# 2007
# PROCEEDINGS


## American Peanut Research and Education Society, Inc.

Volume 39

# Volume 39

# 2007
# PROCEEDINGS

# of

# THE AMERICAN PEANUT RESEARCH AND EDUCATION SOCIETY, INC.

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Production Editor: Irene Nickels
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# TABLE OF CONTENTS

## BOARD OF DIRECTORS

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1970 - San Antonio, TX
1971 - Raleigh, NC
1972 - Albany, GA
1973 - Oklahoma City, OK
1974 - Williamsburg, VA
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2004 - San Antonio, TX
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2007 - Birmingham, AL

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

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| Mr. Paul Blankenship | (2004) | Dr. Daniel W. Gorbet | (1991) |
| Dr. Stanley Fletcher | (2004) | Mr. Norfleet L. Sugg | (1991) |
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| Dr. Charles W. Swann | (1996) | Dr. Leland Tripp | (1983) |
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| Dr. David A. Knauft | (1995) | Dr. Ray O. Hammons | (1982) |
| Dr. Charles E. Simpson | (1995) | Mr. Astor Perry | (1982) |
| Dr. William D. Branch | (1994) | | |

## BAILEY AWARD

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

## JOE SUGG GRADUATE STUDENT AWARD

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

## COYT T. WILSON DISTINGUISHED SERVICE AWARD

| | |
|---|---|
| 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 |
| 1993 | Dr. James Ronald Sholar |
| 1992 | Dr. Harold E. Pattee |
| 1991 | Dr. Leland Tripp |
| 1990 | Dr. D.H. Smith |

## DOW AGROSCIENCES AWARD FOR EXCELLENCE IN RESEARCH

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

1998 Changed to Dow AgroSciences Award for Excellence in Research

## DOW AGROSCIENCES AWARD FOR EXCELLENCE IN EDUCATION

| | |
|---|---|
| 2007 | John P. Damicone |
| 2006 | Stanley M. Fletcher |
| 2005 | Eric Prostko |
| 2004 | Steve L. Brown |
| 2003 | Harold E. Pattee |
| 2002 | Kenneth E. Jackson |
| 2001 | Thomas A. Lee |
| 2000 | H. Thomas Stalker |
| 1999 | Patrick M. Phipps |
| 1998 | John P. Beasley, Jr. |
| 1996 | John A. Baldwin |
| 1995 | Gene A. Sullivan |
| 1993 | A. Edwin Colburn |
| 1992 | J. Ronald Sholar |

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

## PEANUT RESEARCH AND EDUCATION AWARD

| | |
|---|---|
| 2007 | E. Harvey |
| 2006 | D.W. Gorbet |
| 2005 | J.A. Baldwin |
| 2004 | S.M. Fletcher |
| 2003 | W.D. Branch and J. Davidson |
| 2002 | T.E. Whitaker and J. Adams |
| 2001 | C.E. Simpson and J.L. Starr |
| 2000 | P.M. Phipps |
| 1999 | H. Thomas Stalker |
| 1998 | J.W. Todd, S.L. Brown, A.K. Culbreath and H.R. Pappu |
| 1997 | O.D. Smith |
| 1996 | P.D. Blankenship |
| 1995 | T.H. Sanders |
| 1994 | W. Lord |
| 1993 | D.H. Carley and S.M. Fletcher |
| 1992 | J.C. Wynne |
| 1991 | D.J. Banks and J.S. Kirby |
| 1990 | G. Sullivan |
| 1989 | R.W. Mozingo |
| 1988 | R.J. Henning |
| 1987 | L.M. Redlinger |
| 1986 | A.H. Allison |
| 1985 | E.J. Williams and J.S. Drexler |
| 1984 | Leland Tripp |
| 1983 | R. Cole, T. Sanders, R. Hill and P. Blankenship |
| 1982 | J. Frank McGill |
| 1981 | G.A. Buchanan and E.W. Hauser |
| 1980 | T.B. Whitaker |
| 1979 | J.L. Butler |
| 1978 | R.S. Hutchinson |
| 1977 | H.E. Pattee |
| 1976 | D.A. Emery |
| 1975 | R.O. Hammons |
| 1974 | K.H. Garren |
| 1973 | A.J. Norden |
| 1972 | U.L. Diener and N.D. Davis |
| 1971 | W.E. Waltking |
| 1970 | A.L. Harrison |
| 1969 | H.C. Harris |
| 1968 | C.R. Jackson |
| 1967 | R.S. Matlock and M.E. Mason |
| 1966 | L.I. Miller |
| 1965 | B.C. Langleya |
| 1964 | A.M. Altschul |
| 1963 | W.A. Carver |
| 1962 | J.W. Kickens |
| 1961 | W.C. Gregory |

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

## ANNUAL MEETING PRESENTATIONS

**Technical Sessions** **Wednesday, July 11**

### BREEDING, BIOTECHNOLOGY, AND GENETICS I

**Riverchase A**
**Moderator: Fred Shokes, Virginia Tech, Suffolk, VA**



### PRODUCTION TECHNOLOGY

**Riverchase B**
**Moderator: James Hadden, Syngenta Corporation, Tifton, GA**

**ECONOMICS**

**Wynfrey D**
**Moderator: Jim Novak, Auburn University, Auburn, AL**

**POSTER SESSION**

**Prefunction/Foyer Area**
**Moderator: Kira Bowen, Auburn University, Auburn, AL**

**JOE SUGG GRADUATE STUDENT COMPETITION**

**Riverchase AB**
**Moderator: Bob Kemeriat, University of Georgia, Tifton, GA**

**PLANT PATHOLOGY AND NEMATOLOGY**

**Riverchase A**
**Moderators: David Hunt, Bayer CropScience, Opelika, AL, and Kira Bowen (Assistant), Auburn University, Auburn, AL**

**ENTOMOLOGY**

**Riverchase A**
**Moderators: David Hunt, Bayer CropScience, Opelika, AL, and Kira Bowen (Assistant), Auburn University, Auburn, AL**

**BREEDING, BIOTECHNOLOGY, AND GENETICS II**

**Riverchase B**
**Moderators: Baozhu Guo, USDA-ARS, Tifton, GA**

**PHYSIOLOGY AND SEED TECHNOLOGY; PROCESSING AND UTILIZATION**



**BAYER EXCELLENCE IN EXTENSION EDUCATION**

**Wynfrey D**
**Moderators: Herb Young, Bayer CropScience, Tifton, GA**

**EXTENSION TECHNIQUES AND TECHNOLOGY**

**Wynfrey D**



**ORGANIC PRODUCTION**

**Riverchase A**
**Moderator: Emily Cantonwine, University of Georgia, Tifton, GA**

## HARVESTING, CURING, SHELLING, STORING, AND HANDLING

**Riverchase B**
**Moderator: Chris Butts, USDA-ARS, Dawson, GA**



## WEED SCIENCE

**Wynfrey D**
**Moderator: P. Dotray, Texas Tech University, Lubbock, TX**

## BREEDING, BIOTECHNOLOGY AND GENETICS I

Plant Exploration Expedition to Paraguay to Collect New *Arachis* sp. *A. Pflugeae* C.E. Simpson, Krapov. and Valls. C.E. SIMPSON*, K.A. WILLIAMS, P.J. CABALLERO A. and L.E. ROBLEDO. Texas Agri. Exp. Stn, Texas A&M Univ., Stephenville, TX 76401; USDA-ARS National Germplasm Resources Laboratory, Bldg. 003, Rm. 402, BARC-West,. Beltsville, MD 20705; Ministerio de Agricultura y Ganaderia, Dirección de Investigación Agricola, San Lorenzo, Paraguay.

In April-May, 2007 a Plant Exploration Expedition was conducted to northeast Paraguay with the primary objective to collect the new species, *Arachis pflugeae*. Other species in that area were secondary objectives. The new species, *A. pflugeae* has recently been described by Simpson, et al., and has been used in the germplasm evaluation program at EMBRAPA/CENARGEN in Brasilia, DF Brazil to the extent that we are convinced that it can be a valuable germplasm resource for our introgression programs in the USA. The new species occurs in southwest Brazil and northeast Paraguay, and although *A. pflugeae* has been in the germplasm collection in Brazil for several years, it has not been established in the USA collection. Current laws in Brazil prevent collection of germplasm, however we are able to obtain germplasm from Paraguay, and thus, we completed this expedition to Paraguay to collect the germplasm. To our surprise, we were not able to collect from the Paraguayan sites that are listed in the species description because those locations now reside within the Paso Bravo national park of Paraguay. Fortunately we were successful in locating five additional sites for *A. pflugeae* east of the preserve boundary. The most distant site to the east extended the known range of the species by more than 27 km. We collected live plants and some fruits that contain seeds. Additionally, we were able to collect 50 fruits of the Section *Arachis* species, *A. microsperma,* which also grows in the area around Bella Vista, Paraguay. *Arachis microsperma* has not been listed as available in the US collection because it has produced very limited amounts of seed outside its native environment. We also collected yellow flowered *A. nitida* which was growing sympatrically with *A. microsperma*. The US collection has had orange flowered *A. nitida* since Hammons et al., collected it in 1968, but now we have both types. We also made two new collections of *A. glabrata* and we re-collected an accession of *A. major*, and two new sites for *A. paraguariensis* were identified and collected. The mission was a success in meeting our objectives.

Production of New Amphidiploids and Complex Hybrids of *Arachis*. A-P. FÁVERO* and C.E. Simpson. Embrapa Genetic Resources and Biotechnology, Brasília, DF, CP02302, 70770-900 and Texas Agricultural Exp. Station, Texas A&M Univ. Stephenville, TX 76401.

After hybridization among eight wild species with AA genome and BB genome, and polyploidization by treatment with colchicine, we have produced five distinct amphidiploids ((*A. hoehnei* KG 30006 x *A. cardenasii* GKP 10017)$^{4x}$, (*A. hoehnei* x *A. helodes* VSGr 6325)$^{4x}$, (*A. hoehnei* x *A. simpsonii* VSPtSv 13710)$^{4x}$, (*A. ipaënsis* KGBPScS 30076 x *A. duranensis* V 14167)$^{4x}$, (*A. gregoryi* VSGr 6389 x *A. linearifolia* VK 9401)$^{4x}$, very different among each other by the number of seeds produced per plant and four complex hybrids, produced by the hybridization between amphidiploids, trying to combine good crossability results obtained from some amphidiploids and the good resistance observed in other

amphidiploids. The four complex hybrids are: [(*A. ipaënsis* x *A. duranensis*)$^{4x}$ x (*A. gregoryi* x *A. linearifolia*)$^{4x}$]; [(*A. ipaënsis* x *A. duranensis*)$^{4x}$ x (*A. hoehnei* x *A. helodes*)$^{4x}$]; [(*A. gregoryi* x *A. linearifolia*)$^{4x}$ x (*A. hoehnei* x *A. helodes*)$^{4x}$], [(*A. gregoryi* x *A. linearifolia*)$^{4x}$ (*A. hoehnei* x *A. cardenasii*)$^{4x}$]. All complex hybrids are very resistant to fungal organisms that develop diseases under field conditions. The first complex hybrid listed above produced 34 $F_2$ seeds and the second complex hybrid produced just one seed. The other two have not produced any seed at this writing.

Advance of Virginia-type Breeding Lines Through Evaluation Across Multiple Environments. F.M. SHOKES*, Tidewater Agricultural Research and Extension Center, Suffolk, VA 23437; T.G. ISLEIB, Department of Crop Science, North Carolina State University, Raleigh, NC 27695; and D.L. COKER, Texas Cooperative Extension, College Station, TX 77843-2474.

Data on the yield and quality of virginia-type breeding lines from breeding tests and advanced yield tests limit research efforts to accurately assess genotype by environment effects throughout the Virginia-Carolina growing area. Therefore, peanut breeding lines are tested each year in multiple environments (locations) in North Carolina, and Virginia, in the Peanut Variety Quality Evaluation Program (PVQE). A total of twenty-two advanced lines from the North Carolina State University (NCSU) Breeding Program and 18 lines from Virginia Tech (VT) were compared to nine commercial virginia-type peanut cultivars over three years (2004 – 2006) at four locations (two sites in Virginia and two sites in North Carolina). Test plots in all 12 trials were two 40ft rows replicated two times in a randomized complete block design for each of two digging dates. Trials were planted each year in May (May 5 – May 27) and harvested when the earliest lines were mature (September 22 – October 1) for the first digging and approximately two weeks later (October 4 – October 21) for the second digging date. Nine NCSU lines and nine VT lines that were common to three years of testing are considered herein. Peanuts were grown using best management practices according to recommendations of Virginia and North Carolina Cooperative Extension Services. Comparisons were made for yield (lb/A), grade (% fancy, % ELK, % SMK, % total kernels, support price ($/CWT), pod yield (lb/A), and value ($/A). Further comparisons were made for peanut quality (blanching, Ca content of seed, iodine value, and fatty acid composition). Only yield and grade comparisons are presented here. Mean yield for the 27 genotypes for the first digging date ranged from 3645 lb/A – 4394 lb/A. Yields for the second digging date were lower and slightly more variable ranging from 3242 lb/A – 4014 lb/A. Mean yield for all locations and years for the first digging date was 4010 lb/A and for the second digging date was 3707 lb/A. Ten of the breeding lines had high percentages of extra large kernels (40% or more) for the first digging date and all breeding lines had >40% ELK at the second digging while seven lines exceeded 50%. Genotypes were ranked for seven parameters (% fancy pods, % ELK, % SMK, % total kernels, support price, and value) and breeding line N01013T ranked in the top ten for all seven parameters. Three lines (VT 003069, VT 024051, and N02009) ranked in the top 10 for six of the seven parameters and one line ranked in the top 10 for five of the seven parameters. The high oleic line, N99103ol(9), ranked in the top 10 for four of seven parameters. Five of the breeding lines were in the top seven in ranking for support price, yield and value [VT 024051, VT 003069, N01013T, N02009, and N99103ol(9)] and were typically better than the nine commercial cultivars for most of the yield and grade parameters. Real progress is being made in

advancing breeding material of virginia-type peanuts and this group of breeding lines could yield one or more improved cultivars that could be successful across the varied environments of the Virginia-Carolina growing region.

Development of Peanut Germplasm with Improved Drought Tolerance. C.C. HOLBROOK*, D.G. SULLIVAN, B.Z. GUO, USDA-ARS, Tifton, GA 31793; and E. CANTONWINE, D.M. WILSON, W. DONG, University of Georgia, Tifton, GA 31793.

We have observed significant reductions in preharvest aflatoxin contamination (PAC) in peanut genotypes with drought tolerance. These sources of resistance to drought and PAC have been entered into a hybridization program. They have been crossed with cultivars and breeding lines that have high yield, acceptable grade, and resistance to tomato spotted wilt virus (TSWV). This has resulted in the development of breeding lines with relatively high yield and relatively low aflatoxin when grown under heat and drought stress. We are releasing C76-16 as peanut germplasm with improved resistance to drought and aflatoxin contamination. We continue to looks at new approaches which could be used to accelerate our breeding progress for drought tolerance. During the past year we evaluated epidermal conductance as a potential drought tolerance trait. Unfortunately, the genetic variation in epidermal conductance does not appear to be large enough to be useful in our breeding program. More promising results have been observed in the use of ground-based remote sensing of canopy reflectance as a indicator for drought tolerance.

Stability Analysis of Jumbo and Fancy Pod Content and Brightness in Virginia-Type Cultivars and Breeding Lines. T.G. ISLEIB* and S.C. COPELAND, Department of Crop Science, North Carolina State University, Raleigh, NC 27685-7629.

Jumbo and fancy pod content and brightness are important considerations in breeding virginia-type peanut (*Arachis hypogaea* L.) cultivars for the in-shell peanut market. These traits are measured for a pod sample from every plot in every replicated yield test conducted as part of the peanut breeding program at N.C. State Univ. (NCSU). Because shellers desire to contract sufficient production of cultivars that will deliver the right amounts of bright jumbo and fancy pods to satisfy their customers' needs, environmental stability of pod grade and brightness is as important as the average values for cultivars. Data from the NCSU Advanced Yield Test were subjected to stability analyses to determine if stability parameters differentiated lines with similar mean values. The tests were conducted at three locations in N.C. from 2003-2006; 30 cultivars and breeding lines were common to all tests. Each year-by-location combination was considered to be an "environment," and three stability estimation procedures were used: (1) standard deviation of the values for a line across environments, (2) "stability error," the standard deviation of GxE interaction effects for a line across environments, and (3) slope and correlation from regression analysis of the values for a line on the environmental index calculated as the mean of all lines in an environment. As is common with biological data, mean jumbo pod content for a line was positively correlated with its environmental variance, but fancy pod content was not correlated, and jumbo and fancy brightness showed negative correlation between genotypic mean and environmental variance. This negative correlation is the result of genotypes prone to pod darkening having

bright pods under fortuitous environmental circumstances, probably related to precipitation between digging and combining the peanuts. Stability error exhibited similar patterns except that there was also a negative correlation of a line's mean fancy pod content with its stability error. Regression analysis showed that lines with high jumbo or fancy pod brightness were not reactive with the environmental index, *i.e.*, there was negative or no correlation between the genotypic mean and the regression slope. Lines with higher mean jumbo pod content brightness tended to exhibit a range of correlations with the environmental index, suggesting that it is possible to identify some lines with high means that are more predictable than others across environments. Lines with higher fancy pod content or brightness tended to be more predictable. These results suggest that deployment of cultivars with genetically enhanced pod brightness will stabilize the characteristic in commercial channels. Likewise, lines with high, stable fancy pod content can be identified. Stability of jumbo pod content will be more difficult to achieve.

Genotype x Environment Interaction for Peanut Seed Size. B.L. TILLMAN*, D.W. GORBET, North Florida Research and Education Center, Marianna, FL 32446 and T.G. ISLEIB, Department of Crop Science, North Carolina State University, Raleigh, NC 27695.

Seed size is important to many segments of the peanut industry including farmers, shellers, and manufacturers. For this reason, seed size is a major focus of peanut breeding programs in the USA. Information on the relative contribution of genotype and environment to the variability of seed size is important for peanut breeders. Data from the Uniform Peanut Performance Tests (UPPT) and from the University of Florida Variety Tests was used to determine genetic and environmental effects on seed size. From the 2004 and 2005 UPPT, ten genotypes common to both years and nine locations were used. Broad sense heritability varied considerably among the seven traits tested. Heritability of the percentage fancy pods was 0.90, the highest of all the seven traits and similar to the heritability of the weight of 100 seeds at 0.89. Heritability of jumbo, medium, number one, and other kernels was 0.75, 0.73, 0.48, and 0.18, respectively. Heritability from the Florida Variety Tests in two locations over a four year period followed a similar trend with heritability values of 0.94, 0.83, 0.85, 0.67, 0.42, for virginia pods jumbo, medium, number one, and other kernels, respectively. These results indicate that most measures of seed size are highly heritable and that breeders should be able to manipulate seed and pod size easily.

Nutrient Composition of the Peanut Core of the Core Collection. L.L. DEAN*, T. H. SANDERS, Market Quality and Handling Research Unit, USDA, ARS, SAA, Raleigh, NC 27695-7624; and C.C. HOLBROOK, Crop Genetics and Breeding Research Unit, USDA, ARS, SAA, Tifton, GA 31793

Peanuts from the Core Collection designated as the Core of the Core Collection were grown in Tifton, GA in 2005. Amino acids, folic acid and total oil content were determined on the whole seed. Amino acid concentrations were generally close to commonly reported values. Folic acid concentration varied from 100 to 240 micrograms per 100 grams and the higher concentrations exceeded normally reported values. Oil was mechanically expressed from the seed and analyzed for fatty acids and individual tocopherols. Common fatty acid profiles were observed and the highest O/L ratio was 3.5. Some samples had alpha tocopherol contents much higher than commonly reported. The higher concentrations of some nutrients indicated that the core of the core samples may

have potential for improvements in nutrient profiles of peanuts when used in conventional breeding programs.

Flavor Profiles of Species-Derived Peanut Breeding Lines. S.P. TALLURY*[1], H.E. PATTEE[2], T.G. ISLEIB[1], and H.T. STALKER[1]. [1]Department of Crop Science, N.C. State Univ., Raleigh, NC 27695-7629. [2]Department of Biological & Agricultural Engineering, NCSU, Raleigh, NC 27695-7625.

Several diploid wild species of the genus *Arachis* L. have been used as sources of resistance to common diseases of cultivated peanut (*A. hypogaea* L.). Because flavor is the most important quality attribute for commercial acceptance of roasted peanuts, it would be useful to evaluate sensory attributes of these interspecific hybrid derivatives for peanut flavor to determine if transfer of disease resistance from wild species was associated with a concomitant deleterious effect on flavor. Sixteen interspecific hybrid derivatives and the commercial flavor standard, NC 7 were evaluated for sensory quality. Most of the lines traced to *A. cardenasii* Krap. & Greg., but *A. stenosperma* Krap. & Greg., *A. diogoi* Hoehne, *A. correntina* (Burk.) Krap. & Greg. and *A. batizocoi* Krap. & Greg. were also represented in the ancestry of some lines. No significant variation among test entries was found for the roast peanut, sweet, bitter, or astringent sensory attributes. This applied to the overall contrast between NC 7 and species-derived lines and to the variation among the species-derived lines. Introduction of disease and pest resistance traits from the wild species did not result in degradation of the flavor profile, suggesting that flavor of species-derived germplasm will not prevent its use either directly as cultivars or as parental sources in peanut breeding programs.

## PRODUCTION TECHNOLOGY

Planting Date Effect on Disease Severity and Peanut Yield. J.P. BEASLEY, JR.*, Crop and Soil Sciences Department and T.B. BRENNEMAN, A.K. CULBREATH, R.C. KEMERAIT, JR. Department of Plant Pathology, University of Georgia, Tifton, GA 31793-0748.

Planting date of peanut, *Arachis hypogaea* L., in the southeastern United States has traditionally been dictated by climatic conditions such as soil moisture and temperature. Initial infection, rate of infection, and severity of disease symptoms by several fungal organisms and tomato spotted wilt tospovirus on peanut are triggered by planting date, climatic conditions, or a combination of the two abiotic factors. Varying levels of inherent resistance occur in runner-type cultivars to leaf spots caused by *Cercospora arachidicola* and *Cercosporidium personatum*, southern stem rot (white mold or southern blight) caused by *Sclerotium rolfsii* Sacc., limb rot caused by *Rhizoctonia solanii* Kuhn, Cylindrocladium black rot (CBR) caused by *Cylindrocladium crotalariae* (Loos) Bell and Sobers, and tomato spotted wilt caused by tomato spotted wilt tospovirus. Trials were conducted in crop years 2004-2006 to evaluate the disease occurrence and yield response of runner-type cultivars to different planting dates. The most dramatic response was with tomato spotted wilt. There was a significant reduction in tomato spotted wilt severity in late May planting compared to late April, especially in cultivars such as 'Georgia Green' that are more susceptible to tomato spotted wilt. Cultivars that were more susceptible to spotted wilt disease had a more significant yield increase as planting date was delayed from late April until late May. In cultivars with higher levels of resistance to tomato spotted wilt, such as 'AP-3', 'Georgia-03L', and 'Georgia-02C', there was a reduction in disease severity as planting

was delayed but yield response did not always increase at a significant level.

Non-Irrigated Minimum-Input Peanut Yield Tests. W.D. BRANCH* and S.M. FLETCHER. Dept. of Crop and Soil Sciences and Agricultural and Applied Economics, University of Georgia, Coastal Plain Experiment Station, Tifton, GA 31793-0748 and Georgia Experiment Station, Griffin, GA 30223-1797, respectively.

Non-irrigated peanut (*Arachis hypogaea* L.) acreage accounts for > 50% of the total peanut acreage in the southeast U. S. In addition to more drought tolerant cultivars, disease and insect resistant cultivars are also needed to reduce the input cost of peanut production for a greater total dollar value return. This is especially critical today given the significant increase in energy cost while the selling price for peanuts has not changed significantly. This relationship is placing many peanut farms at high risk financially and could impact the whole peanut industry in the future. Thus, the objective of this research study was to evaluate several cultivars and advanced Georgia breeding lines when grown with minimum inputs under dryland conditions. Non-irrigated, minimum-input yield tests were conducted for the past three years (2004-06) at the University of Georgia, Coastal Plain Experiment Station at Tifton, GA and the Southwest Georgia Research and Education Center at Plains, GA. No systemic insecticides were used at planting, and only three fungicide sprays were used throughout the whole growing season. Adequate rainfall and distribution was found to be critically important without irrigation. Thrips injury was the most noticeable insect damage early each year, but plants seemed to recover by mid-season. Spotted wilt caused by *Tomato spotted wilt virus* (TSWV) was the most noticeable disease damage each year, but other foliar and soilborne pathogens and insects also caused some damage particularly toward the end of each growing season. Results from these replicated field tests showed significant differences among the peanut genotypes evaluated. Recently released Georgia cultivars: 'Georgia-05E', 'Georgia-01R', 'Georgia Greener', 'Georgia-06G', 'Georgia-02C', and 'Georgia-03L' consistently had the greatest total dollar value return of all cultivars and breeding lines when tested over years and locations.

Peanut Yield, Grade, and Economics with Two Surface Drip Lateral Orientations. R.B. SORENSEN* and M.C. LAMB, USDA-ARS-National Peanut Research Laboratory, PO Box 509, 1011 Forrester Dr. SE, Dawson, GA 39842

Surface drip irrigation laterals were spaced next to crop rows and in alternate row middles to document crop yield, grade and gross/partial economic returns for this type of irrigation system compared with non-irrigation practices. A subsurface drip irrigation system was installed at two sites on a Faceville (Site 1) fine sandy loam (fine, kaolinitic, thermic Typic Kandiudults) and a Greenville (Site 2) fine sandy loam (fine, kaolinitic, thermic Rhodic Kandiudults) with a 1% and 2 to 3% slope, respectively. Peanut cultivar 'Georgia Green' was planted in both single and twin-row configurations with two lateral orientations (0.91and 1.83 m). Peanut cultivar 'Virugard' was planted in a twin-row configuration with two lateral spacings. Pod yield, farmer stock grade, and economic returns were determined for the 2002 to 2004 growing seasons. Peanut irrigated with surface drip had greater yield, grade, and gross revenue compared with the non-irrigated regime. Both Site 1 and 2 showed no difference in yield, grade, or economic returns between the two lateral spacings. Yield, grade, and revenue differences were shown at Site 1 across years and site location. Differences can be attributed to

yearly variations in climatic patterns and irrigation management. Site 2 was more stable with reference to yield, grade and revenue when compared with Site 1. This was probably due to slope and aspect characteristics associated with each site and not necessarily with soil type. Both Sites 1 and 2 responded positively to twin-row configuration compared with the single row orientation. Twin-row orientation had over 330 kg/ha greater yield, 1% more total sound mature kernels (TSMK), and over $150/ha additional revenue compared with single row orientation. Cultivar 'Georgia Green' had over 500 kg/ha higher yield compared with 'Virugard' (4056 kg/ha). When using surface drip irrigation, a grower can use an alternate row middle lateral spacing without loss of yield, grade, or revenue compared with one lateral per crop row. This also reduces lateral tubing cost by half compared with laterals spaced across each adjacent crop row.

*Bradyrhizobium* Inoculant Type and Mid-Season N Fertilizer Effects on Peanut Yield, Gaines Co., Texas. C.L. TROSTLE*, Texas Cooperative Extension/Texas A&M Univ. Ag. Research & Extension Center, 1102 East FM 1294, Lubbock, TX 79403.

High nitrogen (N) fertilizer rates ≥ 100 kg N $ha^{-1}$ are a common practice in high-yield West Texas peanut production in lieu of encouraging optimum *Bradyrhizobium* nodulation of peanut. The objective was to evaluate the effect of different granular and liquid in-furrow inoculants, with and without mid-season N, on peanut yield in Gaines Co., Texas. Inoculant and N rate trials were conducted in 2001-2004 on Brownfield loamy sand at the Western Peanut Growers research farm. Inoculant trials included controls, seedbox powders, and particularly granular and liquid in-furrow inoculants (1X and 2X rates) from several different companies. In addition, pre-plant starter N (22 kg N $ha^{-1}$) and/or mid-season N (90 kg N $ha^{-1}$) was applied in June for selected granular and liquid inoculant treatments. *Bradyrhizobium* per-plant nodulation was counted in mid August for all treatments. An uninoculated base peanut yield, using 22 kg pre-plant N $ha^{-1}$, was determined to be 3,020 kg $ha^{-1}$ (5 nodules/plant). Relative to the base yield 1X granular or liquid inoculation added 1,020and 1,870 kg $ha^{-1}$ yield increase, respectively, whereas peak nodulation increased to 22 and 40 nodules per plant. Mid-season N of 80 kg N $ha^{-1}$ on uninoculated peanuts increased yields 1,440 kg $ha^{-1}$. Mid-season N fertilization on 1X inoculated peanuts further increased yields 660 kg $ha^{-1}$. Double rate inoculants did not increase yield for liquids but increased yield 360 kg $ha^{-1}$ for granular. Seedbox inoculants did not affect yield. Results suggest inexpensive *Bradyrhizobium* inoculation can increase peanut yields with less cost than N fertilization, but N applications remain a component of peanut production.

Interactions of Tillage and Cropping System on Peanut Yield in North Carolina. P.D. JOHNSON, D.L. JORDAN*, and B.B. SHEW, North Carolina State University, Raleigh, NC 27695; T. CORBETT, J.S. BARNES, C.R. BOGLE, T. MARSHALL, and W. YE, North Carolina Department of Agriculture and Consumer Services, Raleigh, NC 27699.

Research was conducted in North Carolina at Lewiston-Woodville from 1999-2006 and at Rocky Mount from 2000-2006 to evaluate interactions of tillage and cropping systems. At Lewiston-Woodville, cropping systems included: cotton-cotton-cotton-peanut; cotton-cotton-corn-peanut; cotton-peanut; and corn-peanut. At Rocky Mount, rotations included: cotton-peanut and cotton-cotton-peanut during 2000-2003. In 2004 peanut was planted in all rotations followed by cotton in 2005 and peanut in 2006 at Rocky Mount. Within each cropping system,

conventional and strip tillage systems were maintained each year. When peanut was planted in all plots during 2002 and 2006 at Lewiston-Woodville, stale seedbeds were prepared in a portion of each plot receiving strip tillage. Conventional tillage operations included disking twice and field cultivating once followed by ripping and bedding. Stale seedbeds were prepared with one pass of a ripper bedder four or more weeks prior to strip tilling. A similar tillage regime was incorporated at Rocky Mount. Crop yield during each year, bulk density during 2006 in the pegging zone, and disease reaction for peanut were recorded for all plots. At Lewiston-Woodville on a Norfolk sandy loam soil, there was no difference in pod yield when comparing conventional tillage to strip tillage into crop stubble. Additionally, there was no difference in yield when comparing peanut strip tilled into crop stubble or stale seedbeds. However, at Rocky Mount on a Goldsboro loamy sand soil, pod yield was lower when peanut was planted into crop stubble compared with either conventional tillage or stale seedbed systems. While rotation did not affect yield at Rocky Mount, yield at Lewiston-Woodville was lower when peanut was planted in a corn-peanut or cotton–peanut rotation compared with yield in cotton-cotton-cotton-peanut or cotton-cotton-corn-peanut rotations regardless of tillage system. Bulk density in the pegging zone did not differ when comparing conventional and reduced tillage systems, and this was expected because the pegging zone was tilled with either conventional equipment or with a strip tillage implement including coulters and in-row sub-soil equipment. *Cylindrocladium* black rot increased in short rotations at Lewiston-Woodville as did nematode populations. At Rocky Mount, higher populations of volunteer peanut were noted in cotton the year after strip tilling peanut into crop stubble in the short rotation compared with long rotations or when peanut was planted in conventional tillage or stale seedbed systems. A higher population of volunteer peanut in cotton suggests greater pod loss during the digging process in the previous year when peanut was strip tilled into crop stubble. Collectively, these data demonstrate the flexibility of planting peanut in reduced tillage systems on coarse-textured soils and the risks of planting peanut in reduced tillage systems in short rotations on finer-textured soils.

Peanut Yield and Pest Reaction Following Various Crop Rotations in North Carolina. D.L. JORDAN*, B.B. SHEW, and P.D. JOHNSON, North Carolina State University, Raleigh, NC 27695; T. CORBETT, J.S. BARNES, C.R. BOGLE, T. MARSHALL, and W. YE, North Carolina Department of Agriculture and Consumer Services, Raleigh, NC 27699.

Research was conducted at three locations in North Carolina to compare pest reaction and yield of peanut and other crops to rotation systems. At Lewiston-Woodville, rotations from 1997-2006 included: continuous peanut; peanut-cotton; peanut-corn; peanut-cotton-cotton; peanut-corn-corn; peanut-soybean-cotton; peanut-soybean-corn; and cotton-corn-peanut. Peanut was planted in all plots during 2000. Additionally, a rotation of corn-cotton-corn-peanut (1997-2000) followed by continuous corn (2001-2005) was included. At Rocky Mount, rotations since 2001 included: continuous cotton; continuous peanut; cotton-cotton-peanut-cotton-cotton; cotton-cotton-soybean-cotton-cotton; and cotton-peanut-cotton-peanut-cotton. At an additional location near Whiteville, rotations since 2001 included: continuous corn; corn-corn-peanut-corn-corn-peanut; corn-corn-tobacco-corn-corn; tobacco-corn-peanut-tobacco-corn; and corn-tobacco-peanut-corn-tobacco. During 2006 all plots were planted with peanut at all locations. At Lewiston-Woodville, additional treatments within each rotation included the cultivars Gregory and NC 12C with or without metal sodium. At

Rocky Mount, treatments within each rotation included NC-V 11 or NC 12C. At Whiteville, the cultivars Gregory and Perry were planted within each rotation. Soil samples were collected within three weeks prior to digging peanut in 2006 to determine root knot nematode populations. Visual estimates of diseased canopy were recorded within 1 week of digging during 2006 using a scale of 0 to 100% where 0 = no plants expressing symptoms of disease and 100 = the entire peanut canopy expressing disease symptoms. No differences in disease, which was primarily *Cylindrocladium* black rot (CBR), was noted when NC 12C was planted regardless of fumigation treatment or when Gregory was planted and fumigation was included. However, without fumigation, 23% diseased canopy was noted when corn and soybean were included in the rotation while only 12% diseased canopy was noted when cotton and soybean were included. When cotton or corn was rotated with peanut without soybean, disease canopy was 6% or less. Increasing the number of years between peanut crops increased yield for both cultivars regardless of rotation crop. The highest yield for Gregory was noted when peanut was planted only twice from 1997-2006 regardless of fumigation treatment. Fewer differences in yield were noted when Gregory was fumigated or when NC 12C was planted regardless of fumigation compared with planting Gregory without fumigation. These results were not unexpected because Gregory is sensitive to CBR, and NC 12C is considered tolerant of CBR. Fewer differences in root knot nematode populations were noted among rotations when fumigation was included. Higher populations were noted when corn was the rotation crop rather than cotton. At Rocky Mount, diseased canopy was only 1% and pod yield did not differ when cotton was planted five years, when soybean or peanut was included two years before planting peanut during 2006, or when peanut and cotton were rotated every other year. Continuous peanut had the highest amount of disease. Disease was highest and yields lowest in continuous peanut. At Whiteville, no differences in CBR and pod yield were noted when peanut followed five years of corn or four years of corn and one year of tobacco. Reducing the rotation to two non-peanut crops between peanut crops increased CBR and lowered yield of Gregory but did not affect Perry. Collectively, these data continue to suggest that interactions of rotation system, cultivar, and fumigation play a major role in peanut reaction to CBR and subsequent peanut yield.

Evaluation of Peanut Cultivars for Suitability in Biodiesel Production Systems. W.H. FAIRCLOTH*, D.L. ROWLAND, and M.C. LAMB, USDA/ARS, National Peanut Research Lab, Dawson, GA 39842; and J.P. DAVIS, USDA/ARS, Market Quality and Handling Research Unit, Raleigh, NC 27695.

Nineteen currently and previously available peanut cultivars were field tested for oil production capability in a low-input production system designed for biodiesel use. This low input system was characterized by strip tillage into a rolled rye cover crop, no use of either insecticides or fungicides, and limited herbicide usage (< $15.00 acre-1). Treatments were a factorial arrangement of cultivar (13) and irrigation (none or drip irrigation) in a randomized complete block design with four replications. Six more cultivars were included in the dryland area only, for a total of 19 cultivars evaluated. Peanut was planted 2-jun-2006 and harvested at one of two dates (135 or 152 d after planting), depending on maturity classification. The study was conducted on a Redbay loamy sand near Dawson, GA in 2006. Rainfall at the site was 10 inches below average for the entire growing season, resulting in severe drought conditions considering the

sandy soil. Irrigated peanut yield ranged from 1680 to 2890 lb acre-1, while dryland yields ranged from 1180 to 2580 lb acre-1. The top five cultivars in both irrigated and dryland conditions were Georgia-03L, Georgia-04S, DP1, Georganic, and C-99R. Consistently poor performing cultivars included Georgia Browne, Georgia-05E, and Georgia-01R. Yield samples were graded and select kernels analyzed for oil content. Oil production was estimated for eight cultivars by multiplying yield x % kernels x kernel oil content. Oil production ranged from 94 to 133 gal acre-1. C-99R, DP1, and Georganic each yielded in excess of 120 gal acre-1. Production costs in these systems were estimated at $264.17 and $203.75 acre-1 for irrigated and dryland, respectively. At these input levels, peanut oil can be realistically produced for $2.20 to $1.70 per gallon in irrigated and dryland systems, respectively. Both irrigated and dryland systems are competitive with petroleum-based diesel at current prices, however, dryland systems would offer a significant cost savings.

Optimizing Valencia Planting Patterns and Population Densities. R.C. NUTI*[1], N. PUPPALA[2], S. ANGADI[2], R. SORENSEN[1], and M. LAMB[1]. [1]USDA-ARS National Peanut Research Laboratory. Dawson, GA 39842. [2]New Mexico State University, Agricultural Science Center at Clovis. Clovis, NM 88101.
Currently, most Valencia peanuts are grown in single rows on 36 to 40 inch beds. Because of their bunch-type and erect growth habit, Valencia peanuts do not spread over the whole bed and have the opportunity to benefit from multiple row planting designs. This study was conducted near Clovis, NM to compare single row, twin row, and diamond planting patterns in Valencia peanut on 36 inch beds. The diamond pattern is established by planting 4 rows on a bed and placing seed equidistant from each other to optimize individual plant growing space. This study included five planting treatments, including single row, twin row, and one diamond pattern treatment with equal populations (~87,000 seed per acre). Two additional diamond pattern treatments were planted to establish 60% and 80% populations compared to the single row treatment. At mid-season, each plot was sampled by pulling all plants in a 0.5 meter by 3 foot area for biomass partitioning. This was done to document mid-season plant productivity and growth stage on an area basis to compare the five planting treatments. Two weeks prior to harvest, another sample was pulled from the plots to estimate maturity. Farmer stock yield of single row plots averaged 3175 lb per acre which was significantly less than the 4000 to 4325 lb per acre produced by twin row and diamond planting patterns. Peanut grade was similar between all planting treatments ranging between 57 and 62 resulting in value ranging between $510 and $515 per farmer stock ton. Economic analysis including seed cost and crop value were carried out to determine actual return assuming a contract price of $550 per ton and that all other production costs were fixed. Seed cost used was $35 per 50 lb and seed count was figured at 1,000 seed per lb. With these assumptions, single row peanuts in this study had a crop value of $810 per acre while the value produced in twin row and diamond planting pattern treatments was between $1,030 and $1,115 per acre.

## ECONOMICS

Results from a Nationwide Survey: What do Southern Agricultural Producers Want in the 2007 Farm Bill? J.L. NOVAK*, Department of Agricultural Economics and Rural Sociology, Auburn University, AL 36849; N.B. SMITH, Department of Agricultural and Applied Economics, University of

Georgia, Tifton, GA 31793.

In 2006, a survey of over 64,000 agricultural producers was conducted in 28 states to determine their opinions regarding what the content of the 2007 farm bill should be. This presentation keys on the southern region results of the six southern states (Alabama, Arkansas, Florida, Georgia, North Carolina, and Texas) involved in the survey. The survey focused on producer attitude towards farm bill commodities, conservation, rural development and research and education issues. Peanut producer's preferences for the new farm bill will be contrasted to other commodity producer's preferences.

