

2004
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BOARD OF DIRECTORS

2004-05

President James Grichar (2005)

Past President E. Ben Whitty (2005)

President-elect Patrick M. Phipps (2005)

Executive Officer J. Ronald Sholar (2005)

State Employee Representatives:

 (VC Area) Barbara Shew (2007)

 (SE Area) E. Jay Williams (2005)

 (SW Area) Kenton Dashiell (2005)

USDA Representative Ron Sorensen (2007)

Industry Representatives:

 Production Michael Franke (2006)

 Shelling, Marketing, Storage Fred Garner (2007)

 Manufactured Products Richard Rudolph (2005)

American Peanut Council President Howard Valentine (2005)

ANNUAL MEETING SITES

1969 - Atlanta, GA	1987 - Orlando, FL
1970 - San Antonio, TX	1988 - Tulsa, OK
1971 - Raleigh, NC	1989 - Winston-Salem, NC
1972 - Albany, GA	1990 - Stone Mountain, GA
1973 - Oklahoma City, OK	1991 - San Antonio, TX
1974 - Williamsburg, VA	1992 - Norfolk, VA
1975 - Dothan, AL	1993 - Huntsville, AL
1976 - Dallas, TX	1994 - Tulsa, OK
1977 - Asheville, NC	1995 - Charlotte, NC
1978 - Gainesville, FL	1996 - Orlando, FL
1979 - Tulsa, OK	1997 - San Antonio, TX
1980 - Richmond, VA	1998 - Norfolk, VA
1981 - Savannah, GA	1999 - Savannah, GA
1982 - Albuquerque, NM	2000 - Point Clear, AL
1983 - Charlotte, NC	2001 - Oklahoma City, OK
1984 - Mobile, AL	2002 - Research Triangle Park, NC
1985 - San Antonio, TX	2003 - Clearwater Beach, FL
1986 - Virginia Beach, VA	2004 - San Antonio, TX

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

APRES COMMITTEES

2004-05

Program Committee

Patrick Phipps, chair (2005)

Finance Committee

John Beasley, chair (2005)
 Fred Shokes (2005)
 John Altom (2006)
 Richard Rudolph (2006)
 Hassan Melouk (2007)
 Carroll Johnson (2007)
 Ron Sholar, ex-officio

Nominating Committee

E. Ben Whitty, chair (2005)
 Todd Baughman (2005)
 Mac Birdsong (2005)
 Harold Pattee (2005)

Publications and Editorial Committee

Michael Franke, chair (2005)
 Tom Whitaker (2005)
 Chris Butts (2006)
 Marie Fenn (2006)
 Steve Brown (2007)
 Calvin Trostle (2007)

Peanut Quality Committee

Victor Nwosu, chair (2005)
 Jim Cary (2005)
 Tim Sanders (2005)
 Emory Murphy (2005)
 Margaret Hinds (2006)
 Carolyn Bednar (2006)
 Justin Tuggle (2007)
 Howard Valentine (2007)

Public Relations Committee

Bob Sutter, chair (2005)
 Dan Gorbet (2005)
 Brent Besler (2005)
 Ken Barton (2005)
 Brian Anthony (2006)
 Kevin Calhoun (2006)
 Joe Dorner (2006)

Bailey Award Committee

Ames Herbert, chair (2007)
 Nathan Smith (2006)
 Jay Williams (2006)
 Mark Black (2007)
 Joel Faircloth (2007)
 Vernon Langston (2007)

Fellows Committee

Corley Holbrook, chair (2005)
 Max Grice (2005)
 Jimmy Ashley (2006)
 Tim Brenneman (2006)
 Albert Culbreath (2007)
 Mark Burow (2007)

Site Selection Committee

Fred Shokes, chair (2005)
 Patrick Phipps (2005)
 Bob Kemerait (2006)
 Diane Rowland (2006)
 Kira Bowen (2007)
 Austin Hagan (2007)
 Peter Dotray (2007)

Coyt T. Wilson Distinguished Service Award Committee

Patrick Phipps, chair (2005)
 Charles Simpson (2005)
 John Damicone (2006)
 David Jordan (2006)
 Eric Prostko (2007)
 Howard Valentine (2007)

Dow AgroSciences Awards Committee

John Baldwin, chair (2007)
 Rick Brandenburg (2005)
 Chip Lee (2005)
 Bo Braxton (2006)
 Roy Pittman (2006)
 Jim Starr (2007)

Joe Sugg Graduate Student Award Committee

Bob Kemerait, chair (2007)
 Kelly Chenault (2006)
 Austin Hagan (2006)
 Tom Isleib (2006)
 Yolanda Lopez (2007)

PAST PRESIDENTS

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

FELLOWS

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

BAILEY AWARD

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. Gorbett
 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

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

COTY T. WILSON DISTINGUISHED SERVICE AWARD

2004	Dr. Richard Rudolph	1997	J. Frank McGill
2003	Dr. Hassan A. Melouk	1996	Dr. Olin D. Smith
2002	Dr. H. Thomas Stalker	1995	Dr. Clyde T. Young
2001	Dr. Daniel W. Gorbet	1993	Dr. James Ronald Sholar
2000	Mr. R. Walton Mozingo	1992	Dr. Harold E. Pattee
1999	Dr. Ray O. Hammons	1991	Dr. Leland Tripp
1998	Dr. C. Corley Holbrook	1990	Dr. D.H. Smith

DOW AGROSCIENCES AWARD FOR EXCELLENCE IN RESEARCH

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

1998 Changed to Dow AgroSciences Award for Excellence in Research

DOW AGROSCIENCES AWARD FOR EXCELLENCE IN EDUCATION

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

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

APC RESEARCH AND EDUCATION AWARD

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

PROGRAM CHANGES

Paper #2 (program page 4) by A. Herbert entitled “Effect of Insecticide Treatments on Incidence of Tomato Spotted Wilt Virus, and Soil Insect Studies in Virginia Type Peanut” has been moved to the poster session.

Added a paper to the Breeding, Biotechnology, and Genetics II session on Wednesday afternoon (Program page 8) by A. Mutila entitled “Selection from Valencia by Spanish High-Oleic Lines” at 5:15.

Moved paper #49 (program page 11) by T. Moore entitled “CBR Response to Metam Sodium and Peanut Cultivar in Southwest Georgia” to the Extension Techniques and Technology/Education for Excellence section (page 13) at 11:45.

Paper #59 (program page 12) by T. Douglas entitled “Field Evaluation of Transgenic Peanut Lines for resistance to Sclerotinia Blight and Yield” was cancelled.

Added a paper to the Economics II session on Thursday morning (program page 14) by N. Smith entitled “Risk Management Strategy for a Producer Shelling Cooperative” at 11:15.

Paper #78 (program page 15) by J. Reed entitled “Elevation and Slope Effects on Peanut Yield in Circular Crop Rows” will not be presented – it will be a discussion.

Paper #80 (program page 15) by K. Dashiell entitled “The Effect of Irrigation Treatments on the Productivity of High Oleic Acid Peanut Varieties” was cancelled.

Added poster #112 by M. Sheikh entitled “Performance Evaluation of Peanut Genotypes for Drought-Tolerance and Yield Characteristics in Bangladesh”.

ROOM CHANGES

Tuesday, July 13

1:00 – 2:00 p.m.	Fellows Committee has been moved to Pecos
1:00 – 2:00 p.m.	Peanut Genomics Steering Committee will meet in Blanco
1:00 – 5:00 p.m.	Poster Set-up, Medina will not be accessible until 6:00 p.m.

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ENTOMOLOGY

Evaluation of Peanut Production Practices on the Incidence of *Tomato spotted wilt virus*. R.L. BRANDENBURG*, B.M. ROYALS, Department of Entomology, North Carolina State University, Raleigh, NC 27695-7613, D.L. JORDAN, Department of Crop Science, North Carolina State University, Raleigh, NC 27695-7620 and D.A. HERBERT, JR. Department of Entomology, Virginia Polytechnic Institute and State University, Suffolk, VA 23437

Tomato spotted wilt virus has become a serious problem for peanut producers in North Carolina for the past five years. The problem has been aggressively addressed with research and education programs that were initiated in 2000. Research programs have focused on evaluating successful components of the Georgia tomato spotted wilt virus advisory program. The results of trials in North Carolina on the impact of cultural and production on the incidence of tomato spotted wilt have been very consistent with similar studies in Georgia. Cooler, wet weather in 2003 significantly reduced the incidence of symptomatic plants in the field, but analysis of taproot tissue determined a high percentage of plants tested positive for presence of the virus. Early planting dates suffered from the highest incidence of virus and multiple applications of foliar insecticides did not reduce the incidence of virus despite significant reductions in thrips injury to the plants. The impact of at-plant, in furrow use of the systemic insecticides phorate and aldicarb still remains unclear relative to virus incidence and yield potential.

Effect of Insecticide Treatments on Incidence of *Tomato spotted wilt virus*, and Soil Insect Studies in Virginia Type Peanut. D.A. HERBERT, JR.*, and S. MALONE, Department of Entomology, Virginia Tech, Tidewater Agricultural Research and Extension Center, Suffolk, VA 23437, and P.M. PHIPPS, Department of Plant Pathology, Physiology, and Weed Science, Virginia Tech, Tidewater Agricultural Research and Extension Center, Suffolk, VA 23437.

Three field tests (*only two are reported here*) were conducted in 2003 to evaluate the effects of selected insecticide treatments on incidence of tomato spotted wilt virus (TSWV) in virginia-type peanut. Plots were planted on May 7 with VA 98R peanut using a 36-inch row spacing, with 4-row wide by 40-foot long plots, arranged in a randomized complete block experimental design with 4 replicates. In Test 1, treatments included in-furrow applications of Temik 15G at 7 lb/acre, Thimet 20G at 5 lb/acre, and Admire 2F at 19 oz/acre – each with and without a broadcast treatment of Orthene 97 at 6 oz/acre applied at late ground-cracking on May 28. In Test 2, the same in-furrow treatments with Temik 15G and Thimet 20G were followed by broadcast treatments of Orthene 97 at 6 oz/acre applied sequentially either 1, 2, 3, or 4 times, beginning at late ground-cracking (May 28) then repeating at about 2-week intervals (June 10 and 25, and July 9). Disease ratings (percent of plants showing visible TSWV symptoms) were made on the center 2 rows of each plot on July 13 and 29, and on August 31. After digging (October 2), a random sample of 10 taproots per plot was tested for virus presence using the TSWV ImmunoStrip Kit (Agdia, Inc., Elkhart, IN). Results showed that less than 20 percent of plants showed visible disease symptoms during the growing season. However in Test 1, Thimet 20G, either alone or followed by Orthene 97, resulted in significantly fewer symptomatic plants

compared with Admire 2F followed by Orthene 97, or the untreated control. There were a much higher percentage of plants with TSWV-positive taproots, ranging from 47.5 to 77.0 percent. There was no differences among treatments in Test 1. However in Test 2, there was a tendency for less disease when in-furrow treatments were followed by a single broadcast application of Orthene 97. Additional treatments appeared to have the opposite effect and increased virus levels. Seven fields were randomly selected for sampling soil insects. In each, plants were dug weekly from July 21 when peanut plants reached the R3 stage (first appearance of pods) through September 15 when plants reached the R7 stage (beginning maturity). Plants were dug with the associated soil around the pod and root zone (about 2-3 gallons of soil per plant), placed into 5-gallon buckets and returned to a stationary soil screening device. Each was washed through a series of 2 screens, the first made of hardware cloth with quarter-inch mesh, and the second made of commercial window screen. All pods were inspected for presence of injury by soil organisms, and all insects were counted and preserved for later identification. A total of 444 plants were sampled during the season. Results showed that the predominant insect soil pest was southern corn rootworm (*Diabrotica undecimpunctata howardi*) with a total of 238 larvae captured, followed by 30 white grubs (unknown sp.), 25 digging beetles (unknown sp.) and 11 wireworms (unknown sp.). There were two peaks in the rootworm larval numbers, one very small on about August 8 and a much larger one on September 8. A significant number of pods were damaged by northern root-knot nematodes (*Meloidogyne hapla*) and exhibited dark circular scars on the outer pod wall that were initially mistaken for soil insect damage.

Evaluation of Peanut Cultivars for Three-Cornered Alfalfa Hopper Damage and Implications on the Reproductive Rate, Use of Foliar Insecticides, Yield and Southern Stem Rot incidence. S.L. BROWN*, S. KOMAR, W. DUFFIE, AND N. EROGLU. Department of Entomology, University of Georgia, Tifton, GA 31793.

