalently Roasted Peanuts Prepared by Deep Frying, Blister Frying, and Dry Roasting. X. SHI*, Department of Food, Bioprocessing and Nutrition Sciences, North Carolina State University, Raleigh, NC 27695; T.H. SANDERS, L.O. DEAN, USDA-ARS, Market Quality and Handling Research Unit, Raleigh, NC 27695; and J.P. DAVIS, JLA International, Albany, GA 31721.

In the US, peanuts are roasted to make food products, such as peanut butter, snacks, and confectionaries using either dry or oil roasting. The most popular oil roasting method is deep frying, while blister frying is a newer concept that involves boiling the peanuts in water followed by deep frying. Although there are many commercial products prepared by these three methods, the scientific comparison of different roasting methods has not been reported. To investigate the effects of roasting methods on peanut properties, jumbo-size runner peanuts were systematically deep fried, blister fried, or dry roasted at 177°C to Hunter L-values of 53 ± 1, 48.5 ± 1, and 43 ± 1, corresponding to light, medium, and dark roasting, respectively. Scanning electron microscopic images showed the peanut microstructure was most extensively damaged by blister frying, followed by deep frying, and then dry roasting. For light roasting, blister fried peanuts had significantly higher moisture content than the deep fried and dry roasted, while for medium and dark roasting, blister fried had lower moisture than the other two. In storage testing throughout 16 weeks, peroxide value measurements indicated the blister fried had the longest shelf life, followed by the dry roasted, and then the deep fried. Descriptive sensory analysis proved the loss of roast peanut flavor during storage was dry roast > blister fry > deep fry.

MINUTES

BOARD OF DIRECTORS MEETING
47th
Annual Meeting
Charleston, SC
15 July 2015

Board Members Present:

President Naveen Puppala	Yes
President-elect Tom Stalker	Yes
Past President Tim Brenneman	Yes
Noelle Barkley	No
Darlene Cowart	Yes
Peter Dotray	Yes
David Jordan	Yes
Keith Rucker	Yes
Jim Elder	Yes
Barry Tillman	Yes
Howard Valentine	Yes
Dan Ward	Yes
Executive Officer Kim Cutchins	Yes

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

Minutes of June 9, 2015 meeting
Minutes of the June 9, 2015 Board meeting were distributed to the Board for review prior to the meeting. President Puppala asked for any changes and/or additions. There being none, President Puppala called for approval. It was moved by David Jordan, seconded by Howard Valentine, and unanimously passed to:

Approve the minutes of the June 9, 2015 Board meeting.

Executive Officer Report
Kim Cutchins reported the APRES operations are running much more efficiently in her second year, citing familiarity with the organization and hands-on experience. Herring CPA is doing a great job of documenting income and expenses which has been tremendously helpful for membership records and sponsors. This is being done with a new Quick Books program which Herring updates and shares with her on a monthly basis. With two Annual Meetings under her belt, Kim stated the planning of this Annual Meeting went more smoothly (a few minor glitches with the hotel that will be addressed in future contracts). She highlighted the new online submission process for abstracts as being especially helpful in putting together the program and anticipates it will make the process of putting the proceedings together faster. Kim tackled Annual Meeting sponsorship solicitations this year, but said it is not a job she can do alone. Companies are much more willing to give to someone they know or work with and she asked that the Program Committee Chairman to make certain they bring on a member who can help in this area. She noted that APRES will be in need of a new technology consultant as Milbra Schweikert has taken a full time position with her church. Going forward Kim recommended APRES look into hiring

someone who can assist with technology emergencies such as the site being hacked as Kim can handle the day to day updates for the website. Kim also related that she continues to get to as many industry meetings as her time allows, stating that it give APRES visibility and helps her reintegrate into the industry. She thanked the Board for their support and looks forward to another year of accomplishments from APRES committees.

NEW BUSINESS:
The following Committee reports were presented to and approved by the Board. Action taken by the Board is in italics. Unless otherwise noted, the Board voted to accept each report as presented. Full reports from each committee are to be presented at the July 16th Business Meeting and Awards Ceremony in the Ballroom at 5:00 p.m.

FINANCE COMMITTEE:
Financial Statements as of June 30, 2014 - Darlene Cowart reported for Chairman Todd Baughman.

Balance Sheet – APRES operates on a cash basis as it has no assets other than cash. Assets are $280,612 made up of checking, savings, CDs, Vanguard investment accounts, and a small balance in PayPal (credit card deposits) which had not cleared by the end of the month. Liabilities are employment taxes of $707; retained earnings of $231,554 and net income of $48,351 for a total liabilities and equity of $280,612.

Accounts Receivables…..while not recorded on a cash basis balance sheet are $17,483 (sponsorships) as of June 30, 2015. Additionally, in July, APRES will bill Accounts Receivables for Peanut Science Page charges for $6,636 which will be offset by Accounts Payable of $6,666 to Allen Press for the latest issue of Peanut Science (42-1).

Statement of Revenue and Expense
Herring CPA states as of 6-30-2015, APRES has accumulated $76,793 in income; paid out $28,892 in expense; for a net income of $47,901; adding interest income of $450; gives APRES a positive net income over expense of $48,351 as of 6-30-2015. Details of income and expense follow:

Income:
Peanut Science – As mentioned previously Issue 42-1 just came out and APRES will bill $6636. Anticipate 42-2 will come out before the end of the year with similar billing. Anticipate $18K-$20K for the year.

Sponsorships – APRES has received To date, $22,050 to date in sponsorships and has an additional $17,483 in. Anticipating year end will be $39,500 in sponsorships.

Annual Dues – On target to meet or exceed budget of $22,000. $1,500 in July so far. Dues invoices went out mid-June, but most have been paying along with their registration.

Meeting Registrations – Currently at $31,650. July pre-meeting will bring in an additional $3,000 for combined of $34,650 which is equal to 2014, but under the $40K budgeted. Essentially 18 late registrations short to reach our budget. APRES usually takes in 15-25 additional registrations at the door. So we still have a chance of meeting budget. Partial difference is increase in student attendance and gold members moving up to Platinum membership which includes a free registration and is recorded under sponsorships.

Total Income – Currently at 67% of budget. If we meet our projections, discussed above of $18K for Peanut Science; $39,500 for sponsorships; dues of $22,000; registrations of $40,000; income could come in at $119,500 or $4,850 more than budgeted. The bulk of APRES income arrives by the end of July.

Expenses: *Total expenses are projecting to be on budget*
Annual Meeting – A complete picture on Annual Meeting expenses is not possible until the meeting is over. Kim is still negotiating with the hotel over unanticipated expenses and the hotel's unique meeting setup. Kim felt confident that the budget of $45,000 will be sufficient even with the large number of attendees—332 Total = 224 Attendees; 108 spouses/ children.

Peanut Science – Tim Grey is working very hard at managing costs and hopes to come in under budget this year. As mentioned earlier, APRES will bill Accounts Receivables for Peanut Science Page charges for $6,636 which will be offset by Accounts Payable of $6,666 to Allen Press for the latest issue of Peanut Science (42-1). Anticipate similar expenses for Issue 42-2. APRES has also notified Allen Press of its desire to renegotiate its contracts which expires at the end of 2015. Additionally, we are seeking bids from other sources. Editor Tim Grey hopes this renegotiation or move to another source will lower costs even further.

Book Purchase – Tom Stalker relayed that the the joint publishing deal with AOCS will not be completed in 2015. Darlene reported that this financial commitment should be pushed into the 2016 budget.

Administrative Expenses – Of note are the unanticipated legal expenses…..Goldberg and Associates reviewed our Allen Press contracts and agreements to establish who owns what with regards to the website, database, journal articles, etc….in anticipation that APRES may decide to go with another company. These fees can be moved to Peanut Science if the Committee feels they are better categorized there. Bank charges are PayPal fees and should be included in the Credit Card charges. The majority of APRES business is conducted within the first 6-months of its fiscal year; therefore, anticipate credit card charges will be significantly less than budgeted and will confirm that moving to the PayPal credit card system has indeed saved APRES money.

PayPal Credit Card System - Darlene asked Kim to give a brief overview. PayPal has integrated well with the APRESwebsite; has great reports feature to facilitate transfer of information to Herring CPA; and is operating well with only a minor glitch every now and then--extra sensitive security feature. PayPal security occasionally kicks out corporate cards used by several people with the same organization. A work around via their swipe feature or through their online website has resolved most situations, but still a concern which has been brought to PayPal's attention.

CD Conversion to Vanguard VASIX Bond Fund - In July 2014, The Board voted to move all APRES CDs to the Vanguard VASIX fund account. Kim reported that not all all CDs have been moved into the Vanguard account and she takes full responsibility for not following the Board's action, citing a delay in the opening of the account and a hesitation to purchase VASIX at its all time high price. As CDs matured she did move the funds into VASIX--purchasing $10K of VASIX at $15.15; $20K at $15.24. The bond market has recently begun to pull back and VASIX is now trading at $14.85. First dividend was $44.23. As of today, we are down $512 on our $30K investment. She added that while the Board and Committee did not approve this strategy for the short term; she suggested the Board and Committee re-evaluate whether VASIX is the right fund for APRES. VASIX has an

average 5-year return of 5%. All the same, the Committee might re-evaluate VASIX based on whether we believe interest rates will rise, since the fund is primarily bonds which tend to go down when rates rise. Howard Valentine noted that timing the market is impossible, but understood Kim's hesitation on the initial investment. He suggested and the Board concurred that the Finance Committee take another look at VASIX and, if determined, make a recommendation for change. Otherwise, Kim should move forward with investing the remaining CDs in VASIX

Corporate Credit Card - Darlene related that Kim has requested that she be allowed to get a APRES corporate credit card to be used for APRES purchases where a corporate check cannot be easily used (e.g., APRES website renewals). The committee has endorsed this request and is seeking Board approval. It was moved by Howard Valentine, seconded by Tom Stalker, and unanimously approved to:

apply for a APRES corporate credit card for use by the Executive Officer for APRES expenses not easily paid for by corporate check.

APRES Letter of Financial Standing and APRES Audit - The language used in APRES' letter of financial good standing from Herring CPA Group prompted the Committee to draft an audit policy for APRES. APRES' last audit was conducted during the Starr-Cutchins leadership change in September 2013. It was moved by Darlene Cowart, seconded by David Jordan, and approved:

an Audit or Letter of Agreed Upon Procedures will be conducted every five years; at the request of the Executive Officer or Board of Directors; or a change in leadership.

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

the report of the Finance Committee.

Nominating Committee Report

Chairman Tim Brenneman stated the Nominating Committee (Tim, John Damicone, Barbara Shew) met to discuss the expiring Board member terms, as well as the USDA seat being vacated by Noelle Barkely who is no longer with USDA. Upon reviewing the requirements for being a APRES Board member, (5-year member of APRES, served on 3 different Committees, and familiar with APRES and its members), the Committee recommends the following slate of nominees for the APRES 2015-16 Board of Directors:

2015-16 Nominees

President:	*Tom Stalker, NC State University (2017)*
President-Elect:	*Corley Holbrook, USDA (2018)*
Past President:	*Naveen Puppala, New Mexico State University (2016)*
Production Representative:	*Wilson Faircloth, Syngenta*
American Peanut Council Rep:	*Howard Valentine (2016)*
Executive Officer:	*Kim Cutchins (2016)*
USDA Representative (1-year):	*Marshall Lamb (2016)*

Additionally, the Committee is proposing that Marshall Lamb fill the remaining year of Noelle Barkely's term. Marshall will be eligible for election to a 3-year term should he be nominated.

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

Incoming APRES President Tom Stalker presented the Committee rosters for 2015-16.

Darlene Cowart made the motion, seconded by Tom Stalker, and unanimously approved:

to accept the report of the Nominating Committee.

PUBLICATIONS & EDITORIAL COMMITTEE:
Book Update – Jason Woodward reported for Chairman Nick Dufault. Jason asked Tom Stalker to comment on the first book. Tom reported that the book is being finalized for production and should be available for purchase at the end of 2015 or early 2016. The Committee agreed on chapters for the 2nd book, Peanut Production, Management & Utilization--a total of 13 which will include an international segment. Other topics which the Committee might consider are RUTF, ethical trading, nutrition, conservation, sustainability, and food safety. Nick Dufault, Diane Rowland, and Tim Grey have been proposed as editors. Tom Stalker suggested industry review of the outline as well as have industry contributors. Committee is still exploring publications options and several Board members suggested looking at Amazon as an option. Last quote from UGA was $15,485.

Digitized APRES Books - A member of Chris Butts' staff has digitized APRES's teal book and is working on the red book. The books will be posted on the APRES website for download. Jason requested that the Board give special recognition to Beverly Hill at the Business meeting. **The Board unanimously agreed recognition was well deserved for such a monumental task and would do so at the Business meeting.**

PEANUT QUALITY COMMITTEE:
The Committee has no action to bring before the Board and will report at the Business Meeting.

PUBLIC RELATIONS COMMITTEE
Resolutions - Jason reported he had not received any resolutions for APRES members having passed during the last year. However, he would like to have a moment of silence at the Annual Meeting to for members of the peanut industry who deserve remembrance:

Phyllis Adams Pattee, wife of Harold Pattee (NCSU), passed away May 29
Ed Smith, formerly Planters Peanuts, funeral June 6
Ben Mullinix Jr., University of Georgia and Texas A&M University, March 3

Tiered Sponsorship Platform - The Committee in conjunction with Kim developed a new flyer to help Program Committee members approach potential sponsors for the the Annual

Meeting. It will now be easier for the Program Committee to describe the benefits of supporting the APRES Annual Meeting hopefully leading to increased support. Levels are Bronze, Silver, Gold and Platinum. Jason asked the Board to review the flyer and provide feedback for improvement, prior to the Committee requesting the by-laws be updated with the new categories.

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

A. Development of a mentoring committee: pairing of early career professionals with more senior member of the society
B. Side meetings for topics of wider interest to all segments of the industry (similar to the Seed Meeting)
C. When possible, integrate more tours highlighting different aspects of the industry (field tours of production practices, manufacturing facilities, etc.)
D. Updating of program and APRES materials to improve appearance, theme-based program.

which the Committee will pursue jointly with other Committees.

Bailey Award Committee

Chairman Charles Chen reported that nominations were received from all seven eligible sessions of the 2014 Annual Meeting and nominees were notified shortly after the meeting. Six manuscripts were received and accepted for final evaluation. The winning paper will be presented at tomorrow's awards ceremony.

FELLOWS COMMITTEE:

Chairman Mark Burow forwarded 1 name for the attribute of Fellow of the Society. The Committee unanimously recommended and the Board unanimously agreed:

To bestow the honor of Fellow of the Society
in a recognition ceremony at the 47th Annual Meeting in Charleston, SC on:

Robert C. Kemerait, Jr. , University of Georgia

SITE SELECTION COMMITTEE:

Mike Baring, Committee Chairman, said he and Jason Woodward narrowed the search to several properties in Albuquerque, NM. They are recommending the the 2017 Annual meeting be held at the Hotel Albuquerque. The room rate will be $129/night with free internet and parking. Additionally, the hotel group which owns the property is offering discounts on their Santa Fe properties for pre- and post- meeting stays. The proposed contract is provided to the Board for their review. It was moved by Mike Baring, seconded by Jason Woodward, and unanimously approved to:

select the Hotel Albuquerque in Albuquerque, NM as
the site of the 2017 APRES Annual Meeting.

COYT T. WILSON DISTINGUISHED SERVICE COMMITTEE:

Chairman Corley Holbrook reported the Coyt T. Wilson Service Award Committee reached a unanimous recommendation for the 2015 award: Mr. Howard Valentine.

Committee members for 2015 were Austin Hagan, Emily Cantonwine, Nathan Smith, and Corley Holbrook, Chair. All business for this committee was conducted electronically. After reviewing all nominations, the committee unanimously recommended that the 2015 Coyt T. Wilson Distinguished Service Award be presented to Mr. Howard Valentine. Mr. Valentine has been an active member and strong supporter of APRES for 34 years. His outstanding contributions to the society make him richly deserving of the 2015 Coyt T. Wilson Distinguished Service Award.

The committee recommends three minor modifications to the Guidelines for Nomination. 1) Do not require date and place of birth. 2) Change deadline from March 1 to "deadline for submitting will be published in the call for nominations". 3) Change "six hard copies should be sent" to "Nominations should be sent electronically to the committee chair".

The Board unanimously agreed to the Committee's recommendation to award Mr. Howard Valentine the 2015 Coyt T. Wilson Distinguished Service Award.

The Board also unanimously agreed to amend the award guidelines for all APRES awards (not just the Coyt T. Wilson) as published in the APRES By-Laws and Proceedings with the following changes: 1) remove the specific deadline date to "as published in the call for nominations; 2) delete the requirement for date and place of birth; and, 3) accept electronic copies in lieu of hard copies.

JOE SUGG GRADUATE STUDENT COMPETITION COMMITTEE:
Chairman Bob Kemerait reported the Joe Sugg Graduate Student Competition will take place tomorrow morning. Nineteen presentations are expected. This year's competition has attracted the most participating schools and the second largest number of participants. Winners of the Award will be announced during the awards ceremony tomorrow evening.

DOW AGROSCIENCES AWARDS COMMITTEE:
Chairman Kelly Chamberlin reported the Dow AgroSciences Award Committee did not meet at the APRES annual meeting in 2015 because committee business was taken care of prior to the APRES annual meeting. Information on the award was sent to the membership and the committee received nominations for both the Dow AgroSciences Award for Excellence in Research and the Award for Excellence in Education. Nomination packets were distributed to committee members electronically, and the vote on the nominations was conducted electronically. Winners will be announced at the Business Meeting tomorrow.

PROGRAM COMMITTEE:
Program Chairman Tom Stalker recognized the outstanding help and support of Technical Program Chairman Ames Herbert and Local Arrangements Chairman Shyam Tallury. Attendance for 2015 is 370 total; 241 registrants; 84 spouses; 45 children. Feedback from the Opening Session speakers has been outstanding. A new perk was given to registrants this year in the form of thumb drives pre-loaded with the 2015 abstracts, program and attendance list. BASF and Bayer Crop Sciences were recognized as sponsors of Wednesday night dinner. Dow AgroSciences was recognized as the sponsor of the Thursday night reception. The Peanut Institute sponsored the keynote speaker, Dr. Peanny Kris-Etherton. JLA and the National Peanut Board are sponsoring the Fun Run with a record number of participants. South Carolina Peanut Board sponsored the Spouses

Hospitality Suite. Bharthi Tallury put together two excellent tours--Fort Sumter and the Aquarium as well as kids activities in the suite. The North Carolina Peanut Growers Association once again sponsored the Joe Sugg Graduate Student Competition. A host of sponsors supported the Ice Cream Social. APRES continues to have a great group of peanut product suppliers.