Farmer Adjustments to the 2002 Farm Bill and Issues Shaping the 2007 Farm Bill for Peanuts. N.B. SMITH*, Department of Agricultural and Applied Economics, University of Georgia, Tifton, GA 31793;. T.E. HEWITT, Food and Resource Economics Department, University of Florida, Marianna, FL 32446.

The 2002 Farm Bill made historic change to the peanut program by eliminating quota poundage allotments. In place of the old program, a marketing loan program and peanut bases were established on farms with production history to receive direct and counter-cyclical payments. Data is presented showing changes and shifts in production as result of the 2002 Farm Bill. The enabling legislation for the 2002 Farm Bill expires on September 30, 2007 and authorized expenditures end with the 2007 crop year. The intention of Congress is to pass a new farm bill before the beginning of the 2007/08 fiscal year. Issues shaping the discussion and proposals for the 2007 Farm Bill are presented and potential implications for peanut are given.

Potential Impacts of the 2007 Farm Bill on a Southwest Georgia Representative Cotton-Peanut Farm. W.D. SHURLEY*, N.B. SMITH, and A. ZIEHL, Department of Agricultural and Applied Economics, University of Georgia, Tifton, GA 31793.

Cotton and peanuts are Georgia's two largest row crops in both acreage and value. Most farms producing peanuts also produce cotton and the acreage is often in rotation. The present (2002) farm bill eliminated the historic quota-based peanut program and replaced it with acreage base and marketing loan provisions similar to other crops. The 2002 legislation continued to provide fixed payments but also initiated a new countercyclical payment. Peanuts were provided a separate but equal payment limitation - important to farms producing large acreage of both cotton and peanuts. The current farm bill expires after the 2007 crop year. Cotton has been in the cross-hairs of the WTO negotiations. Because Georgia peanut producers are also cotton producers, this is an important consideration. The new 2007 farm bill may contain modifications from the 2002 legislation such as changes in loan rates, reduced marketing loan benefits in favor of larger DCP payments, and stricter payment limitations. This study provides an economic analysis of the impacts of possible changes forthcoming in the 2007 farm bill. The analysis is conducted for a 2,300 acre representative southwest Georgia farm. The analysis provides a comparison of the current 2002 farm bill provisions with scenarios for the 2007 legislation under price and yield projections. Implications for net farm income and enterprise net income are given. The 2007 farm bill would become effective with the 2008 peanut and cotton crops.

Economic Evaluation of Twin Row Plantings for Improving Production Efficiency in Peanuts. T.D. HEWITT*, N.B. SMITH. University of Florida, NFREC, Marianna 32446 and University of Georgia, Tifton, GA 31794.

With recent changes in the federal peanut program, increased efforts have been made to search for ways to improve peanut production efficiency. A major goal of most peanut producers is to improve cultural practices to maintain maximum profitability. Particularly important to peanut producers are ways to reduce costs and increase yields that are associated with pest problems. In particular, the *Tomato spotted wilt virus* (TSWV) has been a major yield limiting factor of peanuts in the Southeast. A tomato spotted wilt risk index has been developed by researchers in the Southeast to help producers manage the disease. Row pattern research has shown that twin row plantings will help to reduce risk and is an important factor in the risk index. Studies have been done for the last five years in Florida and Georgia to compare tillage methods, varieties, and row spacing for best management practices. Economic considerations have been added to answer the "does it pay" question. Economic considerations were evaluated for certain varieties for effects on yields, grades, and disease levels of peanuts. Research in both states has indicated that twin row plantings have an advantage in yield, grades, and evidence of TSWV. In general, twin row plantings yielded over 300 pounds of peanuts more than conventional plantings. Grades were over one percent higher for twin row plantings and TSWV was positively affected. The twin row plantings had an economic advantage of $50 per acre when factoring in the different costs associated with twin row patterns and the additional yields and resulting revenue for the twin row peanuts. Twin row plantings of peanut do have a positive economic benefit and is a practice that improves peanut production efficiency.

Economic Comparison of Irrigation Application Strategies: Results from a Three Year Study. A. ZIEHL*, N.B. SMITH, Department of Agricultural and Applied Economics, University of Georgia, Tifton, GA 31793; J.P. BEASLEY, JR., J.E. PAULK, III, and J.E. HOOK, Crop and Soil Sciences Department, The University of Georgia, Tifton, GA 31793-1209.

Peanuts are a high value crop requiring a high level of capital to produce. Thus, capital risk is greater for peanuts than for most row crops grown in the Southeast. To help mitigate this risk, irrigation is used where available to supplement rainfall. Georgia peanut production surveys indicate an average of 900 pounds per acre increase in yield as a result of irrigation. Irrigation quantity and timing can greatly enhance peanut yield, and irrigation strategies have been developed to optimize application timing and water use efficiency. A three-year study was conducted to determine the response in yield and grade factors of recently released runner peanut cultivars to irrigation strategies. The irrigation application strategies examined included Irrigator Pro, UGA EASY Pan, and an experimental strategy based on a modification of the UGA Extension recommendation in combination with the Stansell and Pallas water curve for peanut. Trials were conducted in crop years 2004-2006 at the University of Georgia's Stripling Irrigation Research Park in Mitchell County. An economic analysis of irrigation strategies is conducted to estimate the costs and returns for alternative irrigation strategies. Higher fuel prices and potential of water use restrictions in drought years add to the importance of efficient use and conservation of water for irrigation. The experimental strategy shows potential for maximizing production and also net returns to irrigation.

Economic Implications of Fungicide Timing and Variety Selection. B. GOODMAN, A. HAGAN, Ag Economics and Plant Pathology, Auburn University, AL, 36849-5406 and N. SMITH, Agricultural Economics, The University of Georgia, Tifton, GA 31793-0748.

Treatment costs were applied to yield data from experiments at the Wiregrass Research and Extension Center in 2005 to determine the economic feasibility of different fungicide scheduling regimes. Applications of Headline® fungicide at 14, 21, and 28 day intervals on three popular peanut cultivars was applied to a "conventional" Bravo® treatment. While peanut yields generally increased with increasing frequency of sprays, material and application costs more than offset the value of the additional peanuts produced. No significant yield differences were observed among the cultivars used in the experiment. When spray schedule was considered, some significant differences were observed. Yield for the 28-day schedule was 200 pounds per acre lower than with the AU-Pnut schedule, and were 200 pounds higher for the 14-day. The 21-day schedule and the AU-Pnut schedule received the same number of sprays and produced the same yield. However, when net returns were calculated, all schedule treatments produced net returns within a $30 per acre range, and these differences were not statistically significant. Because no apparent differences in grades were observed from any of the treatments, no grade data were recorded. However, if grade differences were to result from different spray schedules, these results could be altered.

Economic Implications of Fungicide Material Selection and Application Timing. A. HAGAN, R. GOODMAN, Ag Economics and Plant Pathology, Auburn University, AL, 36849-5406 and N. SMITH, Agricultural Economics, The University of Georgia, Tifton, GA 31793-0748.

Treatment and material costs were applied to yield data from experiments at the Wiregrass Research and Extension Center from 2003 through 2005 to determine the yield impact of different fungicide materials and spray schedule regimes. Applications of Folicur® and Abound® fungicides were compared to Bravo® under different spray schedules. Fungicides were applied at 14, 21, and 28 day intervals as well as on the basis of the "AU-Pnut" scheduling program. Statistically significant differences between yields and net returns were observed. The modern fungicides consistently out performed Bravo®, and peanut yields generally increased with increasing frequency of sprays. However, material plus application costs offset the value of additional peanuts produced in some cases. Folicur® treatment yields were 350 lbs greater than the Bravo® treatments, and the Abound® treatment yields were over 600 lbs greater. However, while net returns for the modern fungicide treatments were both higher than the Bravo® treatments by approximately $120 per acre, cost differences resulted in no significant differences in net returns between Abound® and Folicur®. Significant yield differences from the alternative spray schedules were also observed. The 14-day treatments and the AU-Pnut treatments resulted in yield increases of approximately 200 lbs per acre over the less-frequent spray treatments. There was no significant difference between the 14-day schedule and the AU-Pnut schedule. On the basis of net returns, no significant differences between any of the treatment schedules were observed, and the mean impact of all of the treatments were within a $15 per acre range. No distinctive correlations between any particular fungicides and spray schedules were detected.

## POSTER SESSION

Developing a Web-Based Decision Support Program for Peanut in the V-C Region. B.R. LASSITER*, G.G. WILKERSON, D.L. JORDAN, B.B. SHEW, and R.L. BRANDENBURG, North Carolina State University, Raleigh, NC 27695.

Integrated pest management (IPM) is an essential part of any successful peanut program. Often, the interactions between multiple pest species and crop/pest management strategies are complex. Growers and their advisors may have a difficult time weighing the positive and negative impacts of different strategies. Scientists have developed a comprehensive decision support system to help peanut growers and their advisors assess their risk of developing pest problems. The online pre-season planning aid (http://www.peanut.ncsu.edu/risk/) is free, and available to the public. The program incorporates information from a yearly extension publication (*North Carolina Peanut Information)*, as well as data from individual scientists. Previously validated risk indices for tomato spotted wilt virus (TSWV) and southern corn rootworm (SCR) were used as a framework for the program. Risk indices for other pests important in the V-C region were created using data from individual scientists. Users provide information outlining basic agronomic inputs including cultivar, field history, presence or absence of irrigation, planting date, rotation crops grown in that field for the past 1, 2, 3 and/or 4 years, soil pH, soil drainage and texture, in-furrow insecticides, nematicides, tillage, disease management, plant population, and planting pattern. A risk score for each pest is calculated using data stored in an Access database. Seven diseases are assessed in the decision aid: Cylindrocladium black rot (CBR), early leaf spot, late leaf spot, Sclerotinia blight, southern stem rot, TSWV, and web blotch. The decision aid also includes two arthropods (SCR and twospotted spider mite) and three nematodes (northern root knot, peanut root knot, and sting). As a user enters information into the program, a color-coded risk line is displayed for each individual pest. As a user changes the scenario, the risk line for each pest may shift from one risk category into another: high risk (red), medium risk (yellow) or low risk (green) category. Based upon the values associated with the specified combination of cultural, chemical and management strategies, risks for some pests may go up as risks for others decrease. Reports are available which summarize the risk index calculations for each pest species. Future developments for the program include the inclusion of disease and insect identification pages, as well as the addition of economic values associated with management strategies. Validation of the scoring system and risk is also needed.

Partnering for Success: A Peanut CRSP project in Ghana, West Africa. R.L. BRANDENBURG* and D.L. JORDAN, North Carolina State University, Raleigh, NC 27695-7613; M. OWUSU-AKYAW, Crops Research Institute, Box 3785, Kumasi, Ghana; and M. ABUDALIA, Savanna Agricultural Research Institute, Box 52, Tamale, Ghana.

A USAID funded Peanut CRSP project on pest management in peanuts was initiated in 1996 with North Carolina State University as the lead U.S. institution and the Crops Research Institute in Kumasi, Ghana and the Savanna Agricultural Research Institute in Tamale, Ghana as the host country institutions. The initial focus of the program was to investigate the limiting factors of insects and diseases on peanut production in both northern and southern Ghana. The project rapidly expanded to include weeds, fertility, nematodes, planting and row

patterns, improved cultivars, seed storage and other production components. Several key components of this project have led to the successful adoption of research findings. First was the placement of research trials in farmers' fields as well as at research institutes. Extension workers were actively involved in the process of monitoring and evaluating research plots. The final, and perhaps most important component, was the constant involvement of the farmers from the local villages. They were able to participate and readily grasp new production techniques. The overall results from this project, which includes the incorporation of improved cultivars, disease management with local soaps, and planting in rows with good weed management has produced a doubling of yields on a per acre basis and increased production acreage. Socio-economic studies have documented that this elevated enhancement of peanut production has had positive benefits for local villages.

The Effect of Simulated Hail Damage on Yield and Grade in Texas Runner Peanut. T.A. BAUGHMAN*, Texas Cooperative Extension, Vernon, TX 76384; M. ZARNSTORFF, National Crop Insurance Services, Overland Park, KS, 66210, and J.C. REED, Jr., Texas Cooperative Extension, Vernon, TX.

Field studies were established near Lockett, TX during the 2003, 2004, and 2005 growing seasons to evaluate the effects of simulated hail damage on yield and grade of peanut. Three levels of defoliation (33, 66, and 99%) were used to simulate light to heavy hail damage. In addition, two growth stages were evaluated: beginning bloom (R1 growth stage) and beginning pod (R3 growth stage). These growth stages were chosen based on when the most critical decisions would have to be made on how to manage a crop. When data were combined over years, yields were reduced compared to when no hail damage occurred (untreated = 5180 lb/A) at beginning pod, regardless of defoliation level. Yield reductions were approximately 1000 lb/A at the 33% and 66% defoliation level while yields were cut in half when the defoliation level was 99%. No yield reductions were observed when the hail damage occurred at beginning bloom. There was a year by defoliation level interaction. Regardless of year, when peanuts were defoliated to a level of 99%, a reduction in yield was observed compared to the untreated, while 33% did not reduce yield. There was also a reduction in yield in 2004 and 2005 with the 66% defoliation level. Yields were greater then 4000 lb/A in all years for both the 33% and 66% defoliation level. Grades were reduced with all growth stages and defoliation levels combined over years when compared to the untreated (75%) except with beginning bloom at 66% defoliation and beginning pod at 33% defoliation.

Light Interception in Single Row, Twin Row and Diamond Planting Patterns Of Valencia Peanuts. S.V. ANGADI, R. NUTI, N. PUPPALA* and R. SORENSEN. New Mexico State University, Agricultural Science Center at Clovis, NM 88101, USDA-ARS, National Peanut Research Lab, Dawson, GA 39842.

A field study was conducted on a growers farm South of Clovis in 2006 to compare light interception and radiation use efficiency in a single row, twin row and diamond 100 planting patterns with line quantum sensors (Apogee instruments, Logan, UT) installed across the crop row. Data were recorded using data loggers (Model CR-1000, Campbell Sci. Logan, UT) between 65 and 150 days after planting. Seasonal patterns of light interception by Valencia peanut were significantly affected by planting patterns. Light interception increased over

time and peaked before maturity. Better spatial distribution of peanut plants by diamond 100 planting improved light interception throughout the growing season compared to single row and twin row patterns. The light interception benefits with D100 were greater early in the season suggesting a potential benefit of cooler conditions for improved water use efficiency. Plants in twin rows intercepted less radiation earlier in the season; however at mid-season, it was similar to diamond 100. The regression analysis explained more than 82% of the variation and the relationship was highly significant. Observations indicated that the improved light interception in diamond planting improved biomass and yield, but not the harvest index. These results suggest that diamond and twin row planting have the potential to improve Valencia peanut yields.

Performance of Dual Purpose Valencia Peanut (*Arachis hypogaea* L.) under Irrigation. L.M. LAURIAULT, Plant and Environmental Sciences Department and Agricultural Science Center at Tucumcari, New Mexico State University, 6502 Quay Rd. AM.5, Tucumcari, NM 88401; and N. PUPPALA*, Plant and Environmental Sciences Department and Agricultural Science Center at Clovis, New Mexico State University, 2346 State Road 288, Clovis, NM 88101.

Forage harvests were taken weekly beginning 18 September. Forage from the control treatment was left uncut. Pods from all plots were dug 23 October and left to cure on the soil surface. Forage from the control treatment was collected at threshing. Forage nutrient value was estimated by Near Infrared Spectroscopy. Differences ($P < 0.05$) existed for pod and forage biomass yield and all nutrient variables except phosphorus. Pod yield was unaffected when forage was harvested no less than three weeks prior to pod digging. Forage yield increased until 3 week prior to digging and then declined while forage crude protein and net energy for lactation declined as time progressed. The most optimum compromise between pod and forage yield and maximizing forage nutrient value was harvesting forage approximately three weeks before digging the pods (3716 and 7098 kg $ha^{-1}$ for pod and forage biomass yield, respectively, 135 g $kg^{-1}$ crude protein, and 1.4445 Mcal $kg^{-1}$ net energy for lactation). Also, the Ca:P ratio is generally in excess of 6:1, which is near the upper recommended limit for ruminants. For non-ruminants, the Ca:P ratio should be 1:1 or 2:1. While forage yield and nutrient value were reduced by later harvest dates, possibly due to nutrient transfer to the pods, pod yield was unaffected. Kernel quality may be reduced, however, resulting in off flavor.

Effect of Calcium on Seed Germination and Grade Factors of Four Runner Cultivars. M.W. GOMILLION*, B.L. TILLMAN, and D.W. GORBET. The University of Florida, Agronomy Department, NFREC, Marianna, FL, 32446.

Seed production of the late maturing, disease resistant cultivar DP-1 and others like it either ended or is severely curtailed because of poor seed germination in commercial operations. This study was conducted to determine if calcium played a role in this problem. During 2005 and 2006, we tested the effect of four rates of pegging zone calcium applied as gypsum (none, 700, 1400, and 2100 pounds gypsum per acre) on seed germination and grade components of four runner peanut cultivars, AP-3, C-99R, DP-1 and Georgia Green. The other three cultivars are grown commercially and have not experienced this problem to the same extent as DP-1. On average, emergence from soil was affected by cultivar, but not calcium, and there was no cultivar x calcium interaction. Soil emergence

of AP-3 (90%) and Georgia Green (93%) was similar and greater than that of DP-1 (60%) and 'C-99R' (68%) (P >0.0001). Soil emergence of C-99R was greater than that of DP-1 (P=0.1480). Although the overall effect of calcium on soil emergence was not significant, soil emergence increased linearly with increasing calcium (linear contrast P=0.0728). When the soil emergence was evaluated for each cultivar, there was no effect of calcium on AP-3, DP-1, or Georgia Green, but soil emergence of C-99R increased linearly as applied calcium increased (P=0.0143). The fact that soil emergence of only one cultivar responded to calcium helps explain the lack of overall calcium effect on that trait. Seed size is known to play a part in response of peanut to calcium and C-99R has the largest seed of the four cultivars tested. The fact that calcium did not affect soil emergence of DP-1 indicates that calcium is not a factor in its poor seedling emergence trait. Calcium did not affect most of the grade components tested, but the percentage of jumbo runner seed of Georgia Green decreased as calcium increased.

*Amaranthus palmeri* germination as influenced by storage mechanisms and temperature regimes. A.M. WISE*, T.L. GREY, and E.P. PROSTKO, Crop and Soil Science Department, The University of Georgia, Tifton, GA 31794.

Studies were conducted to determine the optimum storage regime for Palmer amaranth seed that provided consistent germination. An ALS susceptible Palmer amaranth population was collected at two harvest times, August 18, and October 1, 2006, in Ty Ty and Tifton, Georgia. Thyrses were dried at a room temperature of 21 C for 72 h. Seed were hand thrashed, cleaned, and equal amounts (1 g) deposited into either a coin envelope or plastic scintillation vial. The storage containers were then placed in six different storage regimes; greenhouse, cold storage, room temperature, deep freezer, refrigerator, and freezer. Germination test of seed were performed at trial initiation and then seed sampled from the storage regimes every seven days. Seed were placed onto filter paper, moistened with 10 ml of water, and placed in plastic Petri dishes. Petri dishes were then placed into a growth chamber set to maintain a 24 h average temperature of 30 C. Every three days following placement in the growth chamber, germinated seed were counted and removed. Seed were left in the chamber for 21 d. The number of germinated seed was converted to a percentage and then compared. Data was analyzed with ANOVA, comparing the two field harvest dates, container used for storage, and storage regime (temperature) over time.

Weed Control When Applying Cadre and Pursuit Using Different Spray Tips and Carrier Spray Volumes. W.J. GRICHAR*, P.A. DOTRAY, and T.A. BAUGHMAN. Texas Agricultural Experiment Station, Beeville, TX 78102-9410 and Lubbock, TX 79403, respectively; Texas Cooperative Extension, Vernon, TX 76384.

Cadre and Pursuit at 0.063 lbs ai/A were evaluated in three separate small-plot studies in south, Rolling Plains, and High Plains of Texas for weed control with different spray tips and carrier spray volumes. Spray tips evaluated included 110015 FF, 110015 TT, 110015 DG, 110015 AI, 110015 XR, and 110015 TD. With the spray tip study, spray volume at the High Plains location was 10 gallons per acre (GPA) while at the south Texas location, the spray volume was 20 GPA. A crop oil concentrate (Agridex) was included with all treatments at the rate of 1% v/v. The spray volume study was also conducted with Cadre or Pursuit at 0.063 lbs ai/A using Agridex at 1% (v/v). Spray volumes evaluated included 5,

7.5, 10, 12.5, 15, 17.5, and 20 gal/A.

*Spray Tip Study*. At the High Plains location, when evaluated 42 days after treatment (DAT), Devil's-claw, Palmer amaranth, and silverleaf nightshade control was less than 70% with both Cadre and Pursuit and all spray tips. At the south Texas location, when rated 61 DAT, Texas panicum control was at least 98% with Cadre when using any spray tip; however, with Pursuit, 110015 FF or 110015 AI tips controlled this weed at least 94% while 110015 TD tips controlled Texas panicum 86% and 110015 TT or 110015 DG tips controlled less than 80%. Palmer amaranth control was at least 96% with either Cadre or Pusuit and any spray tip with the exception of Pursuit applied with 110015 DG tips which controlled Palmer amaranth 86%. Pitted morninglory control was at least 98% with Cadre applied using any tip. Pitted morningglory control with Pursuit applied with spray tips from best (99%) control to worst (89%) was AI > FF, TD > TT > DG.

*Carrier Spray Volume Study*. At the High Plains location, when evaluated 42 DAT, devil's-claw, Palmer amaranth, or silverleaf nightshade control was 52% or less with either Cadre or Pursuit at any spray volume. At the Rolling Plains location, Palmer amaranth control was no greater than 69% with any gallonage. At the south Texas location, when rated 61 DAT, Cadre at any spray volume controlled Texas panicum, Palmer amaranth, or pitted morningglory at least 95%. Pursuit applied at 5, 7.5, 12.5 or 20 GPA controlled Texas panicum 72 to 81% while Pursuit applied at 10, 15, or 17.5 GPA controlled this weed no less than 90%. Palmer amaranth control with Pursuit was at least 92% regardless of spray volume. Pitted morningglory control with Pursuit was at least 90% with spray volumes of 5, 7.5, 10, 15, or 20 GPA, while Pursuit at the 12.5 and 17.5 GPA spray volumes controlled pitted morningglory 86 and 80%, respectively.

The Effects of Reduced Tillage Practices on Continuous Peanut Production and Pest Management. P.G. MULDER, C.B. GODSEY*, J.P. DAMICONE, C.R. MEDLIN. Dept. of Plant and Soil Sciences, Oklahoma State University, Stillwater, OK 74078.

Reduced tillage in the form of stale seedbed planting (no-tillage) or strip-tillage has become popular in the southwest peanut production area due to moisture conservation and reduced environmental impact. A long-term study was initiated in 2004 at the Fort Cobb, OK Research Station. The objectives were to identify changes in disease, insect, and weed complexes over time in continuous peanut production. Treatments evaluated included strip-tillage (ST), no-tillage (NT), and conventional tillage (CT). All treatments were planted to peanut since 2004. Since 2004, weed populations and number of volunteer peanut plants have increased in NT plots compared to ST and CT. In 2005, increased level of infection by southern blight was observed in ST and NT compared to CT. No consistent differences have been observed between treatments in insect complexes or peanut yield. Tillage practices seem to have minimal impact on peanut yield when grown continuously.

Field Evaluation of Arachis Botanical Varieties Aequatoriana, Hirsuta, and Peruviana for TSWV Resistance. R.N. PITTMAN*, USDA-ARS, Plant Genetic Resources Conservation Unit, 1109 Experiment Street, Griffin, GA 30223, USA, and J.W. TODD, University of Georgia, Coastal Plain Expt. Stn., Tifton, GA 31793.

Disease resistance to Tomato Spotted Wilt Virus (TSWV) is a high priority for peanut breeding programs in the southeast. Only a few peanut cultivars have been identified with resistance to TSWV. In 2006, field evaluation trials were conducted at the Attapulgus Research Farm in Attapulgus, GA , to assess TSWV resistance in *Arachis hypogaea* botanical varieties *aequatoriana*, *hirsuta*, and *peruviana*. Two row plots were 7.6 m long with 50 seed. Two tests were planted; one under a full fungicide spray program and the other non-sprayed. The botanical varieties also varied in their response to the TSWV. Percent of row feet with severely affected plants for standard cultivars varied from 8 to 31% across both tests, among Georgia Green, Georgia 01R, and AP3. The botanical varieties also varied in their response to TSWV. *Arachis* var. *aequatoriana* varied from 5 to 80%, *A*. var. *peruviana* varied from 3 to 45%, and *A*. var. *hirsuta* varied from 3 to 75% across both tests. Nine accessions of *aequatoriana* had fewer symptomatic plants than Georgia Green, 4 accessions of *peruviana* had fewer symptomatic plants than Georgia Green, and 16 accessions of *hirsuta* had fewer symptomatic plants than Georgia Green. A total of 78 botanical varieties were evaluated and 29 were found which show promise for increasing the resistance level in conventional breeding programs where resistance to TSWV is being developed. Three *hirsuta* accessions were found which had apparently better resistance than AP3. Based on this one year of data, there appears to be several accessions from the botanical varieties which have excellent resistance to TSWV.

Evaluation of Crosses from Unrelated Genotypes with Contrasting TSWV Resistance. J.J. BALDESSARI*, Agronomy Department, University of Florida, Gainesville, FL 32611; B.L. TILLMAN, University of Florida, NFREC, Marianna, FL 32446; D.S. WOFFORD, Agronomy Department, University of Florida, Gainesville, FL 32611; and D.W. GORBET, University of Florida, NFREC, Marianna, FL 32446.

Tomato spotted wilt virus epidemics are a serious chronic problem for peanut production in the SE US and genetic resistance is the most important factor in the management of this disease. To study TSWV resistance, unrelated resistant parents were mated to a susceptible genotype. The resulting F2 populations and their parents were field tested at two locations (Marianna and Citra, FL) in the summer of 2006. The populations were obtained by crossing three resistant (AP-3, DP-1 and NC94002) genotypes and one susceptible (NemaTAM) genotype in the following combinations AP-3 x NemaTAM, NemaTAM x AP-3, NemaTAM x DP-1, NemaTAM x NC94002 and DP-1 x NC94002. Cultivation practices such as early planting, low plant population, no phorate application and single row planting pattern were used to favor the development of TSWV epidemics. Plants were individually assessed for stunting at 120 DAP using a 0 (healthy) to 5 (severely stunted) scale. Logistic analysis was performed on stunting scores. Due to Genotype x Location Interaction ($P<0.0001$), genotypes were compared within each location and sets of contrasts were used to test for linear functions of the parameters. Genotypes showed higher average scores at Marianna than at Citra (2.17 vs. 0.67, $P<0.0001$). At both locations, genotype affected stunting scores ($P<0.0001$). Under low disease pressure at Citra, there was no difference among resistant parents while at Marianna the ranking of resistance was NC94002 > AP-3 > DP-1. NemaTAM was the least resistant entry at both locations. Populations exhibited intermediate scores compared with their parents. The parents that showed highest scores, NemaTAM and DP-1, produced the population that showed the highest scores at both sites and

differed from the averages of the tests (2.97 and 1.53, P<.0001 and P=0.0042). Reciprocal populations, involving AP-3 and NemaTAM, showed the closest scores to the test average. No reciprocal effects were found when both populations involving AP-3 and NemaTAM where contrasted at both locations (P=0.1990 & P=0.5253). The most resistant parent (NC94002) produced a Susceptible x Resistant F2 population that did not differ from the other S x R populations (P=0.2039 & P=0.8089). At Marianna, its score was higher than the average score for the test (2.39, P= 0.0120). Under low disease pressure in Citra, only the mean score for the R x R population was less than the scores for both S x R populations. The ranking of mean scores was 0.18<0.71<1.53 for the crosses DP-1 x NC94002, NemaTAM x NC94002 and NemaTAM x DP-1, respectively. Only the high disease pressure in Marianna allowed discrimination among resistant parents. Populations showed intermediate resistance to parents. Resistant x Resistant crosses seemed to provide the best population for selection for resistance even under low pressure conditions. S x R crosses provided populations with similar levels of resistance regardless of the level of resistance of the resistant parent. The less resistant parents produced the less resistant population. No reciprocal effect was detected.

Comparison of Selected Peanut Cultivars for Insect and Disease Susceptibility in an Irrigated Production System in Southeast Alabama. H.L. CAMPBELL*, J.R. WEEKS, and A.K. HAGAN, Dept of Entomology and Plant Pathology, Auburn University, AL 36849; L. WELLS, Wiregrass Research and Extension Center, Headland, AL 36345.

In 2005 and 2006, commercial runner peanut cultivars were evaluated for reaction to insect pests and to late early and late leaf spots, southern stem rot (SSR), and *Tomato spotted wilt virus* (TSWV) at the Wiregrass Research and Extension Center in Headland, AL. Recommendations of the Alabama Cooperative Extension System for tillage, fertility, weed, and nematode control were followed. A high input fungicide program applied on a 2-wk calendar schedule for the control of leaf spot diseases and SSR was followed. A RCB with six replications was used. Plots consisted of four 40-ft rows spaced 36 in apart. Thrips damage ratings (TDR) were made at 6-8 weeks after planting. Incidence of TSWV was assessed at three different dates during the growing season. Leaf spot was rated using the Florida 1-10 leaf spot scoring system. Hit counts for SSR were taken immediately after plot inversion. Yields are reported at 10% moisture. In both years TDR were similar for all cultivars. In 2005, incidence of TSWV increased throughout the growing season with highest incidence on Georgia Green. In 2006, overall incidence was lower; however higher incidence was again seen on Georgia Green compared with the other cultivars. Lowest incidence was observed on Tifrunner in both years. Evaluation of at planting rates of Temik 15G and Thimet 20G insecticides showed very little differences in TDR ratings but each were significantly better the untreated control. Incidence of TSWV showed a similar pattern. Early leaf spot was the primary leaf spot disease observed. Lowest leaf spot ratings were recorded for AP-3 in 2005 and GA03L in 2006. GA02C had the highest ratings in both years. Incidence of SSR remained relatively low on all cultivars in both years. Over two years, SSR incidence was highest on ANorden and Georgia Green and lowest on GA03L. Among the seven peanut cultivars evaluated in both years, AP-3 had the highest average yield. Georgia Green in both 2005 and 2006 had significantly lower yields than that of other cultivars by 400 to 1200 lb/A, respectively. At planting rates of Temik 15G and Thimet 20G had very little effect

on disease control or yield response.

Peanut Disease Issues in the West Texas: An Extension Overview. J.E. WOODWARD*, T.A. WHEELER, Texas A&M Research & Extension Center, Lubbock, TX 79403; and T.A. BAUGHMAN, Texas A&M Research & Extension Center, Vernon, TX 76384.

Texas is the second largest peanut producing state in the United States with approximately 75% of production occurring in the Rolling Plains and Southern High Plains. Substantial losses from fungal diseases such as limb rot (*Rhizoctonia solani*), southern stem rot (*Sclerotium rolfsii*), pod rot (*R. solani* and *Pythium* spp.), as well as early leaf spot (*Cercospora arachidicola*) and late leaf spot (*Cercosporidium personatum*) are routinely incurred throughout the Rolling Plains. Fungicide programs in this region are comprised of products such as, chlorothalonil (Bravo Ultrex 82.5DF), tebuconazole (Folicur 7.2F), and pyraclostrobin (Headline 2.08E). Fungicide use has remained consistent with two to four applications being made throughout the growing season. Historically, losses associated with diseases across the Southern High Plains have been limited, due primarily to the arid environment and the limited history of peanut production in the region. However, an increase in the incidence of pod rot across the region in 2000 led to improved producer awareness. Prior to the 2000 growing season, minimal fungicide applications were made; however, a substantial shift in use of fungicides with pod rot activity, such as azoxystrobin (Abound 2.08F) and metalaxyl (Ridomil Gold EC), was made during the 2001 and 2002 growing seasons. Today the majority of producers with fields infested with *R. solani* or *Pythium* spp. are using the aforementioned products. Applications are typically made in a preventative manner as broadcast or banded applications 60 and 90 days after planting. In high disease pressure situations, in-furrow applications may be made at planting to provide seedling disease control. As a result, metalaxyl use has remained constant over the past six years, while azoxystrobin usage has increased as much as 30%. In addition, the introduction of Sclerotinia blight (*Sclerotinia minor*) to the region has also impacted fungicide usage. Compounds such as boscalid (Endura 70WG) and fluazinam (Omega 500F) are currently being used on acres in isolated areas of the region. Prior to 2003 <1% of acres were treated for control of Sclerotinia blight; however, approximately 5,200 acres were treated in Gaines county in 2006. Reliance on costly fungicides in addition to suppressed peanut prices, increased energy costs, and emerging diseases, such as Verticillium wilt (*Verticillium dahliae*) and Botrytis blight (*Botrytis cinerea*), will greatly impact producers ability to remain economically competitive; therefore, effective management strategies must be implemented.

Soil textures and Organic Fertilization on Peanuts (*Arachis hypogaea* L) Crop. S. SÁNCHEZ-DOMINGUEZ*. Depto de Fitotecnia, Universidad Autonoma Chapingo, Chapingo Mex., 56230. Phone: 595-95-51654, fax number: 595-952-1642, email: samuelsanchez_28@ yahoo.com

Organic agriculture is being strongly increased in Mexico, where various crops such as coffee, fruit crops, sesamum, vegetables and peanuts are being grown with organic techniques. However there is not enough scientific information on organic fertilizers, such as vermicompost (humus), applied across different soil textures. So, the objective of this paper is to present results of a recent investigation related to this theme. An experiment was carried out during the

spring-summer season of 2006, at Experiment Station of the Chapingo's University. It was conducted in a greenhouse facility at 30$^{o}$ C. Peanut seeds (Cv. Rio Balsas) were planted in 10 L pots. Two different soil textures (sandy, S and sandy-loam, SL), were used. One L of humus (vermicompost, VC) was added to each pot at planting. At the flowering stage, Phytotron (an organic foliar fertilizer, F) was sprayed. A total of three sprays were made, each 15 days apart. The next 5 treatments tested were: 1 (S+VC+F), 2 (S+ VC-F), 3 (S+F), 4 (S-F) and 5 (SL+ VC-F). All treatments contained two or three replications. A statistical analysis (SAS version 8.2) was performed. Results indicated that significant differences among treatments were found in biological yield (BY), dry fruit weight (DFW), dry fruit number (DFN) and harvest index. The best treatment for BY (68.5 g/pot) was 4 (S-F); while, treatment 3 (S+F) ranked best for DFW (32.4 g/pot) and DFN (27.3 fruits/ pot). Treatments 1 and 2 ranked third for BY and DFW, indicating that VC was not an efficient organic fertilizer when applied in sandy soils. Treatment 5 (SL + VC-F) was better than treatments 1 and 2 for biological yield, but was the worst treatment for increasing pod yield (DFW), DFN and harvest index. Main conclusion is that VC was not a good organic fertilizer for peanut yield. Sandy soil was better than sandy loam soil for increasing peanut yield. In both soil textures, harvest index was very low, no more than 0.33.

Use of an *In-vitro* Culture System to Study Gravitropic Responses of Peanut Pegs. V.A. JAMES*, M. GALLO, Agronomy Department, The University of Florida, Gainesville, FL 32610-3610

Gravity perception and response by the peanut peg are essential to successful fruit production. Fertilized ovules in the tip of the elongating peg must be carried downwards to position the ovular region beneath the soil. Despite its stem-like morphology, the peg exhibits positive gravitropism similar to that of a root. The region of active cell division and elongation is located within the peg tip, the suggested source of growth regulators. Peanut pegs excised from the plant continue to elongate and respond to gravity when cultured *in-vitro*, providing a unique system to study gravitropic responses. In our research, peanut plants were grown under controlled environment conditions in 4 cm diameter conetainers. Aerial pegs, 2 - 8 cm in length were removed, cut to 15 mm in length, and sterilized in chlorine fumes for 1 h. Vertical orientation was maintained throughout sampling and sterilization. Pegs were then inserted 3 - 4 mm deep into MS basal medium with tips pointing vertically upwards. Gravitropic curvature was evident 3 - 6 h after reorientation, being clearly visible by 24 h, at which time most pegs curved by at least 90°. Excision of the distal 2 mm of peg, which removes the ovular region, prevented geotropic curvature. The effects of exogenous application of growth regulators and their respective inhibitors on the geotropic response of pegs *in-vitro* will be presented. Development of this *in-vitro* culture system will facilitate future studies into the mechanisms controlling growth responses of the peanut peg.

Utilization of Simple Sequence Repeat (SSR) Markers to Assess Allelic Diversity Changes in Virginia-type Peanut Cultivars Released from 1943 to 2005. S.R. MILLA-LEWIS* and T.G. ISLEIB, Department of Crop Science, North Carolina State University, Raleigh, NC 27695-7629.

Like many crop species that are based on a limited number of ancestors, US peanut (*Arachis hypogaea* L.) cultivars are vulnerable to outbreaks of diseases and insects as a result of genetic uniformity. Recent estimates place the average coancestry of two randomly chosen peanut plants at 0.72 in the Southeast, 0.40

in the Southwest, and 0.41 in the Virginia-Carolina production areas. Coancestry is a useful but imperfect method of predicting genetic uniformity because it addresses the probability of identity by descent but not the actuality of identity in state. The objective of this study was to assess allelic diversity changes among 47 Virginia-type cultivars released from 1943 to 2005 using molecular assessment of allelic state. Twenty-two simple sequence repeat (SSR) primers amplified a total of 87 alleles. The mean number of alleles per locus was four, ranging from two to eleven. The informational worth of each marker was evaluated by calculating the polymorphic information content (PIC) for each locus. Frequencies of scored alleles were calculated with respect to primer, breeding period, and breeding program. Changes in the average genetic diversity measured by two different band-sharing methods were analyzed over breeding periods and breeding programs. Results will be discussed in terms of their relevance to the impact of plant breeding in the diversity of peanuts.

Discovery of Late Embryonic Abundant (LEA) Transcripts from seed ESTs. P.M. DANG*, USDA-ARS, National Peanut Research Laboratory, Dawson, GA 39842; B.Z. GUO*, USDA-ARS, Crop Protection and Management Research Unit, Tifton, GA 31793.

Late Embryonic Abundant (LEA) proteins, also called dehydrins, are present in high percentage in plant embryos. Elevated gene expression of LEA transcripts have been correlated to increased drought tolerance in plants. We have utilized a gene discovery approach by sequencing 3 developmental seed stages (R5, R6, R7) from 2 varieties (Tifrunner and C20) totaling to 20,038 high quality 5' single-pass sequences. Resulting sequence data were searched against NCBI Translated Protein Database (BLASTx). A total of 125 transcripts matched to LEA proteins which represent a 0.62% against total sequences. This corresponds to 3 different groups and many have not been discovered in peanuts. Experiments are ongoing to correlate different LEA gene expression in peanut plants to drought response. This information can be directly applied to develop or select peanut varieties that will have enhanced drought tolerance.

EST-based Microsatellite Marker Data Mining and Characterizing. X.P. CHEN*, A.K. CULBREATH, the University of Georgia, Department of Plant Pathology, Tifton, GA 31793; Y. HONG, X.Q. LIANG, K. LIN, Guangdong Academy of Agricultural Sciences, Institute of Crop Science, China; B.Z. GUO, USDA-ARS, Crop Protection and Management Research Unit, Tifton, GA 31793.