The three-cornered alfalfa hopper, *Spissistilus festinus* (Say), has long been recognized as a pest of peanut. However, in Georgia, grower awareness of damage and insecticide applications for control have increased in recent years. Evaluation of various peanut varieties for three-cornered alfalfa hopper feeding sites during 2003 indicated that 'Georgia Green' was very susceptible to damage compared to most other varieties. These results suggest that the shift to 'Georgia Green' during the mid-1990's may have resulted in an increase in damage and reproductive rate. Varietal response to three-cornered alfalfa hopper feeding also seems to vary greatly. Stem swelling above the feeding site is much more dramatic on some varieties than on others. Those varieties that exhibit a great deal of swelling seem to support much greater reproduction as evidenced by numerous oviposition sites about the feeding girdle. Effects of three-cornered alfalfa hopper damage on peanut yield will be discussed as well as indications that feeding sites near the crown of the plant may be contributing to increased incidence of white mold.

Effect of Kernel Feeding by a Burrower Bug, *Pangaeus bilineatus* (Say), on Peanut Flavor and Oil Quality. J.W. CHAPIN*, and J.S.

THOMAS. Department of Entomology, Soils, and Plant Sciences, Clemson University, Edisto REC, 64 Research Road, Blackville, SC 29817. T.H. SANDERS, USDA, ARS, Market Quality and Handling Research Unit, Box 7624, North Carolina State University, Raleigh, NC 27695-7624.

A burrower bug, *Pangaeus bilineatus* (Say) (Heteroptera: Cydnidae), is known to feed extensively on peanut kernels, particularly when certain reduced tillage production systems are subjected to drought stress. These bugs produce a strong odor when infested peanuts are uprooted; and previous anecdotal evidence has indicated that burrower bug feeding is detrimental to kernel flavor. We tested levels of burrower bug kernel feeding (0, 5, 10, 25, and 50% of kernels by weight) for effects on peanut flavor and oil quality. Burrower bug feeding had no detrimental effect on flavor as determined by trained panelists using descriptive sensory criteria. There was a slight, but measurable effect on oil quality as determined by a decrease in oxidative stability and an increase in peroxide values with increased levels of kernel feeding. There was no measurable effect on free fatty acid content at the feeding levels tested. The data indicate that incidental feeding (<20 % of kernels) by this pest is unlikely to be detrimental to peanut flavor. At higher kernel-feeding incidence levels, the potential risks of direct yield loss, grade reductions, and aflatoxin contamination are of greater significance than concern for slight reductions in oil quality.

Field Screening for Insect Resistance Among Peanut Genotypes. W.D. BRANCH* and J.W. TODD. Department of Crop and Soil Sciences and Entomology, respectively, University of Georgia, Coastal Plain Experiment Station, Tifton, GA 31793-0748.

Field screening for insect resistance among peanut (*Arachis hypogaea* L.) genotypes have been conducted for the past three consecutive years (2001, 2002, and 2003) at the University of Georgia, Coastal Plain Experiment Station, Tifton, GA. Irrigated and nonirrigated field trials were used for evaluations, and plants were grown with minimum and without any pesticides (nematicides, fungicides, or insecticides). However, pre-plant and occasionally post-applied herbicides were used for weed control. Thrips (*Frankliniella fusca* Hinds) damage was noticeably uniform and severe early in the growing season, but plants seemingly recovered by mid-season each year. Shortly after thrips recovery, symptoms of leafhopper (*Empoasca fabae* Harris) damage began to appear on the leaf tips with the classic yellowish V-shape chlorosis followed later by leaf scorching or necrosis inside the more severely damaged areas of the leaflets. Results from these replicated tests showed a range of leafhopper resistance. 'Georgia-01R' is a new multiple-pest-resistant runner-type peanut cultivar that consistently had the highest level of leafhopper/leaf scorch resistance among all of these peanut genotypes.

GRADUATE STUDENT COMPETITION

Biological Control of *Sclerotinia minor* in Peanut with *Coniothyrium minitans*.

D.E. PARTRIDGE*, T.B. SUTTON, D.L. JORDAN, and V.L. CURTIS.
Departments of Plant Pathology and Crop Science, North Carolina State University, Raleigh, NC 27695.

Sclerotinia blight of peanut (*Sclerotinia minor*) is an important disease that has spread to all major peanut producing counties in North Carolina. *Coniothyrium minitans*, a hyperparasite of sclerotia of *Sclerotinia* spp., is available commercially as Contans WG. A field experiment was conducted to determine if repeated soil applications of *C. minitans* would reduce sclerotia populations in soil and subsequently sclerotinia blight on peanut. *C. minitans* was applied in the fall of 1999 and each subsequent fall for 2 years in a field with a history of peanut production and disease. In 2001, *C. minitans* application at 4 kg/ha reduced disease only in the moderately resistant cultivar Perry. In 2002 and 2003 both the 2 and 4 kg/ha rates of Contans WG reduced disease. Multiple years of soil application resulted in the lowest amount of disease and also reduced sclerotia numbers in the soil when compared to the untreated control. A management program integrating moderately resistant cultivars, applications in consecutive years of *C. minitans*, and fluazinam may provide the best control of sclerotinia blight in North Carolina.

Infection Cushion Formation on Weed Species and Peanut following Inoculation

with *Sclerotinia minor*. C.B. MEADOR* and H.A. MELOUK. Department of Entomology and Plant Pathology and USDA-ARS. D.S. MURRAY. Department of Plant and Soil Science, Oklahoma State University, Stillwater, OK 74078.

Formation of infection cushions as affected by five weed species and two peanut cultivars to *Sclerotinia minor* was evaluated by quantifying infection cushion formation on a cellophane membrane. Crownbeard, Eclipta, Jimsonweed, Pitted morningglory, Sicklepod, Okrun peanut (sclerotinia-susceptible) and Southwest runner (sclerotinia-resistant) were grown in the greenhouse for five or seven weeks. Plants were uprooted and root systems were rinsed with deionized water and placed in pouches made from dialysis tubing with a molecular weight cut-off of 12,000. Plants were then placed in styrofoam cups (ca. 220ml) containing 15g perlite in which mycelial fragments of *S. minor* were mixed. Mycelial inoculum was prepared as follows: flasks containing 100 ml of potato dextrose broth were inoculated with three 0.6cm mycelial plugs from a two-day-old culture of *S. minor*. Inoculated flasks were placed on a rotary shaker for five days. Mycelial mats were then collected by filtration, and 1g of mycelia was fragmented in 100ml of deionized water using a tissuemizer for 30 seconds at 20,000 rpm. Styrofoam cups were then placed in a humid chamber maintained at 24-29 C and 100% relative humidity for five days. Plants were once again uprooted and the cellophane tubing was carefully removed and washed gently with cold tap water. A 5-cm long section was removed from the center of the cellophane tube and stained for 10 minutes with a 0.1% solution of Lactophenol Cotton Blue, then carefully rinsed with water and two sections were cut and placed on glass slides that each had four pre-marked 1cm² areas. The infection cushions within the 1cm² areas were counted under a compound light microscope. The untreated control consisted of a sleeve of dialysis tubing that contained no plant roots and was inoculated in the same manner as the plants. No infection cushions were

found in the control. Okrun peanut, SW Runner peanut and Pitted morningglory all stimulated production of significantly ($p=0.05$) higher numbers of infection cushions than any of the other weed species or control. Sicklepod, Crownbeard, Eclipta and Jimsonweed plants were not significantly different ($p=0.05$) from the control. Age was also significant with seven-week-old plants having significantly higher ($p=0.05$) numbers of infection cushions than five-week-old plants. These data suggest that at least some weed species are capable of stimulating the formation of infection cushions.

Predicting Incidence of Sclerotinia Blight in North Carolina from Modeled Weather Data. D.L.SMITH* and B.B. SHEW. Department of Plant Pathology, NC State University, Raleigh, NC 27695.

Sclerotinia blight caused by the fungus *Sclerotinia minor* is a serious disease of cultivated peanut (*Arachis hypogaea* L.) in North Carolina. Current Sclerotinia blight advisories used in North Carolina are based on computer algorithms that take into consideration environmental thresholds of various parameters (rainfall, air temperature, soil temperature etc.) after canopy closure. Recently, systems using modeled site-specific weather data have proven useful in disease prediction models for pathosystems such as potato late blight, soybean rust, and grapevine powdery mildew. These systems do not require the use of on-site sensors. A similar system was evaluated for Sclerotinia blight in North Carolina. Incidence of Sclerotinia blight was measured at three field sites in 2002 and 2003. A gradient of disease levels was established by planting the partially resistant cultivar Perry or the susceptible cultivars NC 12C or NC-V11 and by applying the fungicides fluazinam or boscalid at various rates. Weather data were collected at one site in 2003 and modeled for all sites in both years by SkyBit Inc. The daily means, maximums, and minimums of air temperature, leaf wetness, precipitation, and relative humidity were calculated, along with daily means of soil temperature and soil moisture. Two additional parameters were generated from the data: 1) mean air temperature during leaf wetness; 2) daily hours of leaf wetness. The 5-da moving averages for the following parameters were calculated using SAS statements: mean, maximum, and minimum air temperature; mean, maximum, and minimum leaf wetness; temperature during leaf wetness; leaf wetness hours; total, mean, and maximum precipitation; mean, maximum, and minimum relative humidity; soil temperature and moisture. Weekly increments of disease incidence were recorded in all plots. Incremental disease incidence from Perry in two data sets and from NC-V11 in the third data set was the dependent variable in analyses describing effects of the weather parameters on Sclerotinia blight development. Results of a principal components analysis of the moving averages were used to select parameters to input in a stepwise regression analysis with incremental disease incidence as the dependent variable. Finally, nonlinear and interaction effects of the selected variables were evaluated. The resulting model: $\% \text{ plants diseased} = -150.82 - 0.02 \text{ relative humidity}^2 + 4.37 \text{ relative humidity} + 1.91 \text{ air temperature} - 7.86 \text{ leaf wetness} - 2.14 \text{ soil temperature}$ will undergo further evaluation in the 2004 growing season.

Morphological Characterization of *Arachis pintoi* Germplasm. M.A. CARVALHO*, K.H. QUESENBERRY, Agronomy Department, The University of Florida, Gainesville, FL 32611-0300.

Thirty-six accessions of *Arachis pintoi* originally stored at the southern regional PI station at Griffin-GA (NPGS) were transferred to Gainesville-FL in 2001. Upon these accessions, forty different morphological descriptors were applied, in accordance with IPGRI/ICRISAT (1990 and 1992) list of morphological descriptors of the Genus *Arachis*. Ten different plants of each accession were used to collect data of seeds, pods, pegs, stems, leaves, and flowers. Basic statistics were calculated to each variable and correlation coefficients were estimated among each pair of characteristics. To estimate the genetic diversity of the accessions, Simpson's and Shannon-Weaver's diversity indices were calculated to each variable and for the whole set of variables. Differences in seed size, and color; leaves shape, size, and pubescences; flower size, and color are among of those presented among the accessions. The average Simpson's index was 0.58 with leaf shape presenting the highest value (0.83) and flower standard color the lowest (0.18). For the Shannon-Weaver index the average was 0.71, with a range of 1 (leaf pubescence) to 0.33 (flower wing length). In general, we could conclude that there is great genetic diversity among the 36 accessions for the morphological characteristics studied.

Development of Peanut Varieties with Drought and Heat Tolerance. J.R. Wallace, J.J. Burke, A.M. Schubert, M.D. Burow, Dept. of Plant and Soil Science, Texas Tech Univ., Lubbock, TX 79409; D.L. Rowland, National Peanut Research Laboratory, USDA-ARS, Dawson, GA 31742; J.L. Ayers, D. Porter, Texas Agric. Expt. Station, A&M University, Lubbock TX 79403; and C. Holbrook, U.S. Department of Agriculture, ARS-SAA, Tifton, GA 31793.

Groundwater available for irrigation is declining; therefore, future water use requires greater efficiency. Creating effective water usage is important for the viability of peanut production in West Texas and New Mexico due to low annual rainfall. Heat stress is also a problem associated with low rainfall that is seen in the semi-arid regions like West Texas and New Mexico. As cultivation of new varieties with high levels of monounsaturated fatty acids are being introduced, heat stress may become more severe since these varieties are very susceptible to temperature stress. Efforts are currently being made in peanut production to develop peanut cultivars that are high yielding under drought and heat stress. By improving resistance to abiotic and biotic stress, the crucial long-term viability of peanut production will remain effective in providing an adequate yield and will be necessary for efficient use of water. To determine the components of tolerance to abiotic stress, twenty runner and four spanish/valencia accessions were planted in a replicated experiment in 2002 and increased to twenty-four runner/virginia and twelve spanish/valencia accessions were added in 2003. For reproducibility the experiment will be replicated in two locations with twelve of each accession types in 2004. The accessions will be evaluated under drought (50% ET replacement) and irrigation (75% ET replacement). The results of these on going experiments are (1) a 26% reduction in pod yield under drought (runner) conditions in 2002; (2) significant differences were seen in flowering, harvest index, paraheliotropism, chlorophyll content, and root mass among genotypes; and (3) the sequencing of mapped ESTs for development of markers used for

mapping and selection of drought-associated phenotypes and identifiable genes. We expect that by intercrossing different genotypes to combine contrasting stress responses and identity of markers and genes associated with stress tolerance will result in a useful selection program.