Ames reported the 47th Annual Meeting scheduled 137 presentations. Included in these presentations is a symposium on Peanut Post Harvest Quality and 21 were posters.

OTHER BUSINESS:

There being no other business, the meeting was adjourned at 6:30 p.m.

BUSINESS MEETING AND AWARDS CEREMONY

AMERICAN PEANUT RESEARCH AND EDUCATION SOCIETY
Francis MarionHotel
Charleston, SC
JULY 16, 2015

1. **President's Report**.....Naveen Puppala

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

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

4. **New Business**
   - Committee Reports:
   - (a) Nominating Committee ..... Tim Brenneman
   - (b) Finance Committee.....Darlene Cowart
   - (c) Public Relations Committee .....Jason Woodward
   - (d) Peanut Quality Committee .....…….Mark Kline
   - (e) Site Selection Committee..... Mike Baring
   - (f) Publications and Editorial Committee..... Nick Dufault
   - (g) Program Committee.....Tom Stalker

5. **Other Business**

6. **Installation of New Officers** …….....……Tom Stalker
   - Past President's Award……..……..……..Naveen Puppala

5. **Adjourn**……..……..……..Tom Stalker

MINUTES

BUSINESS MEETING AND AWARDS CEREMONY
AMERICAN PEANUT RESEARCH AND EDUCATION SOCIETY
Francis Marion Hotel
Charleston, SC
July 16, 2015

President's Report

It has been a pleasure to serve as president of American Peanut Research and Education Society. Since its inception, APRES never had a meeting in Charleston, SC. What a privilege to serve as your society President. Charleston, is the oldest and 2nd largest city in South Carolina. It is the most friendly and hospitable city in America. I have been involved with APRES for the last 16 years and has benefitted a lot from this organization. Our annual meeting attendance was considerably up this year with 241 attendees, 84 spouses and 45 children. A total of 370 have attended this year. We were up 30 percent compared to last year meeting. The last time we saw these numbers were in 2006 at Savannah, Georgia and in 2005 at Portsmouth, Virginia. I guess being a new location and close to most of us in the east coast has resulted in higher turn out by our members. We had attendees from 15 countries, our International Participation was high this year and I would like to thank Dr. Dave Hoisington, Director of Peanut and Mycotoxin Innovation Lab. By bringing the host country Principal Investigators. I hope all our International collaborators had a good time in Charleston, SC. We would love to see our International members to attend each year as this is the only society where we can exchange ideas and share information about peanuts.

We had an outstanding attendance on our first day to listen to our keynote speaker Dr. Penny Kris-Etherton, Distinguished Professor of Nutrition from Penn State University. Her research has highlighted the nutritional benefits of peanuts to human body. It was well received by all the members and drew one of the largest in APRES history. The Post Harvest Quality Symposium was well represented from our Industry and research and I would like to thank Dr. Jack Davis from J. Leek Associates for sponsoring and arranging the speakers.

Even though APRES had some difficult years in the past, with budgets and down- sizing. We have come across the barrier in such a short time and I would like to commend the tremendous level of commitment and dedication by our Executive Officer Kim Cutchins and all the members of this organization who serve on different committees. Without your support and help it could not be possible. Here are some of the highlights during my term as your President of the organization:

- Our budget in 2014 was surplus and if we can sustain this growth we will be able to reduce page charges for Peanut Science Journal. We need $ 18,000 surplus each year to make peanut Science Journal self-sustaining without page charges.
- Our sponsorship support was up and we were able to return to pre-recession

amounts. Let me tell you that Kim has been doing an excellent job for the society by attending all the state growers meetings and promoting about organization whenever possible. We even have a small pamphlet with our annual meeting dates for the coming year and how our society brings together a wonderful mix of people from all segments of the industry, from all peanut-growing regions of the US, and many from across the globe.

- By moving to Paypal credit card system we were able to save 50% in fees; we are exploring cost savings for Peanut Science to reduce and eliminate page charges through new contract negotiation with Allen Press. Our Editor Dr. Tim Grey is on top of this and is working diligently to achieve this goal.
- APRES just published Peanut Science volume 42-1. A new peanut book, a joint publication with AOCS Advances in Peanut Science that should be out by end of this year. All three books published by our society namely Advance in Peanut Sience, Peanut Science and Technology and Peanut Culture and Uses were scanned by Beverly Hill from National Peanut Research Lab at Dawson, GA. The APRES society would like to thank Ms. Beverly for her services and we will be shortly posting them on our website.
- Our graduate student competition were up this year considerably. We had 19 students who participated in the competition this year. I would like to thank the chair of the graduate student competition Dr. Bob Kemerait and members of the committee for their hardwork in judging the winners of the competition.

By the time I became familiar with the By-laws of the society my term got over but that does not mean that I am done with my responsibility to serve the society but I will be the past President for the coming year. Before I hand over the gavel to Dr. Tom Stalker, I would like to take this opportunity to thank Dr. Tom Stalker who has arranged such an excellent program. Technical Program Chair Dr. Ames Herbert. Our local arrangements by Dr. Shyam Tallury, Dr. Craig Kvien, Chuck Parker, Lee Ann, Gurleen Kaur and Abishek Xavier. Our Spouse's Program was coordinated by Mrs. Bharathi Tallury, Helene Stalker, Dong Chen and Dona Holbrook. Thank you once again for the honor of serving as President of APRES and for a successful annual meeting. See you all in Clearwater, Florida next year. Have a safe travel.

READING OF THE PREVIOUS MEETING'S MINUTES:

The minutes of the 46th Annual Meeting Business Session were distributed via email to the membership and posted online; therefore, the reading of the minutes was waived. It was moved by and seconded,

the minutes of the 46th Annual Meeting Business Session be approved.

NEW BUSINESS

COMMITTEE REPORTS:

NOMINATING COMMITTEE:

Nominating Committee Chairman Tim Brenneman stated the Nominating Committee (Tim, John Damicone, Barbara Shew) met to discuss the expiring Board member terms, as well as the USDA seat being vacated by Noelle Barkely who is no longer with USDA. Upon reviewing the requirements for being a APRES Board member, (5-year member of APRES, served on 3 different Committees, and familiar with APRES and its members), the Committee recommends the following slate of nominees for the APRES 2015-16 Board of Directors:

2015-16 Nominees

President:	***Tom Stalker, NC State University (2017)***
President-Elect:	***Corley Holbrook, USDA (2018)***
Past President:	***Naveen Puppala, New Mexico State University (2016)***
Production Representative:	***Wilson Faircloth, Syngenta (2018)***
American Peanut Council Rep:	***Howard Valentine (2016)***
Executive Officer:	***Kim Cutchins (2016)***
USDA Representative (1-year):	***Marshall Lamb (2016)***

Additionally, the Committee is proposing that Marshall Lamb fill the remaining year of Noelle Barkely's term. Marshall will be eligible for election to a 3-year term should he be nominated.

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

President Puppala called for any nominations from the floor. There being none, it was moved by Howard Valentine, seconded by Darlene Cowart to close the nominations. It was moved by Peggy Ozias-Akins, seconded by Albert Culbreath, to:

approve the nominees to the APRES 2015-16 Board of Directors.

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

to accept the Reports of the APRES Committees.

Other Business:
Outgoing President Naveen Puppala recognized the new President, Tom Stalker, who adjourned the meeting.

Presentation of Awards

JOE SUGG GRADUATE STUDENT COMPETITION:

Chairman Bob Kemerait reported nineteen presentations were heard during the 2015 Joe Sugg Graduate Student Competition. He noted this is the largest group of participating universities in the competition's history and the second largest number of participants. He complimented all on the quality of their research and presentations. This year's winners are:

First Place –
Claire Klevorn, North Carolina State University
"Variation in O/L Ratio Demonstrated among High-Oleic Spanish-type Peanuts" (Dr. Lisa Dean, major professor)

Second Place –
Jake Fountain, University of Georgia
"Potential Roles of Environmental Oxidative Stress in Aflatoxin Production Revealed in the Aspergillus flavus Transcriptome".
(Dr. Robert Kemerait, major professor)

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

THE BAILEY AWARD:

Chairman Charles Chen reported that nominations were received from all seven eligible sessions of the 2014 Annual Meeting and nominees were notified shortly after the meeting. Six manuscripts were received and accepted for final evaluation. The Bailey Award for the best paper from the 2014 APRES Annual Meeting was presented to:

Josh P. Clevenger
University of Georgia
"Single Nucleotide Polymorphism (SNP) Detection in Cultivated Peanut Using the Diploid Wild Progenitor Reference Genomes".
Authors: J. Clevenger, Y. Guo, P. Ozias-Akins

Dow AgroSciences Awards for Excellence in Research & Education

Victor Nwosu announced the winners of the 2015 Dow AgroSciences Awards for Chairman Kelly Chamberlin. The 2015 awardees are:

Research Award –
Dr. Charles Simpson,
Texas A&M AgriLife Research

Education Award –
Dr. Jay Chapin
Auburn University

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

FELLOW OF THE SOCIETY:

Chairman Mark Burow announced the selection of the latest peanut scientist to be awarded the attribute of Fellow of the Society, noting that this scientist was unanimously recommended to the Board for bestowing the honor of Fellow of the Society. The newest honoree of Fellow of the Society is:

Robert Kemerait, Jr.
University of Georgia

Robert C. Kemerait received a bachelor's degree in biology from Davidson College and a doctoral degree in plant pathology from the University of Florida, where he worked on the etiology of peanut diseases with Dr. Tom Kucharek. He joined the University of Georgia Department of Plant Pathology in 2000 as an Extension specialist. He has been very active in APRES over the years, particularly the Graduate student paper competition.

His work focuses on managing disease and nematode problems in peanuts, cotton, corn and soybeans. These crops are planted on

more than 2.5 million acres in more than 80 counties across the state. Kemerait, who became a professor in 2012, was the first recipient of the Senior Specialist Award from the Georgia Association of County Agricultural Agents, and he also received the D.W. Brooks Award for Excellence in Extension from the University of Georgia in 2012. Highlights of his career have included the development of "Peanut Rx," a risk index for peanut diseases and the development of standardized recommendations for controlling nematodes affecting cotton.

He has worked in Guyana since 2002 and in Haiti since 2007 as the co-leader of the Peanut Collaborative Research and Extension Program sponsored by the United States Agency for International Development (now PMIL). Kemerait consistently supervises multiple plant pathology graduate students and manages an Extension program that employs six technicians and numerous student workers. He is married to Pamela Lopez Kemerait, and they have two children, Perrine and Jimmy. Dr. Kemerait is most deserving of this recognition and it is an honor to present him with APRES Fellow award.

COYT T. WILSON DISTINGUISHED SERVICE AWARD:

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

Committee members for 2015 were Austin Hagan, Emily Cantonwine, Nathan Smith, and Corley Holbrook, Chair. All business for this committee was conducted electronically. After reviewing all nominations, the committee unanimously recommended that the 2015 Coyt T. Wilson Distinguished Service Award be presented to Mr. Howard Valentine. Mr. Valentine has been an active member and strong supporter of APRES for 34 years. His outstanding contributions to the society make him richly deserving of the 2015 Coyt T. Wilson Distinguished Service Award.

The Board approved three minor modifications to the Guidelines for Nomination for the all award nominations, including the Coyt T. Wilson: 1) Do not require date and place of birth. 2) Change deadline from March 1 to “deadline for submitting will be published in the call for nominations”. 3) Change “six hard copies should be sent” to “Nominations should be sent electronically to the committee chair”.

Respectfully submitted,
C. Corley Holbrook, chair

Mr. Howard Valentine

Mr. Howard Valentine is the recipient of the 2015 Coyt T. Wilson Award. Mr. Valentine was born in Ozark Alabama, and earned a B.S. degree (1968) in Industrial Engineering from Auburn University. Following a career in the shelling industry, Howard became Executive Director of the Peanut Foundation headquartered in Alexandria, VA, as the funding wing of the American Peanut Council. In his role as Executive Director, Howard solicited from donors and oversaw the distribution of millions of dollars in peanut research funds. Many members of APRES have been beneficiaries of this funding.

Mr. Valentine has been an active member and strong supporter of APRES for 34 years. He has been a member of the Board of Directors

since 2004. He has not been a passive member of the BOD, but rather a regular attendee at the meeting and on conference calls who offers informed and thoughtful suggestions. He is always well prepared, and fully engages in the discussions and decisions that need to be made for the good of the society. Howard was also very instrumental in selecting our current Executive Officer. This has been, and will continue to be of great benefit to APRES.

Mr. Valentine organized an international group of over 135 peanut researchers to sequence the peanut genome with the goal of the group to find genetic markers for resistance to key peanut diseases and key quality factors. He headed the fund raising efforts that have raised over $6 million to fund these research efforts. Howard was elected Fellow of APRES in 2013.

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

PAST PRESIDENT AWARD:

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

Committee Reports

PUBLIC RELATIONS COMMITTEE:

Resolutions - Jason reported he had not received any resolutions for APRES members having passed during the last year. However, he asked members for a moment of silence in honor of those who have endeavored on behalf of the peanut industry, such as:

Phyllis Adams Pattee, wife of Harold Pattee (NCSU), passed away May 29
Ed Smith, formerly Planters Peanuts, funeral June 6
Ben Mullinix Jr., University of Georgia and Texas A&M University, March 3

Tiered Sponsorship Platform - The Committee in conjunction with Kim developed a new flyer to help Program Committee members approach potential sponsors for the the Annual Meeting. It will now be easier for the Program Committee to describe the benefits of supporting the APRES Annual Meeting hopefully leading to increased support. Levels are Sustaining, Bronze, Silver, Gold and Platinum.

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

A. Development of a mentoring committee: pairing of early career professionals with more senior member of the society
B. Side meetings for topics of wider interest to all segments of the industry (similar to the Seed Meeting)
C. When possible, integrate more tours highlighting different aspects of the industry (field tours of production practices, manufacturing facilities, etc.)
D. Updating of program and APRES materials to improve appearance, theme-based program.

which the Committee will pursue jointly with other Committees.

FINANCE COMMITTEE:

Financial Statements as of June 30, 2014 - Darlene Cowart reported for Chairman Todd Baughman.

Balance Sheet – APRES operates on a cash basis as it has no assets other than cash. Assets are $280,612 made up of checking, savings, CDs, Vanguard investment accounts, and a small balance in PayPal (credit card deposits) which had not cleared by the end of the month. Liabilities are employment taxes of $707; retained earnings of $231,554 and net income of $48,351 for a total liabilities and equity of $280,612.

Accounts Receivables…..while not recorded on a cash basis balance sheet are $17,483 (sponsorships) as of June 30, 2015. Additionally, in July, APRES will bill Accounts Receivables for Peanut Science Page charges for $6,636 which will be offset by Accounts Payable of $6,666 to Allen Press for the latest issue of Peanut Science (42-1).

Statement of Revenue and Expense

Herring CPA states as of 6-30-2015, APRES has accumulated $76,793 in income; paid out $28,892 in expense; for a net income of $47,901; adding interest income of $450; gives

APRES a positive net income over expense of $48,351 as of 6-30-2015. Details of income and expense follow:

Income:

Peanut Science – As mentioned previously Issue 42-1 just came out and APRES will bill $6636. Anticipate 42-2 will come out before the end of the year with similar billing. Anticipate $18K-$20K for the year.

Sponsorships – APRES has received To date, $22,050 to date in sponsorships and has an additional $17,483 in. Anticipating year end will be $39,500 in sponsorships.

Annual Dues – On target to meet or exceed budget of $22,000. $1,500 in July so far. Dues invoices went out mid-June, but most have been paying along with their registration.

Meeting Registrations – Currently at $31,650. July pre-meeting will bring in an additional $3,000 for combined of $34,650 which is equal to 2014, but under the $40K budgeted. Essentially 18 late registrations short to reach our budget. APRES usually takes in 15-25 additional registrations at the door. So we still have a chance of meeting budget. Partial difference is increase in student attendance and gold members moving up to Platinum membership which includes a free registration and is recorded under sponsorships.

Total Income – Currently at 67% of budget. If we meet our projections, discussed above of $18K for Peanut Science; $39,500 for sponsorships; dues of $22,000; registrations of $40,000; income could come in at $119,500 or $4,850 more than budgeted. The bulk of APRES income arrives by the end of July.

Expenses: *Total expenses are projecting to be on budget*

Annual Meeting – A complete picture on Annual Meeting expenses is not possible until the meeting is over. Kim is still negotiating with the hotel over unanticipated expenses and the hotel's unique meeting setup. Kim felt confident that the budget of $45,000 will be sufficient even with the large number of attendees—332 Total = 224 Attendees; 108 spouses/children.

Peanut Science – Tim Grey is working very hard at managing costs and hopes to come in under budget this year. As mentioned earlier, APRES will bill Accounts Receivables for Peanut Science Page charges for $6,636 which will be offset by Accounts Payable of $6,666 to Allen Press for the latest issue of Peanut Science (42-1). Anticipate similar expenses for Issue 42-2. APRES has also notified Allen Press of its desire to renegotiate its contracts which expires at the end of 2015. Additionally, we are seeking bids from other sources. Editor Tim Grey hopes this renegotiation or move to another source will lower costs even further.

Book Purchase – Tom Stalker relayed that the the joint publishing deal with AOCS will not be completed in 2015. Darlene reported that this financial commitment should be pushed into the 2016 budget.

Administrative Expenses – Of note are the unanticipated legal expenses…..Goldberg and Associates reviewed our Allen Press contracts and agreements to establish who owns what with regards to the website, database, journal articles, etc….in anticipation that APRES may decide to go with another company. These fees can be moved to Peanut Science if the Committee feels they are better categorized there. Bank charges are PayPal fees and should be included in the Credit Card charges. The majority of APRES business is conducted within the first 6-months of its fiscal year; therefore, anticipate credit card charges will be significantly

less than budgeted and will confirm that moving to the PayPal credit card system has indeed saved APRES money.