Peanut (*Arachis hypogaea* L) is an important crop for oil production. In the recent years, molecular marker technologies have been widely applied to genetic diversity analysis, genetic mapping, molecular marker-assisted breeding, gene tagging and QTLs analysis. However, it is expensive, labor-intensive and time-consuming to develop molecular markers from genomic DNA libraries. With the development of peanut EST projects, a vast amount of available EST sequence data has been generated. These data can be mined for simple sequence repeats (SSR) and their development is inexpensive. The EST-SSRs derived from transcripts represent transcribed genes and a putative function of EST-SSR can be deduced by a homology search. A Perl script known as MIcroSAtellite (MISA) was used to mine microsatellites in available peanut ESTs. A total of 3,581 bi- to hexa-motif SSRs were identified from 3,217 SSR-containing sequences. On average, at least one SSR was found per 7.2 kb of EST sequence. The number of the tri-nucleotide motif was the most abundant type of

SSRs with 1925 (53.7%), followed by bi- (1540, 43%), tetra- (67, 1.9%), penta- (31, 0.9%) and hexa-nucleotide (18, 0.5%) motifs. The top 8 repeat motifs, frequency of which considering sequence complementary is more than 100, included AG/CT, AAT/ATT, AAG/CTT, AT/AT, AC/GT, ACT/ATG, ACC/GGT and AGT/ACTA. A set of 312 pairs of primers were synthesized and used to examine 38 peanut genotypes of wild and cultivated peanuts. The results show that more pairs of primers were found to have polymorphism in wild species than in cultivated peanuts. The PCR polymorphic bands will be characterized further via cloning and sequencing. The results show that insertions/deletions occur in SSR sites among alleles of wild species and cultivated peanuts.

Flavonoid Content in Peanut Seeds Quantified by HPLC. M.L. WANG, D. PINNOW, and R. PITTMAN*, USDA-ARS, Plant Genetic Resources Conservation Unit, 1109 Experiment Street, Griffin, GA 30223, USA

Flavonoids are natural compounds from plants which play an important role in plant defense systems. Consumption of products containing certain flavonoids has beneficial effects to human health due to their antioxidant, antiestrogenic, and antiproliferative activities. Various results on flavonoid content in soybean have been reported but there is little information available in peanut. Flavonoid contents of daidzein, genistein, kaempferol, myricetin and quercetin in peanut seeds from germplasm collection were quantified by high performance liquid chromatography (HPLC). Results were similar across two years of data. Flavonoid content varied between accessions or genotypes of peanuts. In comparison with quercetin content in soybean seeds, peanut seeds contain a high amount of quercetin (211 µg/g ranging from 0 to 547). To investigate flavonoid fluctuations from plants' response to tomato spot wilt virus (TSWV) infection, flavonoid content is being quantified by HPLC from seeds harvested from TSWV-affected plants and non-affected plants. The results from variation in flavonoid content, and the interaction between plant response and TSWV infection in this study, would be useful for peanut breeders, processors and consumers.

Improvement of Oxidative Stability and Organoleptic Properties of Roasted Peanut after Power Ultrasound Treatment and Edible Coatings. P. WAMBURA and W. YANG, Department of Food and Animal Sciences, Alabama A&M University, 4900 Meridian St., Normal, AL 35762.

The oxidative stability, texture and color are important characteristics of roasted peanuts. The sonication and edible coating are two ways to improve the shelf life of peanuts. In this study, peanuts were roasted, subjected to sonication and then coated with Whey protein isolate (WPI), Zein and Carboxymethylcellulose (CMC). In relative to the control, the oxidative stability of roasted-coated samples were improved by 80%, 38%, and 5% for CMC, WPI and ZEIN coating, respectively, while roasted-sonicated-coated samples were improved by 91%, 52%, and 27% for CMC, WPI and ZEIN coating, respectively. Therefore, sonication prior to coating resulted in 11%, 14% and 22% improvement beyond the CMC, WPI and Zein coatings, respectively. Texture analysis showed there were no significant differences ($p < 0.05$) in peanut texture, and color analysis showed the color parameters, L, a, and b- for most of the treatments did not have significant ($p < 0.05$) differences.

Effect of Non-Thermal Processing on Peanut Allergens. S.-Y. CHUNG[*1], W. YANG[2], A. SINGH[2], and K. KRISHNAMURTHY[2]. [1]USDA-ARS, Southern Regional Research Center, New Orleans, LA 70124; [2]Department of Food and Animal Sciences, Alabama A&M University, Normal, AL 35762.

Peanut allergy is on the rise, and the reason is still unclear. Previously, roasting, a thermal method, has been shown to increase the allergenic potency of peanuts. In this study, we determined if non-thermal methods such as pulsed electric fields (PEF) and pulsed UV lights (PUV) affect peanut allergens in a way different from the roasting method. Peanut extracts were prepared from defatted raw peanut meals and treated with the following methods (M): (1) PEF, using an OSU-4J PEF processor at 43.2 KV/cm field strength for 47 μs; (2) PUV1, using a Xenon RS-3000C for 4 min; (3) PUV2, using the same Xenon for 2 min; and (4) PEF+PUV2. The treated extracts were then centrifuged, and supernatants were analyzed for changes in levels of peanut allergens and immunoglobulin E (IgE) binding, using SDS-PAGE, Western blot, and an inhibition ELISA. Results showed that while the major peanut allergen Ara h 2 was unaffected by PEF or PUV, levels of two other major allergens, Ara h 1 and Ara h 3, in the extracts were reduced by the methods except M1. Studies of IgE binding revealed a 7-fold decrease in the allergenic potency of extracts by M2 and M4, compared to the roasting method. The allergenic potency for each method was decreased in the following order: [roasting] > [raw or M1] > [M3] > [M1 and M4]. It was concluded that unlike the roasting method, non-thermal methods such as PUV alone or PEF combined with PUV were able to reduce the allergenic potency of peanut extracts.

## JOE SUGG GRADUATE STUDENT COMPETITION

Surprising Results from a Cover Crop Trial with Peanut. B.R. LASSITER*, G.G. WILKERSON, D.L. JORDAN, B.B. SHEW, and R.L. BRANDENBURG, North Carolina State University, Raleigh, NC 27695.

Experiments were conducted during 2005 and 2006 to determine the impact of planting peanut (*Arachis hypogaea* L.) cultivar VA 98R into desiccated cover crops of annual ryegrass (*Lolium multiflorum* Lam.), cereal rye (*Secale cereale* L.), oats (*Avena fatua* L.), triticale (*Triticale hexaploide* Lart.), wheat (*Triticum spp.*) or native vegetation. In these experiments, raised beds were prepared and planted to cover crops in the fall, and then strip tilled in the spring, prior to planting peanut. Glyphosate and paraquat were applied as a burndown treatment to the cover crops, prior to planting. The experimental design was a split plot with cover crops serving as the whole plot unit and weed/disease management combinations serving as sub-plot units. Herbicide regimes in 2005 were: 1) clethodim applied postemergence, 2) metolachlor applied preemergence followed by acifluorfen plus bentazon plus paraquat and clethodim applied postemergence [based on recommendations using the decision model HADSS (Herbicide Application Decision Support System)], and 3) diclosulam plus metolachlor applied preemergence followed by imazapic postemergence. In 2006, treatments included clethodim applied postemergence, 2) dimethenamid applied preemergence followed by bentazon plus paraquat (based on recommendations using HADSS), and 3) diclosulam plus dimethenamid applied preemergence followed by imazapic applied postemergence. Yellow nutsedge (*Cyperus esculentus* L.) and common ragweed (*Ambrosia artemisiifolia* L.) control late in the season and peanut pod yield did not differ among cover crop

treatments regardless of herbicide program during 2005 or 2006. Disease management programs consisted of three early season applications of chlorothalonil or five fungicide sprays including the three chlorothalonil applications followed by application of pyraclostrobin and application of chlorothalonil. The combination of a chloroacetamide herbicide plus diclosulam followed by imazapic was more effective in controlling common ragweed (in 2006) and yellow nutsedge (in 2005 and 2006) than a chloroacetamide herbicide followed by herbicides based on HADSS. Common ragweed resistance to ALS (acetolactate synthase inhibiting)-herbicide was found in this field, and confirmed in the greenhouse using seed collected from plants that escaped the combination of a chloroacetamide herbicide, diclosulam, and imazapic. Applying chloroacetamide plus diclosulam followed by imazapic increased yield over the clethodim-only treatment (in 2005 and 2006) and the chloroacetamide herbicide followed by the HADSS recommendation (in 2006). Tomato spotted wilt incidence, early and late leaf spot control, and peanut pod yield did not differ when comparing among cover crops or disease management programs. Research in other states has demonstrated less tomato spotted wilt and foliar disease in reduced tillage systems compared with conventional tillage systems. Although a conventional tillage system was not included in this experiment, results from these experiments demonstrate that cover crops may not influence weed and disease control compared to native vegetation in absence of a cover crop. In these experiments the major winter annual weeds included horseweed [*Conyza canadensis* (L.)] Cronq.), henbit (*Lamium amplexicaule* L.), annual bluegrass (*Poa annua* L.), and Virginia winged rockcress (*Sibara virginica*). These data also suggest that annual ryegrass, cereal rye, oats, and triticale can serve as effective alternative cover crops to wheat with no adverse affect on peanut.

Incorporating Perennial Grasses into Peanut Rotations; Effects on Soil Quality Parameters and Peanut Disease, Growth and Development. J.M. WEEKS.*, J.C. FAIRCLOTH, M.A. ALLEY, and C. TEUTSCH, Department of Crop and Soil Environmental Sciences, Virginia Polytechnic Institute and State University, Blacksburg, VA 24060; and P.M. PHIPPS, Department of Plant Physiology, Pathology and Weed Science, Virginia Polytechnic Institute and State University, Blacksburg, VA 24060.

Historical and current studies have demonstrated the potential for incorporation of perennial grasses into annual row crop rotations. Benefits are generally attributed to enhancement of soil quality parameters and disease suppression. In 2004, eight rotations were established to assess potential benefits of cool season perennial grasses in cotton and peanut rotations in the Virginia Tidewater region. Rotations included; continuous cotton, cotton-corn-cotton-peanut, cotton-peanut-cotton-peanut, fescue-fescue-cotton-peanut, orchardgrass-orchardgrass-cotton-peanut, fescue-fescue-fescue-peanut, orchardgrass-orchardgrass-orchardgrass-peanut, and soybean-cotton-cotton-peanut. Prior to planting and following harvest in all years, soils were sampled for plant parasitic nematodes and fruiting bodies of parasitic fungi. All plots were left unfumigated, strip tilled and planted. Stand counts were taken for assessment of damping off. Plots were evaluated monthly beginning 4 wks after planting for incidence of disease. Soil quality parameters that included soil organic matter by depth, bulk density, water infiltration, available water content and resistance to root penetration were assessed. Plant growth was monitored on 3-7 day intervals for rate of movement through pre-determined growth stages. Peanuts were taken to yield and grade.

Results to date are presented.

Critical Period of Weed Interference in Peanut. W. EVERMAN*, S. CLEWIS, and J. WILCUT, Crop Science Department, North Carolina State University, Raleigh, NC 27695.

Researchers have focused on evaluating density-dependent and/or time removal interactions of a single weed species on peanut growth and yield. However, most fields have more than one weed species. Therefore, our objectives were to evaluate peanut yield response to various weed-free timings, weed removal timings, and determine the critical period of weed control for peanut. Trials were conducted at the Peanut Belt Research Station near Lewiston-Woodville and the Upper Coastal Plain Research Station near Rocky Mount, NC in 2005. Treatments were designed to determine the critical timing of weed removal (CTWR), critical weed free period (CWFP), and consequently, the critical period of weed control (CPWC). Treatments included weed competition periods of 0 (Weed-free), 3, 5, 7, 9, 11, and 16 weeks after planting (WAP) where weeds were allowed to compete with the peanut crop then removed and plots were maintained weed-free for the remainder of the season. Treatments also included weed-free periods of 0 (Full season weedy), 3, 5, 7, 9, 11, and 16 WAP where plots were maintained weed-free until weeds were allowed to compete with the crop for the rest of the season, and weedy intervals of 3 to 7, 3 to 9, 3 to 11, 5 to 9, 5 to 11, and 7 to 11 WAP where plots were maintained weed-free for a period of 3, 5, or 7 WAP and weeds were then allowed to grow for a period of up to 8 weeks before being removed and kept weed-free until harvest. Fields contained 20 weed species with 11 common to both locations including common lambsquarters, common ragweed, eclipta, large crabgrass, pitted morningglory, tall morningglory, yellow nutsedge, and purple nutsedge. ANOVA was used to detect differences in studies, replications, and treatments. The logistic equation, $Y = [(1/\{\exp[c * (T - d)] + f\}) + [(f - 1)/f]]$, was fit to peanut yields in the CTWR, while the Gompertz equation, $Y = a\, e^{be^{kT}}$, was fit to peanut yields in the CWFP. The CTWR to avoid a peanut yield loss of 5% or greater was 3.1 WAP, and the CWFP was 7.5 WAP. Therefore the CPWC in peanut was from 3.1 to 7.5 WAP. These data show that you can have timely early season weed control soon after crop emergence and late season weed-free peanuts, but if you are not timely on weed management inputs for the first 8 WAP you can suffer appreciable yield loss. Therefore, growers need to be cognizant of early to mid-season weed interference (3 to 8 WAP) in order to maintain full yield potential.

Managing Seed and Seedling Disease of Peanut in Organic Production Systems. S.J. RUARK* and B.B. SHEW. Department of Plant Pathology, NC State University, Raleigh, NC 27695.

The potential for production of Virginia-type peanut for the organic market presents an opportunity that is currently undeveloped in North Carolina. The objective of this study was to evaluate biological and other novel seed treatments and soil amendments for efficacy against seedling pathogens. Natural soil from a field undergoing transition to organic production was collected from the Peanut Belt Research Station in Lewiston, North Carolina. Greenhouse tests were conducted in this soil with seed from the cultivar Perry, GP-NC 343 (a germplasm line), and N03081T (an advanced breeding line), all of which contain multiple disease resistance. Each seed type was tested for germination using industry standard protocols and seedling vigor was characterized. Treatments included 5 seed treatments: 2 commercial formulations of *Bacillus subtilis* (Serenade ASO

and Kodiak), *B. pumilus* (Yield Shield), *Trichoderma harzianum* (T-22 HC), and activated charcoal; 4 in-furrow treatments: 2 commercial formulations of mycorrhizal innoculant (Plant Success Soluble and Bio-Organics Micronized), *Coniothyrium minitans* (Contans), and binucleate *Rhizoctonia* spp.; 3 soil amendments (dried herbage from different *Monarda* spp.); a commercial fungicide check; and an untreated control. Seed were planted in Conetainers filled with natural or amended soil in experimental units of 21 seeds with 3 replications in a randomized complete block design. Incidence of pre-emergence damping off, post-emergence damping off and total emergence were evaluated weekly for 4 weeks. Biopsies of dead and diseased seedlings were conducted as needed to determine the pathogen or pathogens involved. A second study in microplots at the Central Crops Research Station in Clayton, NC evaluated the same peanut lines following 3 small grain cover crops, 3 *Brassica* spp. cover crops, dried herbage of *Monarda* spp. as a soil amendment, and a no cover control. The incidence of pre- and post-emergence damping off was evaluated for 6 weeks. Biopsies of dead and diseased seedlings were conducted as needed.

Maximizing Economic Returns and Minimizing Stem Rot Incidence with Optimum Plant Densities of Peanut in Nicaragua. J. AUGUSTO*, T. BRENNEMAN, A. CSINOS, A. CULBREATH, Department of Plant Pathology, The University of Georgia, Tifton, GA 31793-0748; and J. BALDWIN, Agronomy Department, The University of Florida, Gainesville, FL 32611-0300.

Field experiments were conducted in 2005 and 2006 to determine the optimum plant density for peanut yield, stem rot (*Sclerotium rolfsii*) management, and maximum economic return to peanut growers in Nicaragua. Experiments were conducted in all three peanut growing regions of Nicaragua in fields naturally infested with *S. rolfsii*. Georgia Green variety was planted in twin rows at all locations, and the experimental design was a split-plot replicated five times. The whole-plot treatments were plant populations (4 to 27 plants $m^{-1}$) and the sub-plot treatments were either sprayed or non-sprayed for stem rot with flutolanil (Moncut 70W @ 1.7 kg/ha applied 50-60 DAP and 80-90 DAP). The experiments were divided into three categories of stem rot incidence (Low, Medium, and High). There was a significant ($P \leq 0.05$) increase of stem rot incidence with increased plant densities, particularly in fields with medium and high levels of disease, regardless of flutolanil application. There was also a significant ($P \leq 0.05$) increase in yield and net income up to 8-11 plants per meter. At higher densities yield and net income declined, even with fungicide applications. For all three levels of stem rot, there was a significant negative correlation between net income and plant densities higher than the optimum densities of 8-11 plants per row meter in plots sprayed with flutolanil ($P \leq 0.05$, Adj $R^2$ = 0.60, 0.55, 0.59 for low, medium and high categories, respectively). In Georgia, 13 plants per meter are recommended, but this is primarily for management of tomato spotted wilt virus (TSWV). In Nicaragua, where TSWV is not a problem, growers may minimize stem rot incidence and maximize their net incomes by utilizing seeding rates to obtain final stand counts of 8-11 plants per meter.

Evaluating Resistance of Spanish and Runner Peanut Genotypes to *Sclerotinia minor*. J.N. WILSON*, Department of Plant and Soil Science, Texas Tech University, Lubbock, TX 79409; T.A. WHEELER, Texas Agricultural

Experiment Station, Lubbock, TX 79403 and M.D. BUROW, Texas Agricultural Experiment Station, Lubbock, TX 79403.

*Sclerotinia minor* is a serious disease of peanut (*Arachis hypogaea*) in the southeastern U.S. that has become a problem in numerous West Texas peanut fields since 1996. Growers need peanut varieties adapted to West Texas growing conditions with resistance to *S. minor*. Methods used to evaluate resistance to *S. minor* in peanut include field evaluations, detached leaflet assays, and stem assays. In 2006, runner and high oleic Spanish germplasm were field tested in Stephenville, TX. Natural inoculum was supplemented with an aggressive isolate of the *S. minor* genotype designated as TX1, which was determined to be the predominate genotype in a *S. minor* population collected in Texas peanut fields. These data were correlated with results from detached stem and leaflet assays performed on genotypes tested in the field. Detached leaflets and stems were inoculated with an aggressive and moderately aggressive isolate of the TX1 genotype along with an aggressive isolate of another prevalent *S. minor* isolate designated as TX2. Results using the aggressive TX1 isolate indicated a moderate correlation between field and detached leaflet assay ($R^2$ = 0.39) in runner genotypes and no correlation between field results and detached leaflet assay in Spanish genotypes.

The Interaction between Root-knot Nematode (*Meloidogyne arenaria*) and Cylindrocladium Black Rot (CBR) in Runner Peanut. W. DONG[1]*, T.B. BRENNEMAN[1], C.C. HOLBROOK[2], P. TIMPER[2], and A.K. CULBREATH[1]. [1]Department of Plant Pathology, The University of Georgia, Tifton, GA 31793; [2]USDA-ARS, Coastal Plain Exp. Stn. Tifton, GA 31793.

Cylindrocladium black rot (CBR), caused by *Cylindrocladium parasiticum*, and root-knot nematode, caused by *Meloidogyne arenaria*, are important soilborne diseases on peanut. Greenhouse and microplot experiments were conducted with the runner peanut genotypes C724-19-15 (resistant to *M. arenaria*), Georgia-02C (resistant to CBR), and C724-19-25 (susceptible to *M. arenaria* and CBR) to better understand the interactions between the two pathogens. In the greenhouse, root rot ratings were increased in all three peanut genotypes by addition of 500-3000 eggs/plant of *M. arenaria* with low inoculum level (1.0 microsclerotia/g soil) of *C. parasiticum*. The nematode did not affect the root rot induced by a high inoculum level (5.0 microsclerotia/g soil) of *C. parasiticum*. Severe pod galling was present on Georgia-02C and C724-19-25, but not C724-19-15. Gall ratings were not affected by *C. parasiticum* inoculations in the greenhouse or microplots. In microplot experiments, the root rot ratings from nematode-susceptible genotypes Georgia-02C and C724-19-25 were higher in plots infested with *M. arenaria* (200-1000 eggs/500 $cm^3$ soil) and *C. parasiticum* than in plots with *C. parasiticum* alone; however, *M. arenaria* did not increase the root rot ratings on the nematode-resistant genotype C724-19-15. This was inconsistent with the greenhouse results. Simultaneous inoculation with *M. arenaria* decreased yield incrementally on C724-19-25 and Georgia-02C as *C. parasiticum* inoculum levels increased, but even a high level of *M. arenaria* (1000 eggs/500$cm^3$ soil) did not decrease yield of C724-19-15 when also inoculated with *C. parasiticum*.

Analyzing the genetic diversity of *Tomato spotted wilt virus* on peanut in North Carolina and Virginia. A. KAYE*, G. KENNEDY, E. PARKS, B. SHEW, M. CUBETA, and J. MOYER, Dept. of Plant Pathology, North Carolina State University, Raleigh, NC 27695-7616.

Symptoms of *Tomato spotted wilt virus* (TSWV) infection on peanut include ringspots, bud necrosis, stunting, wilting, yellowing, and death. In 2005 and 2006, eight hundred samples were collected in Lewiston, NC and Suffolk, VA from peanut plants exhibiting ringspot, stunting, or yellowing symptoms. To date, fifty-three samples that tested positive for TSWV with ELISA were used for extraction of RNA and cDNA synthesis. Primers specific to three optimal regions (RdRP, 1000nt; M, 699nt; N, 720nt) of the TSWV genome were used to amplify and sequence DNA from each sample. The sequence data were analyzed with phylogenetic methods to identify haplotypes and determine the genetic relatedness of the isolates. Currently, our analysis shows a high number of inferred haplotypes across each genomic region, suggesting a large degree of genetic diversity in field populations of TSWV in peanut. Peanut isolates clustered according to global geography when their sequences were compared with those from isolates obtained from other TSWV hosts, supporting previously published studies. Host range studies and further genetic analyses will be applied to determine if there are characteristics of the TSWV sequences that are correlated to specific symptoms of affected peanut plants, such as yellowing, and to determine frequency and genetic distance of haplotypes.

Simple Sequence Repeat Polymorphisms in Cultivated Peanut (Arachis hypogaea L.) Y. LI*[1], W.S. MA[2], A.K. CULBREATH[1], B.Z. GUO[3], S.J. KNAPP[2], C.C. HOLBROOK[3], E. GOLD[1]. [1]Dept. of Plant Pathology, Univ. of Georgia, Athens, GA, 30602; [2]Dept. of Crop and Soil Science, Univ. of Georgia, Athens, GA 30602; [3]USDA-ARS, Coastal Plain Experiment Station, Tifton, GA 31793.

Cultivated peanut (*Arachis hypogaea* L.) is an allotetraploid (2n=4x=40), with little polymorphism at the molecular level. Therefore, it has limited genetic diversity, and this constrains the development of genetic molecular markers in cultivated peanut. Compared with other kinds of markers, SSR markers are more co-dominant and allow better detection of diversity. Therefore, our present objective is to develop SSR polymorphic markers to assess genetic diversity in cultivated peanut. In our research, we used 16 peanut genotypes that included commercial cultivars as well as breeding lines and germplasm accessions, which have varying levels of resistance to Tomato spotted wilt virus (TSWV), *Cercospora arachidicola* (early leaf spot) and *Cercosporidium personatum* (late leaf spot). The total number of SSR markers used for screening was 709 pairs of primers collected from different sources. Among the markers tested, there were 556 SSR markers with PCR products and 178 SSR markers have polymorphisms in the parental lines of an RIL population, which was obtained from the cross between Tifrunner and GT-C20. However, the distribution of amplification length was not well proportioned. Amplification lengths concentrated in the 100-300 bp region. The mean heterozygosity of these markers in cultivated peanut was 0.278. The distribution of heterozygosities primarily was 0-0.200, which accounted for approximately 50%. These results confirmed that there are limited polymorphisms in cultivated peanut in comparison with wild peanuts. In future studies, several hundred additional high-throughput DNA markers also should be developed to supply the critical mass needed for routine genotyping in cultivated peanut.

Navigating the Governmental Approval Process for Release of Transgenic Peanuts with Enhanced Resistance to Sclerotinia Blight. S.M. CHRISCOE*, E.A. GRABAU, Department of Plant Pathology, Physisology

and Weed Science, Virginia Polytechnic Institute and State University, Blacksburg, VA 24061 D.E. PARTRIDGE and P. M. PHIPPS, Tidewater Agricultural. Research & Extension Center, Suffolk, VA 23437

Sclerotinia blight, caused by *Sclerotinia minor* Jagger, is a devastating fungal disease of peanut (*Arachis hypogaea* L.). Transgenic plants of three Virginia-type peanut cultivars (Wilson, Perry and NC-7) have been engineered to express an oxalate oxidase enzyme from barley. Oxalate oxidase degrades oxalic acid, a major pathogenicity factor of *S. minor*, thereby suppressing fungal infection and increasing disease resistance. The enzyme is a member of the cupin superfamily of proteins and has been identified in all cereal crops that have been tested. Oxalate oxidase is normally expressed in cereals during germination and during infection by fungal pathogens. Under the last two Farm Bills, peanut prices have fallen from approximately $662 per metric ton to as low as $368 per metric ton. This, combined with increasing fuel, labor and agrichemical costs have caused peanut production in Virginia to decline from a 50-year average of 35 thousand hectares to only 6.5 thousand hectares in 2006. New transgenic varieties with resistance to Sclerotinia blight will benefit growers by greatly reducing the farmer's input costs for disease control, increasing yields and reducing agrichemical introduction into the environment. Three years of field trials have been conducted and six transgenic lines have been identified for potential commercial production. In 2006, these lines had 86% less disease and increased yields of 537 to 2490 kg/ha more than the parental lines, giving an added value of $222 to 1043/ha. Before these peanuts can be released, they must undergo governmental regulatory review. A petition will be submitted to the Animal and Plant Health Inspection Service, a division of the US Department of Agriculture, which will evaluate the effects of transgenic cultivars expressing the oxalate oxidase gene on US agricultural safety. Data presented in the petition will address various subjects such as genetic characterization of transformed lines, transgene expression profile, risks of transgenic cultivars becoming weeds, and the occurrence of gene transfer by outcrossing. A consultation will also be completed with the Food and Drug Administration to address allergenicity and toxicity potential to ensure the safety of transgenic peanuts for consumption by humans and animals. The Environmental Protection Agency considers oxalate oxidase to be a Plant Incorporated Protectant and requires it to be registered as a pesticide. Requirements for registration include studies on the effects of oxalate oxidase on non-target organisms and the persistence of the enzyme in soil along with the data required by the other two agencies. With recent endorsement by the peanut industry of the potential of bioengineered peanuts and the fact that oxalate oxidase gene occurs naturally in a numbers of food crops, we are optimistic about their potential deregulation.

## PLANT PATHOLOGY AND NEMATOLOGY

Effect of Reduced Tillage and Soil Fumigation on Disease Incidence and Yield of Virginia-and Runner-Type Cultivars of Peanut in Virginia. P.M. PHIPPS* and D.E. PARTRIDGE, Tidewater Agricultural Research & Extension Center, Virginia Tech, Suffolk, VA 23437.

Field trials were conducted at three locations in 2006 for comparing the effect of tillage and soil fumigation on disease incidence and yield of virginia- and runner-type cultivars (virginia – Perry, Ga Hi/OL, Gregory, NC-V 11, Champs, and VA 98R; runners – Ga Green, Ga-01R, Ga-02C, Ga-03L, C99R, and AP3, except

Andru II at loc. 3). Plots were two, 35-ft rows spaced 36-in. apart and treatments were replicated in four randomized complete blocks. Location 1 had a history of peanut-soybean rotations with heavy yield losses to northern root-knot nematode and Cylindrocladium black rot (CBR) in peanut. Land preparation included disking twice, mold-board plowing, and leveling with a field cultivator. Main plots were treated or untreated with Vapam 42% 7.5 gal/A and subplots were planted 3-wk later (28 Apr) to virginia- or runner-type cultivars. The incidence of tomato spotted wilt (TSW) was low in counts at 3- to 4-wk intervals from 13 Jun to 16 Sep. Root galling by northern root-knot nematode was similar in cultivars of each market type and reduced significantly by Vapam treatment. CBR incidence was not significantly different in a comparison of market types, but was reduced significantly by Vapam. Champs, VA 98R and NC-V 11 had the highest incidence of CBR on 4 Oct and Perry had significantly lower incidence in the virginia types. Ga Green and AP-3 had the highest counts of CBR in runner types and Ga-01R had the lowest. Perry had the highest yield ($P$=0.05) of virginia types without Vapam treatment and yielded more than NC-V 11 and Champs with Vapam treatment. Yields of runner types were increased significantly with Vapam treatment, but differences in cultivars were not significant.

Location 2 had a history of peanut-cotton-wheat/soybean rotations with moderate incidence of CBR and Sclerotinia blight in peanut. Main plots were prepared by strip tillage or chisel plowing and planted to either virginia- or runner-type cultivars. All plots were treated after tillage with Sectagon 42% 7.5 gal/A and planted 3-wk later (1 May). TSW incidence was low and not affected by tillage in ratings from 16 Jun to 14 Sep. CBR incidence was significantly higher in strip-tilled than chisel-plowed plots on 14 Sep and 13 Oct. Perry of the virginia types, and Ga-01R and Ga-02C of the runner types had significantly less CBR incidence in plots without Sectagon treatment. Sclerotinia blight reached moderate to high incidence by 13 Oct. Strip tillage reduced the incidence of Sclerotinia in both market types and significantly in virginia types. Ga Hi/OL and Ga-03L had significantly lower incidence of Sclerotinia of the virginia and runner types, respectively. The effect of tillage on yield was not significant. Yields of Perry and Ga Hi/OL were significantly higher than most virginia types, whereas Champs and VA 98R tended to have the lowest yield. Ga-03L and Ga-02C had the highest yields in runner types, and AP-3 had the lowest, especially in strip tillage.

Location 3 had a history of peanut-cotton rotations with moderate CBR and moderate to high incidence of Sclerotinia blight in peanut. The field was prepared by strip tillage and plots were either treated or non-treated with Sectagon 42% 7.5 gal/A. Cultivars were planted on 1 May. TSW and CBR incidence was low to moderate throughout the season, but significantly higher in virginia types. Sclerotinia blight incidence was higher in runner types than in virginia types treated with Sectagon. Ga Hi/OL had lower incidence of Sclerotinia blight, but not significantly lower than other virginia types. Ga-03L had significantly lower incidence of Sclerotinia blight than other runner types.

Results of these trials provided additional evidence that soil fumigation with Vapam or Sectagon increased yields of virginia- and runner-type cultivars in fields with a history of CBR. Strip tillage tended to increase incidence of CBR, but reduced incidence of Sclerotinia blight in comparison to chisel plowing. Cultivars in both market types differed in susceptibility to CBR and Sclerotinia blight. Perry

exhibited the highest level of CBR resistance of virginia types, and Ga-01R followed by Ga-02C were the most CBR resistant of runner types. Ga Hi/OL appeared to offer the greatest level of resistance to Sclerotinia blight of virginia types, and Ga-03L was the most resistant of runner types.

Evaluation of Advanced Peanut Breeding Lines for Resistance to Late Leaf Spot and Rust. F. WALIYAR*, P. LAVA-KUMAR, S.N. NIGAM, R. ARUNA, International Crops Research Institute for the Semi-Arid Tropics, Patancheru 502 324, Andhra Pradesh, India; and K.T. RANGASWAMY, Department of Plant Pathology, University of Agriculture Sciences, Hebal, Bangalore 560 065, Karnataka, India.

Peanut (*Arachis hypogaea* L.) in India are grown in 6.7 million ha with a total production of 6.5 million t and an average productivity of <1 t/ha. The rainy season (June/July- Oct/Nov) is the main cropping season for peanut where the crop is grown generally under rainfed conditions. Rainy season productivity (0.8 t/ha) is much lower than that of the postrainy season. Late leaf spot (LLS) caused by *Phaeoisariopsis personata* [(Berk. & Curtis), Arx] = *Cercosporidium personatum* [(Berk. & Curtis) Deighton) and rust caused by *Puccinia arachidis* Speg. are the most serious fungal diseases of peanut adversely affecting productivity and quality of produce of the rainy season crop in India. The breeding efforts at ICRISAT initiated in the late 70s, succeeded in transferring high levels of resistance to rust in agronomically superior backgrounds but the success with LLS was limited. The recent breeding efforts focus on improving the levels of LLS resistance while maintaining the high levels of rust resistance. Ten high yielding advanced groundnut breeding lines (ICGS 37 and ICGV # 00005, 00064, 00068, 01270, 01276, 86590, 87846, 92267 and 99029), along with susceptible cv. TMV 2, and resistant cv. ICG 13919 (for LLS) and ICGV 86699 (for rust) were evaluated against LLS and rust during 2005 and 2006 rainy seasons in screening nurseries in Bangalore and Patancheru, respectively. Disease development was assessed on a 1 to 9 scale based on the whole plant observations in each replication. Data were collected at 15 days interval from 60 days after sowing (DAS). The genotypes were also evaluated for components of resistance using detached leaves of the ten breeding lines and controls in a greenhouse study during 2006. Highly significant differences *($p=0.001$)* were observed among the genotypes in both the trials (LLS and rust) for disease score and leaf area damage (LAD). This study revealed that ICGV 00068 (LLS score = 2.7; LAD = 7.0) was highly resistant to LLS. Six lines showed moderate resistance (LLS score 3.0 - 5.0; LAD = 11.0 - 26.0) to LLS, and two lines (ICGV # 86590 and 92267) were susceptible (LLS score >5.0; LAD >30.0), compared to the resistant (LLS score = 2.7; LAD = 6.3) and susceptible (LLS score = 7.0; LAD = 60.0) checks. The incubation period of LLS in the test lines ranged from 7.8 to 15.3 days, compared to 7.0 days in susceptible and 11.6 days in resistant checks; days for LLS sporulation was between 17.0 and 25.0, compared to 15.6 days in susceptible and 23 days in resistant checks; percent reduction in lesion number ranged from 48 to 97, compared to 94% in the resistant check. Except for ICGV 92267 (rust score = 3.8; LAD = 18.3) and ICGS 37 (rust score = 4.2; LAD = 20.0), the remaining eight test lines were resistant to rust (rust score = 1 to 2; LAD = 0.3-1.7) compared to the resistant (rust score = 1.8; LAD = 0.8) and susceptible (rust score = 6.0; LAD = 40.0) checks. The incubation period of rust in the test lines ranged from 7.8 to 19.5 days, compared to 7.0 days in susceptible and 11.4 days in resistant checks; days for rust sporulation was between 14.8 and 25.0, compared to 14 days in susceptible and 30 days in

resistant checks; percent reduction in pustules ranged between 51 and 99%, compared to 94% in the resistant check. Of all the advanced breeding lines, ICGV 00068 was found to be highly resistant and ICGS 37 was found to be highly susceptible to LLS and rust. The ICGV 00068 line has CS 16, an interspecific derivative of a cross between *A. hypogaea* and foliar disease resistant *A. cardenasii*, as one of the parents in its pedigree. The advanced breeding lines that showed high resistance to rust and LLS and moderate resistance to LLS will be further evaluated at multi-locations in farmers' fields during the 2007 rainy season.

Field Assessment of Virginia-Type Peanuts Transformed with the Oxalate Oxidase Gene in 2006. D.E. PARTRIDGE*, P.M. PHIPPS, Tidewater Agricultural Research & Extension Center, Virginia Tech, Suffolk, Virginia 23437; S.M. Chriscoe, and E.A. GRABAU, Department of Plant Pathology, Physiology and Weed Science, Virginia Tech, Blacksburg, Virginia 24061.

The barley oxalate oxidase gene was introduced into three virginia-type cultivars (Perry, Wilson, NC-7). The $T_4$ generation was evaluated in field trials in 2006 for disease susceptibility and agronomic characteristics. Two field trials were planted to monitor disease susceptibility and agronomic characteristics while a third trial was planted to evaluate the out-cross potential of the oxalate oxidase gene to non-transformed cultivars. Gene expression was confirmed in all $T_4$ transformed lines in the field. Disease appeared first in the non-transformed parent cultivars and increased to severe levels by harvest. In the first trial transformed lines of NC 7, Perry, and Wilson had an average of 88.3%, 94.7%, and 74.5% less Sclerotinia blight than their non-transformed parent cultivars, respectively. This confirmed the heritability and functionality of the gene in providing resistance against Sclerotinia blight. Fourteen of the transformed lines yielded equal to or better than their non-transformed parent, and eleven lines N70-8-24-B, N99P60-29-10-B, N70-8-B-B, N70-6-B-B, P99N6-1-10-B, P99N6-4-14-B, W14-10-2-B, W59-8-2-B, W171-17-15-B, W73-27-B-B, and W171-17-B-B yielded significantly more (479 to 2222 lb/A) than their non-transformed parent.

The second trial evaluated six superior lines for susceptibility to common foliar diseases in Virginia. There was no difference in susceptibility of the transformed lines and their corresponding non-transformed parent to tomato spotted wilt, early leaf spot, web blotch, and southern stem rot. Three transformed lines, W73-27-B-B, W171-17-B-B, and P53-28-B-B had increased defoliation compared to their non-transformed parent. Transformed lines W171-17-B-B and P53-28-B-B also showed increased susceptibility to Cylindrocladium black rot compared to their non-transformed parent. All six transformed lines had significantly less Sclerotinia blight than their non-transformed parent. All lines yielded equal to or better than their non-transformed parent under high leaf spot pressure, except for P53-28-B-B which yielded 800 lb/A less than the non-transformed Perry cultivar as a result of increased defoliation and susceptibility to CBR. Two transformed lines, N70-8-B-B and N70-6-B-B, yielded significantly more than their non-transformed parent, NC 7.

Gene transfer to non-transformed parent plants through cross-pollination was determined by planting two transformed rows with a non-transformed parent cultivar in between and seven rows of corresponding non-transformed parent on each side for a total of 17 rows per plot. Each row was individually harvested and a subset of seed from each row was germinated in the greenhouse and

evaluated for oxalate oxidase activity. Oxalate oxidase was detected in Perry seed that was harvested from the center row planted between the two transformed rows, indicating the potential of cross pollination in providing a way for the oxalate oxidase gene to be transferred to non-transformed cultivars.

Integrating a Weather-based Model with the TSWV Risk Index for Forecasting Spotted Wilt Severity. R.O. OLATINWO*, J.O. PAZ, and G. HOOGENBOOM, Department of Biological and Agricultural Engineering, University of Georgia, Griffin, GA 30223; S.L. BROWN, Department of Entomology, University of Georgia, Tifton, GA 31793; R.C. KEMERAIT Department of Plant Pathology, University of Georgia, Tifton, GA 31793; J. BEASLEY, JR., Department of Crop and Soil Sciences, University of Georgia, Tifton, GA 31793.

*Tomato spotted wilt virus* (TSWV) (family *Bunyaviridae*) is an important plant virus that causes severe damage to peanut production in the southeastern region of the United States. Severity of TSWV has been extremely variable in Georgia peanut fields due to climatic variability and varying weather patterns. The TSWV risk index components are known to influence the risk of losses to spotted wilt in Georgia peanut. To evaluate the relationships between the TSWV risk index, weather parameters, and severity of spotted wilt, statistical techniques were used to analyze on-farm survey data collected during the 2004-2005 growing seasons. Meteorological data were obtained from the Georgia Automated Environmental Monitoring Network website (www.georgiaweather.net) based on farm locations and nearest weather station. Stepwise regression analysis was used in fitting risk index components and derived weather variables. Results show that the best fitting equation, accounting for 67% of the variation in spotted wilt severity (square root transformed), was Y = 0.045 * (planting date) - 0.276 * (TmaxMar-PD) + 0.01156 * (variety)$^2$ - 0.0196 * (planting date x herbicide) + 0.005 * (plant population x Insecticide) + 0.004 * (plant population x tillage) + 19.906. TmaxMar-PD is the average daily maximum temperature from March 1$^{st}$ until planting date. Additional survey data will be utilized for continued development, testing, and evaluation of the models that have been initially developed. Integrating a weather-based model with the TSWV risk index will assist peanut growers in effectively managing spotted wilt disease.

Variations in Pathogenicity and Aggressiveness of *Sclerotinia minor* Isolates. J.E. HOLLOWELL* and B.B. SHEW, Department of Plant Pathology, North Carolina State University, Raleigh, NC 27695-7903.