Economic Analysis of Integrated Disease Management of Peanut. E.G. CANTONWINE*, A.K. CULBREATH, University of Georgia, Department of Plant Pathology, Tifton, GA 31793; and N.B. SMITH, University of Georgia, Department of Agricultural and Applied Economics, Tifton, GA 31793.

Early and late leaf spot, caused by *Cercospora arachidicola* and *Cercosporidium personatum* respectively, and spotted wilt, caused by *Tomato spotted wilt virus*, are important diseases of peanut. Various cultural practices, including strip-tillage, host resistance, and fungicides, can suppress these diseases. Experiments were carried out to assess the disease and economic impact of integrated disease management (IDM) systems designed for leaf spot and spotted wilt. Genotypes with various levels of resistance to these pathogens, Georgia Green, C-99R, Hull, DP-1, GA-01R, C-11-2-39, C-28-305 and C-24-34, were planted to conventional and strip-tilled fields. Four fungicide programs were assessed, resulting in 0, 4, 5 and 7 sprays of chlorothalonil. Disease intensity, pod yield and grade were recorded for each plot, and production costs were estimated for each fungicide-tillage situation. Net profits were computed and used to compare profitability of IDM systems. Georgia Green had greater disease than the other genotype entries. DP-1 had the lowest leaf spot disease and C-11-2-39 and C-34-24 the lowest spotted wilt. Yields were highest for C-11-2-39 and GA-01R in 2002, and C-99R and C-11-239 in 2003. Georgia Green had the lowest yields both years. Spotted wilt and leaf spot diseases were lower in strip-tillage than conventional tillage. Net profits were similar between tillage treatments in 2002 ($p=0.2922$), but conventional tillage resulted in higher net profits in 2003 ($p=0.0375$). Fungicide programs of 4, 5, and 7 sprays provided similar net profits, which were greater than the 0 spray program.

Effects of Irrigation Timing on the Redistribution of Tebuconazole and Azoxystrobin on Peanut. J.E. WOODWARD* and T.B. BRENNEMAN, Department of Plant Pathology, The University of Georgia, Tifton, GA 31794.

In 2003, a microplot study was conducted to compare the effects of various irrigation timings on the redistribution of tebuconazole (Folicur 3.6F, 0.23 kg ha^{-1}) and azoxystrobin (Abound 2.08SC, 0.33 kg ha^{-1}) on peanut (*Arachis hypogaeae*) cv. Georgia Green. Fungicide schedules used included tebuconazole applied as sprays 4-7 and azoxystrobin as sprays 4 and 6. Cover-sprays of chlorothalonil (Bravo Ultrex, 1.26 kg ha^{-1}) were applied on a 14-day interval as needed to complete a 7-spray regime. Irrigation (1.3 cm) was applied at 0, 6, 12, 24, 48, and 96 hours after application, and a non-irrigated control was included. Microplots not receiving irrigation were covered with a 1.2 m x 1.2 m piece of plywood. Treatments were arranged in a randomized complete block design with seven replications. Leaf spot (primarily *Cercospora arachidicola*) was rated in the upper, middle and lower canopy at 110 days after planting, but due to a lack of interaction these data were combined. There was a significant irrigation by fungicide interaction. Azoxystrobin and tebuconazole with no irrigation had 0.3 and 0.2 lesions per leaf (LPL), respectively, and with immediate irrigation had

significant increases to 1.9 and 2.1 LPL, respectively. With azoxystrobin, irrigation timings of 6-96 hr were equal to that of the non-irrigated. With tebuconazole, the 6 and 12 hr irrigation increased leaf spot to 1.4 and 0.7 LPL, respectively, while the LPL from the 12-96 hr irrigations were similar. *Sclerotium rolfsii* was used to bioassay the upper canopy as well as pods. Pods treated with azoxystrobin and tebuconazole were 25.7 and 48.3% colonized by *S. rolfsii*, respectively in non-irrigated plots. Colonization was similar to the non-irrigated for azoxystrobin in all irrigation treatments. With tebuconazole, any irrigation reduced pod colonization by similar levels of 48-75% compared to the non-irrigated plots. Bioassays of upper leaflets demonstrated equal colonization with azoxystrobin, regardless of irrigation timing. With tebuconazole, immediate irrigation increased colonization to 96% versus 2% in the non-irrigated. Other irrigation timings, however, did not increase colonization. These preliminary results suggest that irrigation is not needed for redistribution of azoxystrobin, and may reduce its activity on leaf spot if applied immediately after application. As for tebuconazole, any irrigation from 6 to 96 hr after application increases its activity on pod infection, and irrigation at 24 hr or after does not reduce leaf spot control.

Investigation of New Breeding Lines and Tillage Practices on Management of Peanut Rust (*Puccinia arachidis*). S. GREMILLION*, A. CULBREATH, J. TODD, Univ. of Georgia, Coastal Plain Expt. Stn., Tifton, GA, R. PITTMAN, USDA-ARS, Georgia Expt. Stn., Griffin, GA, and T. KUCHAREK, Univ. of Florida, Gainesville, FL.

The goal of this research was to define the level of resistance of new peanut breeding lines to peanut rust (*Puccinia arachidis*) and to determine if tillage practices affect disease severity. The first field test included the breeding lines RP-01, RP-08, RP-14 and RP-20, and the cultivars Bayo Grande (BG), Georgia Green (GG), Florida MDR-98 and C-99R. Tillage practices included conventional and strip-tilled soils. A second field test included the aforementioned genotypes with the extra breeding lines, RP-15, RP-19 and RP-22, and excluding GG and C-99R. Results showed that tillage was not an influential factor in rust development ($p=.2413$). When compared to the cultivars BG, GG, MDR-98 and C-99R in the first test, the new breeding lines possessed similar peanut rust severity; therefore, improved resistance to peanut rust was not indicated. However, in the second test of higher disease pressure, the new breeding lines and BG had significantly less disease than that of MDR-98 ($p=.0404$).

BREEDING, BIOTECHNOLOGY, AND GENETICS I

Development and Validation of CAPS Markers for the High Oleic Trait in Peanuts. Y. LOPEZ* and M.D. BUROW. Texas Agricultural Experiment Station, Texas A&M University, Lubbock, TX 79403.

Genes of the Δ^{12} -fatty acid desaturase (one of the main enzymes converting oleic to linoleic), were previously isolated and characterized from two Spanish lines. Several single nucleotide polymorphisms (SNP's) were identified between Tamspan 90 (low oleic to linoleic, O/L) and F435 (high O/L). Based on these polymorphisms, we developed cleaved amplified polymorphism (CAP) markers that can be utilized for possible rapid screening of high oleic trait in peanut. Two

CAPs markers were initially identified and tested from amplification of 541 bp product using two restriction endonucleases which gave distinct digestion pattern between Tamsan 90 and UF 435. The distinct differences in digestion pattern were initially validated for four high oleic and six low oleic peanut cultivars. Further validation of these CAPs markers in a population segregating for the high oleic trait and the potential progenitors of the cultivated peanut, *A. duranensis* and *A. ipaensis* is in progress. The utility of Δ^{12} -FAD CAPs markers in marker-assisted selection for high oleic trait in peanut will be discussed.

Transfer of *Medicago* EST-SSRs to Peanut for Germplasm Evaluation and Cross-species Cloning. M.L. WANG, N. BARKLEY, and R.N. PITTMAN*, USDA-ARS, Plant Genetic Resources Conservation Unit, Griffin, GA 30223, R. DEAN, University of Georgia, Plant Genetic Resources Conservation Unit, Griffin, GA 30223, and C. HOLBROOK, USDA-ARS, Coastal Plain Experiment Station, Tifton, GA 31793.

Transfer of SSR markers is a very efficient approach for DNA marker development, especially for crops which genomes have been not-well characterized. In comparison to genomic SSRs, EST-derived SSRs are relatively easy to transfer from one species to another. We have selected a set of 100 EST-SSRs for across genera transfer from *Medicago truncatula* to peanut. In a pilot experiment, about 20% of tested primers produced single, double or multiple amplicons in both cultivars and wild species. These amplicons will be further investigated as follows: (1) the polymorphic amplicons will be directly used for germplasm evaluation and comparative genetic mapping; (2) the non-polymorphic amplicons will be used for SNP discovery in cultivated peanuts for molecular breeding; and (3) orthologs important for agricultural application will be cloned in peanut by primer-walking and 5' race PCR. Since the model plant *Medicago truncatula* is in the process of whole genome sequencing and many sequences will be available, exploiting its sequence information can probably provide some clues for efficient characterization of the peanut genome.

Genetic Engineering of Peanut for Disease Resistance. P. OZIAS-AKINS*, Y. CHU, C. NIU, X.Y. DENG, H. YANG, and S. HAZRA, Department of Horticulture, The University of Georgia Tifton Campus, Tifton, GA 31793-0748.

The susceptibility of peanut to numerous pathogens makes it a prime target for genetic improvement by insertion of genes from outside of the gene pool of *Arachis*. We have transformed peanut with putative disease resistance genes using the technique of microprojectile bombardment. For *Tomato spotted wilt virus* (TSWV), the nucleocapsid protein gene of the virus, controlled by viral or plant promoters, has been introduced into peanut in either a translatable or non-translatable form. The non-translatable version consisted of 403 bp from the nucleocapsid protein gene that was bombarded into peanut somatic embryos as 1) the sense construct alone, 2) the antisense construct alone, or 3) the sense and antisense constructs co-bombarded. Both sense and antisense sequences were driven by the actin 2 promoter from *Arabidopsis*. Sense and antisense orientations could be distinguished by PCR of DNA from progeny plants. Insertion of the gene(s) was verified by southern blot analysis and ranged from one up to 12 copies. Reverse-transcriptase PCR results indicated that the N-

gene was transcribed in most lines that contained either sense or antisense genes. When the N-gene was present in both sense and antisense orientations, transcription was rarely observed. The resistance to TSWV in these transgenic lines is being tested by mechanical inoculation. In addition, a nonheme chloroperoxidase gene (CPO-P) from *Pseudomonas pyrocinia*, which has been reported to inhibit the growth of mycotoxin producing fungi, was introduced into peanut. Antifungal properties are expressed in leaf tissue from plants growing in the greenhouse.

Identification of Molecular Markers Associated with Tomato spotted wilt virus (TSWV) Resistance in a Genetic Linkage Map of *Arachis kuhlmannii* x *A. diogeni*. S.R. MILLA*, S.P. TALLURY, T.G. ISLEIB, and H.T. STALKER.
Dept. of Crop Science, Box 7629, N.C. State Univ., Raleigh, NC 27695.

Spotted wilt of peanuts, caused by the tomato spotted wilt virus (TSWV), is a major limiting factor to peanut production in the U.S. *Arachis diogeni* Hoehne accession GPK 10602 is known to possess high levels of resistance against the virus. In an attempt to identify *A. diogeni* chromosome segments associated with TSWV resistance, a genetic linkage map was constructed using an F₂ population derived by crossing *A. kuhlmannii* Krapov. and W. C. Gregory accession VRGeSv 7639 with *A. diogeni* accession GPK 10602. A total of 179 individuals were screened with 13 AFLP primer combinations. The map consisted of 102 AFLP markers grouped into 12 linkage groups and spanning 1068.1 cM. Markers were randomly distributed throughout the genome with an average distance between adjacent markers of 13.7 cM. The map allowed us to scan the *Arachis* genome for associations between response to TSWV infection and the AFLP markers. Five markers, all located in the same linkage group (LG V) were closely associated ($0.0009 < P < 0.0021$) with TSWV resistance. Another 10 markers were also associated with resistance although at a lower significance level ($P \leq 0.05$). All these markers will be studied for utilization in peanut breeding with marker-assisted selection.

Shade Avoidance Response as a Tool in Peanut Breeding. I.S. WALLERSTEIN¹, and S. KAHN, Department of Field Crops and Natural Resources, and I. WALLERSTEIN, Department of Ornamental Horticulture, Agricultural Research Organization the Volcani Center, P.O.B. 6, Bet Dagan, 50 250 Israel.