PayPal Credit Card System - Darlene asked Kim to give a brief overview. PayPal has integrated well with the APRESwebsite; has great reports feature to facilitate transfer of information to Herring CPA; and is operating well with only a minor glitch every now and then--extra sensitive security feature. PayPal security occasionally kicks out corporate cards used by several people with the same organization. A work around via their swipe feature or through their online website has resolved most situations, but still a concern which has been brought to PayPal's attention.

CD Conversion to Vanguard VASIX Bond Fund - In July 2014, The Board voted to move all APRES CDs to the Vanguard VASIX fund account. Kim reported that not all all CDs have been moved into the Vanguard account and she takes full responsibility for not following the Board's action, citing a delay in the opening of the account and a hesitation to purchase VASIX at its all time high price. As CDs matured she did move the funds into VASIX--purchasing $10K of VASIX at $15.15; $20K at $15.24. The bond market has recently begun to pull back and VASIX is now trading at $14.85. First dividend was $44.23. As of today, APRES's account is down $512 on its $30K investment. She added that while the Board and Committee did not approve this strategy for the short term; she suggested the Board and Committee re-evaluate whether VASIX is the right fund for APRES. It should be noted that although VASIX has an average 5-year return of 5%, the fund is made up primarily of bonds which tend to go down when interest rates rise. Howard Valentine noted that timing the market is impossible, but understood Kim's hesitation on the initial investment. He suggested and the Board concurred that the Finance Committee take another look at VASIX and, if determined, make a recommendation for change. Otherwise, Kim should move forward with investing the remaining CDs in VASIX

Corporate Credit Card - Darlene related that Kim has requested that she be allowed to get a APRES corporate credit card to be used for APRES purchases where a corporate check cannot be easily used (e.g., APRES website renewals). The committee has endorsed this request and is seeking Board approval. It was moved by Howard Valentine, seconded by Tom Stalker, and unanimously approved to:

apply for a APRES corporate credit card for use by the Executive Officer to be used for APRES expenses not easily paid for by corporate check.

APRES Letter of Financial Standing and APRES Audit - The language used in APRES' letter of financial good standing from Herring CPA Group prompted the Committee to draft an audit policy for APRES. APRES' last audit was conducted during the Starr-Cutchins leadership change in September 2013. It was moved by Darlene Cowart, seconded by David Jordan, and approved:

an Audit or Letter of Agreed Upon Procedures will be conducted every five years; at the request of the Executive Officer or Board of Directors; or a change in leadership.

American Peanut Research and Education Society
Statement of Assets, Liabilities, and Equity - Cash Basis
As of June 30, 2015

ASSETS

Current Assets		
Cash-Checking	$	103,290.71
Cash-MMA Savings		88,149.47
Cash-CD		14,418.23
Cash-CD		18,211.80
Cash-CD		13,440.99
Cash-Bayer Checking		12,307.00
Vanguard		30,198.30
PayPal		595.21
Total Current Assets		280,611.71
TOTAL ASSETS	**$**	**280,611.71**

LIABILITIES AND EQUITY

Current Liabilities		
Federal W/H Taxes	$	129.00
Fica W/H Taxes		237.64
Medicare W/H Taxes		55.58
State W/H Taxes		284.49
Total Current Liabilities		706.71
Equity		
Retained Earnings		231,553.75
Net Income		48,351.25
Total Equity		279,905.00
TOTAL LIABILITIES & EQUITY	**$**	**280,611.71**

See Accountant's Compilation Report

American Peanut Research and Education Society
Statement of Revenues and Expenses - Cash Basis
For the 6 Months Ended June 30, 2015

	June 30, 2015	
Income		
Dividend Income		$ 198.30
Book Sales		50.00
Sponsorship-Annual Meeting		
Awards	$ 2,750.00	
Wednesday Dinner	9,000.00	
Sponsorship-Annual Meeting-Other	10,300.00	
Total Sponsorship-Annual Meeting		22,050.00
Peanut Science		4,570.00
Annual Dues		
Sustaining-Gold Level	1,000.00	
Sustaining-Silver Level	600.00	
Institutional	1,600.00	
Individual-Student	725.00	
Individual-Post Doc/Tech Support	100.00	
Individual-Retired	325.00	
Individual-Regular	13,925.00	
Total Annual Dues		18,275.00
Meeting Registration		31,650.00
Total Income		$ 76,793.30
Expense		
Annual Meeting		
Spouse	$ 1,078.05	
Awards	3,000.00	
Hotel Charges	5,000.00	
Total Annual Meeting		$ 9,078.05
Peanut Science Publishing		
Peanut Science Editor Stipend	3,000.00	
Peanut Science Publishing-Other	493.47	
Totsl Peanut Science Publishing		3,493.47
Wages - Executive Officer		11,499.96
Accounting		1,350.00
Legal		525.00
Credit Card Charges		1,217.00
Taxes - Payroll		921.78

See Accountant's Compilation Report

American Peanut Research and Education Society
Statement of Revenues and Expenses - Cash Basis
For the 6 Months Ended June 30, 2015

	June 30, 2015
Webpage Maintenance	648.04
Bank Charges	158.75
Total Expense	28,892.05
Net Ordinary Income	47,901.25
Other Income	
Interest Income	450.00
Total Other Income	450.00
Net Income	$ 48,351.25

See Accountant's Compilation Report

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

	2013 ACTUAL Jan - Dec 13	2014 ACTUAL Jan - Dec 14	2015 ACTUAL Jan - June 30	PROPOSED BUDGET FY 2015	% of Budget
Ordinary Income/Expense					
Income					
Peanut Science	9,120.00	18,045.00	4,570.00	20,050.00	22.79%
Dividend Income	-	-	198.30	-	0.0%
Book Sales	-	100.00	50.00	7,500.00	0.67%
Miscellaneous Income	330.00	-	-	100.00	0.0%
Sponsorship-Annual Meeting	-	-	10,300.00	25,000.00	
Contribution - Bayer Fund	-	-	-	-	
Contribution - Dow	5,000.00	-	-	-	
Contribution - Joe Sugg Award	750.00	-	-	-	
Contributions - General	9,350.00	-	-	-	
Awards	-	2,000.00	2,750.00	-	
Ice Cream Social	-	4,700.00	-	-	
Thursday Reception	-	3,000.00	-	-	
Wednesday Dinner	-	19,000.00	9,000.00	-	
Total Sponsorship-Annual Meeting	15,100.00	28,700.00	22,050.00	25,000.00	88.2%
Annual Dues				22,000.00	
Sustaining-Platinum Level	-	1,000.00	-	-	
Sustaining-Gold Level	500.00	1,500.00	1,000.00	-	
Sustaining-Silver Level	900.00	2,100.00	600.00	-	
Institutional	700.00	2,200.00	1,600.00	-	
Individual-Student	200.00	400.00	725.00	-	
Individual-Post Doc/Tech Supp	150.00	200.00	100.00	-	
Individual-Retired	75.00	375.00	325.00	-	
Individual-Regular	8,725.00	15,150.00	13,925.00	-	
Annual Dues - Other	9,320.00	-	-	-	
Total Annual Dues	20,570.00	22,925.00	18,275.00	22,000.00	83.07%
Meeting Registration	43,750.00			40,000.00	
Student Registration		1,000.00	1,550.00		
Gold Registration		1,400.00	1,000.00		
Regular Registration		31,900.00	29,100.00		
Total Meeting Registration	43,750.00	34,300.00	31,650.00	40,000.00	79.13%
Total Income	88,870.00	104,070.00	76,793.30	114,650.00	66.98%
Expense					
Annual Meeting					
Awards	3,578.82	5,055.15	3,000.00	5,000.00	
Hotel Charges	-	30,718.37	5,000.00	33,000.00	
Supplies/Equip/AV	-	962.57	-	1,000.00	
Program	1,250.60	-	-	-	
Travel-Bayer Prog Ext Agents	-	4,383.38	-	5,000.00	
Spouse	-	-	1,078.05	-	
Annual Meeting - Other	35,435.64	-	-	1,000.00	
Total Annual Meeting	40,265.06	41,119.47	9,078.05	45,000.00	20.17%
Peanut Science	-	-	-	2,701.00	
Peanut Science Publishing	12,013.94	21,500.62	493.47	3,600.00	
Peanut Science Editor Stipend	-	3,000.00	3,000.00	3,000.00	
Peer Review	-	-	-	387.00	
Website Update	-	-	-	10,312.00	
Total Peanut Science	12,013.94	24,500.62	3,493.47	20,000.00	17.47%
Book Purchases - AOCS	-	-	-	4,125.00	0.0%
Administrative Expenses					
Dues-Cast	375.00	-	-	-	0.0%
Corp Registration Fees	-	30.00	-	50.00	0.0%
Legal Fees	-	-	525.00	250.00	210.0%
Insurance	-	100.00	-	100.00	0.0%
Wages - Executive Officer	23,008.72	22,999.92	11,499.96	23,000.00	50.0%
Administrative Assistant	-	-	-	-	0.0%
Webpage Maintenance	822.50	360.00	648.04	1,500.00	43.2%
Accounting	1,647.15	2,694.42	1,350.00	1,950.00	69.23%
Contract Labor	348.75	52.00	-	350.00	0.0%
Postage	249.65	-	-	50.00	0.0%
Office Expenses	-	183.97	-	250.00	0.0%
Travel - Officer	1,615.17	-	-	1,200.00	0.0%
Bank Charges	2.75	11.00	158.75	25.00	635.0%
Credit Card Charges	2,344.66	2,445.30	1,217.00	2,500.00	48.68%
Miscellaneous Expense	-	-	-	250.00	0.0%
Taxes - Payroll	1,802.17	1,906.56	921.78	2,000.00	46.09%
Total Administrative Expenses	32,216.52	30,783.17	16,320.53	33,475.00	48.75%
Total Expense	84,495.52	96,403.26	28,892.05	102,600.00	28.16%
Net Ordinary Income	4,374.48	7,666.74	47,901.25	12,050.00	397.52%
Other Income					
Interest Income	1,545.32	1,362.99	450.00	1,300.00	34.62%
Total Other Income	1,545.32	1,362.99	450.00	1,300.00	34.62%
Net Income	**5,919.80**	**9,029.73**	**48,351.25**	**13,350.00**	362.18%

PUBLICATIONS AND EDITORIAL COMMITTEE REPORT –

Chairman Nick Dufault updated the members on their projects:

Book Update – The Committee has been working on writing and publishing two new books. Chairman Nick Dufault shared that the first book, ***Peanuts: Genetics, Processing, and Utilization (***a joint publication with AOCS) will be published late 2015 or earch 2016. The Committee has agreed on the initial chapters for the 2nd book, **Peanut Production, Management & Utilization**--a total of 13 which will include an international segment. Additional chapters from industry members such as RUTF, ethical trading, nutrition, conservation, sustainability, and food safety are being considered. Nick Dufault, Diane Rowland, and Tim Grey have been proposed as editors and the Committee will be reaching out for chapter authors.

Digitized APRES Books - A member of Chris Butts' staff has digitized APRES's teal book and is working on the red book. The books will be posted on the APRES website for download. President Naveen asked Chris Butts to come forward to receive a special Certificate of Appreciation for Beverly Hill of the USDA/ARS/NPRL for tackling the monumental task of digitzing APRES' published books, commending her for extending APRES' communication outreach.

Peanut Science - Editors Report – January 1, 2014 to December 31, 2014

The Associate Editors of *Peanut Science* meeting is set for Tuesday, July 14th, 2015 at the Annual APRES meeting at the Francis Marion Hotel in Charleston SC. *Peanut Science* Volumes 40-1 was released online in July 2013, with Volume 40-2 released March 2014 online via the website AllenPress. *Peanut Science* Volume 41-1 was released in May 2014, and Volume 41-2 released September 2014. Volume 42-1 was released June 30 2015 containing 9 articles.

No associate editor terms expired in 2015.

Three new associate editors have been appointed to the committee with terms beginning in 2014:
Maria Balota
Shyamalrau Tallury
Glenn Wehtje

Newly added for 2014 was the 'Online First' for all accepted manuscripts. This allowed ahead of print options for authors to site prior to the volume publication with page numbers. There is a $10 charge for the online first publication. Kim Cutchins as EO for APRES along with Allen Press have been working to make *Peanut Science* available online to a greater number of clients via EBSCO information services. One goal is to establish an Impact Factor for *Peanut Science*. If you go to Google.com and enter '*Peanut Science'*, the journal is the first return and listed returns for *Peanut Science* are the first 4 websites along with APRES (#3). At Googlescholar.com the request for *Peanut Science* returns 410,000 hits, with many journal articles, and Dr. Boote's 'Growth Stages of Peanut' from 1982 listed first if sorted by relevance. The goal of APRES is to continue the promotion of Peanut Science to a wider audience, improve the number of submissions, and increase the relevance of the journal. Additionally, Kim has been working with Allen Press to address issues with the *Peanut*

Science website at http://www.peanutscience.com/. Kim has conducted an examination and review of the Allen Press contract which is in place until December 2015, with a 90 day notification clause. With the advances in technology, we are examining if there are more effective and less expensive ways to publish *Peanut Science*, while maintaining the user friendly search engine. The web site is locked into its current look and cannot be customized under our current rates.

For the 12-month time period from January 1, 2014 to Dec 31, 2014 for manuscripts assigned to Dr. Grey as editor, there were 20 total submissions in 2014, and 1 assigned to Dr. Chris Butts.

Table 1. Performance statistics of reviewers for articles submitted to Peanut Science between 01 January 2014 and 31 December 2014.

Reviewer Performance Metric	Measure
Number of invitations	67
Number of Reviews	42
Number of Reviews declined	13
Un-invited before agreeing	12
Days to Respond to Invitation	1.1
Days to Complete Review (from Date Invited)	16.8
Number of Reviews per Reviewer	0.88
Number of Late Reviews	16
Average Days Late	0.8
Submitted on or ahead of time	26

Table 2. Submissions by year

Month	2010	2011	2012	2013	2014	2015
Jan	0	2	2	2	0	1
Feb	2	2	2	2	0	1
Mar	1	1	1	3	3	1
Apr	1	2	0	0	0	3
May	4	0	3	1	1	1
Jun	0	2	0	1	1	1
Jul	8	0	1	0	0	1
Aug	1	2	3	5	1	2
Sep	3	3	1	2	5	2
Oct	2	3	2	1	1	2
Nov	0	4	3	3	3	1
Dec	1	1	2	1	5	
Totals	**23**	**22**	**20**	**21**	**20**	**16**

PEANUT QUALITY COMMITTEE:

The meeting was called to order by Chairman Mark Kline at 2:00 pm. See attachment for those in attendance.

Cultivar Composition and Flavor Summary (UPPT):
Tom Isleib provided a summary of the 2014 UPPT data. UPPT provides a valuable data resource for comparison of cultivars across geographic regions. It is important to understand how this program can be continued.

High Oleic Purity:
HOAP single kernel purity is critical to achieve optimal flavor over shelf life in confectionery products. A purity standard is needed on HOAP seed. Sample size and methodology will need to be defined for consistency across the industry. Hershey recommends the industry adopt a specification of bulk O/L ≥ 11.0 and a single kernel purity of ≥ 95% on 100 kernels, with a stronger emphasis on single kernel purity versus bulk O/L. Mars is investigating HOAP characterization as well. The manufacturers recommend converting all peanut lines to high oleic to mitigate purity issues. Bill Branch voiced concerns over transition to only high oleic cultivars as this would limit grower's options to manage disease, insect, virus and nematode pressures.

High Oleic Testing Methods:
- Refractive Index using temperature controlled refractometer – Hershey has developed a validated method with 100% correlation to GC. The method is faster and lower cost than GC. A 100 kernel analysis would take ~ 3 hrs. A limitation of the method is that it is destructive. The method was presented at APRES in 2011 and available upon request.
- NIR – Method can yield acceptable results but extremely challenging to transfer calibrations from one unit to another. Linoleic acid calibrations have been difficult to obtain with NIR. The method can be non-destructive. An approach suggested to improve reading is to cut the end of the seed coat off making a flat surface.
- FTIR – Mars has developed calibration curves on an FTIR instrument from Agilent. The method has been validated against single kernel GC measurements. The method takes 2-3 minutes per kernel for measurement. Mars is willing to share method to improve industry standards. Mars is also working on surveying commercial lots to create a baseline and defining the appropriate sample size for accepting/rejecting lots.

High Oleic Contamination Routes:
Low purity levels seen by Hershey are attributed to physical contamination. D. Sweigart shared results demonstrating a clear distinction between high oleic kernels and standard oleic or conventional peanuts. The HOAP bulk O/L ratio ranged from 6 to 35. Low bulk O/L's were attributed to maturity. Standard or conventional peanuts had bulk O/L ratio's of ≤ 1.

Genetic reversion was discussed as a potential cause of variation. In one study, variation in kernels from one pod have been noted. After the Committee Meeting, Charles Chen mentioned that this could likely be seen in the F2 or earlier generation from heterozygote standard oleic or conventional peanut plants.

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

Raw Peanut Storage Conditions:
USDA/Birdsong/Mars is conducting an alternative raw peanut storage study. At 38-42 °F storage, mold can develop in super sacks. A study investigating the impact of storage at 55 °F and 70 °F is currently underway. Samples are being pulled for sensory, FFA's, PV's, seed germination, water activity and wetness (utilizing leaf wetness sensors). To date, results are looking promising. Birdsong has had one of their small cold storage spaces set at 55 °F since August 2014 and has not experienced any mold issues. The study will be completed Q1 2016, but could continue to generate more data. Benefits of increasing the storage temperature include minimizing mold and reducing carbon footprint.

Quality/Nutrition Attributes for Genomics Project:
The peanut industry has a good story to tell about nutrition. The genomics work to date has focused mainly on disease resistance and there is an opportunity to also focus efforts on nutritional improvements. A guideline for targets on micronutrients range would be beneficial for breeders to target. Natural and non-GMO are also current consumer trends.

Peanut Specification Updates:
The current damage specification for peanuts is set at 2.5% based on weight. The industry is proposing to move this to 3.5% based on weight. The change is being proposed due to higher weights of individual kernels.

An update to the Aflatoxin methodology has been proposed by USDA. D. Coward needs support from each industry group to position the peanut industry for opposition of the changes. The changes proposed would only allow Vicam results of 0 ppb for passing, 1 ppb would be considered a presumptive positive and require HPLC. With a maximum limit of 15 ppb total, Vicam has sufficient resolution and does not require HPLC. HPLC testing would increase testing time by 4 times. Darlene will follow up with each respective group to discuss further.

Meeting was adjourned at 3:00 pm.