*Sclerotinia minor*, the soilborne fungus causing Sclerotinia blight, has been isolated from several common weed species found in winter fallow fields used for peanut production in North Carolina. Understanding the variability in pathogen populations and potential for infection of alternate hosts is important in understanding the epidemiology of Sclerotinia blight and disease management of peanut. A petiole inoculation technique was used in the greenhouse to evaluate pathogenicity of *S. minor* isolates obtained from weed species on several peanut lines. Further studies were conducted to determine aggressiveness between and within mycelial compatibility groups of isolates collected from peanut, weed species, apothecia, and single ascospores. Lesion measurements were taken on 4 to 7 days after inoculation and area under disease progress curves were calculated. Two isolates from weeds were weakly pathogenic on peanut; all other isolates were pathogenic. Representative isolates from each mycelial compatibility group differed in aggressiveness, but there was no peanut line by

compatibility group interactions. The results of these studies suggest that populations of *S. minor* associated with weed species, apothecia, single ascospores, and peanut are not distinct with regard to mycelial compatibility group or aggressiveness on peanut.

First Reported Occurrence of Sclerotinia Blight Incited by *Sclerotinia sclerotiorum* on Peanut in New Mexico. S. SANOGO*, Department Entomology, Plant Pathology, and Weed Science, New Mexico State University, Las Cruces, NM 88003; and N. PUPPALA, New Mexico State University, Clovis Agricultural Science Center, Clovis, NM 88101.

During surveys of peanut fields for soilborne fungal diseases in eastern New Mexico in 2005, plants with tan to brown blighted stems, branches, and leaves were discovered. White fluffy mycelium and large sclerotia (> 2 mm) were found on symptomatic stems, within the stem pith, and shredded stem tissue. Samples of infected stems and branches, sclerotia, and mycelium were taken to the laboratory and processed to recover the putative causal agent for identification. A fungus was isolated from infected tissue, and produced darkly-pigmented mycelium on growth media, black sclerotia, and beige to tan apothecia. Asci were uniseriate with 8 ascospores per ascus and a tapered base. Ascospores were 1-celled, hyaline, smooth, ellipsoidal, and uniform in size within asci. Based on the characteristics of sclerotia, apothecia, asci, and ascospores, the isolated fungus was identified as *Sclerotinia sclerotiorum*. In pathogenicity tests, the isolated fungus caused typical Sclerotia blight symptoms on three high-yielding Valencia entries, Valencia-C, NM02565 from NMSU peanut breeding program, and Georgia Valencia. This study is the first report of *S. sclerotiorum* on peanut in New Mexico.

Effects of Fungicide Programs on Control of Pythium Pod Rot of Peanut in Oklahoma. J.P. DAMICONE* and L.R. PIERCE, Department of Entomology and Plant Pathology, Oklahoma State University, Stillwater, OK 74078-3033.

Pod rot is a disease complex caused in Oklahoma primarily by *Rhizoctonia solani* and *Pythium* spp. It is generally of minor importance but can become locally severe, particularly on virginia-type cultivars. In 2006, fungicide programs, targeted either for leaf spot or for leaf spot and soilborne disease such as stem rot and limb rot were evaluated on the virginia cultivar 'Jupiter'. Fungicide programs for leaf spot included chlorothalonil, pyraclostrobin, propiconazole, tebuconazole, trifloxystrobin, and prothioconazole applied in various use patterns from 3 to 5 times per season. Fungicide programs for foliar and soilborne diseases included azoxystrobin, pyraclostrobin, tebuconazole, and prothioconazole applied at rates recommended for control of soilborne diseases in various use patterns within a 5-application schedule. Early leaf spot pressure was moderate with defoliation in untreated check plots reaching 50% in the foliar trial to 70% in soilborne disease trial. Limb and stem rot diseases did not develop in either trial. Symptoms of pod rot became apparent after digging. Isolations made from hull sections taken from numerous symptomatic pods yielded only *Pythium aphanidermatum*, an aggressive pod rotting pathogen. Plots were evaluated by counting the number of 6-inch row sections with severe (>10%) pod rot. Treatment effects on pod rot incidence were not significant (P>0.05) in either trial as the disease counts were variable. Pod rot incidence ranged from 13 to 29% in the foliar trial and 10 to 31% in the soilborne trial. Two applications of azoxystrobin had the lowest level of pod rot (10%) compared to the untreated check (27%) in the soilborne trial, but incidence was high (24%) in

one of the plots receiving azoxystrobin. While pod rot counts were negatively correlated with yield in the foliar trial (r=-37%, P<0.01) and the soilborne trial (r=-0.52, P<0.01), treatment effects on yield were not significant (P>0.05) in either trial. Yields were high in both trials, ranging from 4600 to 5600 lb/A. Results on control of pod rot with fungicides in Oklahoma continue to be inconclusive. Planting moderately resistant cultivars in problem fields is likely to provide better results.

Assessment of Provost Fungicide in Georgia for Management of Southern Stem Rot and Leaf Spot Diseases of Peanut. R.C. KEMERAIT*, A.K. CULBREATH, Department of Plant Pathology, The University of Georgia, Tifton, GA 31793; W.D. DUFFIE, Cooperative Extension, The University of Georgia, Waynesboro, GA 30830, and R.G. McDANIEL, Screvin Gin Company, Inc., Louisville, GA 30434.

Provost fungicide (tebuconazole + prothioconazole) was assessed at four locations in Georgia in 2006 at rates ranging from 8.0 to 10.7 fl oz/A for the management of southern stem rot (*Sclerotium rolfsii*) and leaf spot diseases (*Cercospora arachidicola* and *Cercosporidium personatum*) of peanut. A tank mix of prothioconazole (2.38 fl oz/A) + tebuconazole (5.3 fl oz/A) was assessed in a field trial in 2005. Cultivars 'Georgia Green', 'Carver', and 'AP3' were planted in one or more of these trials. Fungicide applications were timed approximately 14 days apart for a total of seven sprays. Provost and the prothioconazole/tebuconazole tank-mix were applied in four-block programs (applications 3,4,5 and 6) preceded and followed by applications of chlorothalonil at 1.5 pt/A. These programs were compared to an untreated control (except at Midville), plots treated with seven applications of chlorothalonil (1.5 pt/A), and a four-block Folicur program (7.2 fl oz/A at applications 3-6) with chlorothalonil at applications 1, 2, and 7. In trials conducted in 2005 at Tifton and 2006 at Attapulgus, Plains, and Tifton, final leaf spot intensity in untreated plots (measured on the Florida 1-10 scale) rated 8.8, 8.5, 6.8, and 9.7, respectively. Leaf spot intensity in plots treated with the four-block Folicur program rated 6.4, 6.1, 4.2, and 6.6, respectively, which were significantly different from the untreated control. Leaf spot in the plots treated with Provost (8.0 fl oz/A) (or the tebuconazole/prothioconazole tank-mix) rated 5.5, 1.9, 2.3, and 5.0, respectively, all significantly reduced from the 4-block Folicur program. Southern stem rot, measured as % affected row, rated 3.1, 3.0, and 9.8 in plots treated with chlorothalonil in Tifton 05, Plains 06, and Tifton 06. Southern stem rot in untreated plots at Attapulgus 06, rated 38.9. Stem rot in plots treated with chlorothalonil in Midville 06, rated 14.75, 35.5, and 40.5 for cultivars AP3, Carver, and Georgia Green, respectively. Stem rot in plots treated with a four-block Folicur program, (Tifton 05, Plains 06, Tifton 06, Attapulgus 06, Midville 06: AP3, Carver, Georgia Green) rated 0.9, 2.5, 7.6, 23.2, 12.0, 27.8, and 23.2, respectively. Southern stem rot in plots treated with a tank mix of tebuconazole + prothioconazole or Provost (8.0 fl oz/A) rated 3.4, 2.3, 7.6, 20.0, 25.5, 19.8, and 11.0, respectively. In these trials, leaf spot intensity was significantly lower in plots treated with a mixture of prothioconazole and tebuconazole than in plots treated with tebuconazole alone. Yields and severity of stem rot were not significantly different between plots treated with tebuconazole + prothioconazole and tebuconazole alone.

Management of CBR with Partially Resistant Cultivars and Prothioconazole. T. B. BRENNEMAN*, Dept. of Plant Pathology, University of Georgia, Tifton, GA 31794; and H. YOUNG, Bayer Cropscience, Tifton, GA 31794.

Cylindrocladium black rot (CBR), caused by *Cylindrocladium parasiticum*, is a serious soilborne disease of peanut in the southeastern United States. Studies conducted in Plains (2005) and Attapulgus (2006) evaluated 3 mid- and 3 late-maturity peanut cultivars that were treated with 1) Provost (prothioconazole + tebuconazole) 8 fl oz/A at sprays 3-6, 2) Proline (prothioconazole) 5.7 fl oz/A in furrow + Provost 8 oz/A at sprays 3-6, or 3) nontreated. All plots received a chlorothalonil + flutolanil cover spray to control diseases other than CBR. In the mid-maturity test, Carver and GA-03L had less CBR (28 and 30%, respectively) than Georgia Green (36%), but yield and value per acre were all similar. Overall incidence of CBR was lower in the late-maturity test. Tifrunner had the most CBR (24%) followed by GA-02C and GA-01R (19 and 16%, respectively), but yield and value were similar among cultivars. Treatment 2 reduced CBR incidence by 51 and 34% compared to the nontreated control on the mid- and late-maturity groups, respectively. On the mid-maturity group, treatment 2 increased yield by 566 lb/A versus the control and reduced the root colonization of *C. parasiticum* by 31%, but effects were not significant on the late-maturity cultivars. There was no effect of the prothioconazole in furrow on peanut emergence, or on subsequent development of symptoms caused by tomato spotted wilt virus.

PROLINE 480 SC for the Control of CBR in Peanuts. G.H. MUSSON*, H. YOUNG, R.A. MYERS, J.R. BLOOMBERG and R. RUDOLPH. Bayer CropScience, Research Triangle Park, NC. 27709.

PROLINE 480 SC is a broad-spectrum fungicide under development for use in peanut to control CBR (*Cylindrocladium crotalariae*). It contains the systemic sterol biosynthesis inhibitor prothioconazole. Prothioconazole is the first representative from a new chemical class, the triazolinthiones, discovered and developed globally by Bayer CropScience. In field trials, PROLINE 480 SC applied at planting has provided yield protection from CBR superior to current commercial standards. Application methods, product details, registration timeline, and yield / efficacy data will be presented.

PROVOST 433 SC U.S. Efficacy Summary. H.S. YOUNG*, G.H. MUSSON, and R.A. MYERS. Bayer CropScience, Research Triangle Park, NC. 27709.

PROVOST 433 SC fungicide has recently received registration for disease control on peanut. It contains two systemic sterol biosynthesis inhibitors, tebuconazole and prothioconazole. Prothioconazole is the first representative from a new chemical class, the triazolinthiones, discovered and developed globally by Bayer CropScience. Provost overcomes the early and late leaf spot (*Cercospora arachidocola* and *Cercosporidium personatum*) resistance to tebuconazole and performs at the level of the highest standard in the market. Control of southern stem rot or “white mold” (*Sclerotium rolfsii*) has been equal to all commercial standards. Limited testing on limb rot (*Rhizoctonia solani*) has indicated that control is equal to the best commercial standard. Suppression of CBR (*Cylindrocladium crotalariae)* is higher than with any currently available fungicide. Yield, when compared with the previous sterol inhibitor standard Folicur 3.6F, indicates an increase of over 500 lbs/A in the presence of disease. Rainfastness due to product adsorbtion is increased when compared with Folicur 3.6F.

## ENTOMOLOGY

Insecticide Efficacy For Thrips Suppression, Spotted Wilt Suppression, and Yield Protection; and the Relationship Between Spotted Wilt Stunting and Yield Loss in South Carolina. J.W. CHAPIN*, and J.S. THOMAS, Department of Entomology, Soils, and Plant Sciences, Clemson University, Edisto REC, 64 Research Road, Blackville, SC 29817.

Field experiments were conducted from 2004 to 2006 on the efficacy of in-furrow insecticides for suppression of thrips injury and spotted wilt disease, as well as peanut yield and grade response. Treatments were aldicarb 1.1 kg/ha (Temik 15G 7lb/ac), phorate 1.1 kg/ha (Thimet 20G 5 lb/ac), aldicarb 1.0 kg/ha + imidacloprid 0.16 kg/ha (KC791230, Bayer CropScience), acephate 1.1 kg/ha (Orthene 97 1 lb/ac) and an untreated check. Experiments were conducted on a susceptible cultivar (Perry) planted the first week of May. All treatments suppressed thrips injury, reduced spotted wilt disease, and improved yield relative to the check. The order of treatment efficacy for suppression of spotted wilt disease and yield protection was Untreated < KC791230 < Orthene < Temik < Thimet. Orthene in-furrow treatments caused a 20% stand reduction. There was a significant linear relationship between spotted wilt incidence and yield loss over a range of 0 to 50% disease incidence, with each percent increase in stunted area associated with a 1.4 % yield reduction ($y = -1.37x + 100$; $R^2 = 0.51$; $F = 163$; df = 1, 159; $P < 0.001$). A similar relationship between plant stunting and yield loss ($y = -1.44x + 100$; $R^2 = 0.31$; $F = 18.3$; df = 1, 40; $P < 0.001$) was noted under more moderate disease risk (NC-V11 cultivar planted 24 May). These yield estimates reflect loss from direct thrips injury and virus induced loss on unstunted plants, in addition to any losses on stunted plants. The contribution to total loss from each component is unknown. Nevertheless, such regressions may be useful in estimating yield loss in grower fields over the range of stunting levels observed.

Determining the Susceptibility of Virginia Market-type Peanut Varieties and Advanced Breeding Lines to Tomato Spotted Wilt Virus (TSWV) and Tobacco Thrips, *Frankliniella fusca*. D.A. HERBERT, JR.*, S. MALONE, Tidewater Agricultural Research and Extension Center, Virginia Tech, Suffolk, VA, 23437; D.L. COKER, Soil and Crop Sciences, Texas A&M University, College Station, TX, 77843-2474; and T. ISLEIB, Crop Science Department, North Carolina State University, Raleigh, NC, 27695.

Two field tests were conducted at the Virginia Tech Tidewater Agricultural Research and Extension Center to determine if the known differences in incidence of TSWV among peanut varieties are due in part to differences in either the susceptibility to, or preference of the disease vector, tobacco thrips, *Frankliniella fusca*. Tests included several common virginia market-type varieties as well as advanced breeding lines from the North Carolina peanut breeding program that manifest multiple disease resistance (including TSWV). The experimental design was a small plot (2 rows x 40 ft) five replicate split plot with insecticide treatment (Temik 15G applied in furrow at 7 lb per acre and Orthene 97 at 4 oz per acre broadcast at late ground cracking) as the main plot and variety as the sub plot. In-season measurements included weekly larval and adult thrips counts on plant terminal leaflets (10 per plot), and visual thrips plant injury ratings (based on a scale of 0=no injury and 10=dead plants). TSWV incidence was determined weekly by counting the plants in each plot showing symptoms. Yields were determined by harvesting each two-row plot using

standard peanut harvesting equipment modified for small plot use.

Results showed that in the two tests, there were no treatment x variety interactions for numbers of adult or immature thrips or thrips plant injury, and no significant differences between varieties. Varieties appear to be equally susceptible to thrips. There was no treatment x variety interaction for TSWV incidence but there was a significant difference between varieties. In general, runner market-type varieties had lower incidence compared with virginia market-types. N03081T had the lowest incidence of the virginia types evaluated and not significantly different from the best performing runner types. Insecticide treatment was significant for all factors resulting in fewer adult and immature thrips, less thrips plant injury, and lower incidence of TSWV across all varieties. Pod yields ranged from 3,100 to 5,552 lb per acre. There was no treatment x variety interaction for pod yield. There were significant differences between varieties with virginia types generally yielding more than runner types. Combined across treatments, the two virginia market-type varieties, Wilson (5,093 lb per acre) and N03081T (5,061 lb per acre) had the highest yields and GA 02C (3,996 lb per acre) had the lowest. Insecticide treatment resulted in significantly higher yields. Combined across varieties, insecticide treatment improved yields by an average of 1,073 lb per acre in Test 1 and 816 lb per acre in Test 2.

## BREEDING, BIOTECHNOLOGY, AND GENETICS II

Characterization of the peanut mini core collection using RGH-based markers

G.H. HE[1]*, Y. WANG[2], B. ROSEN[3], M.L. WANG[4], R.V. PENMETSA[3], D. COOK[3]. [1]Department of Agricultural Sciences, Tuskegee University, AL 36088; [2] School of Life Sciences, Anhui University, Anhui, China; [3]Department of Plant Pathology, University of California, Davis, CA 95616; and [4]USDA-ARS, Plant Genetic Resources Conservation Unit, Griffin, GA 30223.

With the goal of understanding the evolution of the NBS-LRR family of legume disease resistance gene homologs (RGHs), we are characterizing the phylogenetic history, genomic distribution, and within species diversity of RGH genes from several members of the Papilionoid subfamily, including peanut. Our approach leverages knowledge of RGH homologs in *Medicago truncatula*, and presumes that RGHs present in modern day *Medicago* are representative of the primary clades present in the last common ancestor of the Papilionoideae. A suite of degenerate primers, designed from conserved regions within the NBS domain of *Medicago*, were used to clone two hundred twelve resistance gene homologs (RGHs) from cultivated peanut. Phylogenetic analysis of the peanut genes relative to genes discovered in 4 other Papilionoid legumes and the basal Cesalpinoid legume *Cercis occidentalis*, reveals significant lineage-specific radiations of this large gene family. To assess allelic diversity within peanut germplasm, we recently initiated a project to explore diversity of RGH loci across 96 *Arachis* genotypes, including 82 from the peanut mini core collection and 14 from wild species. The initial analysis has assessed only amplification and length polymorphism, while assessing nucleotide level divergence will require DNA sequence analysis. Most amplified loci were monomorphic for length, consistent with limited insertion/deletion of codons within the NBS protein domain. We also identified cases of presence/absence of entire amplicons, suggesting that certain homology groups have been eliminated from individual genotypes, consistent

with evolution of RGH genes via interlocus recombination. A simple cluster analysis was used to organize the 96 genotypes based on RGA variation. Wild species clustered into a single group, but with larger variation than observed in the cultivated species. These results are consistent with a narrow origin of cultivated germplasm and increased RGH diversity in wild *Arachis* species.

Molecular Cloning of an SSR Marker Associated with Resistance to Sclerotinia Blight in Peanut and Sequence Variation among Resistant and Susceptible Plant Lines. K.D. CHENAULT*, Wheat, Peanut and other Field Crops Research Unit, 1301 N. Western, Stillwater, OK, 74074.

The production of cultivated peanut, an important agronomic crop throughout the United States and the world, is consistently threatened by various diseases and pests. Specifically, peanut production in Oklahoma, Texas, North Carolina and Virginia is challenged by fungal disease such as Sclerotinia blight. The identification of a molecular marker associated with fungal resistance in peanut would greatly assist peanut geneticists in selecting genotypes to be used in breeding programs. Using simple sequence repeat (SSR) primers reported for peanut, molecular markers were identified which are associated with reaction to the fungus *Sclerotina minor*, the causal agent of Sclerotinia blight. Two markers, one consistent with resistance and the other with susceptibility, have been cloned and sequenced from several different peanut genotypes. Sequence analysis revealed that both markers are from the same region on the peanut genome that is well conserved except for differences surrounding the tandem repeat sequence, which varies in length depending on genotype. Studies are underway to understand the nature and significance of these differences which will further illustrate the utility of these markers. Future use of these markers to screen segregating populations and/or germplasm collections will greatly enhance the efficiency of breeding peanut with resistance to Sclerotinia blight.

Development of Peanut Expressed Sequence Tag-based Genomic Resources and Tools. B.Z. GUO*, USDA-ARS, Crop Protection and Management Research Unit, Tifton, GA 31793; P. DANG, USDA-ARS, National Peanut Research Laboratory, Dawson, GA 39842; Y. LI, X. CHEN, A.K. CULBREATH, Department of Plant Pathology, the University of Georgia, Tifton, GA 31793; C.C. HOLBROOK, USDA-ARS, Crop Genetics and Breeding Research Unit, Tifton, GA 31793.

U.S. Peanut Genome Initiative (PGI) has widely recognized the need for peanut genome tools and resources development for mitigating peanut allergens and food safety. Genomics such as Expressed Sequence Tag (EST), microarray technologies, and whole genome sequencing provides robotic tools for profiling genes. In spite of continuous decrease in DNA sequencing costs, it is improbable that many large plant genomes, such as peanut, will be sequenced in the near future. However, partially sequencing of large numbers of expressed genes (ESTs) can deliver substantial amounts of genetic information that will allow comparative and functional studies. Notable research progress has been made recently in development of peanut ESTs. Up to today, we have sequenced a total of 44,064 cDNA clones from ten peanut cDNA libraries. After comparison and assembly of overlapping sequences, about 10,096 unique sequences have been identified. These sequence data will be available to the community in order to develop genomic tools and resources for deciphering the chromosomal location and biological function of genes in the peanut genome and mitigating peanut food safety issues. Our interests are two folds: construction of peanut 70-

mer oligo microarray consisting over 10,000 gene-elements in collaboration with TIGR (the Institute for Genomic Research) and development of markers/genes associated with disease resistance, such as TSWV and leaf spots. A panel of 16 diverse peanut genotypes has been screened for genetic diversity. Several RIL (recombinant inbred line) populations have been constructed for advancement.

High-Resolution Two-Dimensional Gel Electrophoresis (2-DGE) For Peanut Seed Proteomics: Potential Applications in Genotype Differentiation, Taste and Allergens. R. RAKWAL*, Human Stress Signal Research Center (HSS), National Institute of Advanced Industrial Science and Technology (AIST), Tsukuba West, 16-1 Onogawa, Tsukuba 305-8569, Japan; K.R. KOTTAPALLI, Agricultural Science Center at Clovis, New Mexico State University, 2346 State Road 288, Clovis, NM 88101; G. KUMAR AGARWARL, Research Laboratory for Agriculture Biotechnology and Biochemistry (RLABB), Kathmandu, Nepal; J. SHIBATO, HSS, AIST; M. BUROW, Texas Agricultural Experiment Station, Texas A&M University, Lubbock, TX, 79403, USA and Texas Tech University, Department of Plant and Soil Science, Lubbock, TX, 79409, USA and N. PUPPALA, Plant and Environmental Sciences Department and Agricultural Science Center at Clovis, New Mexico State University, 2346 State Road 288, Clovis, NM 88101.

Seed protein extraction is complicated and different seeds need different extraction protocols. In our quest for a high-resolution peanut seed two-dimensional (2-D) gel proteome map, we utilized and standardized a phenol-based protein extraction protocol for separating proteins on pre-cast 24 cm IPG (pH 4-7) strips and large-format gradient (12-14%) SDS-PAGE. Employing dry mature seeds of Valencia C (sweet) and Tamspan (bitter), of subspecies *fastigiata* var. *fastigiata*, we obtained extremely clean and reproducible protein patterns on 2-D gel, fulfilling the main goal of the present study. A total of 20 silver nitrate stained protein spots differentially expressed between these cultivars were detected, excised from gel, and analyzed by nano electrospray ionization liquid chromatography mass spectrometry to reveal 18 distinct proteins. With a good protein extraction and 2-D system in our hands, we also examined the 2-D protein profiles of Georgia Green and NC-7, of subsp. *hypogaea* var. *hypogaea*, to distinguish among the four peanut market types. Allergen Arah3/Arah4 was completely absent in Valencia C unlike Tamspan and NC-7 indicating its superiority in terms of allergen content. A ca. 30 kDa protein with putative homology to Gly1, a 11s globulin seed storage protein was significantly present in Valencia C and absent in Tamspan, and may be associated to taste. Galactose-binding lectin proteins with antinutritive properties were absent in Valencia C, Georgia green and NC-7 cultivars and again could be related to their consumer preference. This study demonstrates the potential application of gel-based proteomics for genotyping (*fastigiata* and *hypogaea* botanical types) and differentiating peanut market types having different taste and allergen contents in seeds.

Development of Molecular Markers to Facilitate Pyramiding Genetic Traits in Peanut Cultivars. Y. CHU*, L. RAMOS, P. OZIAS-AKINS, Horticulture Department, The University of Georgia Tifton Campus, Tifton, GA 31794, and C.C. HOLBROOK, USDA-ARS, Tifton, GA 31793, USA

Molecular markers can reduce the time and labor required to pyramid desirable genetic traits in peanut cultivars. We have developed a PCR-based marker to

screen for nematode resistance whose presence is highly correlated with phenotype although with a 5.8% recombination rate. Therefore, in order to identify additional markers that are flanking or more tightly linked with the resistance gene, we have used a population segregating for nematode resistance and the technique of Amplified Fragment Length Polymorphism (AFLP). Thirteen consistent polymorphisms were identified as linked with resistance, and six of these that bracketed the nematode resistance locus were further confirmed by their presence in a nematode resistant line near-isogenic with a susceptible line. The AFLP fragments were sequenced for marker development. To be able to use marker-assisted selection to facilitate the combination of multiple traits, we also tested a marker for the high oleic acid trait in peanut. This trait is controlled by the activity of oleoyl-PC desaturase and is encoded by recessive alleles in two genes (*ahFAD2A* and *ahFAD2B*). A natural mutation (D150N) has been found in *ahFAD2A* which resulted in a dysfunctional desaturase. The presence or absence of a naturally occurring mutation in *ahFAD2A* determines the segregation ratio of the high oleate trait in peanut breeding projects. We designed a cleaved amplified polymorphic sequence (CAPS) marker and found a 31.6% mutation frequency in the mini core collection of the U.S. peanut germplasm collection. These data will be useful to breeders who would like to transfer disease resistance traits from mini core accessions to high oleic acid cultivars.

Proteomics of Water-Deficit Stress in U. S. Peanut Minicore Accessions. K.R. KOTTAPALLI, Agricultural Science Center at Clovis, New Mexico State University, Clovis, NM, 88101; R. RAKWAL, Human Stress Signal Research Center, AIST, Tsukuba 305-8569, Ibaraki, Japan; G. BUROW, J. BURKE, USDA–ARS Plant Stress & Germplasm Development Unit, Cropping Systems Research Lab, Lubbock, TX, 79415; N. PUPPALA, Agricultural Science Center at Clovis, New Mexico State University, Clovis, NM, 88101; P. PAYTON, USDA–ARS Plant Stress & Germplasm Development Unit, Cropping Systems Research Lab, Lubbock, TX, 79415; and M. BUROW*, Texas Tech University, Department of Plant and Soil Science, Lubbock, TX, 79409, and Texas Agricultural Experiment Station, Texas A&M University, Lubbock, TX, 79403.

Accessions from the U. S. peanut (*Arachis hypogaea* L.) minicore collection were analyzed for differentially-expressed leaf proteins during the reproductive stage under water-deficit stress. Accessions showing tolerant and susceptible responses to stress were selected based on chlorophyll fluorescence yield under elevated respiratory demand, water use efficiency, and specific leaf area. One- and two-dimensional gel electrophoreses were performed on leaf soluble protein extracts of selected tolerant, intermediate, and susceptible accessions. 1-D gel immunoblotting revealed a significant decrease in the oxidative stress-related ascorbate peroxidase (APX) in the tolerant accession and low molecular weight heat shock protein (HSP 30) in the susceptible accession under stress. A total of 40 and 79 protein bands/spots from 1D and 2D gels, respectively, were excised for analysis by matrix-assisted laser desorption/ ionization-time-of-flight mass spectrometry (MALDI-TOF MS) and by MS/MS analysis, and 35 non-redundant proteins were identified. The photosynthetic enzymes ribulose 1,5-biphosphate carboxylase-oxygenase and carbonic anhydrase were induced under stress, suggesting possible photosynthetic adaptation in tolerant accessions. Lipoxygenase involved in jasmonic acid synthesis was suppressed, and a signaling protein, oxygen evolving enhancer 2 (OEE2) was induced under water

stress. Acetyl-CoA carboxylase carboxyl transferase, an enzyme of fatty acid biosynthesis, was induced only in the tolerant accession, indicating a possible role in the tolerance response. The identified proteins from peanut leaves and their corresponding genes can be incorporated in marker assisted breeding for drought tolerance in peanut.

Devleopment of Transgenic Peanut with Reduced Allergen Content. P.C. FAUSTINELLI, Y. CHU, L. RAMOS, P. OZIAS-AKINS*, Department of Horticulture, The University of Georgia Tifton Campus, Tifton, GA 31793, J.J. THELEN, M. HAJDUCH, Department of Biochemistry, University of Missouri-Columbia, Columbia, MO 65211, and S.J. MALEKI, USDA-ARS-SRRC, New Orleans, LA 70124.

Peanut allergy is caused by an immunological reaction to peanut seed proteins. Allergy to peanuts is one of the most serious food allergies affecting approximately 1% of the population, a small fraction of which present with anaphylactic shock. Strict avoidance of peanut-containing food products currently is the only recommended treatment. Nine seed proteins have been officially recognized as allergens. One of these is Ara h 2, a major allergen which is recognized by more than 90% of US peanut allergic patients. Ara h 2, the most potent peanut allergen and a glycoprotein with homology to the conglutin family, has multiple isoforms ranging in molecular mass from 17-20 kDa. This protein is resistant to heat and digestion with gastric enzymes and has trypsin inhibitor activity. Using recombinant DNA and plant transformation techniques, it is possible to reduce or silence the expression of genes that produce allergen proteins. In the research being presented, embryogenic cultures of Georgia Green were bombarded with plasmid pFGC1008 containing a portion of the *ara h 2* gene cloned as an inverted repeat under the control of the CaMV 35S promoter and linked with a hygromycin resistance gene. Regenerated transgenic plants from eight hygromycin resistant lines were positive for the *ara h 2* gene when assayed by PCR using primers that would amplify from only the inverted repeat. Transgenic T1 seeds from four lines were produced in sufficient numbers to be analyzed by Western blot. Two lines were found to contain significantly reduced amounts of Ara h 2 protein whereas two others had no detectable Ara h 2. No other differences in protein patterns were observed upon partial removal of this allergenic protein. The reduction in Ara h 2 also was apparent after two-dimensional Difference Gel Electrophoretic analysis coupled to tandem mass spectrometry as well as an assay for binding of IgE from peanut-allergic individuals. The potential for change in allergic response is being tested using an animal model. If reduced allergenicity were to be shown in the absence of changes in agronomic characters or manufacturing preferences, the approach to knockout Ara h 2 expression through genetic transformation or mutation would be validated.

Differentially expressed cDNA transcripts and proteins in peanut leaf. R. KATAM*, H.K.N. VASNATHAIAH, S.M. BASHA, Center for Viticulture and Small Fruit Research, Florida A&M University, Tallahassee, FL 32317-9300.

Cultivated peanut is an important food legume used for protein and oil content. Aflatoxin contamination caused by *Aspergillus* fungus is of greatest concern in peanut production worldwide. Development of drought tolerant peanut genotypes is one of the strategies to decrease the risk of aflatoxin contamination. Our objectives of this research were to identify the differentially expressed cDNA

transcripts and proteins associated with drought tolerance in peanut. We have initiated a qualitative and quantitative analysis of protein and cDNA transcript changes following water stress. Peanut plants (50 day old), growing in pot culture under greenhouse conditions were subjected to water stress. Following the stress, the leaves were collected and total RNA was isolated for DDRT-PCR analysis to determine progressive changes in transcript profiles. We have identified 52 cDNA transcripts regulated (up- and down) due to water stress. We have generated subtractive hybridized PCR products for water stress from drought tolerant peanut genotype (Vemana) to characterize the unique drought-responsive sequences. Cloning and sequencing of the transcripts is in progress. Total leaf proteins were extracted from irrigated and water stressed plants and subjected to 2-D PAGE. The proteins responding to stress were further characterized. Based on amino acid sequence search they were identified as ribulose 1, 6-bisphosphate carboxylase which is known to play major role in photosynthesis. This protein was found to over express in drought-tolerant peanut genotypes while suppressed in drought-susceptible genotypes. Such global transcript profiling supplemented with protein data will be used to elucidate specific metabolic pathways that are perturbed by water-deficit treatments. Supported by USAID/PCRSP # FAM 51.

Using Geographic Information and Morphological and Agronomic Descriptors to Develop Core Collection Specific to Valencia Peanut Market Type. S.L. DWIVEDI, New Mexico State University, Agricultural Science Center at Clovis, 2346 State Road 288, Clovis, NM 88101; N. PUPPALA*, New Mexico State University, Agricultural Science Center at Clovis, 2346 State Road 288, Clovis, NM 88101; HARI D. UPADHYAYA, International Crop Research Institute for Semi Arid Tropics, Patancheru, Andhra Pradesh, India 502324; and S. SINGH, International Crop Research Institute for Semi Arid Tropics, Patancheru, Andhra Pradesh, India 502324.

Crop improvement and the dissection of complex genetic traits require germplasm diversity. A core collection is a gateway for the utilization of diverse accessions with beneficial traits in applied breeding programs. Six hundred and thirty USDA Valencia peanut germplasm and a control cultivar (New Mexico Valencia C) were evaluated for 26 descriptors in augmented design for two seasons. The accessions were stratified by country of origin, and data on morphological and agronomic descriptors were used for clustering following Ward's method. About 10% or a minimum of one accession from each cluster and region was selected to develop core subset of 77 accessions. Mean comparisons using *t*-test, frequency distribution using $x^2$ test, and Shannon-Weaver diversity index indicated that the genetic variation available for these traits in the entire collection has been preserved in the core subset. The similarity in correlation coefficients in entire collection and core subset suggest that this core subset has preserved most of the co-adapted gene complexes controlling these associations. The peanut breeders engaged in improving the genetic potential of Valencia peanuts will find this core subset useful in cultivar development.

## PHYSIOLOGY AND SEED TECHNOLOGY: PROCESSING AND UTILIZATION

Comparison of Twin Row and Single Row Planting Pattern for Virginia and Runner-Type Peanuts in Virginia. J.C. FAIRCLOTH*, D.L. COKER, P.M. PHIPPS, AND D.A. HERBERT. Tidewater Agricultural Research and Extension Center, Virginia Tech, Suffolk, VA 23437.

In 2006, a study was initiated at the Tidewater Agricultural Research and Extension Center in Suffolk and on a producer farm in Southampton County. The objective of this research was to examine the yield, grade, disease incidence, and maturity response to three recently released virginia-type cultivars and three runner-type cultivars planted in twin- and a single - row planting configurations. Three runner market type peanuts, Georgia Green, Ga 02C, Ga 03L, and three virginia market types, Champs, Brantley, and Phillips, were planted in single row and two different twin row strategies (Twin 1–equivalent seeding rate to single row and Twin 2–1.5 times the single row seeding rate) and all plots were dug at two different timings. All plots were managed similarly and evaluated for disease, yield and grade. Averaged over planting patterns and harvest dates, the runner market type peanuts out yielded the virginia market types in Suffolk ranging from 300 to 2300 lb/acre higher depending on which varieties are compared. Georgia Green and GA 03L yielded similarly and higher than GA 02C. Among virginia market types, Phillips yielded the highest followed by Champs and Brantley, and all were significantly different from one another. At the Southampton Co. location, yield results were mixed. Harvesting all varieties earlier (Oct. 16$^{th}$) produced higher yields than a later harvest (Oct. 26$^{th}$) by 450 lb/acre, while no differences were observed in yield regardless of planting patterns. Grade and disease data are being analyzed and will be presented.

Temperature effect on peanut (*Arachis hypogaea*) seed germination. T.L. GREY*, J.P. BEASLEY, JR., and A.M. WISE Crop and Soil Science Department, University of Georgia, P.O. Box 748, 115 Coastal Way, Tifton, GA 31793, T.M. WEBSTER, USDA-ARS, D.C. BRIDGES, Abraham Baldwin Agriculture College, Tifton GA 31794.

Experiments were conducted to evaluate the germination response of 11 peanut cultivars using a temperature gradient. The effect of temperature on germination response was conducted on a 243 (length) x 91 (width) x 7.6 (depth) cm temperature gradient table. The table is a solid aluminum block with hot water running through one end and cold through the other. This results in a continuous temperature gradient ranging from 14 to 38 ºC along the length of the table. Temperatures were randomly measured and recorded at 30 minute intervals with a data logger by placement of thermocouples into holes uniformly drilled on the underside of the table to within 0.5 cm of the table surface. Seed were randomly distributed on moistened germination paper, which was placed in a Petri dish. For each cultivar, 22 Petri dishes were placed at 1.0 ºC increments along the length of the table. Beginning at 24 hours after seeding, peanut germination was counted when the radicle extended for more than 1 mm, and removed from the dish. Germination was counted daily, through 7 days after seeding. Peanut germination averaged across the 11 cultivars, was 76% and less for temperatures below 18.4 ºC, 86% and greater between 19.4 and 34.2 ºC, but dropped off to 83% at 36.1 ºC. Overall, CRSP98 exhibited the weakest germination responses (0 to 95%) with 3081R having the highest germination

across all temperature regimes (50 to 100%).

Acclimation Response of Peanut to Deficit Irrigation: Pinpointing Water Application to Increase Drought Tolerance. D. ROWLAND*, W. FAIRCLOTH, USDA-ARS, NPRL, 1011 Forrester Dr. SE, Dawson, GA, 39842; P. PAYTON, USDA-ARS, CSRL, 3810 4TH St., Lubbock, TX, 79415; and D. TISSUE, Dept. of Biological Sciences, Texas Tech University, PO Box 43131, Lubbock, TX, 79409.

Water-deficit and high temperature are primary factors limiting peanut production across the U.S., either because of regional aridity or untimely rainfall events during the growing season. In the southern High Plains of west Texas and eastern New Mexico, low natural rainfall (450 mm) necessitates the use of significant irrigation in production systems. However, at the current rates of water use, it is estimated that the Ogallala Aquifer source will be locally depleted within 30 to 40 years. To develop irrigation schemes that maximize peanut production in this environment while reducing overall water consumption, a large-scale field experiment was established in 2005 using differing rates of irrigation (50%, 75%, and 100% of grower applied irrigation) timed to different periods of peanut development (early, middle, and late season). The overall objective was to develop alternative irrigation schedules that maximized peanut maturity and yield, but reduced water consumption by acclimating the crop to early season drought. Specifically, the project determined: 1) the impact of deficit irrigation on peanut yield and maturity; 2) whether yield and maturity responses to deficit irrigation were influenced by plant physiology; and 3) whether the application of a commercial soil surfactant aided in drought tolerance. Early season deficit irrigation (50 or 75% early, 100% mid, 100% late) showed some evidence of acclimation of the crop to later periods of drought stress through maintenance of yield and physiology to similar levels relative to the fully irrigated treatment. Photosynthetic rates evaluated at mid-season were elevated in 50% (early) treatments during dry down periods in comparison to fully irrigated (100%) controls. Seasonal soil moisture levels in the 50% (early) – 100% (mid) – 100% (late) treatment were similar to the 100% (full season) plots. While yields were reduced 16% in the 50% irrigation lasting up to 80 DAP, early and late season drought treatments lasting 45 d in 2006 showed equal or numerically greater yields than the fully irrigated controls (early – 4803, late – 5275, control 4755 lb/acre). The use of soil surfactants increased yield under deficit irrigation across all treatments compared to plots with no surfactant. In several treatments, yield was significantly increased compared to the full irrigation treatment.

Virginia Market-Type Breeding Lines with Flavor Profiles Equivalent to the Runner-Type Standard, Florunner. H.E. PATTEE*[1], T.G. ISLEIB[2], T.H. SANDERS[3], L.O. DEAN[3], and K.W. HENDRIX[3]. [1]Department of Biological and Agricultural Engineering, N. C. State University, Raleigh, NC 27695-7625; [2]Department of Crop Science, N. C. State University, Raleigh, NC 2769-7629; [3]USDA-ARS Market Quality and Handling Research Unit, Raleigh, NC, 27695-7624.