We addressed the question of incompatibility between improved peanut plant yield at breeding fields and the improved yield in the farmers' fields. Increase in plant yield from 120 to 250 pods/plant in the breeding fields contributed only 20% increase to the commercial yield. The main difference in the growing conditions between the two fields was the planting density. For the breeding procedure we used planting density of 2.5 plants m⁻² and the common planting density in the growers' fields was 10 plants m⁻². Therefore we addressed the question of planting density, or plant proximity, importance to breeding for higher yield. We followed the decrease in plant yield with the increase in planting density and found that the variability among our cultivars at planting densities lower than 5 plants m⁻² disappeared under higher planting densities. At this point we understood that there is a genetic control on plant yield which is operating at relatively low planting densities only, and decided to take advantage of this control for the increase in peanut yield/area. For this purpose the plant yield at

relatively low planting density has to increase more then to compensate for the decrease in plants number. By lowering the planting density we also expected to save irrigation water and seeds. After six years of breeding to higher yield at planting density of 2.5 plants m^{-2} we finally have cultivars that reached that goal. The progenies of mother plants selected according to their yield at planting density of 2.5 plants m^{-2} were tested for their yield at three planting densities; 4, 2.5 and 1.3 plants/ m^2 . High correlation between the mother plant yield and that of its progeny was found only for the planting density at which the mother plants were selected. It demonstrates the planting-density dependent genetic control on peanut yield and the importance of planting density in selection fields for the cultivar performance in commercial fields.

Characterization of Five Seed-Proteins Missing in One Peanut Genotype and the

Allergic Nature of these Proteins. B.Z. GUO*, X.Q. LIANG, USDA-ARS, Crop Protection and Management Research Unit, Tifton, GA 31793; S.J. MALEKI, S.Y. CHUNG, USDA-ARS, Southern Regional Research Center, New Orleans, LA 17079; C.C. HOLBROOK, USDA-ARS, Crop Genetics and Breeding Research Unit, Tifton, GA 31793; P. OZIAS-AKINS, University of Georgia, Coastal Plain Experiment Station, Tifton, GA 31793.

Food allergies are serious health problems affecting several million people in the United States alone. Researchers are working on several fronts to prevent or reduce peanut allergies. While we were screening for peanut resistance to *Aspergillus flavus* and aflatoxin contamination and analyzing profiles of peanut seed-storage proteins on 2-D gels, we identified one peanut genotype, GT-C9, lacking 5 proteins in comparison with the other peanut genotypes, Georgia Green, A100, and GT-C20. We have been characterizing and testing these proteins which are missing in one peanut genotype for allergic properties. Five protein spots have been sequenced from 2-D gel of total peanut seed protein extracts using ESI-MS/MS and Edman degradation after trypsin digestion. Based on peptide sequence homology analysis, protein spots labeled as p-1, 2 and 5 are similar to legumin A precursor from *Vicia narbonensis*, which are essentially the same spectra by both MALDI and ESI, and spot p-3 and 4 are similar to glycinin from *Arachis hypogaea*, a peanut allergen Ara h3. In collaborating with USDA-ARS, Southern Regional Research Center in New Orleans, the preliminary results of allergenic properties of the total proteins for IgE binding and advanced glycation end adducts (AGEs) show no significant differences among the 4 genotypes. Using more specific antibodies against peanut allergen Ara h1, Ara h2, and Ara h3, Western immunoblotting analyses will shine light on these proteins on 2-D gels. We will conduct N-terminal or C-terminal sequences of these proteins to understand the possible gene structure. The information gained should be useful in breeding peanut cultivars missing the offending allergy-causing proteins through conventional breeding or in developing gene(s)/markers for molecular breeding and genetic transformation to suppress the allergic gene expression.

WEED SCIENCE

Weed Management in Twin-Row vs. Conventional Row Spacing Peanut. B.J. BRECKE*, University of Florida, Jay, FL.

Within the past few years many growers in the peanut growing areas of Florida, Georgia and Alabama have adopted a twin-row production system because of the greater yield potential with twin-rows. The twin-row pattern may also improve weed control because of the more rapid canopy closure that occurs in the twin-row system. Studies were conducted at the University of Florida, West Florida Research and Education Center, Jay, FL from 2000 to 2003 to compare weed management in a twin-row planting pattern with peanut planted using a conventional row spacing. Treatments were arranged as a split-plot with planting pattern as main plots and 12 herbicide systems as split plots. Results varied with year but weed control was often better in the twin-rows than the conventional rows. When results were averaged over all herbicide treatments, sicklepod control was from 5 to 25% better, Florida beggarweed and common cocklebur from 5 to 15%, prickly sida 20% and browntop millet 5% improved with twin-rows over conventional rows. Peanut yield was also higher in the twin-row system.

Physiological Behavior of Root-Absorbed Flumioxazin in Peanut, Ivyleaf Morningglory, and Sicklepod. J.W. WILCUT*, A.J. PRICE, and S.B. CLEWIS, Crop Science Department, North Carolina State University, Raleigh, NC 27695-7620; and J.R. CRANMER, Valent USA Corp., Cary, NC 27511.

Previous research has shown that flumioxazin has the potential to cause peanut injury. In response to this concern, laboratory experiments were conducted to investigate the influence of temperature on flumioxazin-treated peanut seed germination, as well as greenhouse experiments to investigate the influence of six different simulated rainfall intervals after soil-applied flumioxazin preemergence (PRE) application on peanut emergence and injury. Laboratory experiments utilizing ^{14}C -flumioxazin were also conducted to investigate differential tolerances exhibited by peanut, ivyleaf morningglory, and sicklepod to flumioxazin. Flumioxazin treatments containing either water dispersible granular (WDG) or wettable powder (WP) formulation at 1.4 $\mu\text{mol/L}$ did not influence germination compared to non-treated peanut across all temperature regimes. Peanut treated with a WDG or WP formulation of flumioxazin PRE and receiving simulated rainfall at emergence and at 2 or 4 d after emergence were injured between 40-60%, while peanut treated with flumioxazin PRE and receiving simulated rainfall at 8 and 12 d after emergence were injured 25% and 15%, respectively. Total ^{14}C absorbed by ivyleaf morningglory was 57% of applied while sicklepod absorbed 46% at 72 hours after treatment (HAT). Peanut absorbed >74% of applied ^{14}C 72 HAT. A majority of the absorbed ^{14}C remained in roots for sicklepod, ivyleaf morningglory, and peanut at all harvest times. Ivyleaf morningglory contained 41% of the parent herbicide 72 HAT while sicklepod and peanut contained only 24 and 11% parent compound, respectively. Regression slopes indicated slower metabolism by ivyleaf morningglory (flumioxazin-sensitive specie) compared to sicklepod and peanut (flumioxazin-tolerant species). Field studies were conducted to evaluate weed management with diclosulam, flumioxazin, and sulfentrazone weed management systems. The results of these experiments will also be discussed.

Strongarm Applied Postemergence in Georgia Peanut. E.P. PROSTKO*, Department of Crop & Soil Sciences, The University of Georgia, Tifton, GA 31793; J.T. FLANDERS, Grady County Extension Service, Cairo, GA 39828; S. KOMAR, Randolph County Extension Service, Cuthbert, GA 39840; and E. HARRISON, Mitchell County Extension Service, Camilla, GA 31730.

Strongarm 84WG (diclosulam) is a preemergence broadleaf herbicide that was registered for use in peanut in March 2000. Limited studies have been conducted to evaluate its potential for postemergence use. Six field trials were conducted in Georgia in 2003 to evaluate the response of several weed species to postemergence applications of Strongarm. All trials were conducted using traditional small plot techniques. All treatments were applied in 15 GPA and included a non-ionic surfactant @ 0.25% v/v. No significant peanut injury was observed from any rate or timing of Strongarm. Strongarm applied at rates as low as 0.113 ozs/A provided good to excellent control (>80%) of bristly starbur (*Acanthospermum hispidum*), annual morningglory (*Ipomoea* spp.), and wild radish (*Raphanus raphanistrum*). Tropical spiderwort (*Commelina benghalensis*) control with Strongarm at 0.45 ozs/A applied 17 days after planting (DAP) was 90% at 69 DAP but control fell to 75% by 117 DAP. At least 0.225 ozs/A of Strongarm were needed to control Florida beggarweed (*Desmodium tortuosum*) greater than 80%. At 43 DAP, wild poinsettia (*Euphorbia heterophylla*) control with Strongarm at rates greater than or equal to 0.225 ozs/A was at least 80% but control at 98 DAP was only 60%. Strongarm did not control sicklepod (*Senna obtusifolia*) at any rate.

Addressing Compatibility Issues Associated with Agrichemicals Applied to Peanut. S. HANS, D. JORDAN*, J. WILCUT, and A. YORK, Department of Crop Science, North Carolina State University, Raleigh, NC 27695; and D. MONKS, Department of Horticulture, North Carolina State University, Raleigh, NC 27695.

Peanut requires application of multiple agrichemicals to optimize crop yield. Research was conducted in North Carolina to define interactions among agrichemicals applied to peanut. Efficacy of 2,4-DB, clethodim, and sethoxydim when applied in two-, three-, and four-way combinations with the fungicides azoxystrobin, boscalid, chlorothalonil, fluazinam, propiconazole plus trifloxystrobin, pyraclostrobin, and tebuconazole; the insecticides acephate, carbaryl, esfenvalerate, fenpropathrin, indoxacarb, lambda-cyhalothrin, and methomyl; foliar applied boron fertilizer; and the plant growth regulator prohexadione calcium was evaluated. The fungicides azoxystrobin, boscalid, chlorothalonil, fluazinam, propiconazole plus trifloxystrobin, pyraclostrobin, or tebuconazole and the insecticides acephate, carbaryl, esfenvalerate, fenpropathrin, lambda cyhalothrin, methomyl, or indoxacarb did not reduce sicklepod (*Senna obtusifolia* L.) control by 2,4-DB when compared with 2,4-DB alone. In one experiment, sicklepod control by 2,4-DB applied with pyraclostrobin or tebuconazole with boron, or prohexadione calcium exceeded that of 2,4-DB applied alone. In a second experiment, sicklepod control was lower when applied with azoxystrobin, chlorothalonil, pyraclostrobin, and chlorothalonil plus boron. Entireleaf morningglory (*Ipomoea hederacea* var

integriuscula Gray) control by 2,4-DB was not reduced by azoxystrobin, boscalid, chlorothalonil, fluazinam, propiconazole plus trifloxystrobin, or tebuconazole. Pyraclostrobin did reduce entireleaf morningglory control by 2,4-DB. None of the four-way combinations evaluated reduced tall morningglory [*Ipomoea purpurea* (L.) Roth] control by 2,4-DB. Large crabgrass (*Digitaria sanguinalis* L.) and broadleaf signalgrass [*Brachiaria platyphylla* (Griseb). Nash] control by clethodim and sethoxydim were not reduced by esfenvalerate, indoxacarb, or lambda-cyhalothrin. Azoxystrobin, chlorothalonil, pyraclostrobin, and tebuconazole reduced large crabgrass control in at least one experiment. Prohexadione calcium and boron improved large crabgrass control with combinations of clethodim and fungicides in some experiments. In contrast, prohexadione calcium and boron did not affect broadleaf signalgrass or large crabgrass control by sethoxydim. Fluazinam, propiconazole plus trifloxystrobin, and tebuconazole did not affect graminicide efficacy when compared with graminicides applied alone.

Spanish Peanut Recrop Tolerance to Herbicides Applied Preemergence to Cotton. T.A. BAUGHMAN* and P.A. DOTRAY, Texas A&M Research & Extension Center, Vernon and Lubbock; and Texas Tech University, Lubbock, TX.

Over 3 million acres of cotton are planted in West Texas annually. Of this acreage, several thousand acres are lost each year due to blowing wind and hail along with other weather extremes. This leaves a producer with several issues to decide in regard to replant decisions. Often times a producer is best maintaining the current cotton stand if an average of between 1 and 2 plants per row of foot is left and a significant number of large skips do not occur. If the loss occurs early enough in the growing season producers will often replant cotton. Traditionally grain sorghum was the main crop planted if the loss occurred after the recommended cotton planting date. Other crops that have been tried include beans, guar, peas, sesame, soybeans, and sunflower. With the increase in peanut acres in West Texas along with an increase in available harvesting equipment and local buying points there is an interest in planting Spanish peanut after a failed cotton crop. However, there is a concern, even with Spanish peanut being earlier maturing than Runner peanut, if there is an enough time left in the growing season to produce an adequate yield and grade. The other concern is how Spanish peanut will react to residual preemergence herbicides used in cotton. Therefore, the objectives of this research were to determine Spanish peanut tolerance to preemergence cotton herbicides, effects of tillage on this tolerance, and to compare economics of replanting Spanish peanuts versus replanting cotton. Cotton 'Paymaster 2280 BG/RR' was originally planted on May 5, 2003. Prowl at 0.50 lb ai/A, Staple at 0.063 lb ai/A, Dual Magnum at 1.0 lb ai/A, Caparol at 0.80 lb ai/A, Caparol + Staple at 0.80 + 0.032 lb ai/A were applied PRE immediately after the original cotton planting. Cotton was lost to a hail storm on June 3. Cotton 'Paymaster 2280 BG/RR' and Spanish peanut 'Tamspar 90' were replanted in adjacent studies on June 5. One-half of the plot area was re-bedded and rod-weeded (tilled) prior to planting, while crops were planted into the existing beds (no-tillage) in the other half of the plot. Peanut and cotton visual injury were not affected by tillage treatment at 13, 41, and 123 days after planting (DAP). No injury was observed on peanut or cotton with Prowl or Caparol PRE treatments. Dual Magnum injured peanut 5% throughout the

growing season, while injuring cotton between 10 and 56%. No peanut injury was initially observed with Staple or Caparol + Staple. Later season injury was between 3 to 9%. Staple resulted in 0 to 8% cotton injury, while Caparol + Staple resulted in minimal injury. Peanut and cotton yield were not affected by PRE cotton herbicide treatment. However yields for both peanut and cotton were higher with the no-tillage treatment compared to the tilled treatment.