Respectively submitted,
Mark Kline, Chair

PROGRAM COMMITTEE REPORT –

Program Chairman Tom Stalker recognized the outstanding help and support of Technical Program Chairman Ames Herbert and Local Arrangements Chairman Shyam Tallury. Attendance for 2015 is 370 total; 241 registrants; 84 spouses; 45 children. Feedback from the Opening Session speakers has been outstanding. A new perk was given to registrants this year in the form of thumb drives pre-loaded with the 2015 abstracts, program and attendance list. BASF and Bayer Crop Sciences were recognized as sponsors of Wednesday night dinner. Dow AgroSciences was recognized as the sponsor of the Thursday night reception. The Peanut Institute sponsored the keynote speaker, Dr. Peanny Kris-Etherton. JLA and the National Peanut Board are sponsoring the Fun Run with a record number of participants. South Carolina Peanut Board sponsored the Spouses Hospitality Suite. Bharthi Tallury put together two excellent tours--Fort Sumter and the Aquarium as well as kids activities in the suite. The North Carolina Peanut Growers Association once again sponsored the Joe Sugg Graduate Student Competition. A host of sponsors supported the Ice Cream Social. APRES continues to have a great group of peanut product suppliers.

Ames reported the 47th Annual Meeting scheduled 137 presentations. Included in these

presentations is a symposium on Peanut Post Harvest Quality and 37 were posters.

SITE SELECTION COMMITTEE REPORT –

Mike Baring, Committee Chairman, stated the APRES meeting will continue its rotation between the three peanut producing regions--SE, SW, VC. Next year's--the 48th Annual Meeting--will be at the Hilton Clearwater Beach in Clearwater Florida, July 12-14, 2016. The Committee and Board have agreed to finalize a contract with the Hotel Albuquerque in Albuquerque NM for the 2017 meeting (49th). The dates will be July 11-3. The 50th meeting of the Society will be held in the Virginia-Carolina region. Both NC State and Virginia Tech have offered to help host the meeting in their respective states. The dates will be July 10-12, 2018. The meeting will return to the Southeast in 2019 and Auburn University has expressed an interest in being the host university. Dates are July 9-11, 2019. Chairman Baring suggested whatever meeting you plan to attend to make your hotel reservations early. Hotels are booking their properties tighter and space sells out early. Better to have a reservation and cancel if you cannot attend than to be caught searching for a nearby place to stay.

APPENDIX

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

ARTICLE 1. NAME

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

ARTICLE II. PURPOSE

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

ARTICLE III. MEMBERSHIP

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

a. Individual memberships:

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

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

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

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

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

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

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

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

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

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

ARTICLE IV. DUES AND FEES

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

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

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

ARTICLE V. MEETINGS

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

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

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

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

Section 4. Special meetings in conjunction with the annual meeting by Society members, either alone or

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

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

ARTICLE VI. QUORUM

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

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

ARTICLE VII. OFFICERS

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

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

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

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

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

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

Section 7. (a) The executive officer shall countersign all deeds, leases, and conveyances executed by the Society and affix the seal of the Society thereto and to such other papers as shall be required or directed to be sealed. (b) The executive officer shall keep a record of the deliberations of the Board of Directors, and keep safely and systematically all books, papers, records, and documents belonging to

the Society, or in any wise pertaining to the business thereof. (c) The executive officer shall keep account of all monies, credits, debts, and property of any and every nature accrued and/or disbursed by this Society, and shall render such accounts, statements, and inventories of monies, debts, and property, as shall be required by the Board of Directors. (d) The executive officer shall prepare and distribute all notices and reports as directed in these By-Laws, and other information deemed necessary by the Board of Directors, to keep the membership well informed of the Society activities.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

ARTICLE VIII. BOARD OF DIRECTORS

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

a. The president
b. The most recent available past-president
c. The president-elect

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

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

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

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

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

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

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

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

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

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

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

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

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

ARTICLE IX. COMMITTEES

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

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

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

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

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

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

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

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

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

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

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

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

Site Selection Committee shall:

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

Board of Directors shall:

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

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

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

ARTICLE X. AMENDMENTS

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

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

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

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

MEMBERSHIP (1975-2006)

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

MEMBERSHIP (2007-2015)

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

GUIDELINES for AMERICAN PEANUT RESEARCH AND EDUCATION SOCIETY

FELLOW ELECTIONS

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

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

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

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

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

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

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

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

Processing of Nominations

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

Recognition

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

Distribution of Guidelines

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

GUIDELINES for AMERICAN PEANUT RESEARCH & EDUCATION SOCIETY

BAILEY AWARD

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

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

The following should be considered for eligibility:

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

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

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

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

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

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

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

Manuscripts are judged using the following criteria:

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

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

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

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

Amended 7-16-2015

GUIDELINES FOR THE AMERICAN PEANUT RESEARCH & EDUCATION SOCIETY'S

COYT T. WILSON DISTINGUISHED SERVICE AWARD

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

Eligibility of Nominators

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

Eligibility of Nominees

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

Nomination Procedures

Deadline.

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

Preparation.

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

Format.

TITLE:

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

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

NOMINEE:

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

NOMINATOR AND ENDORSER:

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

SERVICE AREA:

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

Qualifications of Nominees

Personal Achievements and Recognition:

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

Service to the Society:

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

Supporting letters:

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

Re-consideration of nominations.

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

Award and Presentation

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

Amended 7-16-2015

GUIDELINES for

DOW AGROSCIENCES AWARDS FOR EXCELLENCE IN RESEARCH AND EDUCATION

I. Dow AgroSciences Award for Excellence in Research

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

Eligibility of Nominees

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

II. Dow AgroSciences Award for Excellence in Education

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

Eligibility of Nominees

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

Eligibility of Nominators

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

Nomination Procedures

Nominations will be made on the Nomination Form for Dow AgroSciences Awards. Forms are available from the Executive Officer of APRES. A nominator's submittal letter

summarizing the significant professional achievements and their impact on the peanut industry must be submitted with the nomination. Three supporting letters must be submitted with the nomination. Supporting letters may be no more than one page in length. Nominations must be postmarked by the date established in the Call for Nominations and mailed (electronically or postal) to the committee chair. Unsuccessful nominations will be reconsidered the following year and nominators will be contacted and given the opportunity to provide a letter that updates the nomination. After the second year unsuccessful nominations will be reconsidered only following submission of a new, complete nomination package.

Dow AgroSciences Awards Committee

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

Amended 7-16-2015

APRES
American Peanut Research & Education Society, Inc.

47th Annual Meeting
July 14–16, 2015
Francis Marion Hotel
Charleston, SC

2015 Program

APRES 47th Annual Meeting
July 14-16, 2015 * Charleston, SC

Sponsors

Wednesday Night Reception & Dinner
Bayer CropScience
BASF

Awards Reception
Dow AgroSciences

Ice Cream Social
AmVac
DuPont
Golden Peanut & Tree Nuts
Nichino America
United Phosphorus Inc.
U.S. Gypsum
Valent
Valley Irrigation

Registration Bags & Product Donations
South Carolina Peanut Board
VICAM
Romer Labs
Verdesian Life Sciences
Aranex Biotech
Georgia Peanut Commission
Hampton Farms
Severn Peanut Company
Charleston Convention & Visitors Board
South Carolina Department of Agriculture
Ft. Sumter Tours
South Carolina Aquarium
Frothy Beard Brewing Company

Spouses Hospitality Suite
South Carolina Peanut Board

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

Joe Sugg Graduate Student Competition
North Carolina Peanut Growers Association

Fun Run
JLA, Inc.
National Peanut Board

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

47th ANNUAL MEETING of the
AMERICAN PEANUT RESEARCH & EDUCATION SOCIETY
July 14-16, 2015
Charleston, SC

BOARD OF DIRECTORS
2014-15

President……. Naveen Puppala (2016)
Past President…….. Tim Brenneman (2015)
President-Elect……. Tom Stalker (2017)
Executive Officer…….. Kimberly Cutchins (2015)
University Representatives:
Virginia-Carolina……. David Jordan (2016)
Southeast……..Barry Tillman (2016)
Southwest…….. Peter Dotray (2017)
USDA Representative…….. Noelle Barkley (2016)
Industry Representatives:
Production…….. Keith Rucker (2015)
Shelling, Marketing, Storage…… Darlene Cowart (2016)
Manufactured Products…… Jim Elder (2017)
American Peanut Council…… Howard Valentine (2015)
National Peanut Board ……. Dan Ward (2016)

PROGRAM COMMITTEE
Tom Stalker, Chair (2015)

Local Arrangements
Shyam Tallury, Chair
Craig Kvien
Gurleen Kaur
Chuck Parker
Abishek Xavier

Spouses' Program
Bharathi Tallury, Coordinator
Helene Stalker

Fun Run
Jack Davis

Technical Program
Ames Herbert, Chair
Sean Malone
Henry McLean
Shyam Tallury
Bob Kemerait
David Jordan
Barbara Shew
Eric Prostko
Lisa Dean
Keith Rucker
Tom Isleib
Hilary Mehl
Jack Davis

APRES Committees
2014-15

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

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

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

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

Finance Committee
Todd Baughman, Chair (2017)
Darlene Cowart (2015)
George Musson (2015)
Naveen Puppala (2017)
Scott Tubbs (2017)

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

Nominating Committee
Tim Brenneman, Chair (2015)
John Damicone (2015)
Barbara Shew (2015)
Noelle Barkley (2017)
Barry Tillman (2017)

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

Program Committee
Tom Stalker, Chair (2015)
Ames Herbert, Technical Program
Shyam Tallury, Local Arrangements
Bharthi Tallury, Spouses' Program
Jack Davis, Fun Run

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

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

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

APRES 47th Annual Meeting
Schedule of Events

Monday, July 13, 2015	
8:30 a.m. - 12 Noon	**PMIL Working Group**
12:00 - 2:30 p.m. **Gold Ballroom**	**Peanut Genomics Initiative Meeting**
3:00 - 5:00 p.m. **USDA Vegetable Lab**	**Tour - On Your Own** **USDA Vegetable Lab and Clemson University Field Plots**
7:30 - 9:30 p.m. **Gold Ballroom**	**Peanut Trivia Contest**
Tuesday, July 14, 2015	
All Day **Mezzanine Booth**	**Registration**
Morning	**Golf on Your Own**
8:00 - 10:00 a.m. **Carolina B Ballroom**	**Seed Summit**
10:00 a.m. - 12 Noon **Carolina B Ballroom**	**Crop Germplasm Committee**
Mid-day	**Lunch on Your Own**
1:00 - 4:30 p.m. **Bridgeview Suite (1203)**	**Spouses' Hospitality Suite Open** *Sponsored by South Carolina Peanut Board*
Afternoon **Carolina B Ballroom**	**Committee Meetings**
12 Noon	**Program Committee**
1:00 p.m.	Publications and Editorial Committee Associate Editors Peanut Science Nominating Committee
2:00 p.m.	Peanut Quality Committee Site Selection Committe Dow Awards Committee Fellows Award Committee
3:00 p.m.	Public Relations Committee Coyt T. Wilson Award Committee Bailey Award Committee
4:00 p.m.	Finance Committee Joe Sugg Graduate Student Competition Committee
3:00 - 6:00 p.m. **Laurens Room**	**Presentation Uploading**
6:30 - 8:00 p.m. **Gold Ballroom**	**Ice Cream Social**

APRES 47th Annual Meeting
Schedule of Events

Wednesday, July 15, 2015	
All Day **Mezzanine Booth**	**Registration**
All Day **Laurens Room**	**Presentation Uploading**
8:00 a.m. - 4:00 p.m. **Bridgeview Suite (1203)**	**Spouses' Hospitality Suite Open** *Sponsored by South Carolina Peanut Board*
8:00 - 9:15 a.m. **Carolina A&B**	**Opening General Session**
8:00 a.m.	**Call to Order** *APRES President Naveen Puppala*
8:05 a.m.	**Welcome to South Carolina** Richard Rentz Chairman South Carolina Peanut Board
8:15 a.m.	**Research in South Carolina** Dr. Joe Culin Associate Dean, Research & Graduate Studies Clemson University
8:35 a.m.	**The Perfectly Powerful Peanut: One Year On** Bob Parker President and CEO National Peanut Board
8:45 a.m.	**Keynote Address:** ***The Many Health Benefits of Peanuts*** Dr. Penny Kris-Etherton Distinguished Professor of Nutrition The Pennsylvania State University
	Announcements Ames Herbert, Technical Program Chairman
9:30 - 9:45 a.m.	**Break** *Sponsored by Birdsong Peanuts*
9:45 a.m. - 12 Noon	**Peanut Post Harvest Quality Symposium**
	Opening Remarks - Jack Davis, JLA International
9:45 a.m.	**Overview & Management of Raw Material Quality: Thinking Beyond the Moment** Jim Leek Chairman JLA International
10:05 a.m.	**U.S. Shelling Industry Best Practices: Food Safety and Quality** Darlene Cowart Corporate Director of Food Safety & Quality Birdsong Peanuts
10:25 a.m.	**Toll Processing & Peanut Ingredient Processing** Jim Fenn and Robert Moore Senior Vice President Food Scientist Olam Edible Nuts Olam Edible Nuts
10:45 a.m.	**High Oleic Peanut Chemistry & Finished Product Quality** Dan Sweigart and Anne-Marie DeLorenzo Hershey Fellow Strategic Sourcing Manager-Nuts Hershey Chocolate Mars Chocolate North America
11:05 a.m.	**Roasted Peanut Flavor…Limited Characteristic or a Broad Opportunity?** Tim Sanders USDA Retired, North Carolina State University Professor Emeritus

APRES 47th Annual Meeting
Schedule of Events

Wednesday, July 15, 2015 *(continued)*	
9:45 a.m. - 12 Noon	**Peanut Post Harvest Quality Symposium** *(Continues)*
11:25 a.m.	**Peanut Product Innovation and Some Surprising and Useful Characteristics** Dick Phillips Professor Emeritus, Food Product Innovation & Commercialization Ctr University of Georgia - Griffin
	Closing Remarks, Questions & Discussion

12 Noon - 1:00 p.m.	**Lunch on Your Own**

Concurrent Breakout Sessions	
1:00 - 2:45 p.m. **Carolina A**	**Entomology, Weed Science & Mycotoxins**
1:00 - 3:00 p.m. **Calhoun**	**Harvesting, Curing Shelling, Storing & Handling and Processing and Utilization, Economics** ***(Categories Combined)***
1:00 - 3:30 p.m. **Carolina B**	**Breeding, Biotechnology and Genetics I**
3:00 - 3:30 p.m.	**Break** *Sponsored by Syngenta*
3:30 - 4:45 p.m. **Calhoun**	**Bayer Excellence in Extension/Extension Techniques and Technology**
3:30 - 5:00 p.m. **Carolina A**	**Plant Pathology and Nematology I**
3:30 - 5:15 p.m. **Carolina B**	**Physiology and Seed Technology**
5:00 - 6:00 p.m. **Middleton Room**	**Board of Directors Meeting**
6:30 - 7:00 p.m. **Colonial Ballroom** **7:00 - 9:00 p.m.** **Carolina A&B Ballroom**	**Reception** **Dinner** *Sponsored by Bayer CropScience and BASF Corporation*

APRES 47th Annual Meeting
Schedule of Events

Thursday, July 16, 2015	
All Day **Mezzanine Booth**	**Registration**
6:30 a.m **Leave FM Hotel Lobby**	**APRES Fun Run/Walk** *Sponsored by JLA, Inc.*
8:00 a.m.-4:00 p.m. **Bridgeview Suite (1203)**	**Spouses' Hospitality Suite Open** *Sponsored by South Carolina Peanut Board*
8:00 - 10:30 a.m. **Carolina A**	**Joe Sugg Graduate Student Competition** *Sponsored by North Carolina Peanut Growers Association*
8:00 - 10:30 a.m. **Carolina B**	**Breeding, Biotechnology and Genetics II**
10:30 - 10:45 a.m.	**Break** *Sponsored by Olam Edible Nuts*
10:45 a.m. - 12 Noon **Carolina A**	**Joe Sugg Graduate Student Competition** ***(continues)***

12 Noon - 1:00 p.m.	**Lunch on Your Own**

1:00 - 2:15 p.m. **Carolina A**	**Joe Sugg Graduate Student Competition** ***(continues)***
1:00 - 3:15 p.m. **Carolina B**	**Plant Pathology and Nematology II**
1:00 - 3:30 p.m. **Calhoun**	**Production Technology**
3:00-4:00 p.m.	**Break** *Sponsored by Fine Americas, Inc.*
3:30 - 4:30 p.m. **Carolina A Lobby**	**Poster Viewing and Discussions** ***(Authors Present)***
4:30 - 5:30 p.m. **Carolina A&B**	**APRES Business Meeting and Awards Ceremony**
5:30 - 7:30 p.m. **Gold Ballroom**	**Awards Reception** *Sponsored by Dow AgroSciences*

APRES 47th Annual Meeting
Program

Monday, July 13, 2015		
All Day **Middleton Room**		**Registration Setup**
8:30 a.m. - 12 Noon **Gold Ballroom**		**PMIL Working Group**
12:00 Noon - 2:30 p.m. **Gold Ballroom**		**Peanut Genomics Initiative Meeting**
3:00 - 5:00 p.m. **USDA Vegetable Lab**		**Tour - On Your Own** USDA Vegetable Lab and Clemson University Field Plots
Evening Activity **7:30-9:30 p.m.** **Gold Ballroom**		**Peanut Trivia Contest**

Tuesday, July 14, 2015		
Morning		**Golf on Your Own**
All Day **Mezzanine Booth**		**Registration**
8:00 - 10:00 a.m. **Carolina B**		**Seed Summit**
10:00 a.m. - 12 Noon **Carolina B**		**Crop Germplasm Committee**
Mid-day		**Lunch on Your Own**
1:00 - 4:30 p.m. **Bridgeview Suite (1203)**		**Spouses' Hospitality Suite Open** *Sponsored by South Carolina Peanut Board*
Afternoon **Carolina B**		**Committee Meetings**
12 Noon		Program Committee
1:00 p.m.		Publications and Editorial Committee
		Associate Editors Peanut Science
		Nominating Committee
2:00 p.m.		Peanut Quality Committee
		Site Selection Committee
		Dow Award Committee
		Fellows Award Committee
3:00 p.m.		Public Relations
		Coyt T. Wilson Award Committee
		Bailey Award Committee
4:00 p.m.		Finance Committee
		Joe Sugg Graduate Student Competition Committee