Numerous studies have documented that virginia market-type peanuts have less intense roasted peanut flavor than runner market-types. The virginia-type peanut breeding program at N.C. State Univ. has approached this issue through two activities: (1) monitoring flavor profiles of advanced breeding lines and (2) breeding for improved flavor by crossing virginia-type lines with lines of other market-types possessing superior flavor profiles. Flavor quality of advanced

breeding lines entered in the NCSU Advanced Yield Test (conducted at three North Carolina locations each year) has been assessed using the descriptive sensory analysis panel in the NCSU Dept. of Food Science and also by the USDA-ARS Market Quality and Handling Research Unit (MQHRU) panel when entered in the Uniform Peanut Performance Test (UPPT). Several sister lines derived from the cross NC 12C*2 / N96076L were selected as part of a program of breeding for multiple disease resistance. When NC-grown samples of these lines were evaluated by the NCSU Food Science panel, they were found to possess superior flavor profiles, not significantly different from that of Florunner. The best of the group of sister lines was N03090T. Critical flavor attributes of this line compared with Florunner were 4.56 vs. 4.51 flavor intensity units (fiu) (ns) for roasted peanut; 3.77 vs. 3.56 fiu (ns) for sweet; and 2.04 vs. 2.23 fiu (ns) for bitter. In this data set, Georgia Green had the best flavor profile of all lines tested, and virginia-type lines N03089T and N03090T were not significantly different from Georgia Green. When samples grown at nine UPPT locations across the southern USA in 2005 were evaluated by the MQHRU panel, the flavor profile of N03090T was not significantly different from that of Florunner for roasted peanut [4.54 vs. 4.59 fiu (ns)] and bitter [2.57 vs. 2.29 fiu (ns)] attributes but was significantly higher for the sweet attribute [2.51 vs. 2.27 fiu ($P<0.05$)]. Georgia Green was not in the UPPT sample data set, but McCloud (UF03326) had the best flavor profile of any entry. N03090T was not significantly different from McCloud for roasted peanut, bitter, or sweet attributes. The development of a virginia-type peanut line with flavor equivalent to that of Florunner is a significant step in improvement of flavor of virginia market types.

Identification of Volatile Compounds Causing Natural Fruity Fermented Off-flavor in Peanuts. J.L. GREENE, T.H. SANDERS*, AND M.A. DRAKE. USDA-ARS-MQHRU, Department of Food Science, North Carolina State University, Raleigh, NC 27695.

Fruity fermented (FF) off-flavor, caused by high temperature curing, is a common off-flavor in peanuts. Published research indicated that ethyl-2-methylpropanoate, ethyl-2-methylbutanoate, ethyl-3-methylbutanoate, hexanoic acid, butanoic acid, and 3-methylbutanoic acid are responsible for FF off-flavor. These compounds were identified in immature peanut samples cured at a constant temperature of 40ºC. These conditions do not occur in normal peanut curing. There is no information on the compounds responsible for naturally occurring FF off-flavor in peanuts. The objective of this study was to identify the compounds responsible for natural FF off-flavor using instrumental, sensory, and model system studies. Two medium grade-size, runner-type peanut lots identified by a descriptive sensory panel as having no FF off-flavor (control) and high FF flavor (3.5 FF intensity) were chosen for volatile analysis. Prior to sensory and chemical analyses, peanuts were roasted to Hunter L=49±1 and ground into a paste. Peanut volatiles were extracted using solvent extraction/solvent assisted flavor evaporation (SAFE) and phase separated into neutral/basic and acidic fractions. Fractions were analyzed by gas chromatography-olfactometry (GC-O) using postpeak intensity and aroma extract dilution analysis (AEDA) in conjunction with gas chromatography-mass spectrometry (GC-MS) to identify and characterize the volatile components. The most potent volatile compounds identified in natural FF peanuts were: 3-methylbutanal (malty/chocolate), hexanal (green/grassy), 2-ethyl-6-methylpyrazine (sweet), trimethylpyrazine (earthy/soil/dirt), phenylacetaldehyde (rosy/floral), 2-ethyl-3,5-dimethylpyrazine (earthy/soil/dirt), and 2,3-diethyl-5-methylpyrazine (earthy/soil/dirt). The

previously reported esters were not identified in the natural FF sample. However, high concentrations of the previously reported esters added to a peanut paste model system resulted in samples described as rotten garbage (fermented/soured) and at lower concentrations natural FF off-flavor was perceived by a sensory panel. These results confirm that the previously reported esters and acids are responsible for naturally occurring FF off-flavor in peanuts; however, concentrations of the esters in naturally occurring FF samples are below instrumental detection.

Comparisons of Biodiesel Produced from Oils of Various Peanut Cultivars. J.P. DAVIS*[1], D. GELLER[2], W.H. FAIRCLOTH[3], and T.H. SANDERS[1]. [1]USDA-ARS Raleigh, NC; [2]Department of Biological and Agricultural Engineering, The University of Georgia, Athens, GA; [3]USDA-ARS, Dawson, GA.

Biodiesel is a renewable, clean burning alternative fuel that can be used in standard diesel engines with no engine modification and no perceptible loss in engine performance. Biodiesel production typically involves the transesterification of a seed oil feedstock, with soybean oil being the primary feedstock in the U.S. Peanut oil is suitable for biodiesel production, but there is little published information regarding peanut biodiesel. Peanut oils were extracted from 9 common cultivars of peanut and biodiesel was subsequently prepared from these oils using standard transesterification procedures. Viscosity (both dynamic and kinematic) for both the oils and biodiesels had an exponential response to changes in temperature, with higher temperatures resulting in lower viscosities. On average, biodiesels were about 76% and 86% less viscous than parent oils at 100 and 40ºC respectively. Values for the kinematic viscosity of peanut biodiesel at 40ºC ranged from about 6.2 to 5.1 $mm^2/s$, with an average value of 4.9 $mm^2/s$, values that are similar to biodiesels prepared from other common oilseed stocks. In contrast to trends observed in the oils, no clear correlations were observed in oleic acid content and biodiesel viscosity or biodiesel density. The propensity of the peanut biodiesels to crystallize (negative factor from a biodiesel perspective) was related to the fatty acid profiles for the various peanut oils. These data will aid decisions in developing peanut cultivars with optimal biodiesel characteristics.

## BAYER EXCELLENCE IN EXTENSION EDUCATION

Managing Peanut in Southeastern North Carolina. E.R. HARRELSON*, M.W. SHAW, D.E. MORRISON, D.L. JORDAN, B.B. SHEW, and R.L. BRANDENBURG, North Carolina Cooperative Extension Service, Raleigh, NC 27695.

Peanut has been an important crop in southeastern North Carolina for many years. Changes in farm legislation have allowed greater flexibility in peanut production, and growers in southeastern North Carolina have taken advantage of this opportunity. With the governmental system altered dramatically, many growers are able to increase production and many have no intentions of slowing down; there has also been an increase in new growers in southeastern NC. As markets and contracts become more available to growers in our area, enhancing quality of peanuts has become essential for farmers in order to receive the highest contracts possible. With increasing peanut acreage the North Carolina Cooperative Extension Service is an important source of information for producing a top quality commodity. With the aid of NCSU specialist, the county

agents can present the latest information at production meetings and various field days. Extension personnel also offer a "pod blasting" field day where growers can bring samples to determine maturity of the peanuts in order to dig at the optimum time. A peanut disease advisory has also become an integral part of peanut production in NC. We offer the advisory to all producers and encourage advisory use on all farms.

Peanut response to foliar growth promoters in Texas. C.R. CRUMLEY*, Texas Cooperative Extension Service, Seminole, TX 79360; S.A. RUSSELL, Texas Cooperative Extension Service, Brownfield, TX 79316; K.T. SIDERS, Texas Cooperative Extension Service, Levelland, TX 79336; and T.A. BAUGHMAN and J.C. REED, Jr., Texas Cooperative Extension Service, Vernon TX 76384.

Five trials (2 runner, 2 Spanish, and 1 Virginia) in 2005 and 4 trials (2 runner, 1 Valencia, and 1 Virginia) in 2006 were conducted to assess the effect of foliar additives on yield and grade of peanut. Products tested included Peanut Gro 4-2-1, CoRoN, Elemax Nutrient Concentrate + CoRon, Tracite Iron 5%, Cotton & Peanut Mix, Quick Boost Ultra, Humic Acid, Fulvic Acid, Liquid Chicken Compost, Humic Acid + Fulvic Acid + Liquid Chicken Compost, and Humic Acid + Foliar (varied between locations). No foliar product affected yield or grade at any of the locations when compared to where no foliar product was used.

On Farm Crop Enterprise Cost Analysis of Strip Till Vs Conventional Till Peanuts. R.M. BARENTINE*, Pulaski Cooperative Extension, University of Georgia, Hawkinsville, Ga. 31036; A. ZIEHL and N.B. SMITH, Agricultural Economics Department, University of Georgia, Tifton, Ga. 31793.

Strip till peanuts have been promoted as having the potential of being economically and environmentally sustainable compared to conventional tillage. Georgia peanut farmers now plant an estimated 175,000 acres of strip till peanuts each year. To assist growers with budgeting the University of Georgia Department of Agricultural and Applied Economics produces crop enterprise cost analyses for peanuts each year. Strip till budgets have recently been developed for peanuts. To help with the creation of the budgets, on-farm economic analysis was done in Pulaski County in 2006. Data for the case studies were collected from three strip till and one conventional till farm in the county. The data were used to help verify budget estimates and to compare with conventional tillage. Analysis of the data showed that fixed cost and the number of trips across the field are lowered under strip till production. In 2006, total cost for strip till peanuts was found to be lower compared with a conventional till field within one mile radius. Average yield for the strip till peanut fields was significantly higher than for the conventional till fields. The main result of the project was verifying actual strip till practices with UGA budgets.

Yield, Grade and Dollar Value of Two Peanut Cultivars as Affected by Digging Method. W.D. THOMAS* University of Florida Columbia County Extension, Lake City Florida 32025, J.A. BALDWIN, Agronomy, Department, The University of Florida, Gainesville Fl. 32611-0220, W.H. FAIRCLOTH and D.L. ROWLAND USDA/ARS National Peanut Research Laboratory, Dawson Ga. 39842.

Two peanut cultivars, C-99R and Georgia-02C, were planted in a split plot design with four replications. Cultivars were whole plots and split plot being digging method (inverted versus tented). The cultivars were in 36 inch rows planted on a

72 inch bed. The seed were planted at 6 seed per foot of row on the single row patterns. All plots were planted by conventional tillage methods. Both cultivars are late maturing, were dug on September 25, 2006 (156 days after planting) and combined on October 2, 2006. There was no difference in yield, grade, and dollar value due to the digging method utilized at peanut harvest. When comparing cultivars, Georgia 02-C had a significantly higher yield (3840 vs. 3020 lb./a), grade (%TSMK) (78 vs.76), and value per acre ($700.00 vs. $540.00) than C-99R. Further studies comparing these digging methods would be desirable particularly as to the effects on seed quality.

Using On-Farm Testing in a Region with Increasing Peanut Production. J.A. GADDY*, C.D. FOUNTAIN, D.L. JORDAN, B.B. SHEW, and R.L. BRANDENBURG, North Carolina Cooperative Extension Service, Raleigh, NC 27695.

Peanut production in the central coastal plain of North Carolina has increased following changes in federal legislation in 2002. To address increases in production in the area, on-farm research is conducted annually to address issues that newer producers face. Experiments have included fungicide efficacy trials, evaluation of plant growth regulators and inoculants, discussion of harvesting principles, and evaluation of traditional and promising peanut lines through the Peanut Quality and Evaluation (PVQE) program supported by peanut industry groups in North Carolina, Virginia, and South Carolina. These trials have provided hands-on training opportunities for growers and their advisors in the region, and have added to the database used to make recommendations across the Virginia-Carolina Region.

Evaluation of Fungicide Efficacy on Peanuts in Early County, Georgia. B. CRESSWELL*, R. KEMERAIT, University of Georgia Cooperative Extension, Early County and University of Georgia Cooperative Extension, Plant Pathology, Tifton, Georgia.

The cost of a fungicide program is potentially the single most expensive input a peanut producer in Georgia incurs each year. In this study, several fungicide programs for management of peanut diseases were assessed in Early County over a period of four years. These large-plot trials were conducted on commercial fields where each treated plot was 18 rows wide by the length of the field. The fungicide treatments, to include some permissible for organic production, have been evaluated for efficacy on diseases and impact on crop yield. Diseases evaluated in the studies included Rhizoctonia limb rot, white mold, Cylindrocladium black rot, early and late leaf spot, and tomato spotted wilt. Ratings for leaf spot diseases were taken just prior to digging. Soilborne diseases were assessed immediately after the crop was dug and inverted. The fungicides evaluated include: Abound, Artisan, Bravo, Folicur, Headline, Moncut, Provost, Tilt-Bravo, and the organic fungicide Neem oil. Yield was determined by harvesting the center six rows of each 18-row plot and converting the plot yield to pounds per acre. Economic return was determined using the loan value based on yield and grade factors and subtracting out the cost of the fungicides. As expected the “Cadillac” treatment of an Abound and Folicur combination, in three out of four years, gave the highest yield. However, in only one of those years did it show the highest return.

Virginia Regional Market Analysis and Outlook Utilizing the Internet as an Interactive Delivery System. M.T. ROBERTS*, Virginia Polytechnic and State University, Prince George Extension Office, Prince George, VA, 23875.

This project began July 1, 2006 and is scheduled to end June 30, 2007. The interactive delivery system is now a proven concept that is expandable to many extension audiences. Project audiences were: 1) Major commodity producers of peanuts, corn, soybeans, wheat, cotton, and livestock; 2) Specialty crop and small farmers; 3) Extension agents; and 4) Other influencers. Each seminar included a session showing learners how to utilize outlook information to manage risk. The Extension environment is evolving quickly. Fiscal, physical, and human resources require leveraging more now than ever. The Extension Specialist pool has declined not only in Virginia but across the entire spectrum of the land grant university system while the demand for cutting-edge information that is both timely and relevant has expanded. The goals of this project matched those of eXtension. That is, to use improved distance learning technology to leverage limited resources while expanding the capacity to deliver information that may empower participants to better manage risk while maintaining or increasing farm profitability. Survey results show that one-hundred percent of the respondents would not only attend future seminars conducted in this manner but would heartily support and promote future meetings of this type that make more efficient use of valuable and limited extension resources.

## EXTENSION TECHNIQUES AND TECHNOLOGY

Evaluation of Certain Fungicides and Fungicide Combinations on the Incidence of Peanut Disease. P.D. WIGLEY*, Calhoun County Extension, University of Georgia, Morgan, GA 39866; and R.C. KEMERAIT, Department of Plant Pathology, University of Georgia, Tifton, GA 31793-0748.

Field experiments were conducted to evaluate five fungicide systems for control of leafspot, white mold, and Rhizoctonia pod rot during the 2006 growing season. The systems that were evaluated included a four block Folicur program (sprays 3 - 6) with Bravo (sprays 1, 2 & 7); Tilt Bravo (sprays 1 & 2) + Abound (sprays 3 & 5), with Bravo (sprays 4, 6 & 7); Headline (sprays 1a, 4) Moncut (sprays 3 & 6), Bravo (sprays 3, 5, 6 & 7); Moncut (sprays 3 & 5) with Bravo (sprays 1, 3, 4, 5, 6 & 7) with Tilt Bravo (spray 2); and Provost (sprays 3, 4, 5 & 6) with Bravo (sprays 1, 2 & 7). Treatments were applied according to manufacturers' recommendations. Disease control ratings were taken from each plot. Disease control and yield comparisons were not statistically different among treatments.

## ORGANIC PRODUCTION

Effects of Biofungicides and Botanical Extracts on Yield and Quality of Valencia Peanut. N. PUPPALA*, Agricultural Science Center at Clovis, 2346 State Road 288, Clovis, NM 88101, New Mexico State University, and S. SANOGO, Entomology, Plant Pathology and Weed Science, New Mexico State University

Organic Valencia peanuts are contracted at $ 900 per ton compared to the conventional peanuts at $ 550 per ton. The demand for organic peanuts is

increasing and the processors in eastern New Mexico cannot find the growers who can supply organic peanuts. Valencia peanuts yields are less compared to other market types and are very susceptible to fungal diseases. The objective of this study is to look at the efficacy of biofungicides, reduced rate of a chemical fungicide, and in-furrow application of botanical extracts for controlling soil borne diseases on peanut yield and grade. Two field experiments were conducted in 2006 in Clovis area in Curry County in eastern New Mexico. One of the fields had a high pressure of black hull, and the other field had low pressure of pod rot and black hull. Except for Capsicum oleoresin and garlic extracts, the same set of treatments was used in both experiments. Capsicum oleoresin and garlic extracts were used in Experiment 2 only. Plots were arranged in randomized complete block design with three replications. There was no significant difference among treatments with regard to disease incidence.

Evaluation of Seven Peanut Varieties in an Organic Production System on Eastern Shore Virginia. D.L. COKER, Soil and Crop Sciences, Texas A&M University, College Station, TX, 77843-2474; D.A. HERBERT, JR.*, S. MALONE, and F. SHOKES, Tidewater Agricultural Research and Extension Center, Virginia Tech, Suffolk, VA, 23437; and B. JARDINE, Quail Cove Farms, Machipongo, VA, 23405.

A field test was established on Eastern Shore, Virginia at the Quail Cove Farms to evaluate pests and performance of peanuts in an organic farming system. Seven varieties (five virginia market-type and two runner market-type) were planted on May 31, 2006 in randomized strips (four rows by 110 ft) replicated five times. The inoculant Optimize Lift (EMD Crop BioScience, Milwaukee, WI) was applied into the seed furrow at 3 oz per acre diluted in 5 gal water per acre. On July 28, Entrust® Naturalyte Insect Control (spinosad, Dow AgroSciences, Indianapolis, IN) was applied on two of the four rows of each plot at 3 oz per acre as a broadcast spray diluted with water for potato leafhopper control. Data collected included thrips plant injury ratings, leafhopper sweep net counts and plant injury ratings, disease ratings, pod damage by soil insects, pod yield and kernel quality.

Thrips plant injury was very low throughout the test never exceeding 1.0 on the 0 to 10 injury rating scale and did not differ between varieties. There was no treatment x variety interaction for number of leafhoppers. Combined across varieties, application of Entrust® provided no significant difference (P=0.53) (treated = 33 per 25 sweeps, untreated = 34 per 25 sweeps). However, there was a significant difference between varieties (P<0.01) with Georgia Red (20.3 per 25 sweeps), C11-2-39 (22.2 per 25 sweeps) and GPNC 343 (27.7 per 25 sweeps) having the fewest. Disease ratings indicated very little tomato spotted wilt virus (only 3 hits in the entire test) and no sclerotinia or cylindrocladium black rot. Pod damage by soil insects ranged from 12 to 40 percent of pods scarified, and there was a significant difference between varieties (P=0.01), with Wilson (14.4%) and C11-2-39 (12.0%) having the fewest. There was no treatment x variety interaction for pod yield. Combined across Entrust®-treated and untreated plots, the virginia market-type varieties VA 98R (2803 lb/acre), Wilson (2801 lb/acre), NC-V 11 (2682 lb/acre) and Champs (2541 lb/acre) had significantly higher yields than the virginia market-type GPNC 343 (2123 lb/acre) and the runner market-types Georgia Red (1933 lb/acre) and C11-2-39 (1151 lb/acre). With virginia types, percent ELK (extra large kernels) ranged from 19.6 to 26.0 percent and was not significantly different between varieties (P=0.19).

With runner types, ELK ranged from 11.4 to 14.2 percent and was not different between varieties (P=0.37). TM (total meat content) ranged from 66.1 to 69.4 percent and there was no significant difference between runner types (P=0.36), but there was a difference between virginia types (P=0.03) with Wilson (66.1%) having the least.

Evaluation of Organically Acceptable Fungicides for Management of Leaf Spots in Georgia. E.G. CANTONWINE*. National Environmentally Sound Production Agriculture Laboratory, University of Georgia, Tifton, GA, 31793; A.K. CULBREATH, Department of Plant Pathology, University of Georgia, Tifton, GA, 31793; and M.B. BOUDREAU, Hebert Green Agroecology, Asheville, NC, 28801.

Most synthetic fungicides are restricted from use in fields where certified organic crops are grown. Natural products with fungicidal activity, such as mined minerals, secondary products of plants, and biological organisms, are allowed. Field experiments were carried out in Tifton, GA in 2005 and 2006 to evaluate the efficacy of organically acceptable products for management of early and late leaf spots of peanut (cv. Georganic). The fungicide treatments included a non-treated control and 14-d interval applications of neem oil (2 pt/A), copper sulfate (2 lb/A), *Bacillus subtilis* (Serenade, 2 pt/A) + surfactant (0.3% V:V) + copper sulfate (2 lb/A), sulfur (5 lb/A), and copper sulfate (2 lb/A) + sulfur (5 lb/A). Across years, the mean final percent defoliation due to leaf spot was highest for the non-treated control (77%) and neem oil (76%) treatments, lowest for plots treated with copper sulfate alone (9%) or in a mixture (7-9%), and intermediate for the plots treated with sulfur (43%) ($P > 0.01$; LSD = 6.1). Mean pod yields of treatments did not differ significantly from the non-treated control (3055 lb/A), except for the copper sulfate treatment where yields were significantly greater (3440 lb/A) ($P = 0.03$). Results of this study suggest that applications of neem oil do not suppress early and late leaf spot diseases. Sulfur reduced the severity of leaf spot diseases, but did not provide as much control as copper sulfate. Copper sulfate performed as well alone as it did when mixed with *B. subtilis* or sulfur. The yield response to fungicide treatments was minimal, which suggests that Georganic has considerable tolerance to leaf spot diseases.

Developing Enterprise Budgets for Organic Peanut Production. S.K. GREMILLION, E.G. CANTONWINE, The University of Georgia, Coastal Plain Expt. Stn., Tifton, GA 31793; N.B. SMITH*, Department of Agricultural and Applied Economics, University of Georgia, Tifton, GA 31793; M.C. LAMB, USDA/ARS, National Peanut Research Laboratory, Dawson, GA 39842.

Organic production in peanuts is gaining interest among growers and the public. According to the USDA Economic Research Service, organic farming is one of the fastest growing segments of U.S. agriculture over the last decade. The National Peanut Research Laboratory is conducting research related to peanut production under organic conditions. The research provides valuable data for growing peanuts using production practices that meet certification requirements. The University of Georgia is also looking at disease resistant cultivars, acceptable fungicide regimes, and weed management strategies that may perform well under organic production conditions. Obstacles and constraints to adoption for peanut farmers include high managerial costs, production risks, lack of information, marketing and infrastructure. However, interest is expected to grow because of the potential to capture high-value markets and boost farm

income. To help farmers examine the profitability, organic peanut budgets are developed to include equipment and practices specific to organic production. The budgets are based on research results and grower input. The budgets give farmers a tool to use in looking at a new way of farming and estimate the yield and prices needed to be profitable.

Economics of Organics versus Conventional Peanut and Cotton. M.C. LAMB*[1], E. CANTONWINE[2], R.B. SORENSEN[1], R.C. NUTI[1], G. TILLMAN[3], and N.B. SMITH[4]. [1]USDA/ARS-National Peanut Res. Lab., Dawson, GA 39842. [2]University of Georgia, Coastal Plain Expt. Stn., Tifton, GA 31793. [3]USDA/ARS-Crop Protection and Management Lab., Tifton, GA 31793. [4]University of Georgia, Dep. Of Ag. and Applied Economics, Tifton, GA 31793.

The demand for organically produced peanuts and cotton represent the fastest growing sector for each of these commodities. Significant price premiums at the producer level are associated with certified organic commodities. However, such incentives are needed to convert a field or farm from conventional production to an organic production system are not easily or quickly observed due to the transition period required for products to be marketed as “Organic”. Two years (2004 and 2005) of research on an irrigated and non-irrigated peanut/cotton, transitional organic rotation system were completed at the USDA/ARS National Peanut Research Laboratory’s Multi-crop Irrigation Research Farm. Official “Organic Certification” was received in 2006 and research was continued in 2006 in conjunction with on-going irrigated and non-irrigated research in conventionally produced peanut/cotton rotations to provide direct comparisons in terms of production cost(s), yield, grade, and quality. In 2006, peanut yields in the conventional plots were 274 and 1553 lbs per acre higher than the non-irrigated and irrigated organic yields, respectively. The 2006 conventional cotton yields were 96 and 380 lbs per acre higher than the non-irrigated and irrigated organic yields, respectively. The FarmSuite In-Season Cost Monitoring System (developed at the National Peanut Research Laboratory) was used to monitor all crop production inputs from initial tillage to final harvest operations. Final yield and farmer stock grade are recorded to calculate gross revenue per acre. These data, taken comparatively between the organic and conventional production systems, are entered into the WholeFarm Cross Commodity Breakeven Price matrix that will calculate how much the price of one commodity must change such that the economic net returns are exactly the same between commodities. More simply put, this will calculate the exact price premium (and associated yield) that a farmer must receive for organic peanut before he/she should consider converting a field or farm from conventional production to organic production (including the transition period). This will provide producers that are interested in organic production information on production cost(s), expected revenue, and required price premiums to improve their decision making and minimize production and marketing risk.

## HARVESTING, CURING, SHELLING, STORING AND HANDLING

Peanut Quality as Affected by Digging Method. J.A. BALDWIN*, Agronomy Department, The University of Florida, Gainesville Fl. 32611-0220, W.D. THOMAS University of Florida Columbia County Extension, Lake City Florida 32025, W.H. FAIRCLOTH and D.L. ROWLAND USDA/ARS National Peanut Research Laboratory, Dawson Ga. 39842.

Two peanut cultivars, C-99R and Georgia-02C were planted in a split plot design with four replications. Cultivars were whole plots and split plot being digging method (inverted versus tented). The cultivars were in 36 inch rows planted on a 72 inch bed. The seed were planted at 6 seed per foot of row on the single row patterns. All plots were planted by conventional tillage methods. Canopy temperature and relative humidity measurements were recorded prior to peanut digging. The canopy measurements were all significant for digging style. The tented canopies resulted in a more stable environment. The range in both temperature and relative humidity was significantly less ($p<.001$) for tented vs. inverted peanuts. Also, the average temperature was higher, while at the same time the average relative humidity was lower ($p<.05$) giving a better curing effect for the tented digging method. Following peanut harvest the seed were shelled and sorted. The medium size seed were analyzed for seed germination and flavor characteristics. There were no differences due to variety, digging method and no variety by digging method interactions occurred for either germination or flavor characteristics. Both of these cultivars are late maturing and were dug on September 25, 2006 (156 days after planting) and combined on October 2, 2006.

Nondestructive Moisture Content Determination In In-Shell Peanuts Using An Impedance Measuring Instrument. C.V. KANDALA* and C.L. BUTTS, USDA, ARS, National Peanut Research Laboratory, Dawson, GA 39842.

The design of an electronic circuit that measures the impedance (i) and phase angle (φ) of a parallel-plate capacitance system, holding a peanut sample between the plates, is described. A prototype was built, in which, the parallel-plate system was housed inside an acrylic cylindrical tube. Peanut samples were placed inside the tube till they occupied the space between the parallel-plates. i and φ values were measured for peanut pod samples with known moisture contents, as determined by the standard air-oven method, in the moisture range of 7% and 17%, at two frequencies 1 and 5 MHz. From the measured values of i and φ and the known moisture content (mc) values a predictive equation was developed using statistical methods, and the values of the regression coefficients in the equation were determined. The mc value of an unknown sample was then determined by measuring its i and φ values at the two frequencies, and using them in the predictive equation. The estimated values of the samples tested were within 1% of their air-oven values for 95% of all the samples tested in the moisture range of 7% and 17%. This method is nondestructive and rapid, and can be used for other types of nuts and grain.

Poor Field Emergence of Late-Maturing Peanut Cultivars (*Arachis* hypogaea L.) Derived from PI 203396. B.R. MORTON*, B.L. TILLMAN, D.W. GORBET, and K.J. BOOTE, Agronomy Department, The University of Florida, Gainesville, FL 32611-0300.

Late-maturing peanut cultivars DP-1, C-99R, Hull, and Florida MDR-98 (*Arachis hypogaea* L.) have superior resistance to leafspot (*Cercosporidium personatum*, Berk & Curt.), white mold (*Sclerotium rolfsii*, Sacc.), and tomato spotted wilt virus. The improved resistances are primarily derived from PI 203396. The cultivars are high yielding. They provide the grower the opportunity to reduce fungicide applications and variable costs without reducing yields. Because of poor field emergence, commercial seed companies have stopped producing Florida MDR-98, DP-1, and Hull. Official towel germination tests usually show acceptable seed quality. Reduced field emergence seldom occurs when the seed peanuts have been grown, harvested, and stored in small batches in research storage facilities. The poor field emergence occurs when seed production is through commercial channels with large volumes being harvested, stored in bulk bins, and treated with fungicides. The problem may be related to the commercial practice of storing seed peanuts in large piles with inadequate ventilation.

Four cultivars from two different field origins were stored in four environments and then tested for field emergence. Field origin did not affect field emergence, but storage environment did. Peanuts stored in bulk in a traditional peanut warehouse at elevated temperatures and relative humidity had reduced field emergence. There was a genotype by storage environment interaction. Field emergence was maintained when seed was stored at < 16$^{o}$C and < 70% relative humidity. Standard towel germination tests were not reliable indicators of field emergence. Electrolyte conductivity tests and seed vigor tests were highly correlated with field emergence. The increased electrolyte conductivity and decreased rate of growth of the hypocotyl-radicle indicated that cellular membranes were damaged during storage at elevated temperatures and relative humidity. The literature suggests that peroxidation of lipids occurred resulting in the production of free radicals and autoxidation. The antioxidant capacity of seed varied by cultivar and year of production.

Field emergence could be improved by reducing temperatures and relative humidity in the storage environment. Since standard towel germination tests were not reliable indicators of field emergence for these late-maturing cultivars, an alternative method of evaluating peanut seed quality should be adopted.

Effect of Temperature and Relative Humidity on Spotting of Peanuts after Roasting. J.W. DORNER*[1], C.L. BUTTS[1], V.S. SOBOLEV[1], T.H. SANDERS[2], and T.B. WHITAKER[2]. [1]USDA, ARS, National Peanut Research Laboratory, Dawson, GA 39842; [2]USDA, ARS, Market Quality and Handling Research Unit, Raleigh, NC 27695.

A phenomenon commonly known as “spotting” has been recognized for some time in which peanuts that have been roasted and blanched have one or more very dark, distinct, visible discolorations. Spotting is assumed to be associated with some form of damage, but a small percentage (< 2%) of spotted seed in a shelled, roasted lot is generally considered unavoidable and acceptable. In recent years an unusually large number of shelled lots have been found to contain unacceptably high (> 2%) levels of spotted seed. This increase in spotting could relate to conditions that seed are exposed to after shelling and during shipment to end users, or it could be associated with increased length of farmers’ stock storage that exposes peanuts to the higher temperatures and relative humidities of the summer months. The objective of this study was to determine the relationship of various combinations of temperature and high

relative humidity to the presence and/or development of spots. In a series of separate experiments, shelled and unshelled peanuts were placed in an environmental chamber controlled at different temperature and relative humidity combinations. Replicate 300 g samples were taken at various time intervals during each experiment to determine fungal colonization and percent spots after roasting. Results showed that highly significant increases in both fungal load (cfu/g) and spot percentage occurred during extended exposures, and the rate of spot development was associated with increasingly higher temperature/relative humidity combinations. Exposing shelled peanuts to a temperature of 26.7 C and 80% RH for 11 days produced an exponential increase in spotting that is described by the following equation: $y = -1.35 + 0.82\ e^{x/3.16}$, ($r^2 = 0.971$), where y is the % of spotted peanuts and x is the number of days. Fungal colonization of peanuts as measured by total cfu/g also increased exponentially producing an $r^2$ of 0.963 (equation not shown). Reducing either the temperature or RH increased the time necessary for a similar increase in spotting to occur. For example, at the same temperature but a RH of 72%, 37 days were required to produce the same percentage of spotted seed as were produced in only 8 days at 80% RH. An increase in colonization of peanuts by fungi capable of growing at relatively low water activity occurred during the exposures of peanuts to the adverse conditions, particularly where the testae were broken. These data confirm that exposure of peanuts to relatively high temperatures and humidities is most likely responsible for the increase in spotting and illustrate the need to monitor temperature and relative humidity conditions during storage and shipment of peanuts so that adjustments can be made to prevent spotting.

Environmental Conditions During Transport of Shelled Peanuts in Overseas Containers. C.L. BUTTS*[1], J.W. DORNER[1], V. SOBOLEV[1], T.H. SANDERS[2], and T.B. WHITAKER[2]. [1]USDA, ARS, National Peanut Research Laboratory, Dawson, GA 39842; [2]USDA, ARS, Market Quality and Handling Research Unit, Raleigh, NC 27695.

Peanuts exported overseas may be in transit from the shelling plant or cold storage to the overseas manufacturer for 30 d or more. In some instances, quality assurance testing at the overseas destination indicates that peanuts no longer meet contractual quality specifications. Considerable effort and research have been devoted to developing standard sampling and testing protocols for various quality specifications such as aflatoxin contamination in shelled peanuts. A study was undertaken to monitor the temperature and relative humidity conditions in shelled peanuts during transit overseas. Dataloggers (Hobo H08-003-02, Onset Computers, Bourne, MA) were placed in small sample bags with approximately 1 kg of shelled peanuts to record temperature and relative humidity. Three samples with dataloggers were placed in a 1-t unit of shelled peanuts; one at the center, one at the outside edge, and one at the top. The 1-t unit consisted of shelled peanuts in a tote or a pallet of 25 jute bags. Each overseas container held 22 units, five of which were instrumented. Two dataloggers were installed in the headspace of each container to record the temperature and humidity. A total of two containers were shipped between August 2005 and October 2005 through the port at Savannah, GA to Rotterdam, Netherlands. The samples were retrieved from each unit with the datalogger upon unloading at the destination and returned to the US via overnight courier for analysis. Peanut samples were oil roasted and blanched then visually inspected for spotting. Data for percent spotted peanuts before and after shipment were compared.

Shipment 1 contained peanuts contained peanuts packaged in totes and jute bags on pallets. Peanuts were packaged on August 16, 2005 and placed in dry storage. Peanuts were removed from dry storage, placed in containers, and shipped on August 18, 2005. The container arrived at it destination in Rotterdam on September 23, 2005. Total transit time from Headland, AL to Rotterdam was 36 d (864 h). Based on subsequent research in which peanuts were stored at 21 C and 76% relative humidity, spot percentage would be expected to increase above a 2% threshold in about 21 d (504 h). Only one sensor recorded conditions greater than 21 C and 76 % relative humidity for any significant amount of time. The sensor placed in the top of one tote accumulated 59 h above the threshold. Spot percentage did not increase significantly in the first shipment.

Shipment 2 contained peanuts from the same shelled stock lot as Shipment 1. These peanuts were placed in cold storage on August 16, 2005. The peanuts were removed from cold storage and immediately placed in containers on August 26, 2005. The container arrived at its destination in Rotterdam on October 7, 2005 for a total transit time including cold storage of 52 d (1248 h). Percent spots increased from 1.2 to 2.5% during transit. However, using the same temperature and humidity criteria, only 12 h were accumulated above the threshold in one sample out of 15.

In both shipments, conditions were very stable while in transit on the ship because the containers were placed below deck. The temperature conditions in the headspace were not subject to significant diurnal fluctuations. However, once the containers arrived at the European port, diurnal fluctuations in temperature and relative humidity occurred. The containers remained unopened at the port for several days. During this time, the relative humidity remained above 75% for a significant portion of the time. Had the temperature been higher, the conditions could have been conducive for fungal activity.

Determination of the Nature of Spotting in Blanched Peanuts. V.S. SOBOLEV*, J. DORNER and C.L. BUTTS, USDA, ARS, National Peanut Research Laboratory, Dawson, GA 39842 and T.H. SANDERS and T.B. WHITAKER, USDA, ARS, Market Quality and Handling Research Unit, Raleigh, NC 27695.

The peanut spotting is a big problem responsible for significant loss by the peanut industry. The cause of the spotting has been identified in the lab as being due to infection by fungi. Secondary fungal metabolites and peanut stilbene phytoalexins were not involved in the spot formation. The nature of spotting has not been fully characterized, but suggested as being due to a non-enzymatic browning. Significant changes in sugars and proteins upon peanut blanching contribute to the spotting. Compounds that produced orange, green, and blue fluorescence have been isolated from spotted peanuts and analyzed by HPLC-$MS^n$. Those are colorless low-molecular weight compounds that could be considered early indicators of browning. Isolated colored compounds had very complex composition and were similar to compounds yielded from the Maillard reaction. Preliminary data indicated that the brown color of the spots is formed in part by high-molecular weight melanoidin polymers generated by condensation of heterocyclic subunits. Structural elucidation of the pigmented components is crucial for the determination of the nature of spotting. The peanut industry will benefit from knowledge of the exact chemical cause of spotting because further

specific actions may be taken to prevent the problem.

Uncertainty Associated with Measuring the True Level of Spotted Peanuts in Bulk Lots of Shelled Peanuts. T.B. WHITAKER*[1], T.H. SANDERS[1], J.W. DORNER[2], C.L. BUTTS[2], and V.S. SOBOLEV[2]. [1]USDA, ARS, Market Quality and Handling Research Unit, Raleigh, NC 27695; [2]USDA, ARS, National Peanut Research Laboratory, Dawson, GA 39842.

Shelled peanut kernels stored at elevated temperature and relative humidity conditions can exhibit discolored spots after roasting and blanching. Food manufacturers prefer not to use shelled peanuts in the food manufacturing process with excessive levels of spotted peanuts. Handlers estimate the true percent spotted peanuts (PSP) in a commercial lot by measuring the PSP in a small sample taken from the lot before shipment to a food manufacturer. Because of the variability (uncertainty) among sample values taken from the same lot, it is difficult to get an accurate and precise estimate of the true PSP in the lot. The objectives of the study were to measure the variability among replicate sample test results and use the variance estimates to demonstrate how to reduce the variability among sample test results to acceptable levels and make more precise estimates of the true PSP in a bulk lot. Thirty-two samples, 200 g each, were selected at random from each of four commercial lots of shelled peanuts suspected of having different levels of PSP. The PSP, by mass, was measured in each sample. The mean and variance among the 32 sample test results (PSP) was calculated for each of the four lots. Results showed that the variance among sample test results was a function of the mean level of PSP among the 32 sample test results. A regression equation was developed to predict the variance ($S^2$) among sample test results as a function of sample size (ns in grams) and true lot PSP [$S^2=(200/ns)0.417PSP^{0.879}$ with an $R^2=0.99$]. For example, when using 95% confidence limits, the PSP among 200 g samples taken from a lot with a true PSP of 2% will vary 2% +/- 1.72% or from 0.28 to 3.72%. Increasing sample size from 200 to 800 g reduces the variance among sample test results by a factor of four (compared to a 200 g sample) and the variation among sample test results is reduced to 2% +/- 0.86% or from 1.14 to 2.86%. The uncertainty equations can be used by the peanut industry to select sample sizes to reduce uncertainty to acceptable levels and reduce misclassification of lots relative to an established tolerance.

## WEED SCIENCE

Tolerance of "New" Peanut Varieties to "Old" Herbicides. E.P. PROSTKO* and T.L. GREY, Department of Crop and Soil Sciences, The University of Georgia, Tifton, GA 31793.

The increased incidence of tomato spotted wilt virus (TSWV) in the southeastern U.S. has prompted peanut breeding programs to release numerous cultivars in recent years. Because most peanut herbicides were registered for use prior to 1996, the tolerance of these new varieties to older peanut herbicides has not been adequately evaluated. Small-plot, replicated field trials have been conducted over several years to evaluate the tolerance (yield) of new peanut varieties to paraquat (0.129 lb ai/A) or chlorimuron (0.008 lb ai/A). All field trials were conducted under weed-free conditions. All data were subjected to ANOVA ($P \leq 0.10$). In 2003, a significant peanut variety (C-99R, DP-1, Georgia Green) by paraquat timing [7, 14, 28 days after cracking (DAC)] interaction was

observed. Paraquat had no effect on the yield of C-99R. DP-1 yields were reduced when paraquat was applied 14 DAC. Georgia Green yields were reduced by all applications of paraquat. In 2004, an interaction between peanut variety and paraquat timing was not observed. When averaged over the three varieties, paraquat reduced peanut yield when applied 28 DAC. In 2006, paraquat had no effect on the incidence of TSWV or yield of Georgia–02C. In 2005 and 2006, chlorimuron had no effect on the incidence of TSWV or yield of AP-3 or Georgia-02C. Generally, these results suggest that the "new" peanut varieties are not uniquely sensitive to "older" herbicides such as chlorimuron or paraquat.

Does Basagran Safen Peanut Injury from Cobra? P.A. DOTRAY*, Texas Tech University, Texas Agricultural Experiment Station, and Texas Cooperative Extension, Lubbock; W.J. GRICHAR, Texas Agricultural Experiment Station, Beeville, TX; T.A. Baughman, Texas Cooperative Extension, Vernon; and L.V. GILBERT, Texas Agricultural Experiment Station, Lubbock.