Herbicide Reduced Rates for Weed Control in Peanut. P.A. DOTRAY*, Texas Tech University, Lubbock, TX 79409-2122; T.A. BAUGHMAN, Texas Cooperative Extension, Vernon, TX 76385; and W.J. GRICHAR, Texas Agricultural Experiment, Beeville, TX 78102.

Field studies were conducted in West, Northwest and South Texas from 2002-2004 to evaluate weed control in peanut (*Arachis hypogaea* L.) with reduced rates of Cadre and Pursuit. Cadre and Pursuit were applied postemergence at 1/2 or 1X (0.72 or 1.44 oz pr/A) alone or in tank mix combination with Strongarm at 1/2 or 1X (0.225 oz pr/A or 0.45 oz pr/A), Dual Magnum at 1/2 or 1X (10.6 fl oz pr/A or 21.2 fl oz pr/A), 2,4-DB (16 fl oz pr/A), Storm (24 fl oz pr/A), or Ultra Blazer (24 fl oz pr/A). Weed species evaluated included yellow nutsedge (*Cyperus esculentus* L.), Palmer amaranth (*Amaranthus Palmeri* S. Wats.), and ivyleaf morningglory (*Ipomoea hederacea* (L.) Jacq.). Yellow nutsedge was controlled 75 to 95% by 1X Cadre and 45 to 85% by 1X Pursuit over three locations. Cadre at 1/2X plus Strongarm at 1X controlled yellow nutsedge 62 to 94%. Similar control was achieved following Cadre at 1/2X plus Strongarm at 1/2X (60 to 97%). Pursuit at 1/2X plus Strongarm at 1X controlled yellow nutsedge 41 to 96%. Less effective control was achieved following Pursuit at 1/2X plus Strongarm at 1/2X (21 to 87%). Cadre at 1/2X plus Dual Magnum at 1X controlled yellow nutsedge 75 to 98%. Similar control was achieved following Cadre at 1/2X plus Dual Magnum at 1/2X (70 to 96%). Pursuit at 1/2X plus Dual Magnum at 1X controlled yellow nutsedge 25 to 88%. Similar control was achieved following Pursuit at 1/2X plus Dual Magnum at 1/2X (8 to 90%). Cadre or Pursuit at 1X controlled ivyleaf morningglory 73 to 77%. Similar control was achieved following Cadre at 1/2X plus 2,4-DB (70%) or Storm (69%) and Pursuit at 1/2X plus 2,4-DB (63%), Storm (60%), or Ultra Blazer (67%). Cadre at 1X controlled Palmer amaranth 70 to 77% over two locations. Similar control was achieved following Cadre at 1/2X plus 2,4-DB at 2 locations (72 to 92%) and Cadre at 1/2X plus Storm at one of two locations (76%). Less effective control was observed following Cadre at 1/2X plus Ultra Blazer (2 of 2 locations). Pursuit at 1X controlled Palmer amaranth 50 to 75% over two locations. Similar control was achieved following Pursuit at 1/2X plus 2,4-DB at 2 locations (63%). Less effective control was observed following Pursuit at 1/2X plus Storm (1 of 2 locations) or Ultra Blazer (2 of 2 locations). This research indicates that reduce rates of Cadre or Pursuit plus other postemergence herbicides may be as effective as full rates of Cadre or Pursuit applied alone.

BREEDING, BIOTECHNOLOGY, AND GENETICS II

Development of a Core Collection of Peanut Germplasm in China. H. JIANG, B. LIAO, N. DUAN, Oil Crops Research Institute of Chinese Academy of Agricultural Sciences, Wuhan, Hubei Province, 430062, China, X.Q. LIANG, Crop Research Institute of Guangdong Academy of Agricultural Sciences, Guangzhou, Guangdong Province, 510640, China, C. HOLBROOK*, and B. GUO, ARS-USDA, Coastal Experimental Station, Tifton, GA, 31793, USA

Around 6000 accessions of cultivated peanut (*Arachis hypogaea* L.) have been collected in China. In order to characterize and utilize the germplasm more efficiently for further crop improvement, the available morphological and biochemical data were analyzed to develop a core collection. The entire collection was first sorted by botanical types. Data on characters including growth period, seed weight, shelling percentage, oil and protein content were then used to cluster accessions in each botanical type. The 5890 accessions were grouped into 258 clusters and 582 lines were randomly selected to form a core collection. The ranges and means of all the variables for accessions in the core were similar to those for the entire collection. The data on reaction to bacterial wilt (BW), late leafspot (LLS) and early leafspot (ELS) were used to test the core collection's representative of the entire collection. Based on chi square test it was found that this core collection could be used to improve the efficiency of identifying resistances in the entire collection.

Breeding for Early-Maturing Peanut. M.D. BUROW*, Y. LÓPEZ, J. AYERS, Texas Agricultural Experiment Station, Texas A&M University, Lubbock, TX 79403; C.E. SIMPSON, Texas Agricultural Experiment Station, Texas A&M University, Stephenville, TX 76401; A.M. SCHUBERT, Texas Agricultural Experiment Station, Texas A&M University, Lubbock, TX 79403; M.R. BARING, Department of Soil & Crop Sciences, Texas A&M University, College Station, TX 77843; K. DASHIELL, Department of Plant and Soil Sciences, Oklahoma State University, Stillwater, OK 74078; M.C. BLACK, Texas Cooperative Extension, Uvalde, TX 78802; and H. MELOUK, USDA-ARS, Stillwater, OK 74078.

The quality of peanut grown in West Texas is affected by a shorter growing season, longer time to maturity, and reduced oleic to linoleic ratios (O/L). We have begun development of material to combine earlier maturity, high O/L, and acceptable sucrose content. F2:6 runner and Spanish peanuts were grown at 5 locations in Texas and Oklahoma and evaluated for yield, shelling, seed weight, and maturity at selected locations. As in 2002, one runner line (Tx017746) had high yield, acceptable seed size, and an intermediate maturity at multiple locations. Several other lines combined early maturity and high yield but these were not as stable across locations. Selections did not have demonstrable resistance to Sclerotinia blight or tolerance to tomato spotted wilt virus. The selections are low-O/L and the best accessions are being crosses with high-O/L disease-resistant runner lines. For the F2:5 generation, separate populations of runner and bunch peanuts were evaluated at 3 locations in 2003. Several lines possessing early maturity were identified. Lines will be analyzed for O/L ratio - one parent of each cross had a high-O/L ratio.

Comparison of Three Techniques for Selection of a Multiple Disease Resistant Peanut. M.R. BARING*, Soil and Crop Sciences Department, Texas A&M University, College Station, TX. 77843-2474; C.E. SIMPSON, Texas Agricultural Experiment Station, Stephenville, Texas, 76401; H.A. MELOUK, USDA, Stillwater, Oklahoma, 74078; M.C. BLACK, TAMU Texas Cooperative Extension, Uvalde, Texas, 78802-1849.

Several TAMU breeding line selections over the past fifteen years have resulted in a pattern in which lines selected under Tomato Spotted Wilt Virus pressure often have good tolerance to *Sclerotinia minor*. However, lines selected under *Sclerotinia minor* pressure do not typically have good tolerance to TSWV. Differences in pedigrees used for the two disease resistance programs do not allow for sound scientific conclusions as to whether this pattern is a scientific fact or simply an unexplained phenomenon. A study was conducted from 2000 through 2003 to determine whether significant differences could be detected among three selection techniques. Complex crosses using Tamrun 96, Sun Oleic 95R and breeding line Tx901639-3 resulted in four highly segregating F_{2:3} populations, which were used for this selection experiment. A total of 200 individual seeds were space planted for each of the four populations at three different disease screening nurseries across Texas and Oklahoma. All three selection techniques were based on the following traits listed in order of importance: disease resistance, plant growth habit, pod characteristics and seed characteristics. Selection technique #1 was a basic sequential method in which the first year of individual plant selections were made under TSWV pressure and then transferred the following year to the *Sclerotinia minor* nursery for the second cycle of selections. Selection technique #2 was a basic pedigree selection method conducted at a multiple disease screening nursery for two consecutive years. Selection technique #3 was also a basic sequential method set up as the reciprocal of technique #1. This method consisted of the first cycle of selections being conducted in a *Sclerotinia minor* nursery during the first year. The following year the selections were transferred to a TSWV screening nursery for the second cycle of selection. The top two selections for each selection technique from each of the four segregating populations were then yield tested during the 2002 and 2003 growing seasons. The tests were conducted at each of the three disease screening nurseries and at a disease-free site in West Texas. Initial results from analysis to determine differences among the three techniques for yield, value per acre, grade and disease resistance have shown no significant difference. However, interactions have been noted between populations and techniques. Further analysis are being conducted and will be reported at the APRES meetings.

A Program of Selection for Multiple Disease Resistance. T.G. ISLEIB*, S.R. MILLA, S.C. COPELAND, and J.B. GRAEBER. Dept. of Crop Science, Box 7629, N.C. State Univ., Raleigh, NC 27695.

Four diseases affect the North Carolina peanut crop with regularity: early leafspot (ELS) caused by *Cercospora arachidicola* Hori, Cylindrocladium black rot (CBR) caused by *C. parasiticum* Crous, M.J. Wingfield, & Alfenas, Sclerotinia blight (SB) caused by *S. minor* Jagger, and the syndrome caused by tomato spotted wilt virus (TSWV), a *Tospovirus* of the family *Bunyaviridae*. Supported by several sponsors, the NCSU breeding program has a project to

simultaneously select for resistance to all four diseases using early generation testing augmented by a winter nursery. A new set of crosses are made in the greenhouse during the summer, F_1 hybrids are grown at the winter nursery, and F_2 populations subjected to visual selection for plant, pod, and seed characteristics in the field the following summer. $F_{2:3}$ families from selected plants are increased at the winter nursery where plots are harvested first by single seed descent to provide seed for a selection nursery plot, then in bulk to provide adequate seed for testing the $F_{2:4}$ families in separate trials for ELS, CBR, SB, and TSWV. The SSD plots of $F_{2:4}$ families selected for multiple disease resistance are then subjected to visual selection for plant, pod, and seed characteristics. The cycle is repeated for F_4 -derived families. $F_{2:4}$, $F_{4:6}$, and $F_{6:8}$ families are tested together for their reactions to the four disease. F_6 -derived families are harvested only in bulk at the winter nursery, and they are tested for yield and grade at two locations in addition to being tested for their reactions to the four diseases. The first group of crosses was made in 1998, and that group of lines has already passed through the cyclic process and preliminary testing and is now in the mainstream performance and disease testing programs. The second group of crosses made in 1999, and has completed the selection and preliminary testing phases. In 2000, 2001, and 2002, TSWV incidence was so severe at all test locations that it was difficult to rate the effects of CBR, SB, and ELS. In 2003, TSWV incidence was relatively light, and weather conditions were conducive to development of ELS, SB, and CBR although CBR incidence was low at the test site used. Unbalanced analysis of variance of all disease data collected on lines within the overall breeding program shows that the lines emerging from the multiple disease resistance breeding project combine superior resistance with superior agronomic performance.

Screening Peanut Germplasm for Resistance to Aflatoxin Production by *Aspergillus Flavus*. H.Q. XUE, T.G. ISLEIB, G.A. PAYNE, H.T. STALKER, and G. OBRIAN, Dept. of Crop Science, Box 7629, N.C. State Univ., Raleigh, NC 27695-7629 and Dept. of Plant Pathology, Box 7567, N.C. State Univ., Raleigh, NC 27695-7567.