3:00 - 6:00 p.m. **Laurens Room**		**Presentation Uploading**

6:30 - 8:00 p.m. **Gold Ballroom**		**Ice Cream Social**

APRES 47th Annual Meeting
Program

Wednesday, July 15, 2015		
All Day **Messanine Booth**		**Registration**
All Day **Laurens Room**		**Presentation Uploading**
8:00 a.m.-4:00 p.m. **Bridgeview Suite (1203)**		**Spouses' Hospitality Suite Open** *Sponsored by South Carolina Peanut Board*
8:00 - 9:15 a.m. **Carolina A&B**		**Opening General Session**
8:00 a.m.		**Call to Order** APRES *President Naveen Puppala*
8:05 a.m.		**Welcome to South Carolina** Richard Rentz Chairman South Carolina Peanut Board
8:15 a.m.		**Research in South Carolina** Dr. Joe Culin Associate Dean, Research & Graduate Studies Clemson University
8:35 a.m.		**The Perfectly Powerful Peanut: One Year On** Bob Parker President and CEO National Peanut Board
8:45 a.m.		**Keynote Address:** ***The Many Health Benefits of Peanuts*** Dr. Penny Kris-Etherton Distinguished Professor of Nutrition The Pennsylvania State University
		Announcements Ames Herbert, Technical Program Chairman
9:30 - 9:45 a.m. **Carolina A Lobby**		**Break** *Sponsored by Birdsong Peanuts*
9:45 a.m. - 12 Noon **Carolina A&B**		**Peanut Post Harvest Quality Symposium**
		Opening Remarks - Jack Davis, JLA International
9:45	(1)	**Overview & Management of Raw Material Quality: Thinking Beyond the Moment** Jim Leek Chairman JLA International
10:05	(2)	**U.S. Shelling Industry Best Practices: Food Safety and Quality** Darlene Cowart Corporate Director of Food Safety & Quality Birdsong Peanuts
10:25	(3)	**Toll Processing & Peanut Ingredient Processing** Jim Fenn and Robert Moore Senior Vice President Food Scientist Olam Edible Nuts Olam Edible Nuts
10:45	(4)	**High Oleic Peanut Chemistry & Finished Product Quality** Dan Sweigart and Anne-Marie DeLorenzo Hershey Fellow Strategic Sourcing Manager-Nuts Hershey Chocolate Mars Chocolate North America
11:05	(5)	**Roasted Peanut Flavor…Limited Characteristic or a Broad Opportunity?** Tim Sanders USDA Retired, North Carolina State University Professor Emeritus

Wednesday, July 15, 2015 *(continued)*		
9:45 a.m. - 12 Noon **Carolina A&B**		**Peanut Post Harvest Quality Symposium** *(continued)*
11:25	(6)	**Peanut Product Innovation and Some Surprising and Useful Characteristics** Dick Phillips Professor Emeritus, Food Product Innovation & Commercialization Ctr University of Georgia - Griffin
		Closing Remarks, Questions & Discussion

12 Noon - 1:00 p.m.		**Lunch on Your Own**
Concurrent Breakout Sessions **Carolina A, Carolina B & Calhoun**		

1:00 - 2:45 p.m. **Carolina A**		**Entomology, Weed Science & Mycotoxins** *Moderator: Eric Protko, University of Georgia*
1:00	(8)	***A Very Buggy Year: Insect Pests in Georgia Peanut in 2014*** **M.R. ABNEY***, The University of Georgia, Tifton, GA 31794.
1:15	(9)	***Aflatoxin Assessment in Peanut in the Ghana PMIL Value Chain: Preliminary Findings*** **W.O. APPAW***, W.O. ELLIS, R. AKROMAH, Kwame Nkrumah, University of Science and Technology, Kumasi, Ghana; M. MOCHIAH, I. ADAMA, M. OWUSU-AKYAW, Crops Research Institute, Council for Scientific and Industrial Research, Kumasi, Ghana; M. ABUDULAI, J. NAAB, Y. MOHAMMED, Savannah Agricultural Research Institute, Council for Scientific and Industrial Research, Tamle and Wa, Ghana; A. BUDU, University of Legon, Ghana; K. MALLIKARJUNAN, M. BALOTA, Virginia Tech, Blacksburg, VA 24601; J. CHEN, R. PHILLIPS, M. CHINNAN, University of Georgia, Griffin, GA 30223; B. BRAVO-URETA, University of Connecticut, Storrs, CN 06269; K. BOOTE, G. MACDONALD, University of Florida, Gainesville, FL 32611; R.L. BRANDENBURG and D.L JORDAN, North Carolina State University, Raleigh, NC 27695.
1:30	(10)	***Evaluation of Insecticide Efficacy Against Lesser Cornstalk Borer in Peanut*** **B.W. HAYES***, University of Georgia Cooperative Extension, Grady County, Cairo, GA 39828; C.E. POWELL, University of Georgia, Department of Entomology, Tifton, GA 31794; and M.R. ABNEY, University of Georgia, Department of Entomology, Tifton, GA 31794.
1:45	(11)	***Determining the Best Alternatives for Controlling Thrips in Peanut*** **D.A. HERBERT, JR.***, S. MALONE, Department of Entomology, Virginia Tech Tidewater Agricultural Research and Extension Center, Suffolk, VA 23437; D. JORDAN, Department of Crop Science, North Carolina State University, Raleigh, NC 27695; R.L. BRANDENBURG and B.M. ROYALS, Department of Entomology, North Carolina State University, Raleigh, NC 27695.
2:00	(12)	***Insights on Macro- and Micro-level Interactions between Thrips and Tomato Spotted Wilt Virus*** **R. SRINIVASAN***, A. SHRESTHRA, Entomology Department, University of Georgia, Tifton, GA 31793; and A. CULBREATH, Department of Plant Pathology, University of Georgia, Tifton, GA 31793.
2:15	(13)	***Peanut Response to 3-Way Tank-Mixtures of Cadre, Cobra, Ultra Blazer, 2,4-DB, Dual Magnum, and Warrant*** **E.P. PROSTKO***, O.W. CARTER, Department of Crop and Soil Sciences, University of Georgia, Tifton, GA 31794.

Wednesday, July 15, 2015 *(continued)*		
1:00 - 2:45 p.m. **Carolina A**		**Entomology, Weed Science & Mycotoxins** *(continued)* *Moderator: Eric Protko, University of Georgia*
2:30	(14)	***Using Herbicides to Reduce Purple Nutsedge (*Cyperus rotundus*) Tuber Production*** **T.M. WEBSTER***, T.L. GREY, Crop Protection and Management Research Unit, USDA-ARS, Tifton, GA 31793 and Department of Crop and Soil Sciences, University of Georgia, Tifton, GA 31793.

1:00 - 3:00 p.m. **Calhoun**		**Harvesting, Curing, Shelling, Storing & Handling and Processing and Utilization, Economics** *Moderator: Lisa Dean, USDA-ARS*
1:00	(15)	***Intensities of Sensory Attributes in High- and Normal-Oleic Cultivards in the Uniform Peanut Performance Test*** H.E. PATTEE, **T.G. ISLEIB***, Department of Crop Science, North Carolina State University, Raleigh, NC 27695-7629; R.S. TUBBS, Department of Crop and Soil Sciences, 2360 Rainwater Rd., University of Georgia Coastal Plain Exp. Sta., Tifton, GA 31793; and T.H. SANDERS, L.O. DEAN, and K.W. HENDRIX, USDA-ARS Market Quality and Handling Research Unit, Raleigh, NC 27695-7624.
1:15	(16)	***Moisture Determination of Nuts and Dry Fruits using a Capacitance Sensor*** **C.V. KANDALA***, National Peanut Research Laboratory, USDA, ARS, Dawson, GA 39842; and R. HOLSER, USDA, ARS, Athens, GA 30605.
1:30	(17)	***Leathery Hull Peanuts – Effect on Shelling Performance*** **C.L. BUTTS***, M.C. LAMB, USDA-ARS, National Peanut Research Laboratory, Dawson, GA 39842; and G.H. HARRIS, Crop and Soil Sciences Department, University of Georgia, Tifton, GA 31793.
1:45	(18)	***The Challenges of Peanut Skins as Functional Food Ingredients*** **L.L. DEAN***, Market Quality and Handling Research Unit, USDA-ARS, Raleigh, NC 27695-7624.
2:00	(19)	***An Economic Analysis of Herbicide Control of Purple Nutsedge in Peanut*** **O.D. WILLIAMS***, University of Georgia, Athens, GA 30602; N.B. SMITH, T. GREY, R.S. TUBBS, Department of Crop and Soil Science, University of Georgia, Tifton, GA 31793; and T. WEBSTER, USDA/ARS, Crop Protection and Management Research Unit, Tifton, GA 31793.
2:15	(20)	***Economics of Fungal Disease Programs for Peanut in Eastern Georgia*** **A. SMITH***, N. SMITH, Department of Agricultural and Applied Economics, University of Georgia, Tifton, GA 31793; R. KEMERAIT, Department of Plant Pathology, University of Georgia, Tifton, GA 31793; P. CROSBY, University of Georgia Cooperative Extension, Swainsboro, GA 30401; W. PARKER, University of Georgia Cooperative Extension, Millen, GA 30401; and W. TYSON, University of Georgia Cooperative Extension, Statesboro, GA 30401.
2:30	(21)	***An Economic Comparison of Three Irrigation Systems in a Crop Rotation including Peanuts*** S.S. NAIR, **F.D. MILLS, JR.***, T.W. KELCH, C.P. MARTINEZ, Department of Agricultural Sciences and Engineering Technology, Sam Houston State University, Huntsville, TX 77341; R.B. SORENSEN, USDA-ARS National Peanut Research Lab, Dawson, GA 39842.
2:45	(22)	***Generic Base and Market Loan Gains Implications on Peanut Payment Limits*** **N.B. SMITH***, University of Georgia, Tifton, GA 31793; S.M. Fletcher, University of Georgia, Griffin, GA 30223.

Wednesday, July 15, 2015 *(continued)*

1:00 - 3:30 p.m. **Carolina B**		**Breeding, Biotechnology and Genetics I** *Moderator: Tom Isleib, North Carolina State University*
1:00	(23)	***Evidence for a Second RKN Resistance Gene in Peanut*** **W.D. BRANCH***, Department of Crop and Soil Sciences, University of Georgia, Tifton, GA; T.B. BRENNEMAN, and J.P. NOE, Department of Plant Pathology, University of Georgia, Tifton and Athens Campuses, GA, respectively.
1:15	(24)	***Identification of Rare Recombinants Leads to Tightly Linked Markers for Nematode Restance in Peanut*** **Y. CHU***, R. GILL, J. CLEVENGER, P. OZIAS AKINS, Department of Horticulture, University of Georgia Tifton Campus, Tifton, GA 31793-5766; P. TIMPER and C.C HOLBROOK, USDA-Agricultural Research Service, Tifton, GA 31793.
1:30	(25)	***Identification of QTLs for Use in Marker Assisted Selection*** **C.C. HOLBROOK***, USDA-Agricultural Research Service, Tifton, GA 31793; P. OZIAS-AKINS, Y. CHU, University of Georgia, Tifton, GA; T.G. ISLEIB, Department of Crop Science, North Carolina State University, Raleigh, NC 27615; A.K CULBREATH, T.B. BRENNEMAN, University of Georgia; C.Y. CHEN, Auburn University; J.P. CLEVENGER, C. CHAVARRO, S.A. JACKSON, University of Georgia; C. BUTTS, M. LAMB, USDA-ARS; C.K. KVIEN, University of Georgia; T.R. SINCLAIR, A. SHEKOOFA, North Carolina State University; B.L. TILLMAN, University of Florida; M.D. BUROW, Texas A&M University; and B. GUO, Z. ABDO, and S. KIM, USDA-Agricultural Research Service.
1:45	(26)	***Genotypic and Phenotypic Variation in Disease Reaction in the University of Florida Peanut Breeding Program*** **B.L. TILLMAN***, University of Florida, Agronomy Department, North Florida REC, Marianna, FL, 32446; T.B. BRENNEMAN, University of Georgia, Department of Plant Pathology, Tifton, GA 31793.
2:00	(27)	***Association Mapping of SSR Markers to Leaf Spot Disease Resistance in Cultivated Peanut*** **Y.Y. TANG***, C.Y. CHEN, Department of Crop, Soils and Environmental Sciences, Auburn University, Auburn, AL 36849; P.M. DANG, USDA-ARS National Peanut Research Lab, Dawson, GA 39842; A. HAGAN and K. BOWEN, Department of Plant Pathology, Auburn University, Auburn, AL 36849.
2:15	(28)	***Characterization of the U.S. Peanut Core Collection - Phenotypic, Biochemical, and Genetic Evaluations*** **G.E. MacDONALD***, Agronomy Department University of Florida, Gainesville, FL 32611; N.A. BARKLEY, CIP, Lima, Peru; B.L. TILLMAN, Agronomy Department, University of Florida Marianna, FL 32446; and C.C. HOLBROOK, USDA-ARS Crop Genetics and Breeding, Tifton, GA 31793.
2:30	(29)	***Differential Expression of MicroRNAs or Small Nuclear (sn)RNAs and the Corresponding Drought Regulated Genes in Peanut (*Arachis hypogaea*)*** **P.M. DANG***, R.S. ARIAS, M.C. LAMB, USDA-ARS, National Peanut Research Laboratory, Dawson, GA 39842; C.Y. CHEN, Department of Crop, Soil and Environmental Sciences, Auburn University, 201 Funchess Hall, Auburn, AL 36849.
2:45	(30)	***Transcriptome Profiling of Developing Peanut Seed with a Focus on Oil Related Expression Networks*** K. GUPTA, G. KAYAM, A. DORON, **R. HOVAV***, Department of Field Crops, Plant Science Institute, ARO, Bet-Dagan, Israel; and P. OZIAS-AKINS, J.P. CLEVENGER, Department of Horticulture and Institute of Plant Breeding, Genetics & Genomics, University of Georgia, Tifton, GA 31793.

Wednesday, July 15, 2015 *(continued)*		
1:00 - 3:30 p.m. **Carolina B**		**Breeding, Biotechnology and Genetics I** *(continued)* *Moderator: Tom Isleib, North Carolina State University*
3:00	(31)	***Identification of QTLs for Rust Resistance in the Wild Peanut Relative Arachis magna and the Development Markers for Introgression of this Resistance into Cultivated Peanut*** **S.C.M. LEAL-BERTIOLI***, M.C. MORETZSOHN, U. CAVALCAN+A118TE, E. GOUVEA, P. GUIMARAES, Embrapa Genetic Resources and Biotechnology, Brasília, DF, 70770-917, Brazil; C. BALLEN, S.A. JACKSON, Center for Applied Genetic Technologies, University of Georgia, Athens, GA, 30602-6810; K. SHIRASAWA, Kazusa DNA Research Institute, Kisarazu, Chiba, 292-0818, Japan; and D.J. BERTIOLI, University of Brasília, Institute of Biological Sciences, Campus Darcy Ribeiro, 70910-900. Brasília, DF, Brazil.
3:15	(32)	***The Genome Sequences of* A. duranensis *and* A. ipaënsis *Provide New Insights into the Genetics and Genome of Cultivated Peanut.*** **D.J. BERTIOLI***, University of Brasília, Institute of Biological Sciences, Campus Darcy Ribeiro, 70910-900. Brasília, DF, Brazil; S. LEAL-BERTIOLI, M. MORETZSOHN, Embrapa Genetic Resources and Biotechnology, Brasília, DF, 70770-917, Brazil; K. SHIRASAWA, Kazusa DNA Research Institute, Kisarazu, Chiba, 292-0818, Japan; L. FROENICKE, R. MICHELMORE, The Genome Center, University of California Davis, CA; and B. ABERNATHY, S. JACKSON, Center for Applied Genetic Technologies, University of Georgia, Athens, GA, 30602-6810.

3:00 - 3:30 p.m. **Carolina A Lobby**		**Break** *Sponsored by Syngenta*

3:30 - 4:45 p.m. **Calhoun**		**Bayer Excellence in Extension/Extension Techniques & Technology** *Moderator: Keith Rucker, Bayer CropSciences*
3:30	(33)	***Sowing A Bountiful Harvest: The Methods Of Cooperative Extension Service Promotion In Georgia, 1914-1924*** **K.L. BEASLEY***, Department Of History, Florida State University, Tallahassee, FL 32306; J.P. BEASLEY, JR., Department of Crop, Soil and Environmental Sciences, Auburn University, Auburn, AL 36849.
3:45	(34)	***Peanut Response to Inoculation and Ammonium Sulfate Rate in NC*** **M. CARROLL***, T. BRITTON, C. FOUNTAIN, M. PARRISH, D.L. JORDAN, and P.D. JOHNSON, North Carolina Cooperative Extension Service, Raleigh, NC 27695.
4:00	(35)	***Response of the Virginia Market Type Cultivar Bailey to Prohexadione Calcium in North Carolina*** **A. COCHRAN***, D. KING, C. ELLISON, D.L. JORDAN, P.D. JOHNSON, North Carolina Cooperative Extension Service, Raleigh, NC 27695; and M. BALOTA, Tidewater Agricultural Research and Extension Center, Virginia Tech, Suffolk, VA 23437.
4:15	(36)	***Assessment of Innovations for Management of Soilborne Diseases in Peanuts*** **P.M. CROSBY***, Cooperative Extension, University of Georgia, Swainsboro, GA 30401; R.C. KEMERAIT, Department of Plant Pathology, University of Georgia, Tifton, GA 31793; and W.B. PARKER, Cooperative Extension, University of Georgia, Millen, GA 30442.
4:30	(37)	***Summary of Production and Pest Management Practices by Top Growers in North Carolina from 2010-2013*** **R. RHODES***, P. SMITH, W. BURGESS, C. ELLISON, A. WHITEHEAD, A. COCHRAN, C.L. SUMNER, M. SMITH, C. TYSON, L. GRIMES, M. SHAW, R. HARRELSON, M. CARROLL, C. FOUNTAIN, A. BRADLEY, R. GURGANUS, K. BAILEY, R. THAGARD, B. PARRISH, T. BRITTON, J. MORGAN, M. HUFFMAN, M. SEITZ, M. MALLOY, D. KING, R. GOFORTH, T. WHALEY, N. HARRELL, R.L. BRANDENBURG, and B.B. SHEW, North Carolina Cooperative Extension Service, Raleigh, NC 27695.