Cobra (lactofen) has a federal label for postemergence use in soybean (*Glycine max*) and peanut (*Arachis hypogaea*), and postemergence-directed in cotton (*Gossypium hirsutum*) to control several annual broadleaf weeds. Cobra is classified as a diphenyl ether (cell membrane disruptor) and inhibits the enzyme protoporphyrinogen IX oxidase. Thorough spray coverage is important for all contact herbicides to achieve maximum weed control. Tolerance to Cobra is based on the crops ability to metabolize (modify) the herbicide into an inactive form, which often results in some leaf chlorosis and necrosis after application. The degree of crop injury may be related to Cobra rate, environmental conditions, and crop health and growth stage. Several questions have been asked regarding the use of bentazon (Basagran) to safen peanut injury from Cobra. These questions appear to stem from previous peanut research from the southeast, where it was shown that Basagran safens peanut injury from paraquat (another contact inhibiting herbicide). A factorial study was initiated that involved Cobra rates (0, 0.1, 0.15, 0.2 lb air/A), Basagran rates (0, 0.16, 0.31 lb air/A), and application timings (6-leaf, 2 weeks after 6-leaf, 4 weeks after 6-leaf). Visible peanut injury was as much as 8% following Cobra applications and no Basagran treatment reduced leaf necrosis or stunting. No three-way or two-way interaction was observed for peanut yield, which allows main factor mean separation to be investigated. No differences in yield were observed following Cobra rates (averaged across Basagran rates and application timings). Peanut yield ranged from 4629 to 4843 lb/A. No differences in yield were observed following Basagran rates (averaged across Cobra rates and application timings). Peanut yield ranged from 4672 to 4790 lb/A. When averaged across Cobra and Basagran rates, peanut yield following applications made at 6-leaf (4896 lb/A) were greater than yields observed following applications made two weeks later (4738 lb/A). Peanut yield from plots that received applications two weeks after 6-leaf treatments were greater than applications that were made two weeks later (4602 lb/A). The effects of application timing are most likely due to timely control of weeds and reduced weed interference and subsequent higher yields. No differences in peanut grade were observed regardless of treatment. Palmer amaranth (*Amaranths palmer*) control was reduced when Basagran at 0.016 or 0.031 lb air/A was added to Cobra at 0.2 lb air/A plus crop oil concentrate (1% v/v) applied to 2- to 4-inch weeds. In this same test, no antagonism was observed when applications were made to 8- to 10-inch weeds. In a second test, no antagonism was observed when applications were made to 1- to 4-inch and 2-

to 6-inch Palmer amaranth. This research suggests that Basagran does not safen peanut injury from Cobra and herbicide antagonism is possible when trying to control Palmer amaranth with a tank mix of Cobra plus Basagran.

Weed Control and Phytotoxicity of Delayed Applications Dinitroaniline Herbicides in Strip-Tillage Peanut Production. W.C. JOHNSON, III* and E.P. PROSTKO. USDA-ARS, Coastal Plain Experiment Station, Tifton, GA 31793.

Situations occasionally arise where dinitroaniline herbicides are not applied in a timely manner to peanut; either preplant or immediately after seeding. This is particularly frequent in strip-tillage peanut production. In those cases, questions arise if dinitroaniline herbicides can be applied days or weeks after seeding. Trials were initiated in 2004 in Tifton, GA to determine the weed control efficacy of delayed applications of dinitroaniline herbicides and, in separate trials, the injury potential on peanut in strip-tillage peanut production. In the efficacy trials, treatments were a factorial arrangement of seven possible times of pendimethalin application and three possible tank-mixtures with pendimethalin. Pendimethalin was applied immediately after seeding, at vegetative emergence (VE) of peanut, 1-wk after VE, 2-wk after VE, 3-wk after VE, 4-wk after VE, and nontreated control. Tank mixtures with pendimethalin included paraquat, imazapic, and a nontreated control. Texas panicum was the predominant weed present both years. Pendimethalin alone did not control Texas panicum when applied after VE. Delayed applications of pendimethalin partially controlled Texas panicum when tank-mixed with either paraquat or imazapic, although the herbicide combinations applied at VE or 1-wk after VE provided superior Texas panicum control of all treatments evaluated. Separate weed-free studies evaluated the phytotoxicity of delayed applications of pendimethalin and ethalfluralin in strip-tillage peanut. Each herbicide was applied immediately after seeding, VE, 1-wk after VE, 2-wk after VE, 3-wk after VE, 4-wk after VE, and a nontreated control. Both herbicides temporarily stunted peanut when applied 2-wk and 3-wk after VE, based on visual estimates of injury. However, neither pod formation at mid-season nor final yield was affected by any treatment combination. These data show that in strip-tillage production systems, delayed applications of dinitroaniline herbicides are not overly injurious to peanut. However, Texas panicum control is reduced by delayed applications of pendimethalin and requires combinations with either paraquat or imazapic for acceptable weed control.

Physiological Behavior of Root-Applied Diclosulam in Peanut (*Arachis hypogaea*), Pitted Morningglory (*Ipomoea Lacunosa*), and Sicklepod (*Senna obtusifolia*). S.B. CLEWIS*, W.J. EVERMAN, D.L. JORDAN, and J.W. WILCUT; Crop Science Department, North Carolina State University, Raleigh, NC 27695-7620.

Laboratory experiments using 14C-diclosulam were conducted to investigate differential tolerance exhibited by peanut, pitted morningglory, and sicklepod to root-applied diclosulam. Treatments were arranged in a randomized complete block design with six replications to evaluate absorption, translocation, and metabolism of diclosulam. For absorption and translocation studies, peanut plant roots, cotyledon pitted morningglory, and sicklepod were placed into 3 mL of 50% Hoagland's solution containing 1.85 kBq of 14C-diclosulam contained in 5 mL glass vials. Treated plants were harvested 4, 24, 48, or 72 HAT and roots washed with 10 ml of methanol:water (1/1, v/v) and 0.25% (v/v) nonionic

surfactant (Induce®) solution to remove non-absorbed herbicide. A 1 mL aliquot from each stem wash was added to 25 mL of scintillation cocktail and quantified by liquid scintillation spectroscopy (LSS) (Packard® TRI-CARB 2100TR). Peanuts, pitted morningglory, and sicklepod were sectioned into two parts, shoot and roots. These parts were placed into paper bags and dried at 65 C for at least 72 h. The plant parts were then ground with a coffee grinder and subsample was oxidized in a biological oxidizer, where 14C was trapped in scintillation cocktail, and radioactivity quantified by LSS. For the metabolism portion of the study, plants were treated and harvested as previously described for absorption and translocation studies. Plant portions were ground in a tissue homogenizer with 10 mL of methanol. The homogenate was then rinsed into a vacuum filtration apparatus with an additional 10 mL of solvent. The remaining extracted plant material was oxidized and non-extracted 14C quantified as previously described. The filtrate was evaporated to near dryness and then brought to 0.5 mL volume with methanol, shaken, and stored at 4 C until analysis. 150 L of each sample was spotted on a 20 by 20-cm silica gel thin layer chromatography (TLC) plate and developed to a 16-cm solvent front to separate the parent herbicide from possible metabolites. The solvent consisted of benzene:acetone:formic acid (30:10:1, v/v). TLC plates were partitioned into nine 2-cm wide lanes. A 14C-diclouslam standard was spotted on the first lane of each plate. The remaining eight lanes received a single replicate of a treated plant portion sample from each of the 3 species for the 6 runs of the studies. Plates were air dried and radioactive positions, proportions, and corresponding R$f$ values were determined by scanning TLC plates with a radiochromatogram scanner. Radioactive trace peaks were integrated with Win-Scan software and the parent herbicide was identified by comparing R$f$ values from the standard.

Data were subjected to ANOVA with sums of squares partitioned to reflect a split-plot treatment structure and trial effects. The four harvest timings were considered main plots, the three species were considered subplots, and the plant portions and washes were considered sub subplots. Data were log transformed prior to ANOVA. Trial effects were considered random and mean squares were tested based on treatment design. Where main plot effects were significant, regressions were used to explain the measured responses over time. Significant main effects were averaged over harvest times and separated by Fisher's Protected LSD at P = 0.05 performed on non-transformed data.

**Absorption of 14C-diclosulam.** At 4 HAT, absorption of applied 14C-diclosulam was 43 and 51% by pitted morningglory and sicklepod, respectively. Total 14C-diclosulam absorbed by pitted morningglory 72 HAT was 83% whereas sicklepod absorbed only 60%. Most of the herbicide was absorbed within the first 4 HAT for both weed species and both species exhibited linear 14C absorption with time. Peanuts absorbed 64% of the applied 14C-diclosulam at 4 HAT and absorbed 88% of the applied 14C 72 HAT. Most 14C-diclosulam was absorbed within the first 4 HAT and exhibited linear 14C absorption with time.

**Translocation of 14C-diclosulam.** The majority (>90%) of absorbed 14C-diclosulam remained in the roots of peanut with only 11% of absorbed 14C translocated to the shoots after 72 HAT. The majority (91%) of absorbed 14C-diclosulam occurred within the first 4 HAT for the roots of sicklepod. 60% of absorbed 14C remained in the roots of sicklepod with only 40% of absorbed 14C translocated to the shoots after 72 HAT. For pitted morningglory roots, 65% of

absorbed 14C-diclosulam occurred within the first 4 HAT. However, 58% of absorbed 14C was translocated to the shoots within the first 24 HAT. 57% remained in the roots of pitted morningglory with 43% of absorbed 14C translocated to the shoots after 72 HAT.

**Metabolism of 14C-diclosulam.** The majority of the metabolism occurred within the first 4 HAT in the roots of peanut. Peanuts metabolized 14C-diclosulam rapidly with less than 40% of absorbed 14C remaining as parent herbicide 4 HAT. In the shoots of peanuts, a high number of metabolites were seen at 4 HAT as there was very limited translocation of 14C to the shoots of peanut. The majority of the metabolism also occurred within the first 4 HAT in roots of sicklepod. Sicklepod, like peanut, also metabolized 14C-diclosulam rapidly with less than 40% of absorbed 14C remaining as parent herbicide 4 HAT. In the shoots of sicklepod, again a high number of metabolites were seen at 4 HAT as there was very limited translocation of 14C to the shoots of sicklepod. Pitted morningglory had 37% of the 14C-diclosulam remain as parent herbicide 4 HAT and 30% 72 HAT. The regression slopes indicate slower metabolism by pitted morningglory compared to that of peanut and sicklepod. Visual systems of injury began to appear in the leaves of pitted morningglory 48 HAT.

Absorption into the roots for the three species was peanut > pitted morningglory > sicklepod. In pitted morningglory, there was rapid absorption and translocation to the shoots. 60% of the 14C-diclosulam was metabolized a 4 HAT in pitted morningglory compared to >90% for both peanut and sicklepod. Therefore the increased uptake and translocation in pitted morningglory combined with the reduced metabolism results in more herbicidal activity and increased control. Peanuts and sicklepod exhibited limited translocation of 14C-diclosulam and can quickly metabolize it into a non-active form. This rapid metabolism and limited translocation results in peanuts and sicklepod having a high tolerance to soil-applied diclosulam. Differential tolerances exhibited by peanut, pitted morningglory, and sicklepod are likely due to differential translocation and metabolism. Weeds that do emerge through a diclosulam treatment continue to absorb and distribute the herbicide throughout the plant. Although only a portion of the diclosulam taken up by the pitted morningglory reaches the growing points, this quantity is more than sufficient to provide satisfactory control.

## MINUTES OF THE BOARD OF DIRECTORS MEETING
## 39th Annual Meeting, Wynfrey Hotel
## Hoover, Alabama
### July 10, 2007

President Albert Culbreath called the meeting to order at 7:00 pm and welcomed everyone. Present were J. Beasley, N. Smith, A. Hagan, E. Prostko, C. Butts, R. Sorensen, K. Chenault, R. Kemerait, J. Elder, J. Wilcut, J. Starr, H. Valentine, J. Brinkley, R. Myers, T. Baughman, C. Johnson.

Pres. Culbreath called on R. Sholar, Co-Executive Officer, to present the minutes of the last Board of Directors meeting, conducted at the 2006 Annual Meeting held in Savannah, Ga. The minutes were approved as reported in the 2006 Proceedings, Vol. 38.

The following reports were made and approved by the Board.

Old Business -

**Executive Officer Report –** Dr. Sholar reviewed the financial status of the society and reported that the society remains in sound financial condition. J. Starr was introduced as Co-Executive Officer, he will assume all duties of the office following Dr. Sholar's retirement on 31 August 2007.

**CAST Report –** No report presented, but John Sherwood was appointed to represent APRES for a full 3-yr term.

New Business -

**Finance Committee –** Income from all sources for 2006-07 was $128,374.48 compared to the budgeted amount of $128,400. Expenditures for 2006-7 were $113,562.73 compared to budgeted expenses of $127,900. It was recommended that a previously approved, but not yet implemented, reduction in page charges for Peanut Science be resended. This motion was approved.

The financial assets of the society were $178,030.38 on June 30. This included an estimated value of Peanut Science and Technology of $1,810 and Advances in peanut Science of $6,690. In view of the recent low sales figures for these volumes the Finance Committee will be asked to consider whether these volumes should be dropped from the list of assets.

**Nominating Committe**e – Chair P. Phipps reported that the committee was proposing that the following candidates be presented to the membership for approval at the regular business meeting. The committee members were --

President Elect – Kelly Chenault
State representative for the Virginia-Carolina Region – Jay Chapin
Industry Representative – Emory Murphy
USDA Representative – Carroll Johnson

These nominations were accepted by the Board and will be presented to the members at the Friday morning Business meeting.

**Publications and Editorial Committee –** The committee developed an on-line publications and subscription policy for Peanut Science and submitted it to the Board of Directors for consideration. This included an open access period and the development of member access protocol. The target date to begin restricted access to Peanut Science was July 1, 2007. John Wilcut, Editor of Peanut Science, reported that 56 manuscripts have been published since January 2007 in 5 issues. The committee suggested that the Board of Directors investigate the cost of APRES accepting credit cards for payment of page charges along with other accounts receivable.

**Peanut Quality –** Chair Howard Valentine reported that the committee dicussed the issues of peanuts as a source of biofuels; hard kernel issue; peanut butter viscosity; flavor; spotting after roasting; nutrition improvements needed.

**Public Relations Committee –** The committee discussed ways to improve communications within the Society and to external clientele. Amanda Huber of "Peanut Grower" magazine indicated her publication would be willing to discuss with APRES the opportunity to promote the annual meeting in their publication. Continual improvements to the APRES website was indicated as the most efficient way to improve communication within the society.

In regards to a necrology report, Joseph Burrell "Mr. Joe" Bryan of Damascus, Georgia; Mr. J.R. Odom of Sylvester, Georgia; Mr. Raymond Robinson of Williston, FL; and Dr. Sue Hefle who were key to the growth and promotion of the peanut industry passed away since July 2006. Resolutions acknowledging their contributions will be read at the business meeting followed by a moment of silence.

**Bailey Award Committee** – The Board discussed the policy of ensuring that all nominees for this and other appropriate awards (Coyt T. Wilson, Fellows, and Dow Agrosciences Research and Education Awards) be considered for a second and third year without a formal re-nomination. This provision has been considered by the BOD previous but not yet written into the award guidelines. J. Starr will be responsible for making appropriate revisions in the guidelines.

**Fellow Committee** – The Fellows committee selected three persons for recognition as Fellows of the Society. They were James Grichar, G. M. (Max) Grice, and Thomas G. Isleib. Further, it was recommended that award guidelines be reviewed and updated to include the statement that nominations be considered for two years following the year of first submission. The nomination form is to be revised to include information on year of submission. Lastly, names of all nominees should be sent to the Executive Officer.

**Site Selection Committee** – The 2008 meeting will be held in Oklahoma City at the Renaissance Oklahoma City Hotel on 13 to 19 July. The 2009 meeting will be in Raleigh at the Marriott Raleigh City Center on 13 to 17 July. The 2010 meeting will be in Florida, with the site yet to be selected.

**Coyt T. Wilson Distinguished Services Award Committe**e – All committee correspondence was handled via e-mail. Two nominations were received for the 2007 Coyt Wilson Award. Chris Butts was chosen as the recipient of the 2007 Award.

J**oe Sugg Graduate Student Award Committe**e – Ten student papers were submitted for the competition this year. In 2007, committee adopted a new evaluation form for each speaker based upon a total of 150 possible points where 50 points are assigned to organization of the presentation, 50 points are assigned to presentation techniques, and 50 points are based upon research efforts. Copies of the new evaluation form were e-mailed to the students prior to the competition. A copy of the evaluation form is included here.

**Dow Agrosciences Awards Committee** – Chair J. Starr reported that only three nominations were received, one for the research Award and two for the Education Award. The committee voted by email to present the Research Award to James Todd (University of Georgia, Tifton) and the Education Award to John Damicone (Oklahoma State University, Stillwater).

The Board of Directors considered updating the guidelines for these awards to state that an individual may receive either award only one time in their career, but may be awarded both the Research and Education Awards. The proposal was adopted by the Board.

**Program Committee** – Kira Bowen, Austin Hagan, and Susan Hagan were the technical, local arrangement and spouses' committee chairs. There were 89 oral presentations and 17 posters submitted for 2007. The committee recommends that APRES explore the use of credit cards by members to pay meeting registration fees and membership dues.

**Other New Business**

The Board of Directors formally recognized Dr. J. R. Sholar, retiring Executive Officer of APRES, and thanked him for his 23 years of service and leadership.

The Board of Directors expressed their appreciation to Peanut Science Editor John Wilcut and Publications and Editorial Committee members for their efforts to convert Peanut Science to an online journal and for bringing the journal up to date in its publication schedule.

The Board of Directors expressed their thanks to retiring board members Barbara Shew (State Representative for the Virginia Carolina Region) and Ron Sorensen (USDA Representative).

The meeting was adjourned at 10:30 pm.

## OPENING REMARKS BY THE PRESIDENT AT THE 2007 BUSINESS MEETING of APRES – President Albert Culbreath
**July 11, 2007**

Welcome to the 39th annual meeting of the American Peanut Research & Education Society and to Hoover, Alabama. Near the end of a lot of evenings, my three year old son will tell my wife or me, "I've had a busy day". I'd like to borrow his statement this morning and tell you, "We've had a busy year".

Among the most critical items facing APRES at the beginning of our society year were getting our on-line version of Peanut Science on-line, and getting over two years worth of articles published. I cannot tell you how proud I was when I finally got word from John Wilcut that the first issue of 2005 Peanut Science was ready to load. The next four issues came in short order. Since January of this year, we have had 56 Peanut Science articles published through Allen Press, and our January – June issue for 2007 went on-line before this meeting. I believe that is a monumental stride forward for our society, and I greatly appreciate the efforts of all who made that happen. John Wilcut, Chris Butts, Ron Sholar, and Irene Nickels, The Publications Committee, the Peanut Science editors, reviewers, authors, and Allen Press, I thank you.

Now that we are on schedule with Peanut Science publication, we must not let up. In his presentation in the opening session, John Wilcut indicated that he would not be surprised if we have to renegotiate with Allen Press to contract for publication of additional pages. I want to challenge us to submit enough high-quality articles that such renegotiation is needed very soon.

I believe that the online version of Peanut Science will make our journal more accessible and more useful for more people than ever before. I believe that making back issues of Peanut Science available in electronic format would also make very valuable information more available. We discussed that possibility in the board meeting Tuesday night. The board recognizes the merits of doing that. Getting all of our issues of Peanut Science into electronic format will require a significant monetary investment, but I believe it will be a good investment for us to make. I want to challenge us to make that happen.

This year we also faced the challenge of finding a new executive officer, a task our society hasn't had to do since 1983. I believe we have found what we from Alabama call, "A good'un". I believe that Jim Starr is an excellent person for that job, and I know he will serve the society well. I welcome him, and I thank Chris Butts and the rest of the search committee for their efforts in that search. I cannot thank Ron Sholar enough for all that he has done for the society these many years. It has been a pleasure and an honor to serve with him.

The combination of the great scientific content and the wonderful family atmosphere has made this meeting sort of the scientific version of a summer camp meeting revival here in my native state of Alabama. I thank all who helped make it happen. President-elect Austin Hagan, local arrangements and technical program chair, Kira Bowen, and all involved in local arrangements have done an excellent job. I thank them, and our generous sponsors and treat donors for making this possible. I also have special thanks to Past President Pat Phipps,

our very dedicated board of directors, Ron Sholar, Jim Starr, Irene Nickels, and all the chairs and members of the many committees. Thank you. It has been an honor to serve as your president in this past year. We've had a busy year.

## BUSINESS MEETING AND AWARDS CEREMONY
### AMERICAN PEANUT RESEARCH AND EDUCATION SOCIETY
**The Wynfrey Hotel**
**Hoover, Alabama**
**July 13, 2007**

1. **President's Report** ..... Albert Culbreath

2. **Awards Committee Reports and Presentations**

   a. Coyt T. Wilson Distinguished Service Award ..... Eric Prostko
   b. Fellows Award ..... Mark Burow
   c. Bailey Award ..... Nathan Smith
   d. Joe Sugg Graduate Student Competition ..... Bob Kemerait
   e. Dow AgroSciences Awards for Research and Education ..... Jim Starr
   f. Past President's Award ..... Patrick Phipps

3. **Reading of Minutes of Previous Meeting**

4. **New Business**

   a. Nominating Committee ..... Patrick Phipps
   b. Peanut Science Report ..... Chris Butts
   c. Finance Committee ..... Carroll Johnson
   d. Grower Advisory Committee ..... Committee Chair
   e. Public Relations Committee ..... John Beasley
   f. Peanut Quality Committee ..... Howard Valentine
   g. Site Selection Committee ..... Kira Bowen
   h. Publications and Editorial Committee ..... Chris Butts
   i. Program Committee ..... Austin Hagan
   j. Other Business

5. **Adjourn**

## FINANCE COMMITTEE REPORT

The annual meeting of the APRES Finance Committee was held on 10 July 2007 in Birmingham, AL. The following members of the Finance Committee were present; Carroll Johnson (Chairman), Jay Chapin, David Jordan, Steve Harrison, and *Ex-Officio* members Ron Sholar and Jim Starr.

A budget summary for FY 06-07 was presented that compared budgeted versus actual expenditures and receipts. Major points of discussion were:

There were budgeted receipts of $32,000 from page charges for PEANUT SCIENCE, compared to $32,518 in actual receipts. This reflects the process of publishing the backlog in PEANUT SCIENCE.

Unbudgeted receipts for differential postage totaled $512.50.

There was an anticipated budgeted expense of $16,000 for the 2006 annual meeting in Savannah. The actual meeting expenses were $19,961.20.

There was a budgeted expense of $4,500 for awards in 2006, however not all awards were issued due to no nominations for some awards. Thus, the awards expenditure was $2,964.

The anticipated budgeted expense for Peanut Science publication costs was $28,000. The actual expenditure for publishing Peanut Science was $16,461.49.

There was a budgeted expenditure of $6,500 for start-up costs to publish Peanut Science as an electronic journal. This cost was not incurred in FY 06-07.

The budgeted travel expense for APRES Officers in 2006 was $2,500. The actual expenditure for travel was $934.60.

There was a non-budgeted one-time expenditure of $3,784.05, which was the final series of expenses incurred by the former Editor of Peanut Science, Tom Stalker. Dr. Stalker had an authorized local account with Wachovia Bank for expenses related to the printed journal. Now that all pending expenses have been covered and the account is no longer needed due to electronic publication, the account has been closed.

In summary, APRES finished the last fiscal year in the black by $14,811.75.

A proposed budget was presented by Ron Sholar for FY 07-08. The proposed FY 07-08 budget has the following changes of significance:

- Receipts from page charges for PEANUT SCIENCE in FY 07-08 reflect two issues for 2007 being published (the PEANUT SCIENCE journal backlog has been corrected), thus receipts from page charges totaling $14,400. This proposed value is also shown in the budgeted expenditure as the cost to publish PEANUT SCIENCE.
- The proposed budget for FY 07-08 is balanced.

The Finance Committee agreed that it may be too soon to accurately gauge the cost of publishing PEANUT SCIENCE as an electronic journal. The costs the previous fiscal year reflected publishing a large backlog of issues and those

costs tend to distort the budget. Furthermore, a new contract will be negotiated with Allen Press beginning January 1, 2008 and terms of the new contract are unknown at this time. The Finance Committee feels that an accurate estimation of the annual cost to electronically publish two issues of PEANUT SCIENCE will be clarified in July 2008 due to these circumstances.

The Finance Committee unanimously recommends the financial reports presented and the proposed budgets for FY 07-08.

Respectively Submitted;
W.C. Johnson, III
Chairman – Finance Committee

## 2007-08 BUDGET

| | |
|---|---|
| **RECEIPTS** | |
| Registration | $ 40,000 |
| Membership Dues | 26,300 |
| Contributions – Ice Cream Social | 11,000 |
| Contribution – Dow AgroScience | 5,500 |
| Contribution – Bayer Fund Replenishment | 4,000 |
| Contribution – Syngenta | 5,000 |
| Contribution – National Peanut Board | 1,000 |
| Contribution – General | 0 |
| Differential Postage | 0 |
| Interest | 3,000 |
| Peanut Science & Page Charges | 14,000 |
| Advances in Peanut Science | 200 |
| Peanut Science & Technology | 200 |
| Quality Methods | 0 |
| Proceedings | 0 |
| Peanut Research | 0 |
| Spouse Program | 0 |
| Misc Income | 0 |
| **Total Receipts** | **$110,200** |

| | |
|---|---|
| **EXPENDITURES** | |
| Annual Meeting | $ 20,000 |
| Awards (Coyt Wilson, Dow AgroScience, Joe Sugg) | 3,000 |
| Bank Charges | 0 |
| CAST Membership | 700 |
| CAST Travel | 0 |
| Corporation Registration | 300 |
| Legal Fees (tax preparation) | 800 |
| Professional Services – Executive Officer | 19,400 |
| Professional Services – Secretarial Services | 21,112 |
| Professional Services – Peanut Science Editor | 19,400 |
| Peanut Science EPublishing | 14,000 |
| Peanut Science – set up fee-electronic submission | 0 |
| Proceedings | 300 |
| Peanut Research | 1,000 |
| Travel – Officers | 600 |
| Office Expenses | 3,000 |
| Postage | 0 |
| Travel – Bayer – Prog for Ext Agents | 4,000 |
| Spouse Program | 188 |
| Misc | 0 |
| **Total Expenditures** | **$107,800** |

## 2006-07 BALANCE SHEET

| **ASSETS** | June 30, 2006 | June 30, 2007 |
|---|---|---|
| Petty Cash Fund | $ 562.61 | 633.56 |
| Checking Account | 74,683.91 | 90,971.14 |
| Certificate of Deposit #3 | 10,864.81 | 10,864.81 |
| Certificate of Deposit #4 | 14,337.60 | 15,110.03 |
| Certificate of Deposit #6 | 15,761.83 | 16,505.91 |
| Certificate of Deposit #7 | 13,537.39 | 13,976.99 |
| Certificate of Deposit #8 | 6,020.47 | 6,215.97 |
| Money Market Account | 1,870.60 | 1,884.34 |
| Savings Account (Wallace Bailey) | 40.92 | 40.92 |
| Bayer Account | 12,020.22 | 12,092.49 |
| Computer and Printer | 847.16 | 1,234.22 |
| Peanut Science Account (Wachovia Bank) | 3,784.05 | 3,784.05 |
| Prior Period Adjustment | 0.00 | - 3,784.05 |
| Inventory of PEANUT SCIENCE & TECHNOLOGY Books | 1,810.00 | 1,810.00 |
| Inventory of ADVANCES IN PEANUT SCIENCE Books | 6,690.00 | 6,690.00 |
| **TOTAL ASSETS** | **$162,831.57** | **$178,030.38** |
| **Liabilities** | | |
| No Liabilities | 0.00 | 0.00 |
| Fund Balance | $162,831.57 | $178,030.38 |
| **TOTAL LIABILITIES & FUND BALANCE** | **$162,831.57** | **$178,030.38** |

## STATEMENT OF ACTIVITIY FOR YEAR ENDING 06/30/06

| **RECEIPTS** | **June 30, 2006** |
|---|---|
| Advances Book | $ 92.00 |
| Ann Mtg Reg | 42,250.00 |
| Contributions – General | 13,200.00 |
| Contribution – Dow AgroSciences | 5,500.00 |
| Contribution – Bayer CropScience | 4,931.63 |
| Contribution – Valent | 2,000.00 |
| Contribution –Sipcam | 4,000.00 |
| Contribution – Syngenta | 4,000.00 |
| Differential Postage | 1,037.50 |
| Dues | 28,615.00 |
| Interest | 872.53 |
| Misc Income | 20.00 |
| Peanut Research | 8.00 |
| Peanut Science | 1,049.00 |
| Peanut Science Page Charges | 16,931.00 |
| Peanut Science & Technology | 384.00 |
| Proceedings | 16.00 |
| Quality Methods | 30.00 |
| Spouse Reg | 30.00 |
| **TOTAL RECEIPTS** | **$124,966.66** |

| **EXPENDITURES** | |
|---|---|
| Annual Meeting (Program–1,624.79/AV-1,206.50/ Supplies/Equip–470.56/Breaks/Meals–11,936.44) | $ 15,238.29 |
| Awards (Dow, Coyt Wilson, Joe Sugg) | 4,317.45 |
| Bank Charges | 61.50 |
| CAST Membership | 603.00 |
| Corporation Registration | 130.00 |
| Exec Off | 17,305.57 |
| APRES portion of FICA/Medicare | 1,323.85 |
| Prof Services – Admin Assist | 18,214.24 |
| APRES portion of FICA/Medicare | 1,393.41 |
| Legal Fees | 596.00 |
| Miscellaneous (frame for Dr. Stalker's gift) | 209.39 |
| Oklahoma Withholding | 1,644.00 |
| Oklahoma Withholding – Exec Off | -1,200.00 |
| Oklahoma Withholding – Admn Asst | -444.00 |
| Office Expenses | 2,884.33 |
| Peanut Science | 54,727.03 |
| Postage | 1,533.92 |
| Proceedings | 0.00 |
| Sales Tax | 1.73 |
| Spouse Program Expenses | 250.00 |
| Travel, Exec Off, Sec | 1,641.83 |
| Travel, Bayer | 3,994.86 |
| **TOTAL EXPENDITURES** | **$124,426.40** |

| | |
|---|---|
| **2006 EXCESS RECEIPTS OVER EXPENDITURES** | **$ 540.26** |

## STATEMENT OF ACTIVITIY FOR YEAR ENDING 06/30/07

| | |
|---|---|
| **Receipts** | |
| Advances Book | $ 0.00 |
| Ann Mtg Reg | 40,000.00 |
| Contributions | 25,400.00 |
| Differential Postage | 512.50 |
| Dues | 26,704.00 |
| Interest | 2,396.98 |
| Misc. Income | 820.00 |
| Peanut Science | 238.00 |
| Peanut Science Page Charges | 32,280.00 |
| Proceedings | 23.00 |
| **TOTAL RECEIPTS** | **$128,374.48** |
| | |
| **Expenditures** | |
| Annual Meeting | $ 22,925.20 |
| (Program-66.70/AV-1,780.80/Awards-2,964/ Supplies/Equip-77.18/Breaks/Meals-17,520.21/ Reg=516.31) | |
| Peanut Science | 35,861.53 |
| (CrossRef-250/Wilcut-19,400.04/Allen Press-16,211.49) | |
| Proceedings | 200.00 |
| CAST Membership | 629.00 |
| Corporation Registration | 130.00 |
| Legal Fees | 625.00 |
| Prof Services - Exec Off | 18,019.66 |
| FICA/Medicare – APRES portion | 2,821.18 |
| Prof Services – Admin Assist | 18,857.52 |
| Oklahoma Withholding | 1,653.00 |
| Oklahoma Withholding (Exec Off) | -1,200.00 |
| Oklahoma Withholding (Admin Asst) | -453.00 |
| Travel (Exec Off, Admin Asst) | 934.60 |
| Office Expenses | 4,104.54 |
| Postage – publications | 109.70 |
| Postage – general correspondence | 527.38 |
| Prior Period Adjustment )close PS Wachovia Acct) | 3,784.05 |
| Bank Charges | 59.00 |
| Travel, Bayer | 3,954.37 |
| Sales Tax | 20.00 |
| **TOTAL EXPENDITURES** | **$113,562.73** |
| | |
| **2007 EXCESS RECEIPTS OVER EXPENDITURES** | **$ 14,811.75** |

## ADVANCES IN PEANUT SCIENCE SALES REPORT 2006-07

| | | |
|---|---|---|
| Beginning Inventory | | 669 |
| 1st Quarter | 0 | 669 |
| 2nd Quarter | 0 | 669 |
| 3rd Quarter | 0 | 669 |
| 4th Quarter | 0 | 669 |
| **TOTAL** | **0** | |

669 REMAINING BOOKS X $10.00 (BOOK VALUE) = $6,690.00 total value of remaining book inventory.

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

## PEANUT SCIENCE AND TECHNOLOGY
## SALES REPORT 2006-07

| | | |
|---|---|---|
| Beginning Inventory | | 181 |
| 1st Quarter | 0 | 181 |
| 2nd Quarter | 0 | 181 |
| 3rd Quarter | 0 | 181 |
| 4th Quarter | 0 | 181 |
| **TOTAL** | **0** | |

181 remaining books x $10.00 (book value) = $1,810.00 total value of remaining book inventory.

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

## PUBLIC RELATIONS COMMITTEE REPORT

The Public Relations Committee of the American Peanut Research and Education Society met at 2:00 pm on Tuesday, July 10, 2007 in the Avon Room of the Wynfrey Hotel in Hoover, AL. Committee members present were: John Beasley, Chair, Lee Campbell, Joyce Hollowell, Cal Chancy, and Amanda Huber. The committee discussed ways to improve communications within the Society and to external clientele. Amanda Huber of "Peanut Grower" magazine indicated her publication would be willing to discuss with APRES the opportunity to promote the annual meeting in their publication. The committee would also follow up with other peanut and agricultural publications for promoting the annual meeting. Continual improvements to the APRES website was indicated as the most efficient way to improve communication within the society. It was also mentioned that the website would also be a good way to promote our society to external clientele. John Beasley indicated he had utilized the Auburn University College of Agriculture Communications unit to make contact with the *Birmingham News* (newspaper) and several television stations in the Birmingham area to alert them that APRES was meeting in the Birmingham area.

In regards to a necrology report, several individuals that were key to the growth and promotion of the peanut industry passed away since our annual meeting in Savannah in July 2006. The following individuals were recommended for recognition with a resolution to be read at the business meeting followed by a moment of silence: Joseph Burrell "Mr. Joe" Bryan of Damascus, Georgia; Mr. J.R. Odom of Sylvester, Georgia; Mr. Raymond Robinson of Williston, FL; and Dr. Sue Hefle. The resolutions will also be published in the *Proceedings of APRES*.

The meeting was adjourned at 2:35 pm.

Resolution recognizing the contributions of Mr. Joseph Burrell Bryan of Damascus Peanut Company in Early County, Georgia to the peanut industry

*Whereas, Mr. Joseph Burrell "Mr.Joe" Bryan was born in 1920 and was a native and lifelong resident of Early County, Georgia having lived and grown up near Damascus, attending Shady Grove Primitive Baptist Church all of his life, and*

*Whereas, Mr. Joe Bryan was an agri-businessman and warehouseman who owned and operated Damascus Peanut Company since 1949, and*

*Whereas, Mr. Joe Bryan was one of the seven original founders of Chem-Nut, Inc., was a former president of the Southern Peanut Warehousemens Association (now known as the National Peanut Buying Points Association), served on the Georgia Agri-Business Council, and was honored by the National Peanut Buying Points Association in 2005 with the coveted Pioneer Award for his dedicated service to support peanut buying points, and*

*Whereas, Mr. Joe Bryan supported the research and extension programs of the University of Georgia, Auburn University, and the University of Florida by promoting genetically improved peanut cultivars, best management practices in production, and the certified seed program by always selling and providing high quality seed through Damascus Peanut Company, and*

*Whereas, Mr. Joe Bryan always extended a helping hand to those in need and served as a valued advisor to many peanut industry leaders, and*

*Whereas, Mr. Joe was a quiet, easy going, honest, man of integrity, and a peacemaker who truly cared for those that worked for him and those in the peanut industry, and*

*Whereas, Mr. Joe was one of the greatest promoters of peanuts in the southeast, and*

*Whereas, Mr. Joe passed away in April 2007 and left a loving family of three daughters and their husbands, a brother, two sisters, five grandchildren, and eight great-grandchildren, several whom continue his legacy in the peanut industry*

*Be it resolved this 13th day of July in the year of our Lord, 2007 that the American Peanut Research and Education Society in their annual meeting in Birmingham, Alabama honor the life of and recognize the tremendous contributions to the peanut industry by Mr. Joe Bryan.*

Resolution recognizing the contributions of Mr. J.R. Odom of Worth County, Georgia to the peanut industry

*Whereas, Mr. J.R. Odom was born in 1919 and was a native and lifelong resident of Worth County, Georgia having been a peanut farmer all his life, and*

*Whereas, Mr. J.R. was a member of the Georgia Agricultural Commodity Commission for Peanuts for many years, serving as chairman of the Georgia Peanut Commission for most of those years, and*

*Whereas, Mr. J.R. was a member of the Worth County Farm Bureau for over 50 years, including 24 years as chairman, and*

*Whereas, Mr. J.R. was a vocal supporter of peanuts and the peanut industry as a member of the Georgia Peanut Commission, and*

*Whereas, Mr. J.R. was a strong supporter of University of Georgia and USDA peanut research both as a farmer and as a member of the Board of Directors of the Georgia Peanut Commission, and*

*Whereas, Mr. J.R. passed away in May 2007 at the age of 88 years, leaving behind a brother and many nieces and nephews, and great nieces and nephews,*

*Be it resolved this 13th day of July in the year of our Lord, 2007 that the American Peanut Research and Education Society in their annual meeting in Birmingham, Alabama honor the life of and recognize the tremendous contributions to the peanut industry by Mr. J.R. Odom.*

Resolution recognizing the contributions of Mr. Raymond Robinson of Williston, Florida to the peanut industry

*Whereas, Mr. Raymond Robinson was a native and lifelong resident of Levy County, Florida, and*

*Whereas, Mr. Raymond Robinson was president and CEO of Williston Peanut Company in Williston, Florida and*

*Whereas, Mr. Raymond Robinson was a peanut farmer, peanut buying point operator, peanut sheller, and retailer, and*

*Whereas, Mr. Raymond Robinson was a kind and caring person that was always promoting the peanut industry, and*

*Whereas, Mr. Raymond Robinson was a major supporter of University of Florida peanut research and extension programs,*

*Be it resolved this 13th day of July in the year of our Lord, 2007 that the American Peanut Research and Education Society in their annual meeting in Birmingham, Alabama honor the life of and recognize the tremendous contributions to the peanut industry by Mr. Raymond Robinson.*

Resolution recognizing the contributions of Dr. Sue Hefle of University of Nebraska - Lincoln to the peanut industry

*Whereas, Dr. Sue Hefle was a food toxicologist at the University of Nebraska – Lincoln and Co-Director of the Food Allergy Research and Resource Program, and*

*Whereas, Dr. Hefle was a member of the National Peanut Board's Scientific Advisory Council, and*

*Whereas, Dr. Hefle has been a fundamental contributor in finding causes, cures, treatments, and management of food allergies, including peanut allergy, and*

*Whereas, Dr. Hefle was a collaborator and published more than 60 studies of food allergy, nutrition and food safety, and*

*Be it resolved this 13th day of July in the year of our Lord, 2007 that the American Peanut Research and Education Society in their annual meeting in Birmingham, Alabama honor the life of and recognize the tremendous contributions to the peanut industry by Dr. Sue Hefle.*

Respectfully submitted,
John Beasley, Chair

## PUBLICATIONS AND EDITORIAL COMMITTEE REPORT

The committee conducted business throughout the year via email prior to our meeting on July 10, 2007 at the Wynfrey Hotel in Hoover, AL. During the year, the committee developed an on-line publications and subscription policy for Peanut and submitted it to the Board of Directors for consideration. This included an open access period and the development of member access protocol. The target date to begin restricted access to Peanut Science was July 1, 2007. The database for usernames and passwords for members has been developed and submitted to Allen Press for review. Institutional access will be provided by IP address recognition.