Aflatoxins are carcinogenic and toxic secondary metabolites produced primarily by the fungi *Aspergillus flavus* Link ex Fries and *A. parasiticus* Speare. Elimination of aflatoxin contamination in peanut (*Arachis hypogaea* L.) is a high priority of the peanut industry. Resistant cultivars should be an effective and low-cost part of an integrated aflatoxin management program. Peanut genotypes with resistance to *in vitro* seed colonization (IVSCAF), field seed colonization (FSCAF) and preharvest aflatoxin contamination (PAC) have been reported, but no germplasm highly resistant to aflatoxin production has been found in cultivated peanut. A technique was developed to identify genotypes with resistance to aflatoxin production when subjected to post-harvest conditions conducive to fungal growth and aflatoxin synthesis. Seeds cotyledons were separated, manually blanched, inoculated with conidia of *A. flavus*, placed on moistened filter paper in petri dishes and incubated for 8 d at 28 C. Dishes were arranged using incomplete block designs on plastic trays enclosed in plastic bags and stacked with PVC spacers between trays. Seven accessions of wild peanut species of *A. cardenasii* Krapov. and W. C. Gregory, 29 accessions of *A. duranensis* Krapov. and W. C. Gregory, and 17 interspecific tetraploid lines were evaluated for the resistance to aflatoxin production. On average, the wild

species produced significantly less aflatoxin than *A. hypogaea* checks. The difference between the two wild species was not significant. *Arachis duranensis* accessions PI 468319 (GKBSPSc 30073), PI 468200 (GKBSPSc 30064), and PI 262133 (GKP 10038sl), and *A. cardenasii* accessions PI 262141 (GKP 10017), PI 475997 (KSSc 36018) had very low levels of aflatoxin accumulation and should be valuable sources of resistance to aflatoxin contamination. Only one interspecific tetraploid line, GP-NC WS 2, contained aflatoxin not significantly different from resistant parent *A. cardenasii* GKP 10017, and it appears to be a line with reduced capacity for aflatoxin accumulation. In order to identify germplasm with more than one type of resistance, lines previously reported with resistance to IVSCAF, FSCAF, or PAC were tested for their ability to support aflatoxin production. None of the genotypes examined was completely resistant to aflatoxin production, but significant genotypic variation was observed in the amount of total aflatoxin accumulated in seeds. Four lines (PI 590325, PI 590299, PI 290626, and PI 337409) supported reduced levels of aflatoxin, and their degree of resistance was consistent across tests. The results suggested that there were no absolute relationships of aflatoxin production resistance with IVSCAF, FSCAF or PAC resistance, but that it should be possible to combine different kinds of resistance in one genetic background.

Performance of Senegalese Seed-Dormant Peanut Lines in Burkina Faso. P.

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Seven peanut (*Arachis hypogaea* L.) genotypes were selected in Senegal for their ability to remain dormant at maturity in the presence of humidity. These lines were tested in Burkina Faso in 2002 and 2003 along with their parents (Fleur 11, 55-437, and 73-30) and two local checks TS32-1 and CN94-C. In 2002, the trial was conducted in only one locality, Gampela, where the average rainfall is 800 mm and mean temperature and humidity during the growing season are 28°C and 75% respectively. The design was an RCBD with 4 replications, and plots consisted of 5 rows of 6 m length spaced 50 cm between rows, with plant spacing of 15 cm. Fertilizer, NPK, was applied at a rate of 100 kg/ha. In 2003, in addition to Gampela, the experiment was conducted in Farakoba where the average rainfall is 1000 mm and the mean temperature and humidity are 25°C and 90%, respectively, during the rainy season. Results revealed that four genotypes (55-437 x 73-30 = G4; Fleur 11 x 73-30 = G6; 55-437 x 73-30 = G9; Fleur 11 x 73-30 = G27) and their three parents 55-437, Fleur 11, and 73-30 along with the two checks germinated at maturity. The genotypes 55-437 x 73-30 = G2; 55-437 x 73-30 = G9; 55-437 x 73-30 = G19 and the line PC79-79 remained dormant at maturity. Most of the genotypes were sensitive to leafspot disease except for PC79-79, which was rated as a 3 at Gampela and 4 at Farakoba, according to the ICRISAT scale; disease pressure was higher at Farakoba. At Gampela, the mean haulm yield was between 1.84 and 3.44 t/ha, mean pod yield varied from 1.81 to 2.94 t/ha, and the TSMK was 53.4 to 60.5%.

At Farakoba, the mean yield varied from 1.85 to 5.15 t/ha for haulm, from 0.62 to 1.42 t/ha for pods, and mean TSMK was between 45.85 and 53.8%. The low mean pod yield at Farakoba was attributed to aluminum toxicity, known in that region, that prevented good pod fill. The dormant genotypes can be released to farmers to help alleviate germination and sprouting of early-maturing peanut varieties at maturity in Burkina Faso.

Selection for Resistance to Early Leaf Spot of Peanut Lines Derived from Crosses Between West African and U. S. Germplasm. P. SANKARA, Département de Phytopathologie, Université de Ouagadougou, Burkina Faso; O. NDOYE*, Institut Sénégalais de Recherches Agricoles, ISRA-CNRA Bambey, Sénégal; B.M. ZAGRE, Institut de l'Environnement et de Recherches Agronomique, Burkina Faso; M. BUROW, Texas A&M University Agricultural Research and Extension Center, Lubbock, TX 79403 USA; O.D. SMITH, Department of Soil and Crop Sciences, Texas A&M University, College Station, TX. 77843; and C.E. SIMPSON, Texas Agricultural Experiment Station, Stephenville, TX 76401 USA.

Peanut production in Burkina Faso has increased from 180,532 tons in 1997 to 323,642 t in 2002. Despite this increase, peanut production faces various constraints. Foliar diseases such as leafspots are the most important because they can induce defoliation, reducing pod yield up to 80% in Burkina Faso. Crosses have been made between a local variety, NAMA, which is a late-maturing variety with small seeds but resistant to early leaf spot, and either Andru or the interspecifically-derived lines G5Y4463 and 1333, which are productive but sensitive to the disease. Crosses were made in Texas, F₂ and F₃ generations were then evaluated in Burkina Faso, making single plant selections. Following a one-year of observation trial, selections were evaluated for four years at Gampela (800 mm of rainfall annually) and Farakoba (1000 mm of rainfall annually) in a randomized complete block design with two replicates. Plots were made of 5 rows, 3 m long, spaced 50 cm apart between rows, with a plant spacing of 15 cm. Twenty-two genotypes had a mean score of 3 (ICRISAT scale) in each of the two locations. The line TX95541-17 had a high pod yield (3.144 t/ha) at Gampela, and a very low defoliation percentage (25%) at Gampela and 27% at Farakoba. Its low yield at Farakoba was due to aluminum toxicity which prevented good pod fill. The others genotypes had higher yield than the checks, hence they can be used by farmers in order to help increase peanut production in Burkina Faso. The crosses between NAMA and the varieties from Texas have given promising lines that can enable farmers to grow peanut in Burkina Faso without the severe losses that could occur otherwise from early leaf spot.

Selection from Valencia by Spanish High-Oleic Lines. A. MUITIA*, Department of Plant and Soil Sciences, Texas Tech University, Lubbock, TX 79409, and Instituto Nacional de Investigação Agronomica, Lichinga, Mozambique; M.D. BUROW, Texas Agricultural Experiment Station, Texas A&M University, Lubbock, TX 79403, and Department of Plant and Soil Sciences, Texas Tech University, Lubbock, TX 79409; Y. LÓPEZ, M.R. BARING, J. AYERS, Texas Agricultural Experiment Station, Texas A&M University, Lubbock, TX 79403; N. PUPPALA, Agricultural Sciences

Center, New Mexico State University, Clovis, NM 88008; and O.D. SMITH, Department of Soil and Crop Sciences, Texas A&M University, College Station, TX 77843.

Early-maturing peanuts are desirable for production of a mature crop where the growing season is limited, as in West Texas and New Mexico where cool fall temperatures predominate, and in parts of Mozambique where there is a short rainy season. Enhanced oleic to linoleic (O/L) ratios are helpful for improved oxidative stability. Crosses were made among 3 Valencia varieties and a high-oleic Spanish breeding line (Tx962120). Progeny were selected for high-O/L content, and planted for observation as single plants at two locations in 2002 and as space-planted replicated trials at multiple locations in 2003. Selection was performed for Spanish and Valencia plant and pod types. At Etter in 2003, several accessions were identified with yield and early maturity both in the top category, similar to New Mexico Valencia A. Maximum maturity was 52%, but was in part a consequence of the late planting necessitated by unusually-cold soil temperatures. Data will be presented also on oil content and plant type.

WEED SCIENCE SYMPOSIUM: WEED CONTROL ACROSS THE PEANUT BELT

Peanut Weed Control in the Southeast - An Overview. E.P. PROSTKO* and N.B. SMITH, University of Georgia, Tifton, GA 31793; W.C. JOHNSON, III, USDA/ARS, Tifton, GA 31793; B.J. BRECKE and J.A. FERRELL, University of Florida, Milton and Gainesville, FL 32583; and C.D. MONKS and J.W. EVEREST, Auburn University, Auburn, AL 36849.

Peanut weed management systems in the southeast have undergone many changes over the past few years due to the presence of tomato spotted wilt virus (TSWV) and the registration of several new herbicides. TSWV has lead to an increase in both twin row and reduced tillage production systems. The increase in reduced tillage practices has altered the typical use patterns and effectiveness of the dinitroaniline herbicides resulting in more frequent problems with Texas panicum (*Panicum texanum*) and Florida pusley (*Richardia scabra*). Additionally, these tillage changes, in combination with twin row production systems, have helped contribute to a decline in mechanical cultivation. Other factors, such as high fuel prices and disease management concerns, have also helped contribute to the decline in cultivation. Since the later part of the 1990's, five new herbicides have been registered for use in peanut. These include Cadre (imazapic) - 1996, Select (clethodim) - 1998, Strongarm (diclosulam) - 2000, Valor (flumioxazin) - 2001, and Spartan (sulfentrazone) - 2004. The use of these newer herbicides has lead to a reduction in the use of older products such as Dual (metolachlor), Pursuit (imazethapyr), and Classic (chlorimuron). Because of its low cost and broad spectrum of activity, Gramoxone Max (paraquat) continues to be one of the most frequently used herbicides for peanut weed management in the southeast. New or emerging weed problems include species such as tropical spiderwort (*Commelina benghalensis*), groundcherry (*Physalis* spp.), hophornbeam copperleaf (*Acalypha ostryifolia*), eclipta (*Eclipta prostrata*), carpetweed (*Mollugo verticillata*), purple morningglory (*Ipomoea turbinata*), pink purslane (*Portulaca pilosa*), and various spurges (*Euphorbia* spp.)

Peanut Weed Control in the Southwest-An Overview. W.J. GRICHAR*, Texas Agricultural Experiment Station, Beeville 78102; P.A. DOTRAY, Texas Agricultural Experiment Station, Lubbock 79403; T.A. BAUGHMAN, Texas Cooperative Extension, Vernon 76385.

The incidence of weeds is an extensive problem in all peanut-growing regions of Texas. Weeds can reduce peanut yield and quality considerably, especially when allowed to compete during stand establishment and early season plant growth. Late-season weeds interfere with digging, causing further loss of yield. Therefore, efficient weed management is essential for the profitable production of peanut. It has been estimated that weed losses in peanut exceed \$50 million in the three southwestern states of Texas, Oklahoma, and New Mexico. Estimated total income losses from control procedures for weeds, yield, and quality reductions, increased cultural inputs, and reduced harvesting efficiency are approximately \$53/A for Texas peanut producers. The dinitroaniline herbicides are the base for most herbicide programs in the southwest. Since these herbicides do not control yellow nutsedge (*Cyperus esculentus* L.), other herbicides such as Dual Magnum, Outlook, Pursuit, or Strongarm must be used in combination with (preplant incorporated) or following (preemergence) a dinitroaniline herbicide to improve yellow nutsedge control. Concerns about peanut injury with chloroacetamide herbicides such as Dual Magnum and Outlook when applied preplant incorporated (PPI) and preemergence (PRE) on sandy soils, has resulted in postemergence (POST) applications of these herbicides, followed within 24 h by irrigation or rainfall, to yellow nutsedge less than 8 inches in height. This method of yellow nutsedge control has provided effective (>90%) control without peanut injury. After weed emergence, Basagran, Cadre, or Pursuit may be applied POST to control yellow nutsedge. Purple nutsedge (*Cyperus rotundus* L.) has become an increasing problem across the state and only Cadre (POST only), Pursuit (PPI, PRE or POST), or Strongarm (PRE only) provide effective control. Broadleaf weed control can be improved with a PRE application of Valor following a dinitroaniline herbicide while POST applications of Cadre, 2,4-DB, Storm, Ultra Blazer, or Pursuit can control many broadleaf weed escapes. Cadre will also control small-seeded annual grasses such as southern crabgrass [*Digitaria ciliaris* (Retz.) Koel.] and broadleaf signalgrass [*Brachiaria platyphylla* (Griseb.) Nash] when applied to grass less than 2 inches in height but will not effectively control taller annual grasses. Annual and perennial grass escapes can be effectively controlled with Poast Plus or Select. Rotation crop restrictions following peanut have resulted in reduced use of Cadre and Pursuit when cotton and certain other crops including many vegetables follow peanut.