Wednesday, July 15, 2015 *(continued)*

3:30 - 5:00 p.m. **Carolina A**		**Plant Pathology and Nematology I** *Moderator: Hilary Mehl, Virginia Tech University*
3:30	(38)	***Developing a Rapid Assay for Quantifying Populations of Sclerotia of* Sclerotinia minor *in Soil*** **M. CANNON*** and B. SHEW, Department of Plant Pathology, North Carolina State University, Raleigh, NC 27695.
3:45	(39)	***A Candidate Causal Agent for Irregular Leaf Spot of Peanut*** **E.G. CANTONWINE***, Department of Biology, Valdosta State University, Valdosta, GA 31698; Z. ABDO, USDA-Agricultural Research Service, Athens, GA 30605; A.K. CULBREATH, Department of Plant Pathology, University of Georgia, Tifton, GA 31798; and R. ARIAS, National Peanut Research Laboratory, USDA-Agricultural Research Service, Dawson, GA 39842.
4:00	(40)	***Effect of In-Furrow Application of Fluopyram on Early Leaf Spot*** **A.K. CULBREATH***, T.B. BRENNEMAN, R.C. KEMERAIT, Department of Plant Pathology, University of Georgia, Tifton, GA 31793-5766; and K.S. RUCKER, Bayer CropScience, Tifton, GA 31794.
4:15	(41)	***Efficacy of Priaxor Fungicide on Peanut Foliar and Soilborne Diseases in Georgia*** **T.B. BRENNEMAN***, R.C. KEMERAIT, A.K. CULBREATH, Department of Plant Pathology, University of Georgia, Tifton, GA 31794; and S. NEWELL, BASF, Statesboro, GA 30458.
4:30	(42)	***Integrated Management of Leaf Spot and Stem Rot with Partial Resistance and Applications of Foliar and In-furrow Fungicides*** **B.B. SHEW*,** Department of Plant Pathology, North Carolina State University, Raleigh, NC 27695; and T.G. ISLEIB and D.L. JORDAN, Department of Crop Science, North Carolina State University, Raleigh, NC 27695.
4:45	(43)	***Resistance to Sclerotinia Blight in the U.S. Peanut Mini-Core Collection*** **R.S. BENNETT***, K.C. CHAMBERLIN, USDA-ARS, Wheat, Peanuts and Other Field Crops Research Unit, Stillwater, OK 74075-2714; and J.P. DAMICONE, Department of Entomology and Plant Pathology, Oklahoma State University, Stillwater, OK, 74078-3033.

3:30 - 5:15 p.m. **Carolina B**		**Physiology and Seed Technology** *Moderator: Henry McLean, Syngenta Crop Protection*
3:30	(44)	***Pixe Analysis of Groundnut Genotypes for Toxic Elements*** **A.U. REHMAN***, U. KHA, Department of Botany Hazara University, KPK, Pakistan.
3:45	(45)	***Genotype-by-Environment Interaction Effects on Germination of Runner-Type Peanut Cultivars*** **T.L. GREY***, W.D. BRANCH, R.S. TUBBS, Crop and Soil Science Department, University of Georgia Tifton, GA 31793; T.M. WEBSTER, Crop Protection and Management Research Unit, USDA-ARS, P.O. Box 748 Tifton, GA 31794; J. ARNOLD, Pioneer Hi-Breed International Inc, 2300 Industrial Park Dr, Cairo, GA 39828; and X. LI, Department of Crop, Soil, and Environmental Sciences, Auburn University, AL 36879.
4:00	(46)	***Phenotyping Tifrunner×NC3033 RILs Population for the Transpiration Response Using Silver Ion*** **A. SHEKOOFA***, T.R. SINCLAIR, Department of Crop Science, Box 7620, North Carolina State University, Raleigh, NC 27695-7620; P. OZIAS-AKINS, Department of Horticulture, University of Georgia, Tifton, GA 31793-0748; and C.C. HOLBROOK, USDA–ARS, Crop Genetics and Breeding Research Unit, Tifton, GA 31793.

Wednesday, July 15, 2015 *(continued)*

3:30 - 5:15 p.m. **Carolina B**		**Physiology and Seed Technology** *Moderator: Henry McLean, Syngenta Crop Protection*
4:15	(47)	***High Throughput Single Kernel Near Infrared Prediction and Sorting for Oleic Content*** **D.J. OCONNOR***, R.C.N RACHAPUTI, R.J. HENRY, A. FURTADO, Queensland Alliance for Agriculture and Food Innovation, University of Queensland, St Lucia, QLD, 4072; G.C. WRIGHT, Peanut Company Australia, Kingaroy, QLD, 4610; and R. MEDER, Meder Consulting, Bracken Ridge, QLD, 4017.
4:30	(48)	***Examination of the Impact of Peanut Maturity on Emergence, Vigor, and Subsequent Life History Traits*** **D.L. ROWLAND***, E.T. CARTER, Agronomy Department, University of Florida, Gainesville, FL 32611; B.L. TILLMAN, North Florida Research and Education Center, Marianna, FL 32446; T.L. GREY, Crop and Soil Science Department, University of Georgia, Tifton, GA 31794.
4:45	(49)	***Identification of Peanut Lines with Superior Root Growth*** **C.K. KVIEN***, Crop and Soil Sciences, University of Georgia, Tifton, GA 31793; C.C. HOLBROOK, Crop Genetics and Breeding, USDA-ARS, Tifton, GA 31793; and P. OZIAS-AKINS, Horticulture, University of Georgia, Tifton, GA 31793.
5:00	(50)	***Effect of Soil Moisture on Peanut Yield and Quality*** **M. BALOTA***, Tidewater Agric. Res. & Ext. Center, Virginia Tech, Suffolk, VA 23437-7099; T.G. ISLEIB, Department of Crop Science, North Carolina State University, Raleigh, NC 27695-7629; and S.P. TALLURY, Pee Dee Res. & Educ. Center, Clemson University, Florence, SC 29506-9727.

5:00 - 6:00 p.m. **Middleton Room**		**Board of Directors Meeting**

6:30 -7:00 p.m. **Colonial Ballroom** **7:00- 9:00 p.m.** **Carolina A&B**		**Reception** **Dinner** *Sponsored by Bayer CropScience and BASF Corporation*

Thursday, July 16, 2015		
6:30 a.m. **Leave FM Hotel Lobby**		**APRES Fun Run/Walk** *Sponsored by JLA, Inc. and National Peanut Board*
All Day **Mezzanine Booth**		**Registration**
8:00 a.m.-4:00 p.m. **Bridgeview Suite (1203)**		**Spouses' Hospitality Suite Open** *Sponsored by South Carolina Peanut Board*

8:00 - 10:30 a.m. **Carolina A**		**Joe Sugg Graduate Student Competition** *Sponsored by North Carolina Peanut Growers Association* *Moderator: Bob Kemerait, University of Georgia*
8:00 AM	(51)	***Effectiveness of Current Boron Application Recommendations and Practices on Peanuts*** **A. BENTON***, M. BALOTA, D. MACCALL, Plant Pathology, Physiology, and Weed Science Department, Virginia Polytechnic and State University, Blacksbrug, VA 24061; and G. WELBAUM, Horticulture Department, Virginia Polytechnic and State University, Blacksburg, VA 24061.
8:15 AM	(52)	***Determining Pest Status of Threecornered Alfalfa Hopper (Membracidae: Spissistilus festinus) in Peanut*** **B. BEYER***, M. ABNEY, and R. SRINIVASAN, Entomology Department, University of Georgia, Tifton, GA 31793.
8:30 AM	(53)	***Middle-Season Drought Tolerance in a RIL Population of Cultivated Peanut*** **J. CARTER*** and C.Y. CHEN, Crop, Soil and Environmental Sciences Department, Auburn University, Auburn, AL 36849.
8:45 AM	(54)	***Pod Maturity in the Shelling Process*** **E.T. CARTER***, D.L. ROWLAND, Agronomy Department, University of Florida, Gainesville, FL 32611; B.L. TILLMAN, North Florida Research and Education Center, Marianna, FL 32446; T.L. GREY, Crop and Soil Science Department, University of Georgia, Tifton, GA 31794.
9:00 AM	(55)	***Evaluating Sicklepod (Senna obtusifolia) Resistance to Imazapic*** **O.W. CARTER***, E.P. PROSTKO, Crop and Soil Science Department, University of Georgia, Tifton, GA 31793-0748; and T.M. WEBSTER, USDA-ARS, Tifton, GA 31793-0748.
9:15 AM	(56)	***Worm Killer: Genetic Regulation of Nematode Resistance in Peanut*** **J. CLEVENGER***, Y. CHU, L. GUIMARAES, P. OZIAS-AKINS, Institute of Plant Breeding, Genetics & Genomics, University of Georgia, Tifton, GA 31793; and C.C. HOLBROOK, USDA-ARS, Tifton, GA 31793.
9:30 AM	(57)	***Prescription Programs via Peanut Rx: Reassessing Application Timings for Late Leaf Spot of Peanut*** **A. FULMER***, A. CULBREATH, and R. KEMERAIT, JR., Department of Plant Pathology, University of Georgia, Tifton, GA 31793.
9:45 AM	(58)	***Influence of Planting Date on Peanut Response to Injury from Thrips and Herbicides*** **M.D. INMAN***, D.L. JORDAN, P.D. JOHNSON, R.L. BRANDENBURG, and B.B. SHEW, North Carolina State University, Raleigh, NC 27695.
10:00 AM	(59)	***An Assessment of Groundnut Aflatoxin Contamination Awareness and Mitigation Practices in Rural Uganda*** **J. JELLIFFE***, B. BRAVO-URETA, Department of Agricultural and Resource Economics, University of Connecticut, Storrs, CT 06269-4021; and C. DEOM, Department of Plant Pathology, University of Georgia, Athens, GA 30602-7274.
10:15 AM	(60)	***Variation in O/L Ratio Demonstrated among High-Oleic Spanish-type Peanuts*** **C.M. KLEVORN***, K.W. HENDRIX, and L.L. DEAN, Market Quality and Handling Research Unit, USDA-ARS, Raleigh, NC; and N.A. BARKLEY, International Potato Center (CIP), Lima, Peru.

Thursday, July 16, 2015 *(continued)*

8:00 - 10:30 a.m. **Carolina B**		**Breeding, Biotechnology and Genetics II** *Moderator: Shyam Tallury, Clemson University*
8:00	(61)	***Phenotyping a RIL Population for Middle-Season Drought Resistance in Cultivated Peanut*** J. CARTER, Crop, Soil, and Environmental Sciences Department, Auburn University, Auburn, AL 36849; P.M. DAND, R.B. SORENSEN, M.C. LAMB, USDA-ARS National Peanut Research Lab, Dawson, GA 39842; C.C. HOLBROOK, USDA-ARS Plant Breeding and Genetics Unit, Tifton, GA 31793; T.G. ISLEIB, Department of Crop Science, North Carolina State University, Raleigh, NC 27695; Y. CHU, P. OZIAS-AKINS, University of Georgia; and **C.Y. CHEN***, Crop, Soil and Environmental Sciences Department, Auburn University, Auburn, AL 36849.
8:15	(62)	***Screening of the U.S. Peanut Minicore Collection for Tolerance to Drought and Heat Stress*** M.G. SELVARAJ, J. CHAGOYA, J.L. AYERS, Texas A&M AgriLife Research, Lubbock, TX 79403; V. BELAMKAR, R. CHOPRA, K.R. KOTTAPALLI, Texas Tech University, Department of Plant and Soil Science, Lubbock, TX 79409; P. SANKARA, Université de Ouagadougou, BP 7021, Ouagadougou 03, Burkina Faso; B. ZAGRÉ, Institut de l'Environnement et de Recherches Agricoles/Centre National de la Recherche Scientifique et Technologique, Kamboinsé, BP 476, Burkina Faso; G. BUROW, P. PAYTON, USDA-ARS-CSRL, Lubbock, TX 79415; N. PUPPALA, Agricultural Sciences Center, New Mexico State University, Clovis NM 88001; and **M. D. BUROW***, Texas A&M AgriLife Research, Lubbock, TX 79403, and Texas Tech University, Department of Plant and Soil Science, Lubbock, TX 79409.
8:30	(63)	***Performance of Genotypes Selected in Burkina Faso for their Resistance to Leaf Spots, and Drought Tolerance in the U.S. Minicore Collection*** **P. SANKARA***, Université de Ouagadougou, BP 7021, Ouagadougou 03, Burkina Faso; B. ZAGRÉ, M'BI BERTIN, Institut de l'Environnement et de Recherches Agricoles/Centre National de la Recherche Scientifique et Technologique, Kamboinsé, BP 476, Burkina Faso; M. BUROW, Texas A&M AgriLife Research, Lubbock, TX 79403; and A.T. NANA, Université de Ouagadougou, BP 7021, Ouagadougou 03, Burkina Faso.
8:45	(64)	***Genotypic variation for oil quality traits in groundnut (*Arachis hypogaea *L.) grown under intermittent drought*** **H.L. NADAF***, UAS, Dharwad, Karnataka, India; P.SRIVALLI, Ph.D Scholar, Department of GPB, UAS, Dharwad, Karnataka, India.
9:00	(65)	***Progress in the Breeding of High Oleic, Early Maturing Peanut Varieties in Australia*** **G.C. WRIGHT***, Peanut Company of Australia, Kingaroy, Queensland, Australia, 4610; D.FLEISCHFRESSER and L. OWENS, AgriSciences Queensland, Department of Agriculture and Fisheries, Kingaroy, Queensland, Australia, 4610.
9:15	(66)	***Genetic Gain in Reduction of Four Peanut Diseases in the North Carolina State University Peanut Breeding Program*** **W.G. HANCOCK***, T.G. ISLEIB, S.C. COPELAND, J.W. HOLLOWELL, S.R. MILLA-LEWIS, Department of Crop Science, North Carolina State University, Raleigh, NC 27695-7629; B.B. SHEW, Department of Plant Pathology, North Carolina State University, Raleigh, NC 27695-7616.
9:30	(67)	***Breeding Adapted and High-Yielding Peanuts With Enhanced Market Qualities*** **N.N. DENWAR***, R. OTENG-FRIMPONG, D.A-R. ISSAH, CSIR Savanna Agricultural Research Institute, P.O. Box 52, Tamale, Ghana; and M.D. BUROW, Texas A&M AgriLife Research, Lubbock, TX 79403.

Thursday, July 16, 2015 *(continued)*		
8:00 - 10:30 a.m. **Carolina B**		**Breeding, Biotechnology and Genetics II** *(continued)* *Moderator: Shyam Tallury, Clemson University*
9:45	(68)	***Release of Four Virginia and Three Spanish Groundnut Genotypes in Malawi*** **J.M.M CHINTU***, D. SIYENI, Department of Agricultural Research Services, Chitedze Research Station, P.O. Box 158, Lilongwe; A.M.Z CHAMANGO, Agricultural Research and Extension Trust, Private Bag 9, Lilongwe; P. OKORI, E.S. MONYO, W. MUNTHALI, and H. CHARLIE, International Crops Research Institute for the Semi-arid Tropics-Malawi, Chitedze Research Station, P.O. Box 1096, Lilongwe, Malawi.
10:00	(69)	***Comparison of Bailey Virginia-Type Cultivar with High-Oleic Backcross Derivatives*** **T.G. ISLEIB***, S.C COPELAND, J.E. HOLLOWELL, H.E. PATTEE, S.R. MILLA-LEWIS, Department of Crop Science, North Carolina State University, Raleigh, NC 27695-7629; and B.B. SHEW, Department of Plant Pathology, North Carolina State University, Raleigh, NC 27695-7616.
10:15	(70)	***Release of 'Emery' High-Oleic Large-Seeded Virginia-Type Peanut*** S.C. COPELAND, T.G.ISLEIB, H.E. PATTEE, S.R. MILLA-LEWIS, J.E. HOLLOWELL, **W.G. HANCOCK***, Department of Crop Science, North Carolina State University, Raleigh, NC 27695-7629; B.B. SHEW, Department of Plant Pathology, North Carolina State University, Raleigh, NC 27695-7616; T.H. SANDERS, L.O. DEAN, K.W. HENDRIX, USDA-ARS Market Quality and Handling Research Unit, Raleigh, NC 27695-7624; M. BALOTA, Tidewater Agric. Res. And Ext. Ctr., Suffolk, VA 23437; J.W. CHAPIN, Edisto Agric. Res. And Educ. Ctr., Blackville, SC 29817.

10:30 - 10:45 a.m. **Carolina A Lobby**		**Break** *Sponsored by Olam Edible Nuts*

10:45 a.m. - 12 noon		**Joe Sugg Graduate Student Competition** *(continues)* *Moderator: Bob Kemerait, University of Georgia*
10:45	(71)	***The Peanut Lipoxygenase Gene Family*** **W.A. KORANI*** and P. OZIAS-AKINS, Institute of Plant Breeding, Genetics and Genomics, University of Georgia, Tifton, GA 31793-0748.
11:00	(72)	***Investigating the Biology, Epidemiology and Management of Neocosmospora Root Rot of Peanut in Australia*** **K.M. WENHAM***, V.J. GALEA, W. BRYDEN, School of Agriculture and Food Science, The University of Queensland, Gatton, Queensland, 4343; M.J. RYLEY, Centre for Crop Health, University of Southern Queensland, Toowoomba, Queensland, 4350; and G. WRIGHT, Peanut Company of Australia, Kingaroy, Queensland, 4610.
11:15	(73)	***Investigate the Heratibility of TSWV in Florida-EPTM'113'*** **Y-C. TSENG***, North Florida REC, Agronomy Department, University of Florida, Marianna, FL 32446; J. WANG, Agronomy Department, University of Florida, Gainesville, FL 32610B; and B.L. TILLMAN, North Florida REC, Agronomy Department, University of Florida, Marianna, FL 32446.