John Wilcut, Editor of Peanut Science, reported that 56 manuscripts have been published since January 2007 in 5 issues. Vol. 32, Issue 2 of Peanut Science was first published on-line on February 16, 2007 and followed shortly by Vol. 32(1), 33(1), and 33(2). The January-June 2007 issue, Vol 34(1), was published prior to June 1, 2007. Since July 1, 2006, 43 articles had been submitted for review. Of those 43 manuscripts, 18 had been submitted since January 1, 2007. Since January 1, 2007, 17 manuscripts have been accepted for publication and 8 have been rejected or withdrawn. John expressed his appreciation to the associate editors, reviewers and authors for this success. The 2007-2009 Associate Editors are:

| | | | |
|---|---|---|---|
| Tim Brenneman | Mark Burrow | Chris Butts | Jay Chapin |
| Kelly Chenault | Manjeet Chinnan | Wilson Faircloth | Ames Herbert |
| Maria Gallo | Tim Grey | James Grichar | Tom Isleib |
| David Jordan | Peggy Ozias-Akins | Diane Rowland | Barry Tillman |
| Tom Whitaker | | | |

John stated that we need Associate Editors for the Plant Pathology area.

The committee has the following goals for the 2007-2008 year.

1. Develop guidelines for types of articles including research and education, notes, symposia, and surveys. Barry Tillman will develop a report of how other journals are differentiating these and develop a draft set of guidelines for Peanut Science.
2. Revise Instructions for authors in the form of a downloadable template to use when preparing a manuscript for submission to Peanut Science. The document will include styles and formatting for page set up, font, paragraph styles, formatting for tables, figures, citations, etc.
3. In conjunction with the Finance Committee, examine page charges for publishing in Peanut Science.
4. Begin migrating legacy issues (2004 and prior) of Peanut Science into our on-line library. This will include conversion from print to electronic format and explore funding sources for the process.
5. Develop specifications for more robust APRES website. This should include a public section and a members only section, links to other peanut related sites, events calendar, on-line member rosters, among other features.

The committee suggested that the Board of Directors investigate the cost of APRES accepting credit cards for payment of page charges along with other

accounts receivable.

July 10, 2007 Committee Meeting Attendance

| | | |
|---|---|---|
| Chris Butts, Chair | John Wilcut, Editor | Calvin Trostle (2007) |
| Michael Baring (2008) | Tim Brenneman (2008) | Jason Woodward (2009) |

Respectfully submitted,
Christopher L. Butts, Chair

## PEANUT SCIENCE EDITOR'S REPORT

No report given.

## NOMINATING COMMITTEE REPORT

Chair P. Phipps reported that the committee was proposing that the following candidates be presented to the membership for approval at the regular business meeting . The committee members were --

President Elect – Kelly Chenault
State representative for the Virginia-Carolina Region – Jay Chapin
Industry Representative – Emory Murphy
USDA Representative – Carroll Johnson

These nominations were accepted by the Board and will be presented to the members at the Friday morning Business meeting.

Respectively submitted,
Patrick Phipps, Chair

## FELLOWS COMMITTEE REPORT

The Fellows Committee met before the annual meeting. Members of the Fellows Committee were Albert Culbreath, Michael Franke, W. Carroll Johnson, Sanford Newell, Tom Stalker, and Mark Burow. Four nominations were received, and three were approved by the Fellows Committee and were subsequently elected to membership by the Board of Directors. The three new fellows are Mr. James Grichar of Texas A&M University, Mr. Max Grice of Birdsong Peanuts, and Dr. Thomas G. Isleib of North Carolina State University.

Respectfully submitted,
Mark Burow, Chair.

## BIOGRAPHICAL SUMMARIES OF FELLOWS RECIPIENTS

**Mr. G. M. (Max) Grice** grew up on a peanut farm in the Gorman area, the heart of peanut country in Texas at that time. He graduated from Sam Houston State University, Huntsville, Texas with a Bachelor of Science Degree in Agricultural Education in May 1967. After a period of training Mr. Grice was placed in charge of the Birdsong Seed Production group, and from there worked his way up into the upper management level of the Southwest Division of the Birdsong Corporation, where he currently serves as Vice President of the Birdsong Corporation and General Manager of Southwest Operations.

In service to the industry, Mr. Grice has served on the Board of the Southwest Peanut Shellers Association since the mid 1980's, and has been president or vice president of that board for the past 15 years. At this time he is President of the Board. Mr. Grice served on the NPC/APC Board in the 1990's, helping to guide the overall industry's most important organization, and he served as the Chairman of the Membership Committee of the NPC (now APC) in '91-'92.

Mr. Grice has lead the way in several of the quality issues over the years involving manufactures, shellers, and growers. For example, his leadership helped address the flavor questions that have arisen with Southwest peanuts. He has always been quick to support research activities in order to solve issues that might affect consumption of peanut and peanut products. The Birdsong Corporation, through Max's leadership has been ready and willing to take, or provide samples for research projects to help answer questions from within and outside the peanut industry to make sure that the quality of peanuts provided through all companies were the highest quality available.

Mr. Grice has served on the Texas Foundation Seed Committee, a part of the Texas A&M University System, lending his expertise to seed issues of the state, and providing support in the variety development program for Texas. Mr. Grice is also a member of the Texas Seed Trade Association, an organization that promotes growth and sale of high quality seed within and outside the state of Texas. He has served on several committees within this organization.

In service to APRES, Mr. Grice has served a total of 28 service years on four major committees and the Board of Directors. On three of the committees he has served multiple terms, and he has served on the Board of Directors a total of nine (9) years. Mr. Grice has often availed himself as an APRES member to render advice and recommendations on shelling, marketing, and storage of peanuts, and as a Board member for so many years he has played a major role in guiding the Society during the past 24 years.

Mr. Grice's forty years of service to the Peanut Industry and to APRES eminently qualify him as a Fellow in the American Peanut Research and Education Society.

**Mr. W. James Grichar** is Senior Research Scientist with Texas A&M University and is stationed at the Texas Agricultural Experiment Station at Beeville.

Mr. Grichar has a long history of accomplishments and service to the peanut industry and other commodities. He has helped solve problems for peanut growers in multiple areas, including weed science, agronomy, variety improvement, and plant pathology. He has worked with the agricultural chemical industry on product evaluation, development and deployment. He has been at the forefront of new weed management technologies learning how peanut growers can best utilize these technologies for maximum economic effectiveness. Due to peanut injury concerns with soil-applied applications of metolachlor, Mr. Grichar developed a method to effectively apply the herbicide postmergence for yellow nutsedge control. This was a standard practice until the development of Cadre; however, growers across Texas still use this practice because of rotational crop concerns following Cadre. More recently, Mr. Grichar has been a leader in Valor and Cobra research to help growers maximize their effectiveness while minimizing crop response.

Mr. Grichar's highly effective work in teams with Experiment Station scientists, Extension specialists, and County agents has generated very useful information on herbicides, fungicides, other products, and germplasm performance. He has worked extensively in reduced tillage peanut production, cropping systems, and disease management. He communicates effectively in tandem with Extension specialists and growers quickly adopt superior new pesticides and use patterns that he helped elucidate for the southwest peanut production region. Mr. Grichar served as administrator (Research Scientist in Charge) at the Yoakum satellite station for 10 years while carrying on his research project.

He is one of the most prolific writers in applied weed management in peanuts. He is an author on 104 refereed articles, 161 editor-reviewed publications, and two book chapters. He has served as associate editor for two refereed journals and ad hoc reviewer for several journals. He has authored or co-authored numerous grower-oriented bulletins and articles.

Mr. Grichar has been a very active participant in APRES. His service to the society includes work on numerous committees and the presidential succession. He consistently participates in APRES annual meetings as presenter and in

various service roles. He has published much of his work in Peanut Science. In 1997, he received the APRES DowElanco Award for Excellence in Research.

**Dr. Thomas G. Isleib** is a Professor of Crop Science at North Carolina State University. He leads a multidisciplinary team in a comprehensive research program on peanut cultivar development. He has investigated the effects of epistasis and heritability on pathogens such as early and late leafspot, Cylindrocladium black rot, Sclerotinia, and tomato spotted wilt virus; biological nitrogren fixation; seed size; and pod brightness. Dr. Isleib developed methodology for introgressing exotic cultivated germplasm into self-pollinated polyploid species such as peanut. He has published 93 refereed journal articles, numerous non-refereed papers and 77 abstracts. Dr. Isleib has taught both undergraduate and graduate level plant breeding and served as advisor to 1 M. Ag., 4 M.S., and 8 Ph.D students who are now making impacts in agriculture. Since 1992, Dr. Isleib has released 12 cultivars which account for more than 70% of the virginia-type acreage in the U.S. In addition to high-yielding, disease-resistant cultivars, he has released large-seeded types specifically selected for boiling and bright pods for the in-shell market. Dr. Isleib has assumed a leadership role in coordination of the multi-state winter nursery in Puerto Rico and is involved in several international research projects.

Dr. Isleib has served APRES as President, Chair of the Site Selection and Program Committees, and has been an active member of many other committees. He served as associate editor of *Peanut Science* for six years. Dr. Isleib was awarded the APRES Dow AgroSciences Award for Excellence in Research in 2001 (with H. E. Pattee); the Epsilon Sigma Phi State Friend of Extension Award from Epsilon Sigma Phi in 1997; and the NC Cooperative Extension Service Friend of Extension Award, NC Cooperative Extension Service in 1997.

Dr. Isleib is an effective leader in the peanut industry and has worked closely with extension personnel and commodity leaders to develop cultivars to keep producers competitive in the marketplace. He is a tireless cooperator and has worked to develop associations to make his research more effective and more responsive to the needs of the peanut industry. His activity in research, education, extension and APRES qualify him fully as a Fellow of APRES.

## GUIDELINES for AMERICAN PEANUT RESEARCH AND EDUCATION SOCIETY FELLOW ELECTIONS

### Fellows

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

### Eligibility of Nominators

Nominations may be made by an active member of the Society except members of the Fellows Committee and the APRES Board of Directors. A member may nominate only one person for election to fellowship in any one year.

### Eligibility of Nominees

Nominees must be active members of the Society at the time of their nomination and must have been active members for a total of at least five (5) years.

The nominee should have made outstanding contributions in an area of specialization whether in research, extension or administration and whether in public, commercial or private service activities. Members of the Fellows Committee and voting members of the APRES Board of Directors are ineligible for nomination.

### Nomination Procedures

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

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

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

Deadline. Six (6) copies of the nomination are to be received by the chairman of the Fellows Committee by March 1 each year.

## Basis of Evaluation

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

## Processing of Nominations

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

## Recognition

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

## Distribution of Guidelines

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

**FORMAT for AMERICAN PEANUT RESEARCH AND EDUCATION SOCIETY FELLOW NOMINATIONS**

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

DATE SUBMITTED:

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

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

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

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

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

I. Personal Achievements And Recognition (10 points)

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

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

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

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

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

D. Administration or Business

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

III. Service to The Profession (30 Points)

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

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

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

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

## BAILEY AWARD COMMITTEE REPORT

The Bailey Award Committee met Tuesday, July 10, at 2:00 pm in the Hampshire Room. The committee's business was tended to prior to the annual meeting. Nominees were notified of their selection following the 2006 annual meeting. Manuscripts were requested from qualified nominations chosen from 11 paper sections at the 2006 annual meeting. Eight papers were received and accepted for final evaluation by the committee. The winning paper is presented the Bailey Award at the 2007 meeting. The winning paper was #12 titled "Yield and Market Quality of Virginia-Type Peanut Cultivars with the Oxalate Oxidase Gene for Resistance to Sclerotinia Blight" submitted by D.E. Partridge*, P.M. Phipps, D.L. Coker, and E.A. Grabau. D.E. Partridge was the presenter.

2006-07 Bailey Award Committee:
Nathan Smith, Chair (2008)
Ames Herbert (2007)
Mark Black (2007)
Joel Faircloth (2007)
Elizabeth Grabau (2008)
Diane Rowland (2009)

Diane Rowland (2009) joins the committee.

Respectfully Submitted by:
Nathan Smith, Chair

**GUIDELINES for AMERICAN PEANUT RESEARCH AND EDUCATION SOCIETY BAILEY AWARD**

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

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

1. The presenter of a nominated paper, whether the first or a secondary author, must be a member of APRES.
2. Graduate students being judged for the Joe Sugg Award are also eligible for the Bailey Award if they meet all other criteria for eligibility.

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

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

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

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

Authorship of the manuscript should be the same (both in name and order) as the original abstract. Papers with added author(s) will be ruled ineligible. Manuscripts are judged using the following criteria:

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

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

a) notify session moderators for the upcoming meeting of their

responsibilities in relation to judging oral presentations as set in the guidelines in APRES PROCEEDINGS,

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

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

## JOE SUGG GRADUATE STUDENT AWARD REPORT

The Joe Sugg Graduate Student Award Committee met on Tuesday, 10 July 2007 from 3:00 to 4:00 PM in the Avon Room at the Wynfrey Hotel.

Present for the meeting were Roy Pittman, Jason Woodward, and Bob Kemerait. Judges for the 2007 competition also included Maria Gallo and Tom Islieb.

Ten student papers were submitted for the competition this year.

In 2007, this committee has adopted a new evaluation form for each speaker based upon a total of 150 possible points where 50 points are assigned to organization of the presentation, 50 points are assigned to presentation techniques, and 50 points are based upon research efforts.

Copies of the new evaluation form were e-mailed to the students prior to the competition. A copy of the evaluation form is included here.

The awards for this competition were presented at the Dow AgroSciences awards breakfast on Friday.

First place went to J. M. Weeks, Virginia Polytechnic Institute, for his presentation, “Incorporating perennial grasses into peanut rotations: effects on soil quality parameters and peanut disease, growth, and development.”

Second place went to A. Kaye, North Carolina State University, for her presentation, “Analyzing genetic diversity of tomato spotted wilt virus on peanut in North Carolina and Virginia.

Respectfully submitted,
Robert C. Kemerait, Jr., Chair

## COYT T. WILSON DISTINGUISHED SERVICE AWARD REPORT

1) Committee members: Howard Valentine, Tom Whitaker, Corley Holbrook, Tom Isleib, and Mark Black.

2) All committee correspondence was handled via e-mail.

3) Two nominations were received for the 2007 Coyt Wilson Award.

4) Chris Butts was chosen as the recipient of the 2007 Award.

Respectfully submitted by,
Eric Prostko, Chair

## BIOGRAPHICAL SUMMARY OF COYT T. WILSON DISTINGUISHED SERVICE AWARD RECIPIENT

**Dr. Christopher L. Butts** received his BS (1979) and MS (1981) degrees in Agricultural Engineering from Virginia Tech. Prior to receiving his PhD in Agricultural Engineering from the University of Florida in 1988, he worked as a research engineer at the University of Georgia Coastal Plain Experiment Station in Tifton. Dr. Butts began his research career as an engineer with USDA, ARS, in Gainesville, Florida while completing his graduate studies. He then transferred to the USDA, ARS, National Peanut Research Laboratory in Dawson, Georgia. While in Dawson, he has become a leader in peanut drying and storage research and a valued member of a research team that has developed decision support systems for the U.S. peanut industry. Dr. Butts has participated in several important industry-sponsored projects, including the Peanut Quality Enhancement Project, Shrink Study, and High Moisture Grading Study. Through his collaborative research and technology transfer efforts, innovative curing and storage systems have been implemented throughout the peanut industry.

Dr. Butts has a record of distinguished service to APRES having been an active member since 1987 and providing thirteen years of Society service. He has attended 20 annual meetings since 1986 and made 16 presentations. Dr. Butts has served on numerous APRES committees, including Public Relations, Dow Agrosciences Awards, Local Arrangements, Nominating, Publications and Editorial, and the ad hoc Committee to Revise Membership Structure. He has chaired the following committees: Dow Agrosciences Awards, Publications and Editorial, Technical Program, ad hoc committee to Improve Society Finances, and the ad hoc Executive Officer Search Committee. As chair of the Dow Agrosciences Awards committee, Dr. Butts led the committee to implement a change in policy to retain unsuccessful nominations and request updated information from the original nominators for future consideration. This change insured a larger pool of qualified candidates each year for both Dow Agrosciences Awards. As chair of the Technical Program Committee, Dr. Butts led in the first-time production of a CD containing the 2006 Annual Meeting Program and Abstracts that was distributed to attendees at the annual meeting. In recent years, Dr. Butts was asked to serve as chair of two very important ad hoc committees: (1) Committee to Improve the Financial State of APRES (2005); (2) Executive Officer Search Committee (2006-2007). The work of these committees was considered vital to the continued viability and success of the Society, and Dr. Butts successfully led each committee to accomplish its task. During this same time period, Dr. Butts willingly served a two-year term as chair of the Publications and Editorial Committee to help provide a smooth transition between editors and to electronic publication of Peanut Science. This culminated in the recent on-line publication of Volumes 32, 33, and 34 Issue 1 of Peanut Science. In addition, Dr. Butts has served as the USDA representative on the Society Board of Directors and is now in his second term as Engineering Associate Editor for Peanut Science. All of these leadership activities have been very important to APRES and have been contributed willingly, selflessly, and professionally. The significance of this body of service is obvious and makes Dr. Christopher L. Butts a most deserving recipient of the Coyt T. Wilson Distinguished Service Award.

## GUIDELINES for AMERICAN PEANUT RESEARCH AND EDUCATION SOCIETY COYT T. WILSON DISTINGUISHED SERVICE AWARD

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

### Eligibility of Nominators

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

### Eligibility of Nominees

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

### Nomination Procedures

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

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

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

NOMINEE: Include the name, date and place of birth, mail address (with zip code) and telephone number (with area code).

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

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

## Qualifications of Nominee

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

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

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

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

## Award and Presentation

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

## DOW AGROSCIENCES AWARDS COMMITTEE REPORT

In 2007 the committee received three nominations, one for the research award and two for the education award. Nomination packets were distributed to committee members electronically and the vote on the nominations was conducted electronically. James Todd received the research and John Damicone received the education award. The remaining nomination for the education award will be re-considered in 2008 and the nominator will be given the opportunity to update the nomination packet.

Respectfully submitted by,
Jim Starr, Chair

## BIOGRAPHICAL SUMMARY OF DOW AGROSCIENCES AWARD FOR EXCELLENCE IN RESEARCH RECIPIENT

University of Georgia Professor Emeritus of Entomology, **James W. Todd**, was awarded the Dow AgroSciences Award for Excellence in Research during the American Peanut Research and Education Society's annual meeting held July 10-13, 2007 in Hoover, Alabama.

Dr. Todd's research has been critical to the survival of the Southeast peanut farmers. Dr. Todd recognized the potential impact that Tomato Spotted Wilt Virus disease could have on the Southeast peanut industry with ramifications on the local economies heavily dependent on the peanut sector. Dr. Todd provided the leadership and helped coordinate a team of peanut scientists from Alabama, Florida and Georgia. This has become the "model" multidisciplinary team in the peanut industry.

In a second multi-disciplinary team, CRSP project UF16p with the University of Florida, University of Georgia, USDA, and Bolivia, Dr. Todd has lead the team in developing cultivars adapted to the southeast with new sources of resistance for leaf spot and Tomato Spotted Wilt Virus. These new varieties are expected to reduce leaf spots spray programs to between zero and two sprays per season; thus significantly reducing the cost of production to the farmer.

During the last 10 - 12 years, Dr. Todd has been working to identify and incorporate new sources of disease and insect resistance in runner type peanuts for the southeast. He has evaluated germplasm from throughout South America for leaf spot, rust, TSWV, thrip, leafhopper, and three cornered alfalfa hopper resistance with the objective of identifying new sources of resistance for use in variety development. Additionally, current work includes identifying resistance in wild species with the objective of moving immunity type resistance to cultivated peanuts.

With his 'eye on the future,' he is working to identify peanuts with increased oil content for introduction into cultivated peanuts. His goal is to have a peanut which you apply herbicides only, no fungicides, irrigate, and harvest a highly desirable high yielding crop for use in the oil market, edible market, or phyto-chemical market.

## BIOGRAPHICAL SUMMARY OF DOW AGROSCIENCES AWARD FOR EXCELLENCE IN EDUCATION RECIPIENT

**John Damicone** received his BS in Botany from the University of Rhode Island (1977) and his MS and PhD degrees plant pathology from Un Massachusetts (1980 and 1985). John did a post-doctoral at Louisiana State University, worked with the Mississippi Cooperative Extension Service for a short time, and then joined the faculty at Oklahoma State University in 1990, raising through the academic ranks to his current position of Professor and Extension State Specialists.

Dr. Damicone has worked tirelessly for 17 years to aggressively address disease problems facing peanut producers in Oklahoma. John's record and accomplishments in Extension and Education has helped peanut producers in Oklahoma stay in business. Dr. Damicone has been an active member of the "OSU Peanut Improvement Team" that has had research and demonstration trials, production meetings, and field tours in all peanut producing regions of the state. He was interim leader of the team for 3 years. Dr. Damicone was instrumental in the development of a web-based, county- specific advisory program, which has been adopted by over 30% of growers in Oklahoma, as a risk management tool to prevent losses from leaf spot. The risk-management benefits of this program are evident by the fact that local agribusiness, most of which sell fungicides to peanut growers, have been among its best supporters and promoters.

Dr. Damicone has supported county based programs by authoring "Peanut Disease Control Guidelines" section of the "OSU Extension Agent's Handbook of Insect, Plant Disease and Weed Control" and "OSU Peanut Production Guide". Additionally he has authored several hundred additional extension publications that have appeared in numerous newsletters, newspapers, and agricultural magazines, which collectively have had an enormous impact on peanut production practices in Oklahoma.

While Dr. Damicone has had a primary extension appointment his whole career, he has maintained an active research program, serving as major professor or committee member for 18 graduate students. He has published 27 articles in refereed journals and over 70 abstracts of presentations made at professional meetings.

Among the many honors and award Dr. Damicone has received are the Inventor Recognition Award from Oklahoma State University, twice he has received the Southern Region Extension Publication Award from the American Society for Horticultural Science, and the Outstanding Field Staff Award, Oklahoma Cooperative Extension Service

Dr. Damicone has been a loyal supporter of APRES through his participation in the annual meetings and presentation of numerous papers. He has served the society in numerous capacities, including President (2002), President-Elect and Annual Meeting Program Chair, and Nominating Committee Chair, Associate Editor for Peanut Science, and Technical Program Committee Chair. He has also served on the Board of Directors and on numerous committees.

For his outstanding service and contributions to the peanut industry and the growers of Oklahoma, it is fitting that John Damicone be recognized with the Dow Agrosciences Award for Excellence in Education.

## GUIDELINES for DOW AGROSCIENCES AWARDS FOR EXCELLENCE IN RESEARCH AND EDUCATION

### I. Dow AgroSciences Award for Excellence in Research

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

### Eligibility of Nominees

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

### II. Dow AgroSciences Award for Excellence in Education

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

### Eligibility of Nominees

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

Eligibility of nominators, nomination procedures, and the Dow AgroSciences Awards Committee are identical for the two awards and are described below:

### Eligibility of Nominators

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

## Nomination Procedures

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

## Dow AgroSciences Awards Committee

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

**NOMINATION FORM FOR DOW AGROSCIENCES AWARDS**

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

**********

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

___ Dow AgroSciences Award for Excellence in Education

___ Dow AgroSciences Award for Excellence in Research

**********

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

**DATE:**

**Nominee(s):** _____

Address _____

Title _____ Tel No. _____

**II. Nominator:**

Name _____ Signature_____

Address _____

Title _____Tel No._____

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

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

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

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

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

## PEANUT QUALITY COMMITTEE REPORT

1) Discussion of issues involving peanuts as a source of biofuels
   High oil content of oil varieties, Texture, identity preserved in storage to minimize use in edible market

2) Hard kernel issue
   A. Causes - lack of maturity, structural difference
   B. Corrections - early maturing variety, earlier planting

3) Peanut butter viscosity
   A. Holding and processing peanuts - later in year butter becomes less viscous
   B. Last two years peanut butter too viscous, more free oil. Additional research needed

4) Flavor
   A. Flavor of newer varieties are improving, Need more research on flavor chemistry

5) Spotting after roasting - reviewed work done at USDA Raleigh and Dawson with various industry members contributing data. Research work has determined issues involved.

6) Nutrition improvements needed. Areas selected were, in order of importance
   A. Folate
   B. Protein quality
   C. Quantify arginine levels in current cultivars
   D. Quantify and improve antioxidant levels, especially polyphenols.

Respectfully submitted by:
Howard Valentine, Co-chair

## PROGRAM COMMITTEE REPORT

The 39th annual APRES meeting was held July 10-13, 2007 at the Winfrey Hotel in Hoover, Alabama. Kira Bowen, Austin Hagan, and Susan Hagan were the technical, local arrangement and spouses' committee chairs. There were 89 oral presentations and 17 posters. Eleven of the oral presentations were made as part of the graduate student competition. Spouses' activities included visits to Mountain Brook Village and the Birmingham Zoo. The committee recommends that APRES explore the use of credit cards by members to pay meeting registration fees and membership dues.

Registration included 196 members and approximately 150 spouses' and children.

Respectively submitted by:
Austin Hagan, Chair

## CONTRIBUTORS TO 2007 APRES MEETING

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

### Special Activities

Bayer CropScience –Wednesday Reception/Dinner
BASF – Wednesday Reception/Dinner
College of Agriculture, Auburn University
Dow AgroSciences – Awards Breakfast
Syngenta – Daily Breaks
Alabama Peanut Producers Association – Spouses' Hospitality

### Ice Cream Social

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## Spouses' Program

Susan Hagan, Chair
Amy Balkcom Beth Campbell

## Program Highlights
## Tuesday July 10

### Committee, Board, and Other Meetings

| | | |
|---|---|---|
| 8:00-12:00 | Seed Summit | Yorkshire |
| 12:00-6:00 | APRES Registration | Convention Reservation Desk |
| 1:00-5:00 | Spouses Hospitality | Buckingham Suite |
| 1:00-5:00 | Exhibitor Setup | Prefuntion/Foyer Area |
| 1:00-5:00 | Presentation Loading | Berkshire |
| 1:00-2:00 | Associate Editors, Peanut Science | Devon |
| 1:00-2:00 | Site Selection Committee | Avon |
| 1:00-2:00 | Fellows Committee | Hampshire |
| 1:00-2:00 | Peanut Genomics Initiative | Wyndsor I |
| 1:00-2:00 | Coyt T. Wilson Distinguished Service Award | Wyndsor II |
| 2:00-3:00 | Publications and Editorial Committee | Devon |
| 2:00-3:00 | Public Relations Committee | Avon |
| 2:00-3:00 | Bailey Awards | Hampshire |
| 2:00-3:00 | Dow AgroSciences Awards Committee | Wyndsor I |
| 3:00-4:00 | Nominating Committee | Devon |
| 3:00-4:00 | Joe Sugg Graduate Student Award Committee | Avon |
| 3:00-5:30 | Peanut Quality Committee | Hampshire |
| 4:00-5:00 | Grower Advisory Committee | Devon |
| 4:00-5:30 | Program Committee | Avon |
| 4:00-5:00 | Finance Committee | Wyndsor I |
| 7:00-10:00 | Board of Directors | Yorkshire |
| **7:00-9:00** | **Ice Cream Social** | **Wynfrey AB** |

## Wednesday July 11
## Morning

| | | |
|---|---|---|
| 8:00-4:00p | APRES Registration | Convention Reservation Desk |
| 8:00-6:00 | Presentation Loading | Berkshire |
| 7:00-6:00 | Spouses Hospitality | Buckingham Suite |
| 8:00-6:00 | Exhibits | Prefunction Area |
| 8:00-9:30 | General Session | Wynfrey AB |
| **9:40-10:00** | **Break** | **Prefunction/Foyer Area** |
| 9:30-4:00 | Posters (displayed) | Prefunction/Foyer Area |
| 10:30-12:00 | Posters (with authors) | Prefunction/Foyer Area |
| 10:00-11:45 | Breeding, Biotechnology, and Genetics I | Riverchase A |
| 10:00-11:45 | Production Technology | Riverchase B |
| 10:00-11:45 | Economics | Wynfrey D |
| | **Lunch** | |

## Wednesday July 11
## Afternoon and Evening

| | | |
|---|---|---|
| 1:30-2:45 | Joe Sugg Graduate Student Competition | Riverchase AB |
| **3:00-3:15** | **Break** | **Prefunction/Foyer Area** |
| 3:15-4:15 | Graduate Student Competition, continued | Riverchase AB |
| 4:00 | Remove Posters | Prefunction/Foyer Area |
| **6:00-9:00** | **Bayer CropScience and BASF Dinner** | **Wynfrey ABC** |

**Thursday July 12**
**Morning**

| | | |
|---|---|---|
| 8:00-4:00p | APRES Registration | Convention Reservation Desk |
| 8:00-1:00 | Presentation Loading | Berkshire |
| 7:00-6:00 | Spouses Hospitality | Buckingham Suite |
| 8:00-4:00 | Exhibits | Prefunction Area |
| 8:15-12:00 | Plant Pathology and Nematology | Riverchase A |
| 8:15-12:00 | Breeding, Biotechnology, and Genetics II | Riverchase B |
| 8:15-10:00 | Physiology and Seed Technology Processing and Utilization | Wynfrey D |
| **9:45-10:15** | **Break** | **Prefunction/Foyer Area** |
| 10:15-12:00 | Bayer Excellence in Extension | Wynfrey D |
| 11:15-11:45 | Entomology | Riverchase A |
| **12:00-1:00** | **Lunch** | |

**Thursday July 12**
**Afternoon and Evening**

| | | |
|---|---|---|
| 1:15-2:15 | Organic Production | Riverchase A |
| 1:15-2:45 | Harvesting, Curing, Storage, and Handling | Riverchase B |
| 1:15-2:00 | Weed Science | Wynfrey D |

**Dinner on your own**

**Friday July 13**

| | | |
|---|---|---|
| **7:00-8:00** | **DowAgroScience Awards Breakfast** | **Wynfrey AB** |
| 8:00-10:00 | APRES Awards Ceremony and Business Meeting | Wynfrey AB |
| 10:00-12:00 | Peanut CRSP Project | Yorkshire |

**General Session** **Wednesday, July 11**

**Morning**

**Wynfrey AB**
**Moderator: Austin Hagan, Auburn University, Auburn, AL**

| | | |
|---|---|---|
| 8:00 | Call to Order | Austin Hagan<br>APRES President Elect |
| 8:05 | Welcome to Alabama | Tony Peletos<br>Mayor, Hoover, AL |
| 8:15 | New Institute to encompass Agriculture and Natural Resources at AU | Richard Guthrie<br>Dean and Director<br>College of Agriculture<br>Auburn University |

8:30 Peanut Science Online . ..... John Wilcut
Professor
Crop Science Department
North Carolina State University

8:45 Bringing Agriculture to Water .... .....Jim Hairston
Professor
Department of Agronomy and Soils
Auburn University

9:30 Announcements .. ..... Kira Bowen
Chair, Technical Program

**9:40 Break**

## BREEDING, BIOTECHNOLOGY, AND GENETICS

**Riverchase A**
**Moderator: Fred Shokes, Virginia Tech, Suffolk, VA**

10:00 (1) Plant Exploration Expedition to Paraguay to Collect New *Arachis* sp. *A. Pflugeae*. C.E. SIMPSON*, K.A. WILLIAMS, and P.J. CABALLERO A. and L.E. ROBLEDO. Texas Agri. Exp. Stn, Texas A&M Univ., Stephenville, TX 76401; USDA-ARS National Germplasm Resources Laboratory, Bldg. 003, Rm. 402, BARC-West,. Beltsville, MD 20705; Instituto Agronomico Nacional (IAN), Asuncion, Paraguay.

10:15 (2) Production of New Amphidiploids and Complex Hybrids of *Arachis*. A-P. FÁVERO* and C.E. SIMPSON. Embrapa Genetic Resources and Biotechnology, Brasília, DF, CP02302, 70770-900 and Texas Agricultural Exp. Station, Texas A&M Univ. Stephenville, TX 76401.

10:30 (3) Advance of Virginia-type Peanut Breeding Lines Through Evaluation Across Multiple Environments. F.M. SHOKES*, Tidewater Agricultural Research and Extension Center, Suffolk, VA 23437; T.G. ISLEIB, Department of Crop Science, North Carolina State University, Raleigh, NC 27695; and D.L. COKER, Texas Cooperative Extension, College Station, TX 77843-2474.

10:45 (4) Development of Peanut Germplasm with Improved Drought Tolerance. C.C. HOLBROOK*, D.G. SULLIVAN, B.Z. GUO, USDA-ARS, Tifton, GA 31793; and E. CANTONWINE, D.M. WILSON, W. DONG, University of Georgia, Tifton, GA 31793.

11:00 (5) Stability Analysis of Jumbo and Fancy Pod Content and Brightness in Virginia-Type Cultivars and Breeding Lines. T.G. ISLEIB* and S.C. COPELAND, Department of Crop Science, North Carolina State University, Raleigh, NC 27685-7629.

11:15 (6) Genotype x Environment Interaction for Peanut Seed Size. B.L. TILLMAN*, D.W. GORBET, North Florida Research and Education Center, Marianna, FL 32446 and T.G. ISLEIB, Department of Crop Science, North Carolina State University, Raleigh, NC 27695.

11:30 (7) Nutrient Composition of the Peanut Core of the Core Collection. L.L. DEAN*, T.H. SANDERS, Market Quality and Handling Research Unit, USDA, ARS, SAA, Raleigh, NC 27695-7624; and C.C. HOLBROOK, Crop Genetics and Breeding Research Unit, USDA, ARS, SAA, Tifton, GA 31793.

11:45 (8) Flavor Profiles of Species-Derived Peanut Breeding Lines. S.P. TALLURY*[1], H.E. PATTEE[2], T.G. ISLEIB[1], and H.T. STALKER[1]. [1]Department of Crop Science, N.C. State Univ., Raleigh, NC 27695-7629. [2]Department of Biological & Agricultural Engineering, NCSU,

Raleigh, NC 27695-7625.

## PRODUCTION TECHNOLOGY

**Riverchase B**
**Moderator: James Hadden, Syngenta Corporation, Tifton, GA**

10:00 (9) Planting Date Effect on Disease Severity and Peanut Yield. J.P. BEASLEY, JR.*, Crop and Soil Sciences Department and T.B. BRENNEMAN, A.K. CULBREATH, R.C. KEMERAIT, JR. Department of Plant Pathology, University of Georgia, Tifton, GA 31793-0748.

10:15 (10) Non-Irrigated Minimum-Input Peanut Yield Tests. W.D. BRANCH* and S.M. FLETCHER. Dept. of Crop and Soil Sciences and Agricultural and Applied Economics, University of Georgia, Coastal Plain Experiment Station, Tifton, GA 31793-0748 and Georgia Experiment Station, Griffin, GA 30223-1797, respectively.

10:30 (11) Peanut Yield, Grade, and Economics with Two Surface Drip Lateral Orientations. R.B. SORENSEN* and M.C. LAMB, USDA-ARS-National Peanut Research Laboratory, PO Box 509, 1011 Forrester Dr. SE, Dawson, GA 39842.

10:45 (12) *Bradyrhizobium* Inoculant Type and Mid-Season N Fertilizer Effects on Peanut Yield, Gaines Co., Texas. C.L. TROSTLE*, Texas Cooperative Extension/Texas A&M Univ. Ag. Research & Extension Center, 1102 East FM 1294, Lubbock, TX 79403.

11:00 (13) Interactions of Tillage and Cropping System on Peanut Yield in North Carolina. P.D. JOHNSON, D.L. JORDAN*, and B.B SHEW, North Carolina State University, Raleigh, NC 27695; T. CORBETT, J.S. BARNES, C.R. BOGLE, T. MARSHALL, and W. YE, North Carolina Department of Agriculture and Consumer Services, Raleigh, NC 27699.

11:15 (14) Peanut Yield and Pest Reaction Following Various Crop Rotations in North Carolina. D.L. JORDAN*, B.B. SHEW, and P.D. JOHNSON, North Carolina State University, Raleigh, NC 27695; T. CORBETT, J.S. BARNES, C.R. BOGLE, T. MARSHALL, and W. YE, North Carolina Department of Agriculture and Consumer Services, Raleigh, NC 27699.

11:30 (15) Evaluation of Peanut Cultivars for Suitability in Biodiesel Production Systems. W.H. FAIRCLOTH*, D.L. ROWLAND, and M.C. LAMB, USDA/ARS, National Peanut Research Lab, Dawson, GA 39842; and J.P. DAVIS, USDA/ARS, Market Quality and Handling Research Unit, Raleigh, NC 27695.

11:45 (16) Optimizing Valencia Planting Patterns and Population Densities. R.C. NUTI*[1], N. PUPPALA[2], S. ANGADI[2], R. SORENSEN[1], and M. LAMB[1]. [1]USDA-ARS National Peanut Research Laboratory. Dawson, GA

39842. [2]New Mexico State University, Agricultural Science Center at Clovis. Clovis, NM 88101.

## ECONOMICS

### Wynfrey D
### Moderator: Jim Novak, Auburn University, Auburn, AL

10:00 (17) Results from a Nationwide Survey: What do Southern Agricultural Producers Want in the 2007 Farm Bill? J.L. NOVAK*, Department of Agricultural Economics and Rural Sociology, Auburn University, AL 36849; N.B. SMITH, Department of Agricultural and Applied Economics, University of Georgia, Tifton, GA 31793.

10:15 (18) Farmer Adjustments to the 2002 Farm Bill and Issues Shaping the 2007 Farm Bill for Peanuts. N.B. SMITH*, Department of Agricultural and Applied Economics, University of Georgia, Tifton, GA 31793, T.E. HEWITT, Food and Resource Economics Department, University of Florida, Marianna, FL 32446.

10:30 (19) Potential Impacts of the 2007 Farm Bill on a Southwest Georgia Representative Cotton-Peanut Farm. W.D. SHURLEY*, N.B. SMITH, and A. ZIEHL, Department of Agricultural and Applied Economics, University of Georgia, Tifton, GA 31793.

10:45 (20) Economic Evaluation of Twin Row Plantings for Improving Production Efficiency in Peanuts. T.D. HEWITT*, N.B. SMITH. University of Florida, NFREC, Marianna 32446 and University of Georgia, Tifton, GA 31794.

11:00 (21) Economic Comparison of Irrigation Application Strategies: Results from a Three Year Study. A. ZIEHL*, N.B. SMITH, Department of Agricultural and Applied Economics, University of Georgia, Tifton, GA 31793; J.P. BEASLEY, JR., J.E. PAULK, III, and J.E. HOOK, Crop and Soil Sciences Department, The University of Georgia, Tifton, GA 31793-1209.

11:15 (22) Economic Implications of Fungicide Timing and Variety Selection. B. GOODMAN*, A. HAGAN, Ag Economics and Plant Pathology, Auburn University, AL, 36849-5406 and N. SMITH, Agricultural Economics, The University of Georgia, Tifton, GA 31793-0748.

11:30 (23) Economic Implications of Fungicide Material Selection and Application Timing. A. HAGAN, R. GOODMAN*, Ag Economics and Plant Pathology, Auburn University, AL, 36849-5406 and N. SMITH, Agricultural Economics, The University of Georgia, Tifton, GA 31793-0748.

## POSTER SESSION

**Prefuntion/Foyer Area**
**Moderator: Kira Bowen, Auburn University, Auburn, AL**

(24) Developing a Web-Based Decision Support Program for Peanut in the V-C Region. B.R. LASSITER*, G.G. WILKERSON, D.L. JORDAN, B.B. SHEW, and R.L. BRANDENBURG, North Carolina State University, Raleigh, NC 27695.

(25) Partnering for Success: A Peanut CRSP project in Ghana, West Africa. R.L. BRANDENBURG* and D.L. JORDAN, North Carolina State University, Raleigh, NC 27695-7613; M. OWUSU-AKYAW, Crops Research Institute, Box 3785, Kumasi, Ghana; and M. ABUDALIA, Savanna Agricultural Research Institute, Box 52, Tamale, Ghana.

(26) The Effect of Simulated Hail Damage on Yield and Grade in Texas Runner Peanut. T.A. BAUGHMAN*, Texas Cooperative Extension, Vernon, TX 76384; M. ZARNSTORFF, National Crop Insurance Services, Overland Park, KS, 66210, and J.C. REED, Jr., Texas Cooperative Extension, Vernon, TX.