BREEDING, BIOTECHNOLOGY, AND GENETICS III

Evaluating the Performance of Bulgarian Peanut Lines for Yield and Disease Resistance. N. PUPPALA*, New Mexico State University, Agricultural Science Center at Clovis, Star Route Box 77, Clovis – NM 88101; and S.G. DELIKOSTADINOV, Institute for Plant Genetic Resources, Sadovo – Bulgaria.

Valencia peanuts have been an almost perfect niche crop for eastern New Mexico. The Valencia's are usually known for their taste and produce 3 or more seeds per pod. These red skinned peanuts have a short growing season

compared to the other three market types. Two experiments were conducted at two different locations to evaluate the performance of Valencia peanuts. The first experiment consisted of 13 lines of Valencia peanuts that were planted at South Research Facility. The varieties consisted of two standard checks, eight lines from Bulgarian and three preliminary breeding lines. Mean yield for this trial was only 2122 kg/ha. There was no significant difference between the two checks Valencia – A and Valencia –C. The Bulgarian line Sadovo 3685 resulted in higher yield (2841 kg/ha), higher percent Total Sound Mature Kernels (59) and lower discoloration (13%) resulting in higher gross return per acre (\$ 440). The Bulgarian lines are mainly bold seeded like the Virginias and are mostly 2 to 3 seeds per pod. They are very rarely four seeds per pod unlike the New Mexico Valencia's. Among the three preliminary NMX lines tested only NMX 2 gave higher yield (2670 kg/ha) and gross return per acre compared to other lines tested at this location for the 2003 growing season. The second experiment consisted of 22 lines. Mean yield for this trial was 3070 kg/ha. Four lines Valencia C, NMX-1, NMX-2 and NMX- 5 resulted in higher gross return per acre (\$ 722/ha.). The variety H&W Genetex 102 had the highest percent TSMK (70). Among the Bulgarian lines Sadovo 3685 and Sadovo 3542 performed better compared to other lines.

Response of New Peanut Cultivars to Seeding Rates and Row Patterns. B.L.

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Tomato spotted wilt virus (TSWV) is a major disease problem on peanuts in the Southeast. Research indicates that several management factors can help minimize losses from TSWV, with cultivar resistance being of prime importance. Plant stands (seeding rates), row-pattern, planting date and tillage systems are also important factors. Studies were conducted at Marianna, FL (2001-2003) to evaluate response of several new cultivars with good TSWV resistance to seeding rates and twin vs. single row treatments. Six cultivars were included in the seeding rate tests (ANorden, C-99R, Hull, Carver, Fla. MDR 98 and DP-1) with Georgia Green as a check. Only ANorden, C-99R and Georgia Green were tested in all three years. Seeding rates were 16.4, 19.7, and 23 seed per linear meter of row. Combined individual data showed no significant effect of seeding rate on pod yields, total sound mature kernels (TSMK), or disease (TSWV) ratings. Individual year analysis showed similar results on cultivars that were not in all tests.

In twin vs. single row tests (2001-2003) on ANorden, Andru II, Hull, Carver, C-99R, Fla. MDR 98, SunOleic 97R, and Georgia Green, significant differences were noted among cultivars and row patterns for pod yields and TSWV ratings. Overall, twin rows gave a 538 kg/ha yield advantage with a 1% increase in TSMK and a significant reduction in TSWV. About half of the new cultivars responded in a similar way, although yields of some cultivars, most notably C-99R, were similar in twin and single row culture. These results would indicate that growers may reduce seeding rates to 16.4 seed/meter and twin rows should be favored over single row planting patterns for certain cultivars.

PROCESSING AND UTILIZATION

Fruity/Fermented Odorants in High Temperature Cured Roasted Peanuts. J. DIDZBALIS*, K.A. RITTER, A.C. TRAIL, F.J. PLOG, Masterfoods USA 800 High Street Hackettstown, NJ 07840.

A study was designed to identify the odorants responsible for the fruity/fermented off-note in roasted peanuts. Freshly dug peanuts were divided into two classes, mature (black, brown) and immature (yellow, orange), using pod mesocarp color based maturity, and subjected to normal (27°C) and high temperature curing (40°C). GC-olfactometry on a concentrate of volatiles obtained by solvent assisted flavor evaporation (SAFE) from roasted peanuts was used to identify the odorants responsible for the flavor defect. The high temperature cured immature peanuts were found to contain fruit-like esters (ethyl 2-methylpropanoate, ethyl 2-methylbutanoate and ethyl 3-methylbutanoate) along with increased levels of short chain organic acids (butanoic, 3-methylbutanoic and hexanoic). Mature peanuts cured at high temperature and both mature and immature peanuts cured at low temperature were free of the off-note. The odorants were also detected in high temperature cured unroasted peanuts. These findings were confirmed by sensory evaluation of models, where the addition of these compounds produced the fruity fermented flavor defect in a control peanut paste. The study identified the odorants producing the off-note; this in turn may help identify the mechanism for formation and lead to a strategy to control this flavor defect in peanuts.

Color Sorting to Remove Fruity Fermented Off-flavor in Roasted Peanuts. M. MEHROTRA, Department of Food Science, North Carolina State University, Raleigh, NC 27695-7624; T.H. SANDERS, and K.W. HENDRIX*, USDA, ARS, Raleigh, NC 27695-7624.

Fruity fermented off-flavor results from high temperature exposure during curing of peanuts. Immature peanuts are associated with increased fruity fermented off-flavor and upon roasting, in any grade size, acquire a darker color and have lower flavor potential. This work was conducted to determine the effectiveness of a novel application of machine color sorting to remove fruity fermented off-flavor by removal of darker (immature) roasted peanuts. Fruity fermented and non-fruity fermented runner-type peanut lots (65 kg each) were roasted at 174 ± 2 C, blanched, and subdivided into 3 lots. Each sub-lot was color sorted using a Sortex color sorter (model #3201). The color sorter was adjusted to remove ca. 5, 12 and 20% of the darkest peanuts, which had resultant Hunter L colors of ca. 40, 42 and 44. The lighter color-sorted peanuts (mature) were stored at 30 C and samples were evaluated at 0, 1, 2, 4, 8, and 12 wk. Peroxide value (PV), oxidative stability index (OSI), descriptive sensory analysis, and single-seed roast color were determined for all samples. The darker (immature) peanuts had higher concentrations of unsaturated fatty acids, FFA and carbohydrates. Descriptive sensory analysis showed that fruity fermented off-flavor decreased with successively higher percentage removal of darker-roasted, immature peanuts. The reduction of fruity fermented off-flavor in roasted peanuts by machine color sorting may be of significant economic value to the peanut industry.

Comparison of Peanut Flavor and Shelf-life Characteristics of Peanuts from Argentina, China and the United States. T.H. SANDERS, L.L. DEAN*, and K.W. HENDRIX, USDA, ARS, Raleigh, NC 27695-7624.

This study was conducted to compare flavor characteristics and shelf-life potentials of peanuts produced in China, Argentina and the United States. Approximately twenty sample lots from each country were randomly selected by European manufacturers and shipped for analysis. Composition data on shelf-life factors documented significantly different oleic/linoleic acid ratios of 1.7, 1.2 and 0.98 for peanuts from the U.S. Argentina, and China, respectively. Oxidative stability index was higher in U.S. samples, while free fatty acids, and peroxide value, commonly used measures of oil quality, were lower. Seed size distribution determinations indicated that U.S. peanuts were more uniformly sized than peanuts from the other countries. For sensory analysis, all samples were roasted and descriptive sensory analysis was conducted by two trained expert panels to determine flavor profiles for the lots. Means for roasted peanut flavor intensity were significantly higher in U.S. peanuts (6.3) compared to peanuts from Argentina (4.8) and China (4.2). The term musty was associated with 40% of the samples from Argentina but was not found in other origins. Bitter intensity in peanuts from China was 4.1 compared to 2.9 in peanuts from Argentina and 2.4 in U.S. peanuts. Descriptive sensory data clearly indicated higher intensity of positive flavor characteristics in U.S. peanuts and more frequent occurrence of off-flavors in peanuts from Argentina and China. These data are meaningful to development of marketing strategies for U.S. peanuts.

Effect of Power Ultrasound on Surface Lipid Removal of Roasted Peanuts. P. WAMBURA, W. YANG* and L. WILLIAMS. Department of Food and Animal Sciences, Alabama A&M University, Normal, AL 35762.

Based on its surface cleaning effect, power ultrasound was used in this study for removing surface lipid of roasted peanuts to minimize lipid oxidation and extend shelf life. Georgia green runner peanut kernels were roasted in an oven at 177°C for 20 min. Roasted samples, 50 g each, were subjected to sonication in 100 ml hexane at room temperature for 12 durations ranging from 10 s to 45 min in a sonicator of combinational frequencies of 25, 40 and 80 kHz. After sonication, oil was recovered using a Soxtec. Similarly, the surface lipid of control samples that were shaken in hexane for 3-5 min without sonication was also recovered. The cleanliness of surface after lipid removal was studied by examining a microtoned, stained slice from the kernel surface under a light microscope. Results showed that a constantly higher quantity of surface lipid was removed from the sonicated samples compared to the control samples, confirming the enhanced surface cleaning effect of ultrasound on peanuts. For less than 10 min of sonication, the quantity of surface lipid removed was comparable. However, after 10 min, the quantity of recovered surface lipid increased considerably, indicating that besides surface oil was also extracted from inside the kernels. Microscopic examinations confirmed that surface of the peanut kernels sonicated for less than 10 min was free of oil stains, but that of 30-min sonication showed existence of oil stains, signifying that oil had migrated from inside the kernel to the surface in this case.

Trends in Sensory Quality of Roasted Peanuts Across 15 Years (1986-2000).

H.E. PATTEE*, T.G. ISLEIB, and D.W. GORBET. USDA-ARS and Crop Science Dept., N.C. State Univ., Raleigh, NC 27695-7625; North Florida Research & Education Center, Marianna, FL 32446.

Enhancement of flavor of roasted peanut (*Arachis hypogaea* L.) has been a long-standing objective of the peanut industry. Studies relative to roasted peanut flavor variation have separated the effects of genotype, environment, and genotype-by-environment interaction on the sensory attributes roasted peanut, sweet, bitter, and astringent. Much of the focus of these studies has been on the genotypic variation and the possibility of genetic improvement of peanut flavor. However, most of the variation in sensory attributes is caused by non-genetic factors. Years were found to be the largest single source of variation for the sensory attributes roasted peanut and bitter. Because roasted peanut is the sensory attribute most important to the peanut consumer, it is important to know if the observed year effects varied randomly or if there was any directional trend in peanut flavor over time. Examination of a 15-year data set for directional trends in peanut flavor indicated that all three sensory attributes (roasted peanut, sweet, and bitter) exhibited adverse trends across the span of this study. These trends were independent of whether or not the effects of years were unadjusted for other effects or adjusted for the effects of regions, locations within regions, and the covariates fruity attribute intensity and roast color. The nature of the evident trends, *i.e.*, whether they were linear or curvilinear, was often affected by adjustment. Changes in sensory quality of a single cultivar over time are likely due to changes in prevailing cultural practices such as rotations and chemicals applied to the peanut crop. It was not clear whether consumers would have noticed the change in sensory quality over time because the trends within individual cultivars were confounded with changes in the dominant runner-type cultivars with variable sensory quality marketed over the span of the study.

Properties of Dried Plum Supplemented Peanut Muffins Fortified with Calcium.

M.J. HINDS*, Nutritional Sciences Department; T. BOWSER, S. REILLY, Food and Agricultural Products Research and Technology Center, Oklahoma State University, Stillwater, OK 74078.