Thursday, July 16, 2015 *(continued)*		
10:45 a.m. - 12 noon		**Joe Sugg Graduate Student Competition** *(continues)* *Moderator: Bob Kemerait, University of Georgia*
11:30	(74)	***Analysis of Genetic Diversity and Population Structure of Peanut Cultivars and Breeding Lines from China, India and USA*** **H.WANG***, P. KHERA, A. CULBREATH, University of Georgia, Department of Plant Pathology, Tifton, GA 31793; B. HUANG, X. ZHANG, Henan Academy of Agricultural Sciences, Cash Crops Research Institute, Zhengzhou, China 450002; M. YUAN, Shandong Peanut Research Institute, Qingdao, China 266100; R. KATAM, Florida A&M University, Department of Biological Sciences, Tallahassee, FL 32307; K. MOORE, AgResearch Consultants Inc., Shingler Little River Road, Sumner, GA 31789; R. VARSHNEY, International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), Patancheru, India 502324; L. XIE, Fujian Agricultural and Forestry University, College of Plant Protection, Fuzhou, China 350002; and B. GUO, USDA-ARS, Crop Protection and Management Research Unit, Tifton, GA 31793
11:45	(75)	***Integration of a Risk Index and Weather-Based Predictive Model to Better Manage Spotted Wilt in Peanut in the Southeast United States*** **B.W. WILLIAMS***, R.C. KEMERAIT, A.K. CULBREATH, Department of Plant Pathology, University of Georgia, Tifton, GA 31793; R.S. TUBBS, Department of Crop and Soil Science, University of Georgia, Tifton, GA 31793; R. SRINIVASAN, M. ABNEY, Department of Entomology, University of Georgia, Tifton, GA 31793; T.M. CHAPPELL and G.G. KENNEDY, Department of Entomology, North Carolina State University, Raleigh, NC 27695.

12 Noon - 1:00 p.m.		**Lunch on Your Own**

1:00 - 2:00 p.m. **Carolina A**		**Joe Sugg Graduate Student Competition** *(continues)* *Moderator: Bob Kemerait, University of Georgia*
1:00 PM	(76)	***The Interaction Effects of Herbicide and Temperature on Peanut Germination*** **A.N. WILLIAMS***, T.L. GREY, R.S. TUBBS, and S.R. CROMER, University of Georgia, Crop and Soil Science Department, Tifton, GA 31793.
1:15 PM	(77)	***Yield and Physiological Response of Different Peanut Genotype Under Water-limited Conditions*** **A. XAVIER***, New Mexico State University, Las Cruces, NM; P. PAYTON, J.MAHAN, USDA-ARS, Lubbock, TX; K.R. KOTTAPALLI, Texas Tech University, Lubbock, TX; D.L. ROWLAND, University of Florida, Gainesville, FL; C.C. HOLBROOK, USDA-ARS, Tifton, GA 31793; Y.K. CHO, Eastern New Mexico University, NM; and N. PUPPALA, New Mexico State University, ASC at Clovis, NM.
1:30 PM	(78)	***Peanut Genotypic Root Architecture in Response to Irrigation*** **B.A. ZURWELLER***, D.L. ROWLAND, Agronomy Department, University of Florida, Gainesville, FL 32611; B.L. TILLMAN, Agronomy Department, University of Florida, Marianna, FL 32446; P. PAYTON, Plant Stress and Germplasm Development, USDA/ARS, Lubbock, TX 79415.
1:45 PM	(79)	***Potential Roles of Environmental Oxidative Stress in Aflatoxin Production Revealed in the Aspergillus flavus Transcriptome*** **J.C. FOUNTAIN***, L. YANG, R.C. KEMERAIT, University of Georgia, Department of Plant Pathology, Tifton, GA, 31793; S.N. NAYAK, M. PANDEY, V. KUMAR, P. BAJAJ, A.S. JAYALE, A. CHITIKINENI, R.K. VARSHNEY, International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), Patancheru, India, 502324; R.D. LEE, University of Georgia, Department of Crop and Soil Sciences, Tifton, GA, 31793; B.T. SCULLY, U.S. Horticultural Research Laboratory, Fort Pierce, FL 34945; and B. GUO, USDA-ARS, Crop Protection and Management Research Unit, Tifton, GA 31793.

Thursday, July 16, 2015 *(continued)*

1:00 - 3:15 p.m. Carolina B		**Plant Pathology and Nematology II** *Moderator: Barbara Shew, North Carolina State University*
1:00	(80)	***Chemical Control of* Sclerotium rolfsii *Incidence in Peanut Cultivars in the Hula Valley in Israel*** **M. DAFNY YELIN***, Northern Research & Development, P.O.B. 831 Kiryat Shemona Israel 11016; S. DOR, Golan Research Institute P.O.B. 97 Qatzrin Israel 12900; R. DAHAR, Ohalo College, Katsrin Israel 12900; O. RABINOVICH, Extension Service, Ministry of Agriculture, Kiryat Shemona Israel 10200; and Y. BEN-YEPHET, Department of Plant Pathology and Weed Research, Plant Protection Institute, the Volcani Center ARO, Bet-Dagan Israel 50250
1:15	(81)	***Preliminary Examination of thePotential Risk for QoI Fungicide Resistance in Cercosporidium personatum, the Late Leaf Spot Pathogen of Peanut.*** **W.M. ELWAKIL***, Doctor of Plant Medicine Program, University of Florida, Gainesville, FL 32611; and N.S. DUFAULT, Department of Plant Pathology, University of Florida, Gainesville, FL 32611.
1:30	(82)	***Multi-state Assessment of Elatus TM Peanut Disease Management Programs*** **H. MCLEAN***, W. FAIRCLOTH, V. MASCARENHAS, K. BUXTON, and A.H. TALLY, Syngenta Crop Protection, LLC, Greensboro, NC.
1:45	(83)	***Yield Response, as well as Disease and Nematode Control with Velum Total on Peanut*** **A.K HAGAN***, H.L. CAMPBELL, K.L. BOWAN, Auburn University, AL 36849; and L. WELLS, Wiregrass Research and Extension Center, Headland, AL 36345.
2:00	(84)	***Assessment of Chemical Control for Management of Peanut Root-Knot Nematodes*** **B.J. WADE***, T.B. BRENNEMAN, and R. KEMERAIT, JR., Department of Plant Pathology, University of Georgia, Tifton, GA 31793.
2:15	(85)	***Recent Occurrence of Peanut Diseases in Arkansas*** **T.R. FASKE*** University of Arkansas, Lonoke Research and Extension Center, Lonoke, AR 72086.
2:30	(86)	***An Evaluation of* Cercospora arachidicola *Monocyclic Components of Three Newly Released Peanut Cultivars*** L. GONG, H.L. CAMPBELL, **K.L. BOWEN***, Entomology and Plant Pathology Department, Auburn University, Auburn, AL 36849.
2:45	(87)	***Effects of Cultivar, Fungicide Frequency and Seeding Rate on Foliar Diseases of Peanut: Small Plot Trial Data from 2010 to 2013 in Citra, FL*** **N.S. DUFAULT***, Department of Plant Pathology, University of Florida, Gainesville, FL 32611-0680.
3:00	(88)	**Evaluation of New High Oleic Virginia-Type Peanut Cultivars for Disease Tolerance, Yield, and Quality** **H.L. MEHL***, Virginia Tech Tidewater Agricultural Research and Extension Center, Suffolk, VA 23437-9588.

Thursday, July 16, 2015 *(continued)*

1:00 - 3:30 p.m. Calhoun		**Production Technology** *Moderator: David Jordan, North Carolina State University*
1:00	(89)	***Effect of Rotation Length and Crop Species Between Peanuts on Agronomic and Pathogenic Variables*** **R.S. TUBBS***, Crop and Soil Sciences Department, University of Georgia, Tifton, GA 31793; T.B. BRENNEMAN, R.C. KEMERAIT, A.K. CULBREATH, Department of Plant Pathology, University of Georgia, Tifton, GA 31793; and J.P. BEASLEY, Department of Crop, Soil and Environmental Sciences, Auburn University, Auburn, AL 36849.
1:15	(90)	***Effects of Herbicide and Fungicide Applications on Leaf Spot Diseases and Peanut Yield in Ghana*** **M. ABUDULAI***, CSIR-Savanna Agricultural Research Institute, Tamale, Ghana; I.K. DZOMEKU, University for Development Studies, Tamale, Ghana; J.B. NAAB, CSIR-Savanna Agricultural Research Institute, Wa, Ghana; D.L. JORDAN, R.L. BRANDENBURG, Department of Crop Science, North Carolina State University, Raleigh, NC 27695; K.J. BOOTE and G. MACDONALD, Agronomy Department, University of Florida, Gainesville, FL 32611.
1:30	(91)	***Historical Contribution of the Peanut CRSP and PMIL to Peanut Growers in Ghana*** **M.B. MOCHIAH***, M. OWUSU-AKYAW, J.Y. ASIBUO, G. BOLFREY-ARKU, K. OSEI, J.N.L. LAMPTEY, I. ADAMA, B.W. AMOABENG, Crops Research Institute, Council for Scientific and Industrial Research, Kumasi, Ghana; M. ABUDULAI, J.B. NAAB, S. NARH, CSIR- Savanna Agricultural Research Institute, Tamale (and Wa), Ghana; R.L. BRANDENBURG, D.L JORDAN, Department of Crop Science, North Carolina State University, Raleigh, NC 27695; K. BOOTE and G. MACDONALD, Agronomy Department, University of Florida, Gainesville, FL 32611.
1:45	(92)	***Chemical Interruption of Flowering to Improve Harvested Peanut Maturity*** **M.C. LAMB***, R.B. SORENSEN, C.L. BUTTS, P.M. DANG, R.S. ARIAS, USDA-ARS, National Peanut Research Laboratory, Dawson, GA 39842; C.Y. CHEN, Crop, Soil, and Environmental Sciences, Auburn University, Auburn, AL 36849; and J.P. DAVIS, JLA Global, Albany, GA 31721.
2:00	(93)	***Measurements of Oleic Acid among Individual Kernels Harvested from Test Plots of Purified Runner and Spanish High Oleic Seed*** **J.P. DAVIS***, J.M. LEEK, JLA International, Albany, GA 31721; D.S. SWEIGART, Technical Center, The Hershey Company, Hershey, PA 17033; P. DANG, C.L. BUTTS, R.B. SORENSEN, and M.C. LAMB, USDA-ARS, National Peanut Research Laboratory, Dawson, GA 39842.
2:15	(94)	***Validation of Adjusted Growing Degree Day (aGDD) Maturity Model for Predicting Optimum Maturity in Runner Peanut*** **W.S. MONFORT***, R.S. TUBBS, Crop and Soil Science Department, University of Georgia, Tifton, GA 31793; and D. ROWLAND, Agronomy Department, University of Florida, Gainesville, FL 32611.
2:30	(95)	***Pest Management Strategies in Peanut in Northern Ghana*** **I.K. DZOMEKU***, University for Developmental Studies/CSIR-SARI, Tamale, Ghana; M. ABDULAI, SARI, Tamale, Ghana; J. NAAB, SARI, Tamale, Ghana; G. BOLFREY-ARKU, M. MOCHIAH, CSIR, Kumasi, Ghana; K. BOOTE, G. MACDONALD, Agronomy Department, University of Florida, Gainesville, FL 36211; D. JORDAN and R. BRANDENBURG, Department of Crop Science, North Carolina State University, Raleigh, NC 27695.

Thursday, July 16, 2015 *(continued)*		
1:00 - 3:30 p.m. **Calhoun**		**Production Technology** *(continues)* *Moderator: David Jordan, North Carolina State University*
2:45	(96)	***Effects of Planting Date on Yield of Five Peanut Varieties in Northern Mozambique*** **A.M. MUITIA***, M.J.C. MOPECANE, Nampula Research Station, Av. FPLM km 7, Via Corrane, Nampula, Mozambique; and J.A. MUTALIANO, Mapupulo Research Station, N'tchinga Road, Montepuez, Cabo Delgado, Mozambique.
3:00	(97)	***Evaluating Replant Options in Peanut at Multiple Planting Dates and Multiple Durations between Planting and Replanting*** **J.M. SARVER***, Department of Plant and Soil Sciences, Mississippi State University, Mississippi State, MS 39762; and R.S. TUBBS, Crop and Soil Science Department, University of Georgia, Tifton, GA 31793.
3:15	(98)	***Irrigation Scheduling Methods for Peanuts in the Southeast*** **W.M. PORTER***, C.D. PERRY, W.S. MONFORT, J.L. SNIDER, G. VELLIDIS, Department of Crop and Soil Sciences, University of Georgia, Tifton, GA 31793-0748; and A.R. SMITH, Department of Agricultural Economics, University of Georgia, Tifton, GA 31793-0748.

3:00 - 4:00 p.m. **Carolina A Lobby**		**Break** *Sponsored by Fine Americas, Inc.*

Thursday, July 16, 2015 *(continued)*

3:30 - 4:30 p.m. **Carolina B Lobby**		**Poster Viewing and Discussions *(Authors Present)*** *Organizer: Shyam Tallury, Clemson University*
Poster	(99)	***Field Performance of New Peanut Genotypes in Texas*** **J.E. WOODWARD***, Texas A&M AgriLife Extension Service and Plant and Soil Science, Texas Tech University, Lubbock, TX 79403.
Poster	(100)	***Irrigated Evaluation of Peanut Varieties*** W.B. PARKER, Cooperative Extension, University of Georgia, 434 Barney Avenue, Millen, GA 30442; **W.S. MONFORT***, J. ARNOLD, J.P. BEASLEY, J.E. PAULK, Department of Crop and Soil Science, University of Georgia, Tifton, GA 31793.
Poster	(101)	***Effect of Calcium Timing on Runner-type Peanut Yield, Grade, Seed Calcium, and Germination*** **R. YANG***, J.A. HOWE, Department of Crop, Soil and Environmental Sciences, Auburn University, AL 36849; G. HARRIS, Department of Crop and Soil Sciences, University of Georgia, Tifton, GA 31793; and K.B. BALKCOM, Department of Crop, Soil and Environmental Sciences, Auburn University, AL 36849.
Poster	(102)	**Effect of Calcareous Soils on the Productivity Parameters in Groundnut RIL Population** **G.K. NAIDU***, O.K. SINGH, B.D. BIRADAR, Department of Genetics and Plant Breeding, University of Agricultural Sciences, Dharwad, Karnataka, India; S.K. PATTANASHETTI, V. VADEZ, H.D. UPADHAYAYA, and R.K. VARSHNEY, International Crops Research Institute for the Semi Arid Tropics (ICRISAT), Hyderabad, India.
Poster	(103)	***Genetic Differences for Iron Absorption Efficiency Related Traits in Groundnut*** **S.K. PATTANASHETTI***, H.D. UPADHYAYA, B.N. MOTAGI, A.A. KANATTI, International Crops Research Institute for the Semi-Arid Tropics, Patancheru 502324, India; I. BOODI, B.D. BIRADAR, G.K. NAIDU, and V.P. CHIMMAD, College of Agriculture, Bijapur 586101, University of Agricultural Sciences, Dharwad, India.
Poster	(104)	***Genetic Variability for Root Traits in Groundnut (*Arachis hypogaea *L.) Grown under Intermittent Drought.*** **P. SRIVALLI*** Ph.D Scholar, Department of GPB, UAS, Dharwad, Karnataka, India; and H.L. NADAF, Principal scientist, oil seed scheme, UAS, Dharwad, Karnataka, India.
Poster	(105)	***Adaptation of Peanut Varieties and Their Yield and Quality Under Osmaniye Conditions*** **F.F. ASIK***, R. YILDIZ, Oil Seed Station, Osmaniye, Turkey; and H. ARIOĞLU, Çukurova University, Faculty of Agriculture, Department of Field Crops, Adana, Turkey.
Poster	(106)	***Source-Sink Ratio Among Different Branches Categories in Peanut*** **F.D. MORLA***; O. GIAYETTO; G.A. CERIONI, and E.M. FERNANDEZ. Facultad de Agronomía y Veterinaria – Universidad Nacional de Río Cuarto. Córdoba, Argentina.
Poster	(107)	***Shade Effects on Growth and Pod Yield of Different Branch Categories in Peanut*** **F.D. MORLA***; O. GIAYETTO; G.A. CERIONI, and E.M. FERNANDEZ. Facultad de Agronomía y Veterinaria – Universidad Nacional de Río Cuarto. Córdoba, Argentina.

Thursday, July 16, 2015 *(continued)*		
3:30 - 4:30 p.m. **Carolina B Lobby**		**Poster Viewing and Discussions *(Authors Present)*** *(continued)* *Organizer: Shyam Tallury, Clemson University*
Poster	(108)	***Influence of Glyphosate + Dicamba Drift on Peanut Growth and Development*** **P.A. DOTRAY***, Texas Tech University, Texas A&M AgriLife Research, and Texas A&M AgriLife Extension Service, Lubbock, TX 79409-2122; W.J. GRICHAR, Texas A&M AgriLife Research, Beeville, TX 78102; T.A. BAUGHMAN, Oklahoma State University, Ardmore, OK 73401; M.R. MANUCHEHRI and R.M. MERCHANT, Texas Tech University, Lubbock, TX 79409-2122.
Poster	(109)	***Peanut Response to Aim and ET Applied as Harvest Aides*** M.D. INMAN*, D.L. JORDAN, and P.D. JOHNSON, Department of Crop Science, North Carolina State University, Raleigh, NC 27695.
Poster	(110)	***Possible Yellow Nutsedge Resistance to Cadre Found in a South Texas Peanut Field*** **W.J. GRICHAR***, Texas A&M AgriLife Research, Corpus Christi, TX 78406; P.A. DOTRAY, Texas A&M AgriLife Research, Lubbock, TX 79403; and R.M. MERCHANT, Texas A&M AgriLife Research, Lubbock, TX 79403.
Poster	(111)	***At-Plant Fluridone Based Herbicide Programs in Peanut*** **M.W. MARSHALL*** and C.H. SANDERS, Agricultural and Environmental Sciences Department, Clemson University, Blackville, SC 29817.
Poster	(112)	***Developing an Economic Decision Aid for Replanting Peanut*** **RUIZ, C.J.*** University of Georgia, Athens, GA 30602; **N.B. SMITH***, R.S. TUBBS, University of Georgia, Tifton, GA 31793; J.M. SARVER, Mississippi State University, Mississippi State, MS 39762; and J.P. BEASLEY, Auburn University, Auburn, AL 36849.
Poster	(113)	***Assessment of Replant Options for Reduced Plant Stands in Peanut Planted in Strip Tillage*** J.M. SARVER, **C.C. ABBOTT***, Mississippi State University, Mississippi State, MS 39762; and R.S. TUBBS, University of Georgia, Tifton, GA 31793.
Poster	(114)	***Disease Occurrence and Yield Response of Ten Peanut Cultivars at Three Alabama Locations*** **H.L. CAMPBELL***, A.K. HAGAN, K.L. BOWEN, Department of Entomology and Plant Pathology, Auburn University, AL 36849; B. MILLER, Brewton Agricultural Research Unit, Brewton, AL 36426; J. PITTS, Chilton Research and Extension Center, Clanton, AL 35045; and A. CAYLOR, North Alabama Horticulture Research Center, Cullman, AL 35055.
Poster	(115)	***On-Farm Evaluation of a Seed Treatment and In-Furrow Granular Insecticide for Thrips and TSWV Management in Virginia Type Peanuts*** **J.K. CROFT***, Clemson University Extension Service, Orangeburg, SC 29115; and W.S. MONFORT, Associate Professor, Crop & Soil Science, University of Georgia, Tifton, GA 31793.
Poster	(116)	***Utilizing Local Research to Enhance Soilborne Disease Control Strategies in Southeast Georgia*** **P.M. CROSBY***, Cooperative Extension, University of Georgia, Swainsboro, GA 30401; W.B. PARKER, Cooperative Extension, University of Georgia, Millen, GA 30442; R.C. KEMERAIT, Department of Plant Pathology, University of Georgia, Tifton, GA 31793; A.R. SMITH, Extension Economist, University of Georgia, Tifton, GA, 31793.
Poster	(117)	***Evaluating the Performance of* Sclerotinia sclerotiorum *under the Effect of Registered Fungicides*** **G. KAUR***, Department of Plant and Environmental Sciences, New Mexico State University; P. LUJAN, S. SANOGO, Department of Entomology, Plant Pathology and Weed Science, Las Cruces, New Mexico State University; and N. PUPPALA, Agricultural Science Center, New Mexico State University, Clovis.