(27) Light Interception in Single Row, Twin Row and Diamond Planting Patterns Of Valencia Peanuts. S.V. ANGADI, R. NUTI, N. PUPPALA* and R. SORENSEN. New Mexico State University, Agricultural Science Center at Clovis, NM 88101, USDA-ARS, National Peanut Research Lab, Dawson, GA 39842.

(28) Performance of Dual Purpose Valencia Peanut (*Arachis hypogaea* L.) under Irrigation. L.M. LAURIAULT, Plant and Environmental Sciences Department and Agricultural Science Center at Tucumcari, New Mexico State University, 6502 Quay Rd. AM.5, Tucumcari, NM 88401; and N. PUPPALA*, Plant and Environmental Sciences Department and Agricultural Science Center at Clovis, New Mexico State University, 2346 State Road 288, Clovis, NM 88101.

(29) Effect of Calcium on Seed Germination and Grade Factors of Four Runner Cultivars. M.W. GOMILLION*, B.L. TILLMAN, and D.W. GORBET. The University of Florida, Agronomy Department, NFREC, Marianna, FL, 32446.

(30) *Amaranthus palmeri* germination as influenced by storage mechanisms and temperature regimes. A.M. WISE*, T.L. GREY, and E.P. PROSTKO, Crop and Soil Science Department, The University of Georgia, Tifton, GA 31794.

(31) Weed Control When Applying Cadre and Pursuit Using Different Spray Tips and Carrier Spray Volumes. W.J. GRICHAR*, P.A. DOTRAY, and T.A. BAUGHMAN. Texas Agricultural Experiment Station, Beeville, TX 78102-9410 and Lubbock, TX 79403,

respectively; Texas Cooperative Extension, Vernon, TX 76384.

(32) The Effects of Reduced Tillage Practices on Continuous Peanut Production and Pest Management. P.G. MULDER, C.B. GODSEY*, J.P. DAMICONE, C.R. MEDLIN. Dept. of Plant and Soil Sciences, Oklahoma State University, Stillwater, OK 74078.

(33) Field Evaluation of Arachis Botanical Varieties Aequatoriana, Hirsuta, and Peruviana for TSWV Resistance. R.N. PITTMAN*, USDA-ARS, Plant Genetic Resources Conservation Unit, 1109 Experiment Street, Griffin, GA 30223, USA., and J.W. TODD, University of Georgia, Coastal Plain Expt. Stn., Tifton, GA 31793.

(34) Evaluation of Crosses from Unrelated Genotypes with Contrasting TSWV Resistance. J.J. BALDESSARI*, Agronomy Department, University of Florida, Gainesville, FL 32611; B.L. TILLMAN, University of Florida, NFREC, Marianna, FL 32446; D.S. WOFFORD, Agronomy Department, University of Florida, Gainesville, FL 32611; and D.W. GORBET, University of Florida, NFREC, Marianna, FL 32446.

(35) Comparison of Selected Peanut Cultivars for Insect and Disease Susceptibility in an Irrigated Production System in Southeast Alabama. H.L. CAMPBELL*, J.R. WEEKS, and A.K. HAGAN, Dept of Entomology and Plant Pathology, Auburn University, AL 36849; L. WELLS, Wiregrass Research and Extension Center, Headland, AL 36345.

(36) Peanut Disease Issues in the West Texas: An Extension Overview. J.E. WOODWARD*, T.A. WHEELER, Texas A&M Research & Extension Center, Lubbock, TX 79403; and T.A. BAUGHMAN, Texas A&M Research & Extension Center, Vernon, TX 76384.

(37) Soil textures and Organic Fertilization on Peanuts (*Arachis hypogaea* L) Crop. S. SÁNCHEZ-DOMÍNGUEZ*. Depto de Fitotecnia, Universidad Autonoma Chapingo, Chapingo Mex., 56230.

(38) Use of an *In-vitro* Culture System to Study Gravitropic Responses of Peanut Pegs. V.A. JAMES*, M. GALLO, Agronomy Department, The University of Florida, Gainesville, FL 32610-3610

(39) Utilization of Simple Sequence Repeat (SSR) Markers to Assess Allelic Diversity Changes in Virginia-type Peanut Cultivars Released from 1943 to 2005. S.R. MILLA-LEWIS* and T.G. ISLEIB, Department of Crop Science, North Carolina State University, Raleigh, NC 27695-7629.

(40) Discovery of Late Embryonic Abundant (LEA) Transcripts from seed ESTs. P.M. DANG*, USDA-ARS, National Peanut Research Laboratory, Dawson, GA 39842; B.Z. GUO*, USDA-ARS, Crop Protection and Management Research Unit, Tifton, GA 31793.

(41) EST-based Microsatellite Marker Data Mining and Characterizing. X.P. CHEN*, A.K. CULBREATH, the University of Georgia, Department of Plant Pathology, Tifton, GA 31793; Y. HONG, X.Q. LIANG, K. LIN, Guangdong Academy of Agricultural Sciences, Institute of Crop Science, China; B.Z. GUO, USDA-ARS, Crop Protection and Management Research Unit, Tifton, GA 31793.

(42) Flavonoid Content in Peanut Seeds Quantified by HPLC. M.L. WANG, N. BARKLEY*, D. PINNOW, and R. PITTMAN, USDA-ARS, Plant Genetic Resources Conservation Unit, 1109 Experiment Street, Griffin, GA 30223, USA

(43) Improvement of Oxidative Stability and Organoleptic Properties of Roasted Peanut after Power Ultrasound Treatment and Edible Coatings. P. WAMBURA and W. YANG, Department of Food and Animal Sciences, Alabama A&M University, 4900 Meridian St., Normal, AL 35762.

(44) Effect of Non-Thermal Processing on Peanut Allergens. S.-Y. CHUNG*[1], W. YANG[2], A. SINGH[2], and K. KRISHNAMURTHY[2]. [1]USDA-ARS, Southern Regional Research Center, New Orleans, LA 70124; [2]Department of Food and Animal Sciences, Alabama A&M University, Normal, AL 35762.

## JOE SUGG GRADUATE STUDENT COMPETITION

**Riverchase AB**
**Moderator: Bob Kemerait, University of Georgia, Tifton, GA**

1:30 (45) Surprising Results from a Cover Crop Trial with Peanut. B.R. LASSITER*, G.G. WILKERSON, D.L. JORDAN, B.B. SHEW, and R.L. BRANDENBURG, North Carolina State University, Raleigh, NC 27695.

1:45 (46) Incorporating Perennial Grasses into Peanut Rotations; Effects on Soil Quality Parameters and Peanut Disease, Growth and Development. J.M. WEEKS.*, J.C. FAIRCLOTH, M.A. ALLEY, and C. TEUTSCH, Department of Crop and Soil Environmental Sciences, Virginia Polytechnic Institute and State University, Blacksburg, VA 24060; and P.M. PHIPPS, Department of Plant Physiology, Pathology and Weed Science, Virginia Polytechnic Institute and State University, Blacksburg, VA 24060.

2:00 (47) Critical Period of Weed Interference in Peanut. W. EVERMAN*, S. CLEWIS, and J. WILCUT, Crop Science Department, North Carolina State University, Raleigh, NC 27695.

2:15 (48) Managing Seed and Seedling Disease of Peanut in Organic Production Systems. S.J. RUARK* and B.B. SHEW. Department of Plant Pathology, NC State University, Raleigh, NC 27695.

2:30 (49) Maximizing Economic Returns and Minimizing Stem Rot Incidence with Optimum Plant Densities of Peanut in Nicaragua. J. AUGUSTO*, T. BRENNEMAN, A. CSINOS, A. CULBREATH, Department of Plant Pathology, The University of Georgia, Tifton, GA 31793-0748; and J. BALDWIN, Agronomy Department, The University of Florida, Gainesville, FL 32611-0300.

2:45 (50) Evaluating Resistance of Spanish and Runner Peanut Genotypes to *Sclerotinia minor*. J.N. WILSON*, Department of Plant and Soil Science, Texas Tech University, Lubbock, TX 79409; T.A. WHEELER, Texas Agricultural Experiment Station, Lubbock, TX 79403 and M.D. BUROW, Texas Agricultural Experiment Station, Lubbock, TX 79403.

3:15 (51) The Interaction between Root-knot Nematode (*Meloidogyne arenaria*) and Cylindrocladium Black Rot (CBR) in Runner Peanut. W. DONG[1]*, T.B. BRENNEMAN[1], C.C. HOLBROOK[2], P. TIMPER[2], and A.K. CULBREATH[1]. [1]Department of Plant Pathology, The University of Georgia, Tifton, GA 31793; [2]USDA-ARS, Coastal Plain Exp. Stn. Tifton, GA 31793.

3:30 (52) Analyzing the genetic diversity of *Tomato spotted wilt virus* on peanut in North Carolina and Virginia. A. KAYE*, G. KENNEDY, E. PARKS, B. SHEW, M. CUBETA, and J. MOYER, Dept. of Plant Pathology, North Carolina State University, Raleigh, NC 27695-7616

3:45 (53) Simple Sequence Repeat Polymorphisms in Cultivated Peanut (Arachis hypogaea L.). Y. LI*[1], W.S. MA[2], A.K. CULBREATH[1], B.Z. GUO[3], S.J. KNAPP[2], S.E. GOLD[1]. [1]Dept. of Plant Pathology, Univ. of Georgia, Athens, GA, 30602; [2]Dept. of Crop and Soil Science, Univ. of Georgia, Athens, GA 30602; [3]USDA-ARS, Coastal Plain Experiment Station, Tifton, GA 31793.

4:00 (54) Navigating the Governmental Approval Process for Release of Transgenic Peanuts with Enhanced Resistance to Sclerotinia Blight. S.M. CHRISCOE*, E.A. GRABAU, Department of Plant Pathology, Physisology and Weed Science, Virginia Polytechnic Institute and State University, Blacksburg, VA 24061. D.E. PARTRIDGE and P.M. PHIPPS, Tidewater Agricultural. Research & Extension Center, Suffolk, VA 23437

## PLANT PATHOLOGY AND NEMATOLOGY; ENTOMOLOGY SESSIONS

**Riverchase A**
**Moderators: David Hunt, Bayer CropScience, Opelika, AL, and Kira Bowen (Assistant), Auburn University, Auburn, AL**

8:00 (55) Effect of Reduced Tillage and Soil Fumigation on Disease Incidence

and Yield of Virginia- and Runner-Type Cultivars of Peanut in Virginia. P.M. PHIPPS* and D.E. PARTRIDGE, Tidewater Agricultural Research & Extension Center, Virginia Tech, Suffolk, VA 23437.

8:15 (56) Evaluation of Advanced Peanut Breeding Lines for Resistance to Late Leaf Spot and Rust. F. WALIYAR*, P. LAVA-KUMAR, S.N. NIGAM, R. ARUNA, International Crops Research Institute for the Semi-Arid Tropics, Patancheru 502 324, Andhra Pradesh, India; and K.T. RANGASWAMY, Department of Plant Pathology, University of Agriculture Sciences, Hebal, Bangalore 560 065, Karnataka, India.

8:30 (57) Field Assessment of Virginia-Type Peanuts Transformed with the Oxalate Oxidase Gene in 2006. D.E. PARTRIDGE*, P.M. PHIPPS, Tidewater Agricultural Research & Extension Center, Virginia Tech, Suffolk, Virginia 23437; S.M. CHRISCOE, and E.A. GRABAU, Department of Plant Pathology, Physiology and Weed Science, Virginia Tech, Blacksburg, Virginia 24061.

8:45 (58) Integrating a Weather-based Model with the TSWV Risk Index for Forecasting Spotted Wilt Severity. R.O. OLATINWO*, J.O. PAZ, and G. HOOGENBOOM, Department of Biological and Agricultural Engineering, University of Georgia, Griffin, GA 30223; S.L BROWN, Department of Entomology, University of Georgia, Tifton, GA 31793; R.C. KEMERAIT Department of Plant Pathology, University of Georgia, Tifton, GA 31793; J. BEASLEY, JR, Department of Crop and Soil Sciences, University of Georgia, Tifton, GA 31793.

9:00 (59) Variations in Pathogenicity and Aggressiveness of *Sclerotinia minor* Isolates. J.E. HOLLOWELL* and B.B. SHEW, Department of Plant Pathology, North Carolina State University, Raleigh, NC 27695-7903.

9:15 (60) First Reported Occurrence of Sclerotinia Blight Incited by *Sclerotinia sclerotiorum* on Peanut in New Mexico. S. SANOGO*, Department Entomology, Plant Pathology, and Weed Science, New Mexico State University, Las Cruces, NM 88003; and N. PUPPALA, New Mexico State University, Clovis Agricultural Science Center, Clovis, NM 88101.

9:30 (61) Effects of Fungicide Programs on Control of Pythium Pod Rot of Peanut in Oklahoma. J.P. DAMICONE* and L.R. PIERCE, Department of Entomology and Plant Pathology, Oklahoma State University, Stillwater, OK 74078-3033.

10:15 (62) Assessment of Provost Fungicide in Georgia for Management of Southern Stem Rot and Leaf Spot Diseases of Peanut. R.C. KEMERAIT*, A.K. CULBREATH, Department of Plant Pathology, The University of Georgia, Tifton, GA 31793; W.D. DUFFIE, Cooperative Extension, The University of Georgia, Waynesboro, GA 30830, and R.G. McDANIEL, Screvin Gin Company, Inc., Louisville, GA 30434.

10:30 (63) Management of CBR with Partially Resistant Cultivars and

Prothioconazole. T.B. BRENNEMAN*, Dept. of Plant Pathology, University of Georgia, Tifton, GA 31794; and H. YOUNG, Bayer Cropscience, Tifton, GA 31794.

10:45 (64) PROLINE 480 SC for the Control of CBR in Peanuts. G.H. MUSSON*, H. YOUNG, R.A. MYERS, J.R. BLOOMBERG and R. RUDOLPH. Bayer CropScience, Research Triangle Park, NC. 27709.

11:00 (65) PROVOST 433 SC U.S. Efficacy Summary. H.S. YOUNG*, G.H. MUSSON, and R.A. MYERS. Bayer CropScience, Research Triangle Park, NC. 27709.

## ENTOMOLOGY

**Riverchase A**
**Moderators: David Hunt, Bayer CropScience, Opelika, AL, and Kira Bowen (Assistant), Auburn University, Auburn, AL**

11:15 (66) Insecticide Efficacy For Thrips Suppression, Spotted Wilt Suppression, and Yield Protection; and the Relationship Between Spotted Wilt Stunting and Yield Loss in South Carolina. J.W. CHAPIN*, and J.S. THOMAS, Department of Entomology, Soils, and Plant Sciences, Clemson University, Edisto REC, 64 Research Road, Blackville, SC 29817.

11:30 (67) Determining the Susceptibility of Virginia Market-type Peanut Varieties and Advanced Breeding Lines to Tomato Spotted Wilt Virus (TSWV) and Tobacco Thrips, *Frankliniella fusca*. D.A. HERBERT, JR.*, S. MALONE, Tidewater Agricultural Research and Extension Center, Virginia Tech, Suffolk, VA, 23437; D.L. COKER, Soil and Crop Sciences, Texas A&M University, College Station, TX, 77843-2474; and T. ISLEIB, Crop Science Department, North Carolina State University, Raleigh, NC, 27695.

## BREEDING, BIOTECHNOLOGY, AND GENETICS - II

**Riverchase B**
**Moderator: Baozhu Guo, USDA-ARS, Tifton, GA**

8:15 (68) Characterization of the peanut mini core collection using RGH-based markers. G.H. HE[1]*, Y. WANG[2], B. ROSEN[3], M.L. WANG[4], R.V. PENMETSA[3], D. COOK[3]. [1]Department of Agricultural Sciences, Tuskegee University, AL 36088; [2] School of Life Sciences, Anhui University, Anhui, China; [3]Department of Plant Pathology, University of California, Davis, CA 95616; and [4]USDA-ARS, Plant Genetic Resources Conservation Unit, Griffin, GA 30223.

8:30 (69) Molecular Cloning of an SSR Marker Associated with Resistance to

Sclerotinia Blight in Peanut and Sequence Variation among Resistant and Susceptible Plant Lines. K.D. CHENAULT*, Wheat, Peanut and other Field Crops Research Unit, 1301 N. Western, Stillwater, OK 74074.

8:45 (70) Development of Peanut Expressed Sequence Tag-based Genomic Resources and Tools. B.Z. GUO*, USDA-ARS, Crop Protection and Management Research Unit, Tifton, GA 31793; P. DANG, USDA-ARS, National Peanut Research Laboratory, Dawson, GA 39842; Y. LI, X. CHEN, A.K. CULBREATH, Department of Plant Pathology, the University of Georgia, Tifton, GA 31793; C.C. HOLBROOK, USDA-ARS, Crop Genetics and Breeding Research Unit, Tifton, GA 31793.

9:00 (71) High-Resolution Two-Dimensional Gel Electrophoresis (2-DGE) For Peanut Seed Proteomics: Potential Applications in Genotype Differentiation, Taste and Allergens. R. RAKWAL*, Human Stress Signal Research Center (HSS), National Institute of Advanced Industrial Science and Technology (AIST), Tsukuba West, 16-1 Onogawa, Tsukuba 305-8569, Japan; K.R. KOTTAPALLI, Agricultural Science Center at Clovis, New Mexico State University, 2346 State Road 288, Clovis, NM 88101; G. KUMAR AGARWARL, Research Laboratory for Agriculture Biotechnology and Biochemistry (RLABB), Kathmandu, Nepal; J. SHIBATO, HSS, AIST; M. BUROW, Texas Agricultural Experiment Station, Texas A&M University, Lubbock, TX, 79403, USA and Texas Tech University, Department of Plant and Soil Science, Lubbock, TX, 79409, USA and N. PUPPALA, Plant and Environmental Sciences Department and Agricultural Science Center at Clovis, New Mexico State University, 2346 State Road 288, Clovis, NM 88101.

9:15 (72) Development of Molecular Markers to Facilitate Pyramiding Genetic Traits in Peanut Cultivars. Y. CHU*, L. RAMOS, P. OZIAS-AKINS, Horticulture Department, The University of Georgia Tifton Campus, Tifton, GA 31794, and C.C. HOLBROOK, USDA-ARS, Tifton, GA 31793, USA

9:30 (73) Proteomics of Water-Deficit Stress in U. S. Peanut Minicore Accessions. K.R. KOTTAPALLI, Agricultural Science Center at Clovis, New Mexico State University, Clovis, NM, 88101; R. RAKWAL, Human Stress Signal Research Center, AIST, Tsukuba 305-8569, Ibaraki, Japan; G. BUROW, J. BURKE, USDA–ARS Plant Stress & Germplasm Development Unit, Cropping Systems Research Lab, Lubbock, TX, 79415; N. PUPPALA, Agricultural Science Center at Clovis, New Mexico State University, Clovis, NM, 88101; P. PAYTON, USDA–ARS Plant Stress & Germplasm Development Unit, Cropping Systems Research Lab, Lubbock, TX, 79415; and M. BUROW*, Texas Tech University, Department of Plant and Soil Science, Lubbock, TX, 79409, and Texas Agricultural Experiment Station, Texas A&M University, Lubbock, TX, 79403.

10:15 (74) Devleopment of Transgenic Peanut with Reduced Allergen Content.

P.C. FAUSTINELLI, Y. CHU, L. RAMOS, P. OZIAS-AKINS*, Department of Horticulture, The University of Georgia Tifton Campus, Tifton, GA 31793, J.J. THELEN, M. HAJDUCH, Department of Biochemistry, University of Missouri-Columbia, Columbia, MO 65211, and S.J. MALEKI, USDA-ARS-SRRC, New Orleans, LA 70124.

10:30 (75) Differentially expressed cDNA transcripts and proteins in peanut leaf. R. KATAM*, HKN. VASNATHAIAH, S.M. BASHA, Center for Viticulture and Small Fruit Research, Florida A&M University, Tallahassee, FL 32317-9300.

10:45 (76) Using Geographic Information and Morphological and Agronomic Descriptors to Develop Core Collection Specific to Valencia Peanut Market Type. S.L. DWIVEDI, New Mexico State University, Agricultural Science Center at Clovis, 2346 State Road 288, Clovis, NM 88101; N. PUPPALA*, New Mexico State University, Agricultural Science Center at Clovis, 2346 State Road 288, Clovis, NM 88101; HARI D. UPADHYAYA, International Crop Research Institute for Semi Arid Tropics, Patancheru, Andhra Pradesh, India 502324; and S. SINGH, International Crop Research Institute for Semi Arid Tropics, Patancheru, Andhra Pradesh, India 502324.

## PHYSIOLOGY AND SEED TECHNOLOGY; PROCESSING AND UTILIZATION

**Wynfrey D**
**Moderator: Tim Grey, University of Georgia, Tifton, GA**

8:15 (77) Comparison of Twin Row and Single Row Planting Pattern for Virginia and Runner-Type Peanuts in Virginia. J.C. FAIRCLOTH*, D.L. COKER, P.M. PHIPPS, and D.A. HERBERT. Tidewater Agricultural Research and Extension Center, Virginia Tech, Suffolk, VA 23437.

8:30 (78) Temperature effect on peanut (*Arachis hypogaea*) seed germination. T.L. GREY*, J.P. BEASLEY, JR., and A.M. WISE Crop and Soil Science Department, University of Georgia, P.O. Box 748, 115 Coastal Way, Tifton, GA 31793 and T.M. WEBSTER, USDA-ARS, Tifton GA 31794.

8:45 (79) Acclimation Response of Peanut to Deficit Irrigation: Pinpointing Water Application to Increase Drought Tolerance. D. ROWLAND*, W. FAIRCLOTH, USDA-ARS, NPRL, 1011 Forrester Dr. SE, Dawson, GA, 39842; P. PAYTON, USDA-ARS, CSRL, 3810 4TH St., Lubbock, TX, 79415; and D. TISSUE, Dept. of Biological Sciences, Texas Tech University, PO Box 43131, Lubbock, TX, 79409.

9:00 (80) Virginia Market-Type Breeding Lines with Flavor Profiles Equivalent to the Runner-Type Standard, Florunner. H.E. PATTEE*[1], T.G. ISLEIB[2], T.H. SANDERS[3], L.O. DEAN[3], and K.W. HENDRIX[3]. [1]Department of Biological and Agricultural Engineering, N. C. State University,

Raleigh, NC 27695-7625; [2]Department of Crop Science, N. C. State University, Raleigh, NC 2769-7629; [3]USDA-ARS Market Quality and Handling Research Unit, Raleigh, NC, 27695-7624.

9:15 (81) Identification of Volatile Compounds Causing Natural Fruity Fermented Off-flavor in Peanuts. J.L. GREENE, T.H. SANDERS*, and M.A. DRAKE. USDA-ARS-MQHRU, Department of Food Science, North Carolina State University, Raleigh, NC 27695.

9:30 (82) Comparisons of Biodiesel Produced from Oils of Various Peanut Cultivars. J.P. DAVIS*[1], D. GELLER[2], W.H. FAIRCLOTH[3], and T.H. SANDERS[1]. [1]USDA-ARS Raleigh, NC; [2]Department of Biological and Agricultural Engineering, The University of Georgia, Athens, GA; [3]USDA-ARS, Dawson, GA.

## BAYER EXCELLENCE IN EXTENSION EDUCATION

**Wynfrey D**
**Moderator: Herb Young, Bayer CropScience, Tifton, GA**

10:00 (83) Managing Peanut in Southeastern North Carolina. E.R. HARRELSON*, M.W. SHAW, D.E. MORRISON, D.L. JORDAN, B.B. SHEW, and R.L. BRANDENBURG, North Carolina Cooperative Extension Service, Raleigh, NC 27695.

10:15 (84) Peanut Response to Foliar Growth Promoters in Texas. C.R. CRUMLEY*, Texas Cooperative Extension Service, Seminole, TX 79360; S.A. RUSSELL, Texas Cooperative Extension Service, Brownfield, TX 79316; K.T. SIDERS, Texas Cooperative Extension Service, Levelland, TX 79336; and T.A. BAUGHMAN and J.C. REED, Jr., Texas Cooperative Extension Service, Vernon TX 76384.

10:30 (85) On Farm Crop Enterprise Cost Analysis of Strip Till Vs Conventional Till Peanuts. R.M. BARENTINE*, Pulaski Cooperative Extension, University of Georgia, Hawkinsville, Ga. 31036; A. ZIEHL, Agricultural Economics Department, University of Georgia, Tifton, Ga. 31793. N.B. SMITH, Agricultural Economics Department, University of Georgia, Tifton, Ga. 31793.

10:45 (86) Yield, Grade and Dollar Value of Two Peanut Cultivars as Affected by Digging Method. W.D. THOMAS* University of Florida Columbia County Extension, Lake City Florida 32025, J.A. BALDWIN, Agronomy, Department, The University of Florida, Gainesville Fl. 32611-0220, W.H. FAIRCLOTH and D.L. ROWLAND USDA/ARS National Peanut Research Laboratory, Dawson Ga. 39842.

11:00 (87) Using On-Farm Testing in a Region with Increasing Peanut Production. J.A. GADDY*, C.D. FOUNTAIN, D.L. JORDAN, B.B. SHEW, and R.L. BRANDENBURG, North Carolina Cooperative Extension Service, Raleigh, NC 27695.

11:15 (88) Evaluation of Fungicide Efficacy on Peanuts in Early County, Georgia. B. CRESSWELL*, R. KEMERAIT, University of Georgia Cooperative Extension, Early County and University of Georgia Cooperative Extension, Plant Pathology, Tifton, Georgia

11:30 (89) Virginia Regional Market Analysis and Outlook Utilizing the Internet as an Interactive Delivery System. M.T. ROBERTS*, Virginia Polytechnic and State University, Prince George Extension Office, Prince George, VA, 23875

## EXTENSION TECHNIQUES AND TECHNOLOGY

**Wynfrey D**

11:45 (90) Evaluation of Certain Fungicides and Fungicide Combinations on the Incidence of Peanut Disease. P.D. WIGLEY*, Calhoun County Extension, University of Georgia, Morgan, GA 39866; and R.C. KEMERAIT, Department of Plant Pathology, University of Georgia, Tifton, GA 31793-0748.

## ORGANIC PRODUCTION

**Riverchase A**
**Moderator: Emily Cantonwine, University of Georgia, Tifton, GA**

1:15 (91) Effects of Biofungicides and Botanical Extracts on Yield and Quality of Valencia Peanut. N. PUPPALA*, Agricultural Science Center at Clovis, 2346 State Road 288, Clovis, NM 88101, New Mexico State University, and S. SANOGO, Entomology, Plant Pathology and Weed Science, New Mexico State University.

1:30 (92) Evaluation of Seven Peanut Varieties in an Organic Production System on Eastern Shore Virginia. D.L. COKER, Soil and Crop Sciences, Texas A&M University, College Station, TX, 77843-2474; D.A. HERBERT, JR.*, S. MALONE, and F. SHOKES, Tidewater Agricultural Research and Extension Center, Virginia Tech, Suffolk, VA, 23437; and B. JARDINE, Quail Cove Farms, Machipongo, VA, 23405.

1:45 (93) Evaluation of Organically Acceptable Fungicides for Management of Leaf Spots in Georgia. E.G. CANTONWINE*, National Environmentally Sound Production Agriculture Laboratory, University of Georgia, Tifton, GA, 31793; A.K. CULBREATH, Department of Plant Pathology, University of Georgia, Tifton, GA, 31793; and M.B. BOUDREAU, Hebert Green Agroecology, Asheville, NC, 28801.

2:00 (94) Developing Enterprise Budgets for Organic Peanut Production. S.K. GREMILLION, E.G. CANTONWINE. The University of Georgia, Coastal Plain Expt. Stn., Tifton, GA 31793; N.B. SMITH*, Department

of Agricultural and Applied Economics, University of Georgia, Tifton, GA 31793; M.C. LAMB, USDA/ARS, National Peanut Research Laboratory, Dawson, GA 39842.

2:15 (95) Economics of Organics versus Conventional Peanut and Cotton. M.C. LAMB*[1], E. CANTONWINE[2], R.B. SORENSEN[1], R.C. NUTI[1], G. TILLMAN[3], and N.B. SMITH[4]. [1]USDA/ARS-National Peanut Res. Lab., Dawson, GA 39842. [2]University of Georgia, Coastal Plain Expt. Stn., Tifton, GA 31793. [3]USDA/ARS-Crop Protection and Management Lab., Tifton, GA 31793. [4]University of Georgia, Dep. Of Ag. and Applied Economics, Tifton, GA 31793.

## HARVESTING, CURING, SHELLING, STORING AND HANDLING

**Riverchase B**
**Moderator: Chris Butts, USDA-ARS, Dawson, GA**

1:15 (96) Peanut Quality as Affected by Digging Method. J.A. BALDWIN*, Agronomy Department, The University of Florida, Gainesville Fl. 32611-0220, W.D. THOMAS University of Florida Columbia County Extension, Lake City Florida 32025, W.H. FAIRCLOTH and D.L. ROWLAND USDA/ARS National Peanut Research Laboratory, Dawson Ga. 39842.

1:30 (97) Nondestructive Moisture Content Determination In In-Shell Peanuts Using An Impedance Measuring Instrument. C.V. KANDALA* and C.L. BUTTS, USDA, ARS, National Peanut Research Laboratory, Dawson, GA 39842.

1:45 (98) Poor Field Emergence of Late-Maturing Peanut Cultivars (*Arachis* hypogaea L.) Derived from PI 203396. B.R. MORTON*, B.L. TILLMAN, D.W. GORBET, and K.J. BOOTE, Agronomy Department, The University of Florida, Gainesville, FL 32611-0300.

2:00 (99) Effect of Temperature and Relative Humidity on Spotting of Peanuts after Roasting. J.W. DORNER*[1], C.L. BUTTS[1], V.S. SOBOLEV[1], T.H. SANDERS[2], and T.B. WHITAKER[2]. [1]USDA, ARS, National Peanut Research Laboratory, Dawson, GA 39842; [2]USDA, ARS, Market Quality and Handling Research Unit, Raleigh, NC 27695.

2:15 (100) Environmental Conditions During Transport of Shelled Peanuts in Overseas Containers. C.L. BUTTS*[1], J.W. DORNER[1], V. SOBOLEV[1], T.H. SANDERS[2], and T.B. WHITAKER[2]. [1]USDA, ARS, National Peanut Research Laboratory, Dawson, GA 39842; [2]USDA, ARS, Market Quality and Handling Research Unit, Raleigh, NC 27695.

2:30 (101) Determination of the Nature of Spotting in Blanched Peanuts. V.S. SOBOLEV*. USDA, ARS, National Peanut Research Laboratory, Dawson, GA 39842.

2:45 (102) Uncertainty Associated with Measuring the True Level of Spotted Peanuts in Bulk Lots of Shelled Peanuts. T.B. WHITAKER*[1], T.H. SANDERS[1], J.W. DORNER[2], C.L. BUTTS[2], and V.S. SOBOLEV[2]. [1]USDA, ARS, Market Quality and Handling Research Unit, Raleigh, NC 27695; [2]USDA, ARS, National Peanut Research Laboratory, Dawson, GA 39842.

## WEED SCIENCE

**Wynfrey D**
**Moderator: P. Dotray, Texas Tech University, Lubbock, TX**

1:15 (103) Tolerance of "New" Peanut Varieties to "Old" Herbicides. E.P. PROSTKO* and T.L. GREY, Department of Crop and Soil Sciences, The University of Georgia, Tifton, GA 31793.

1:30 (104) Does Basagran Safen Peanut Injury from Cobra? P.A. DOTRAY*, Texas Tech University, Texas Agricultural Experiment Station, and Texas Cooperative Extension, Lubbock; W.J. GRICHAR, Texas Agricultural Experiment Station, Beeville, TX; T.A. BAUGHMAN, Texas A&M University Agricultural Research and Extension Center, Vernon; and L.V. GILBERT, Texas Agricultural Experiment Station, Lubbock.

1:45 (105) Weed Control and Phytotoxicity of Delayed Applications Dinitroaniline Herbicides in Strip-Tillage Peanut Production. W.C. JOHNSON, III* and E.P. PROSTKO. USDA-ARS, Coastal Plain Experiment Station, Tifton, GA 31793.

2:00 (106) Physiological Behavior of Root-Applied Diclosulam in Peanut (*Arachis hypogaea*), Pitted Morningglory (*Ipomoea Lacunosa*), and Sicklepod (*Senna obtusifolia*). S.B. CLEWIS*, W.J. EVERMAN, D.L. JORDAN, and J.W. WILCUT; Crop Science Department, North Carolina State University, Raleigh, NC 27695-7620.

## SITE SELECTION COMMITTEE REPORT

The 2008 meeting will be held in Oklahoma City at the Renaissance Oklahoma City Hotel on 13 to 19 July. The 2009 meeting will be in Raleigh at the Marriott Raleigh City Center on 13 to 17 July. The 2010 meeting will be in Florida, with the site yet to be selected.

Respectfully submitted by,
Kira Bowen, Chair

## CAST REPORT

No report given.

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

### ARTICLE I. NAME

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

### ARTICLE II. PURPOSE

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

### ARTICLE III. MEMBERSHIP

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

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

b. Sustaining memberships: Industrial organizations and others that pay dues as fixed by the Board of Directors. Sustaining members are those who wish to support this Society financially to an extent beyond minimum requirements as set forth in Section 1c, Article III.

Sustaining members may designate one representative who shall have individual member rights. Also, any organization may hold sustaining memberships for any or all of its divisions or sections with individual member rights accorded each sustaining membership.

1. Silver Level, this maintains the current level and is revenue neutral. Discounted meeting registration fees would result in revenue loss with no increase in membership fee. Registration discounts can be used as an incentive for higher levels of membership.
2. Gold Level, the person designated by the sustaining member would be entitled to a 50% discount on annual meeting registration. This benefit cannot be transferred to anyone else.
3. Platinum Level, the person designated by the sustaining member would be entitled to a 100% discount on annual meeting registration. This benefit cannot be transferred to anyone else.

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

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

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

## ARTICLE IV. DUES AND FEES

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

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

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

## ARTICLE V. MEETINGS

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

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

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

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

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

## ARTICLE VI. QUORUM

Section 1. Forty voting members shall constitute a quorum for the transaction of business at the business meeting held during the annual meeting.

Section 2. For meetings of the Board of Directors and all committees, a majority of the members duly assigned to such board or committee shall constitute a quorum for the transaction of business.

## ARTICLE VII. OFFICERS

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

Section 2. The president and president-elect shall serve from the close of the annual meeting of this Society to the close of the next annual meeting. The president-elect shall automatically succeed to the presidency at the close of the annual meeting. If the president-elect should succeed to the presidency to complete an unexpired term, he/she shall then also serve as president for the

following full term. In the event the president or president-elect, or both, should resign or become unable or unavailable to serve during their terms of office, the Board of Directors shall appoint a president, or both president-elect and president, to complete the unexpired terms until the next annual meeting when one or both offices, if necessary, will be filled by normal elective procedure. The most recent available past president shall serve as president until the Board of Directors can make such appointment.

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

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

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

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

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

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

Editorial responsibilities include:

1. Review performance of associate editors and reviewers. Recommend associate editors to the Publications and Editorial Committee as terms expire.
2. Conduct Associate Editors' meeting at least once per year. Associate Editors' meetings may be conducted in person at the Annual Meeting or via electronic means such as conference calls, web conferences, etc.
3. Establish standard electronic formats for manuscripts, tables, figures, and graphics in conjunction with Publications and Editorial Committee and publisher.
4. Supervise Administrative/Editorial assistant in:
    a. Preparing routine correspondence with authors to provide progress report of manuscripts.
    b. Preparing invoices and collecting page charges for accepted manuscripts.
5. Screen manuscript for content to determine the appropriate associate editor, and forward manuscript to appropriate associate editor.
6. Contact associate editors periodically to determine progress of manuscripts under review.
7. Receive reviewed and revised manuscripts from associate editor; review manuscript for grammar and formatting; resolve discrepancies in reviewers' and associate editor's acceptance decisions.
8. Correspond with author regarding decision to publish with instructions for final revisions or resubmission, as appropriate. Follow-up with authors of accepted manuscripts if final revisions have not been received within 30 days of notice of acceptance above.
9. Review final manuscripts for adherence to format requirements. If necessary, return the manuscript to the author for final format revisions.
10. Review final formatting and forward compiled articles to publisher for preparation of first run galley proofs.
11. Ensure timely progression of journal publication process including:
    a. Development and review of galley proofs of individual articles.
    b. Development and review of the journal proof (proof of all revised articles compiled in final publication format with tables of contents, page numbers, etc.)
    c. Final publication and distribution to members and subscribers via electronic format.
12. Evaluate journal publisher periodically; negotiate publication contract and resolve problems; set page charges and subscription rates for electronic formats with approval of the Board of Directors.
13. Provide widest distribution of *Peanut Science* possible by listing in various on-line catalogues and databases.

## ARTICLE VIII. BOARD OF DIRECTORS

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

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

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

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

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

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

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

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

Section 8. Should a member of the BOD resign or become unable or unavailable to complete his or her term, the president shall request that the Nominating Committee nominate a qualified member of the same category to fill the remainder of the term of that individual and submit the nominee's name to the BOD for approval.

## ARTICLE IX. COMMITTEES

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

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

a. Finance Committee: This committee shall consist of six members, three representing State employees, one representing USDA, and two representing Private Business segments of the peanut industry. Appointments in all categories shall rotate among the three U.S. peanut production areas. This committee shall be responsible for preparation of the financial budget of the Society and for promoting sound fiscal policies within the Society. They shall direct the audit of all financial records of the Society annually, and make such recommendations as they deem necessary or as requested or directed by the Board of Directors. The term of the chairperson shall close with preparation of the budget for the following year, or with the close of the annual meeting at which a report is given on the work of the Finance Committee under his/her leadership, whichever is later.

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

c. Publications and Editorial Committee: This committee shall consist of six members appointed to three-year terms, three representing State, one USDA, and two Private Business segments of the peanut industry with membership representing the three U.S. production areas. The members may be appointed to two consecutive three-year terms. This committee shall be responsible for the publication of Society-sponsored publications as authorized by the Board of Directors in consultation with the Finance Committee. This committee shall formulate and enforce the editorial policies for all publications of the Society subject to the directives from the Board of Directors.

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

e. Public Relations Committee: This committee shall consist of seven members, one each representing the State, USDA, Grower, Sheller, Manufacturer, and Services segments of the peanut industry, and a member from the host state who will serve a one-year term to coincide with the term of the president-elect. The primary purpose of this person will be to publicize the meeting and make photographic records of important events at the meeting. This committee shall provide leadership and direction for the Society in the following areas:

   (1) Membership: Development and implementation of mechanisms to create interest in the Society and increase its membership. These shall include, but not be limited to, preparing news releases for the

home-town media of persons recognized at the meeting for significant achievements.

(2) Cooperation: Advise the Board of Directors relative to the extent and type of cooperation and/or affiliation this Society should pursue and/or support with other organizations.

(3) Necrology: Proper recognition of deceased members.

(4) Resolutions: Proper recognition of special services provided by members and friends of the Society.

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

g. Fellows Committee: This committee shall consist of six members, two representing each of the three major geographic areas of U.S. peanut production with balance among State, USDA, and Private Business. Terms of office shall be for three years. Nominations shall be in accordance with procedures adopted by the Society and published in the previous year's PROCEEDINGS of APRES. From nominations received, the committee shall select qualified nominees for approval by majority vote of the Board of Directors.

h. Site Selection Committee: This committee shall consist of eight members, each serving four-year terms. New appointments shall come from the state which will host the meeting four years following the meeting at which they are appointed. The chairperson of the committee shall be from the state which will host the meeting the next year and the vice-chairperson shall be from the state which will host the meeting the second year. The vice-chairperson will automatically move up to chairperson.

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

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

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

## ARTICLE X. DIVISIONS

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

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

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

## ARTICLE XI. AMENDMENTS

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

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

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

## MEMBERSHIP (1975-2006)

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

## MEMBERSHIP (2007)

| | |
|---|---|
| **Individual, Regular** | 228 |
| **Individual, Retired** | 13 |
| **Individual, Post Doc/Tech Support** | 6 |
| **Individual, Student** | 20 |
| **Sustaining, Silver** | 7 |
| **Sustaining, Gold** | 1 |
| **Sustaining, Platinum** | 1 |
| **Institutional** | 6 |
| | |
| **TOTAL** | 280 |

## NAME INDEX