Thursday, July 16, 2015 *(continued)*		
3:30 - 4:30 p.m. **Carolina B Lobby**		**Poster Viewing and Discussions *(Authors Present)*** *(continued)* *Organizer: Shyam Tallury, Clemson University*
Poster	(118)	***Identification and Genetic Evaluation of New Resource for Pod Wart Tolerance in Peanut*** D. FRAIMAN-MEIR, Y. SHEM-TOV, G. KAYAM, I. HEDVAT, **R. HOVAV***, Department of Field Crops, Plant Science Institute, ARO, Bet-Dagan, Israel.
Poster	(119)	***Yield Loss Modeling for Late Leafspot and Rust in Groundnut*** **B.N. MOTAGI***, S.K. PATTANASHETTI, International Crops Research Institute for the Semi-Arid Tropics, Patancheru 502 324; M.V.C. GOWDA, H.L. NADAF, K.P. CHANDRAN, K.V. ASHALATHA, and G.K. NAIDU, University of Agricultural Sciences, Dharwad 580 005, India.
Poster	(120)	***Assessment of Leaf Spots Partial Resistance in Peanut via Fixed and Mixed Models*** **Poster Withdrawn**
Poster	(121)	***Evaluating Peanut Cultivars Using a Reduced Cost and a Premium Fungicide Program*** **D.S. CURRY*,** University of Georgia Extension, Appling County, Baxley, GA 31519; R.C. KEMERAIT, Department of Plant Pathology, University of Georgia, Tifton, GA, 31793; T.B. BRENNEMAN, Department of Plant Pathology, University of Georgia, Tifton, GA, 31793; A. WILLIAMS, University of Georgia Extension Summer Intern, Appling County, Baxley, GA 31519; C.T. TYSON, University of Georgia Extension, Tattnall County, Reidsville, GA 30453; B. GRIFFIN, University of Georgia Extension, Tattnall County, Reidsville, GA 30453; C.M. RINER, University of Georgia Extension, Vidalia Onion & Vegetable Research Center, Lyons, GA 30436; C.R. HILL, University of Georgia Extension, Vidalia Onion & Vegetable Research Center, Lyons, GA 30436; D.R. THIGPEN, University of Georgia Extension, Vidalia Onion & Vegetable Research Center, Lyons, GA 30436.
Poster	(122)	***Transpiration Efficiency and Association Mapping in the U.S. Peanut Minicore Collection*** **J.C. CHAGOYA***, Department of Plant and Soil Science, Texas Tech University, Lubbock, TX 79409 and Texas A&M AgriLife Research, Lubbock, TX 79403; R. CHOPRA, V. BELAMKAR, Department of Plant and Soil Science, Texas Tech University, Lubbock, TX 79409; and M.D. BUROW, Texas A&M AgriLife Research, Lubbock, TX 79403 and Department of Plant and Soil Science, Texas Tech University, Lubbock, TX 79409.
Poster	(123)	***Identification of SNPs for* Arachis hypogaea *L. Genotypes using WGS Based on the Two Diploid Reference Genomes*** **C. CHAVARRO***, B. ABERNATHY, D. BERTIOLI, S. JACKSON, University of Georgia, Institute of Plant Breeding Genetics and Genomics, 111 Riverbend Athens, GA; C.C. HOLBROOK, USDA-ARS 115 Coastal Way Tifton, GA; and J. CLEVENGER and P. OZIAS-AKINS, University of Georgia, Institute of Plant Breeding Genetics and Genomics, 2356 Rainwater Rd., Tifton, GA
Poster	(124)	***Annotation of Transposable Elements in Peanut for Peanut Improvement and Genome*** **D.Y. GAO***, D.J. BERTIOLI , A. IWATA, S. JACKSON, Center for Applied Genetic Technologies (CAGT), University of Georgia, Athens, GA, USA; Y. CHU, J.P. CLEVENGER, Department of Horticulture, University of Georgia, Tifton, GA; L. FROENICKE, Genome Center-GBSF, University of California, Davis, CA; X. LIU, BGI-Shenzhen, Shenzhen 518083, China; and S. CANNON, Corn Insects and Crop Genetics Research Unit, US Department of Agriculture–Agricultural Research Service, Ames, IA.

Thursday, July 16, 2015 *(continued)*		
3:30 - 4:30 p.m. **Carolina B Lobby**		**Poster Viewing and Discussions *(Authors Present)*** *(continued)* *Organizer: Shyam Tallury, Clemson University*
Poster	(125)	***Identification of Molecular Markers Linked to the Resistance to Bacterial Wilt Disease in Peanut using bulked Segregant Analysis*** Y. ZHAO, C.S. PRAKASH, **G. HE***, Tuskegee University, Tuskegee, AL 36088; C. ZHANG, H. CHEN, W. ZHUANG, Fujian Agriculture and Forestry University, Fuzhou, China; M. YUAN, Shandong Peanut Research Institute, Qingdao, China; and R. NIPPER, Floragenex Inc., Portland, OR 97239.
Poster	(126)	***Comparison of Peanut Genetic and Physical Maps Provides Insights on Collinearity, Reversions and Translocations*** **P. KHERA***, H. WANG, A.K. CULBREATH, University of Georgia, Department of Plant Pathology, Tifton, GA 31793; P. KHERA, S. KALE, M.K. PANDEY, R.K. VARSHNEY, International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), Hyderabad, India; J. WANG, University of Florida, Department of Agronomy, Gainesville, FL 32611; and B. GUO, USDA-ARS, Crop Protection and Management Research Unit, Tifton, GA 31793.
Poster	(127)	***Transcriptome of Cultivated Peanut (*Arachis hypogaea *L.) Roots Infected by Bradyrhizobia Revealed Candidate Genes Involved in Nodulation*** **Z. PENG***, F. LIU, L. WANG, and J. WANG, Agronomy Department, University of Florida, Gainesville, FL 32611.
Poster	(128)	***ISSR Molecular Markers a Good Tool for Characterizing and Classifying Peanuts (*Arachis hypogaea *L.) Bred lines for Registration*** **S. SANCHEZ-DOMINGUEZ***, C. SÁNCHEZ-ABARCA, and G. PEÑA-ORTEGA, Professors at Departamento de Fitotecnia, Universidad Autónoma Chapingo, Chapingo, Mexico.
Poster	(129)	***Regeneration Procedure for Three* Arachis hypogaea *L. Botanicals in Uganda through Embryogenesis*** **D.K. OKELLO***, L.B. AKELLO, National Semi-Arid Resources Research Institute, P.O. Box, Private Bag Soroti, Uganda; P. TUKAMUHABWA, S.M. OCHWO, T.L. ODONG, Department of Crop Production, School of Agricultural Sciences, Makerere University, P.O. Box 7062, Kampala, Uganda; J. ADRIKO, C. MWAMI, National Agricultural Research Laboratories (NARL), Kawanda, P.O. Box 7065 Kampala, Uganda; and C.M. DEOM, Department of Pathology, University of Georgia, Athens, GA 30602.
Poster	(130)	***Cytological, Molecular and Phenotypic Evaluation of a Peanut Interspecific Hybrid Population Derived from* Arachis hypogaea *cv. Gregory x* A. diogoi *(GK 10602; PI 276235)*** S.S. KANDHOLA, Punjab Agricultural University, Ludhiana, Punjab 141004, India; and **S.P. TALLURY***, Clemson University, PDREC, Florence, SC 29506-9727.
Poster	(131)	***High-Oleic Virginia Peanuts in the Southwestern US: A Summary of Data Supporting the Release of 'VENUS'*** **K.D. CHAMBERLIN***, R.S. BENNETT, H.A. MELOUK, USDA-ARS, Wheat, Peanut and Other Field Crops Research Unit, Stillwater, OK 74075-2714; J.P. DAMICONE, Department of Entomology and Plant Pathology, Oklahoma State University, Stillwater, OK 74078; and C.B. GODSEY, Department of Plant and Soil Sciences, Oklahoma State University, Stillwater, OK 74078-1056.
Poster	(132)	***Peanut Lipid Profile by NIR Correlation Spectroscopy*** R.A. HOLSER, **C. KANDALA***, USDA-ARS, Athens, GA 30605-2720; and N. PUPPALA, Agricultural Science Center, New Mexico State University, Clovis, NM 88101-1295.
Poster	(133)	***Inhibition of Digestion of Peanut Allergens: An Approach to Reducing Peanut Allergy*** **S.-Y. CHUNG*** and S. REED, Southern Regional Research Center, USDA-ARS, New Orleans, LA 70124.

Thursday, July 16, 2015 *(continued)*		
3:30 - 4:30 p.m. **Carolina B Lobby**		**Poster Viewing and Discussions *(Authors Present)*** *(continued)* *Organizer: Shyam Tallury, Clemson University*
Poster	(134)	***Application of Some Detoxification Methods to Reduce of Aflatoxin*** **O. UÇKUN***, I. VAR, R. YILDIZ, Oilseeds Research Station, Osmaniye, Turkey and Cukurova University, Faculty of Agriculture, Department of Food Engineering, Adana, Turkey.
Poster	(135)	***Developing A Student Led Peanut Experiment Program under EHELD USAID in Liberia at Cuttington University*** J. DIDI, I. SULONTEH, D. GOODLIN, P. NYAHN, J. HOWARD, F. BOUQUET, D. YAHBA, Cuttington University, Suakoko, Bong County, Liberia; **B. THAPA***, D. JORDAN, R. BRANDENBURG, North Carolina State University, Raleigh, NC 27695; C. MULBAH, RTI International, Monrovia, Liberia; and J. SIMON and R. JULIANI, Rutgers University, New Brunswick, NJ 08901.
Poster	(136)	***Overview of Groundnut Research in Zambia*** H. CHARLIE, International Crop Research Institute for the Semi Arid Tropics, Box 1096, Lilongwe, Malawi; K. KANENGA and **L. MAKWETI***, Crop Improvement and Agronomy, Zambia Agriculture Research Institute, Msekera Research Institute, Box 510089, Chipata, Zambia.
Poster	(137)	***Physical and Storage Properties of Equivalently Roasted Peanuts Prepared by Deep Frying, Blister Frying, and Dry Roasting*** **X. SHI***, Department of Food, Bioprocessing and Nutrition Sciences, North Carolina State University, Raleigh, NC 27695; T.H. SANDERS, L.O. DEAN, USDA-ARS, Market Quality and Handling Research Unit, Raleigh, NC 27695; and J.P. DAVIS, JLA International, Albany, GA 31721.

4:30 - 5:30 p.m. **Carolina A&B**		**APRES Business Meeting and Awards Ceremony**

5:30 - 7:30 p.m. **Gold Ballroom**		**Awards Reception** *Sponsored by Dow AgroSciences*

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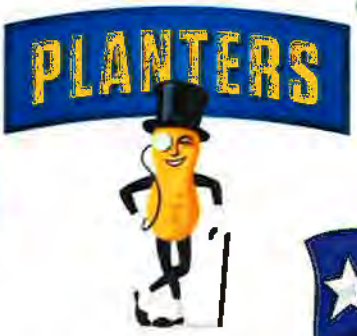

A Waters Business

PEANUT AND TREE NUTS

Overview

2015 APRES Annual Meeting

July 14-16 * Charleston, SC

The 47th Annual Meeting of the American Peanut Research and Education Society (APRES) was held July 14-16, 2015 at the Francis Marion Hotel in Charleston, SC. Outgoing APRES President Naveen Puppala (New Mexico State University) presided over the very well attended meeting of 370 attendees from every peanut producing state and 16 countries, grouped as 241 registrants, 84 spouses and 45 children.

Technical Program Chairman Ames Herbert (Virginia Tech) arranged 137 presentations/posters from peanut scientists around the world. Highlights of the program included opening addresses by:

Richard Rentz, Chairman, South Carolina Peanut Board; welcomed the crowd to Charleston, stating they were thrilled to host APRES for the first time in the state of South Carolina and that they were pleased many got to see first hand the peanut production and peanut research being conducted by Clemson University the day before on their field tour.

Dr. Joe Culin, Associate Dean for Research & Graduate Studies, Clemson University gave an excellent overview of how South Carolina is embracing peanut production in his presentation *Research in South Carolina*. South Carolina produced their first official crop in 2005. The state now has over 100,000 acres in production, yielding on average 3500 lb/ac. In May 2014, Rogers Brothers Farm announced plans to construct the first commercial shelling facility in the state with a capacity of 10 tons per hour. The new plant should be operational in early 2016.

Bob Parker, President and CEO, National Peanut Board, spoke on the Board's *The Perfectly Powerful Peanut* multi-faceted marketing campaign, highlighting their recent popup event in New York City. He shared a beautifully produced video which gave an overview of each approach--digital, print advertising, packaging, product development, social media, public relations, grower communications, events, social media, collaborative industry efforts. As the video related, NPB has shared, tweeted, fed, inspired, educated, facebooked, handed out samples and information, hosted events, engaged 40 foodbloggers, Carla Hall of The Chew, and Chef JJ Johnson of the Cecil Restaurant, and delivered PBJ sandwiches. With over 12 million consumer hits in NYC, NPB repeated this wonderful outreach effort in Chicago, Los Angeles, DC, and Atlanta. Bob closed by saying with all segments of the industry working together… nothing can stop us.

Dr. Penny Kris-Etherton, Distinguished Professor of Nutrition, The Pennsylvania State University, was the keynote speaker. Her presentation, *The Many Health Benefits of Peanuts*, left members of the peanut industry feeling proud of the work they do for such a wonderfully

blessed (in terms of nutrition and health) commodity. Her research and a compilation of statistics provide strong evidence showing the benefits of peanuts and tree nuts on risk of major chronic diseases in the U.S., particularly CVD, diabetes, and overweight/obesity; peanuts confer health benefits on many risk factors for many cardiometabolic diseases; and peanuts improve dietary quality. Given this evidence, dietary guidance recommends a health dietary pattern that includes peanuts and nuts and health fats. This is great news as peanut butter is consumed by 94 percent of the households in the USA; peanuts account for 2/3 of all snack nuts consumed in the USA; and the average American consumes more than 6 pounds of peanuts and peanut butter each year.

Two Symposiums on *Peanut Post Harvest Quality*, moderated by Jack Davis, JLA and the *Bayer Excellence in Extension and Extension Techniques*, moderated by Keith Rucker, Bayer CropScience were held.

Breakout Sessions topics included: Entomology, Weed Science & Mycotoxins; Harvesting, Curing, Shellling, Storing & Handling; Processing and Utilization, Economics; Breeding, Biotechnology and Genetics I and II; Plant Pathology and Nematology I and II; Physiology and Seed Technology; Production Technology.

Thirty-eight (38) scientific posters were also displayed.

Another highlight of the APRES meeting is the annual **Joe Sugg Graduate Student Competition**. The largest number of universities (8) and second largest number of participants (19) competed in this year's competition of outstanding presentations. This 2015 winners are: **First Place – Claire Klevorn** (North Carolina State University) (Dr. Lisa Dean, major professor) *"Variation in O/L Ratio Demonstrated among High-Oleic Spanish-type peanuts"* and **Second Place – Jake Fountain,** University of Georgia (Dr. Bob Kemerait, major professor) *"Potential Roles of Environmental Oxidative Stress in Aflatoxin Production Revealed in the Aspergillus flavus Transcriptome"*.

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

The highest honor the Society bestows on an individual, **Fellow of the Society**, was awarded to: Dr. Robert Kemerait, Jr., University of Georgia.

The **Coyt T. Wilson Award for Distinguished Service** to APRES went to Mr. Howard Valentine of the American Peanut Council and Peanut Foundation.

Dr. Jay Chapin was selected as this year's recipient of **the Dow Agrosciences Award for Education**.

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

The **Bailey Award** for the best paper from the 2014 Annual Meeting went to Josh A. Clevenger, University of Georgia (Presenter) and co-authors Drs. Yufang Guo and Peggy Ozias-Akins (UGA)for their paper, *"Single Nucleotide Polymorphism (SNP) Detection in Cultivated Peanut Using the Diploid Wild Progenitor Reference Genomes"*.

At the conclusion of the meeting, **new officers and directors** for the Society were inducted. Outgoing President, Dr. Naveen Puppala (New Mexico State University). presented the gavel to incoming President, Dr. Tom Stalker (North Carolina State University). President-Elect is Corley Holbrook of USDA-ARS. Newly elected Board of Directors are Wilson Faircloth, Syngenta, Marshall Lamb, USDA/ARS, and Howard Valentine, American Peanut Council. Outgoing Board members Keith Rucker, Bayer CropScience; Noelle Barkley, USDA/ARS, Tim Brenneman, UGA, were recognized for their support and service. The first action of President Stalker's term was to present Dr. Naveen Puppala (NMSU) with the Past President's Award.

The 2016 APRES meeting will be held July 12-14 at the Hilton Clearwater Beach in Clearwater, FL.

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