Products that contribute positively to bone health are in demand because of the steady increase in percent of 50-year old plus consumers. Dried plums contain boron and selenium which modulate bone and calcium metabolism, and preserve bone mineral density. Dried plum consumption has also been observed to increase rate of bone formation in postmenopausal women. However, current utilization level of dried plum as an ingredient in bakery products is 3-5%. From previous studies, muffins containing peanut flour and peanut butter had good texture when up to 60% wheat flour was replaced by peanut (12% fat) flour. The objective of this study was to ascertain the highest levels of 12%-fat peanut flour and dried plum powder that could be used to develop muffins with good quality. Response surface methodology and a three-level Box-Behnken Balanced Incomplete Block Design were used to evaluate the effects of peanut flour (PF: 50, 75, 100% wheat flour replacement), dried plum puree powder containing 97% dried plum and 3% calcium stearate (DPP: 6, 15, 24% wt of dried ingredients), calcium stearoyl lactylate (CSL: 1.5, 2.0, 2.5% wt of dried ingredients), and glycerol monostearate (GMS: 0.5, 1.0, 1.5% wt dried ingredients) on muffin

properties. Texture profile (TA XT2i Texture Analyzer fitted with TA-25 probe at test speed of 2 mm/sec), color (Minolta Chromameter), water activity (Rotronic meter) and sensory screening were used to evaluate experimental and commercial muffins and set limits for acceptability. Muffins became a darker brown (decreased hue angle and L value) as PF and DPP were increased. Hardness of the muffin treatments increased as PF and DPP increased, and peaked at 100% PF and 24% DPP. When CSL was 1.5%, muffin crumb had highest cohesiveness with PF=100% or DPP=24%, and least cohesiveness for combined highest levels of PF (100%) and DPP (24%). When CSL was 2.0-2.5%, cohesiveness generally increased with increased PF, but decreased with increased DPP. Muffin springiness peaked when DPP was 8-11%, whereas muffin resilience generally decreased with increased GMS. Optimization studies based on RSM predictions and sensory evaluation indicated that good quality high-peanut-plum muffins could be obtained when formulations containing either 75%PF + 24%DPP or 84.4%PF + 18.2%DPP are used.

EXTENSION TECHNIQUES and TECHNOLOGY

Peanuts in Virginia: the Dilemma and the Future. J.C. FAIRCLOTH*, Crop, Soil and Environmental Sciences, Virginia Tech, Suffolk, VA, 23437.

Following the loss of the peanut government quota system, Virginia peanut acreage has declined from 75,000 acres (2000) to 33,000 acres (2003). South Carolina, Georgia, and Florida have all increased acres planted to peanuts over this same time period. The acreage shift in other states is due to reduced input cost associated with soils that have not previously been planted to peanut. While many soils in Virginia possess characteristics (texture) ideal for peanut production, growers are confronted with excessive disease control inputs. This is because a significant amount of southeastern Virginia farmland has produced peanuts since the late 1800's in short rotations (cotton, soybeans, corn, or wheat), thus allowing for buildup of extreme disease pressure. Under the quota system, past research was focused primarily on maximizing yields and optimizing quality. This approach paid less attention to minimizing input costs which due to chemical usage are abnormally high in Virginia. Under the new marketing structure, future research programs to be discussed focus on management practices that minimize overall inputs without sacrificing yield and quality. This will include examinations of longer rotations, alternative tillage methods, and the impacts of rotating with various commodities.

Continued Investigations on the Control of Tropical Spiderwort. J.T. FLANDERS*, Grady County Cooperative Extension Service, Cairo, GA 39828; and E.P. PROSTKO, Department of Crop and Soil Sciences, University of Georgia, Tifton, GA 31793.

Over the past few years, tropical spiderwort (*Commelina benghalensis*) has become one of the most troublesome weeds in south Georgia. Limited information on the control of this species is available. In 2003, on-farm, small plot field trials were conducted in peanut and following field corn harvest to evaluate several herbicides for the control of tropical spiderwort. In the peanut trial, the following results were obtained: 1) The addition of 0.5 pts/A of Basagran 4SC (bentazon) to Gramoxone Max 3SC (paraquat) at 5.5 ozs/A did

not influence control; 2) Preemergence applications of Valor 51WG (flumioxazin) at 3 ozs/A provided 95% control at 17 days after planting (DAP) but control was less than 70% at 31 DAP; 3) Strongarm 84WG (diclosulam) at 0.45 ozs/A was more effective when applied postemergence than preemergence; 4) Spiderwort control was better with Gramoxone Max 3SC at 5.5 ozs/A and Cadre 70DG (imazapic) at 1.44 ozs/A when applied separately 14 days apart rather than when applied in a tank-mix. 5) Dual Magnum 7.62EC (s-metolachlor) at 1.33 pts/A applied in combination with Cadre provided better control of spiderwort than Cadre applied alone. In the post-harvest control trial, herbicides were applied on October 31 to tropical spiderwort that was 6" in height. Herbicide treatments included Classic 25DF (chlorimuron) at 0.25 and 0.50 ozs/A; Firstrate 84WG (cloransulam) at 0.20 and 0.30 ozs/A; 2,4-DB 1.75SC at 1.1 and 2.2 pts/A; Strongarm 84WG at 0.225 and 0.45 ozs/A; Basagran 4SC at 1 and 2 pts/A; Atrazine 4L at 1 and 2 qts/A; Permit 75DG (halosulfuron) at 0.67 and 1.0 ozs/A; Storm 4SC (bentazon + acifluorfen) at 1.5 and 2.0 pts/A; Gramoxone Max 3SC at 5.5 and 11 ozs/A; and Valor 51WG at 3 ozs/A. A non-ionic surfactant at 0.25% v/v was included with Classic, Firstrate, Strongarm, Permit, and Gramoxone Max. A crop oil concentrate at 1.0% v/v was included with 2,4-DB, Basagran, Atrazine, Storm, and Valor. At 2 WAT, Gramoxone Max at 11 ozs/a provided 75% control of tropical spiderwort. All other treatment provided less than 65% control.

Fungicide Treatment Effects on the Incidence of Soilborne Diseases in Peanut.

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Field experiments were conducted to evaluate four fungicide programs for control of soilborne diseases in peanut (*Arachis hypogaea*). Azoxystrobin (Abound 2.08 F), Tebucanazole (Folicur 3.6 F), Flutolanil (Moncut 50 WP), and Flutolanil plus Propiconazole (Montero) were applied according to manufacturer's recommendations and compared to chlorothalonil alone (Bravo 6 EC) during the 2000, 2001 and 2002 growing season in Southwest Georgia. No difference in *Cercosporidium personatum* and *Cercospora arachidicola* leafspots was observed among treatments. White mold (*Sclerotium rolfsii*) pressure was light during all years resulting in less than one hit per 50 foot of row in any replication. All treatments numerically reduced the incidence of soilborne disease when compared to the chlorothalonil only plots. Among treatments, Azoxystrobin (Abound) provided significantly better control of *Rhizoctonia solani* and *Lasiodiplodia theobromae* during the 2000 and 2001 seasons. No differences were observed in disease control during the 2002 season. Differences in yield were observed and varied by year and treatment.

CBR Response to Metam Sodium and Peanut Cultivar in Southwest Georgia.

T.W. MOORE*, Miller County Cooperative Extension Service, Colquitt, GA 39837; and T.B. BRENNEMAN, Coastal Experiment Station, University of Georgia, Tifton, GA 31793.

CBR is a growing problem in certain areas of the Georgia peanut production belt. For the past 5 years, we have conducted replicated on farm tests to test the

response to metam sodium in severely infected fields. Since 2000, we have also looked at the response to metam sodium of cultivars with certain levels of resistance to CBR.

ECONOMICS I

What Can A Producer Really Pay for Land Rent? T.D. HEWITT*, Department of Food and Resource Economics, University of Florida, North Florida Research and Education Center, Marianna, FL 32446-7906; and T.D. DAVIS, Department of Applied Economics and Statistics, Clemson University, Clemson, SC 29634-0313.

The pricing structure for peanuts changed due to the provisions of the 2002 Farm Security and Rural Investment Act. Under previous legislation, peanuts were produced under a marketing quota which established a guaranteed price of \$610 per ton. The 2002 Farm Bill eliminated the quota, allowing price to vary subject to local peanut supply and demand conditions. The 2002 Farm Bill does still provide a floor on the peanut price at \$355 per ton. However, the change in policy has reduced peanut profitability, and producers must examine ways to reduce costs to maintain profitability. Rental rates paid for peanut land is often mentioned as a large proportion of production costs for peanuts. Rental rates can have significant impacts on the risk and returns to an operation. Rental rates are usually influenced by the landowners' costs, tenant's expected earnings, rental history, competition with other crops, government programs, and land availability. In this study conventional rental agreements as well as alternative idea are evaluated using a simulation model that incorporates stochastic yields, prices, and government payments. The returns to management are analyzed for peanut producers under different rental agreements and a determination is made for the maximum rental rate that peanut producers in the Southeast are able to pay and maintain profit margins.

Impact of Commodity Price on Profitability in Irrigated and Non-irrigated Cropping Systems in the Southeast. M.C. LAMB*, D.L. ROWLAND, R.B. SORENSEN, and C.L. BUTTS. USDA, ARS, National Peanut Research Laboratory, Dawson, GA. 39842.

In simplest terms, net returns in crop production can be defined as (yield multiplied by price) minus cost of production. Proper management of each of these variables (yield, price, cost) is essential to ensure the profitability of a crop during a production season. Further, farm managers must also consider these variables within the scope of a cropping system and the longer-term impact on profitability of potential cropping systems. To address the impact of irrigated and non-irrigated cropping systems profitability, a large-scale irrigation research project was established in CY 2001. Six replicated irrigated and non-irrigated cropping sequences including peanuts, cotton, and corn were defined as: continuous peanuts (PPP), cotton/peanuts/cotton (CPC), corn/peanuts/corn (MPM), cotton/cotton/peanuts (CCP), and cotton/corn/peanuts (CMP). Irrigation scheduling (timing and amount) for peanut was managed by the Irrigator Pro expert system. Irrigation scheduling for cotton and corn was based on the recommended water curves and application amount schedules in the University of Georgia crop production guides for cotton and corn. Production costs (defined

as total cost per acre consisting of variable and fixed cost) were obtained from crop year 2003 University of Georgia crop enterprise budgets. Three price levels for corn, cotton, and peanuts were defined as low, median, and high. The Farm Security and Rural Investment Act of 2002 established a loan price for corn, cotton, and peanuts providing a minimum price for each commodity even in periods of depressed commodity prices. Thus, the loan rate prices define the low prices while the high price was defined as the higher of the average annual market price received by farmers during the 1990-2003 crop years or the target price defined by The Farm Security and Rural Investment Act of 2002. The median price is defined as the simple average of the low and high price for each respective crop. The profitability of each irrigated and non-irrigated cropping system for each potential crop price combination was calculated.

The Economics of Conservation Tillage and Row Spacing. N.B. SMITH*, V. SUBRAMANIAM, Department of Agricultural and Applied Economics, The University of Georgia, Tifton, GA 31793, S.M. FLETCHER, Department of Agricultural and Applied Economics, National Center for Peanut Competitiveness, The University of Georgia, Griffin, GA 30223, J.A. BALDWIN and J.P. BEASLEY, JR., Department of Crop and Soil Sciences, The University of Georgia, Tifton, GA 31793.

Peanut production research has focused on tillage practices and row spacing in recent years. The number of producers using strip tillage in Georgia was estimated at twelve percent in 2001 by county agents. The number of producers growing peanuts in twin rows was estimated at over 30% in 2001. Interest in these alternative production practices is being driven by several factors including less tomato spotted wilt virus and better water holding capacity. Strip tillage in many cases is purported to save time and money with fewer trips across the field. Twin rows have been proven to yield 400-500 lbs/A more than single rows on average with a 1-2% higher grade. Research data is combined from tillage and row-spacing studies across multiple locations and years to analyze the cost and returns for conventional and strip tillage production and single versus twin row spacing. Results indicate similar returns for strip and conventional tillage and significant returns to twin rows versus single rows.

Maximum Bid Price for Peanut Digger-Inverters and Combines. T.D. DAVIS *, Department of Applied Economics and Statistics, Clemson University, Clemson, SC 29634-0313; and T.D. HEWITT, Department of Food and Resource Economics, University of Florida, North Florida Research and Education Center, Marianna, FL 32445-7906.

The 2002 Farm Security and Rural Investment Act eliminated the peanut marketing quota, creating an opportunity for Southeastern producers to add peanuts to their crop enterprise mix. New peanut producers will have to invest in specialized peanut equipment, a digger-inverter and combine, for this crop enterprise. This equipment is expensive and adds to fixed costs of production. Producers will need to manage costs and become more efficient to remain profitable. In fact, more intensive management may be needed as peanut harvest may conflict with harvest of other crops. A stochastic simulation model is used to define yield, price, and government payment risk in the returns to irrigated and non-irrigated peanut production. A net present value model is used

to determine the maximum amount producers could pay for a digger-inverter and combine given the variability in prices, yields, and government payments. This information is important to help producers maintain a profitable business in a more competitive marketplace.

Peanut Acreage Shift: How has the Farm Security and Rural Investment Act of 2002 Impacted the Distribution of Planted Acres? A.E. McCORVEY*, A.S. LUKE-MORGAN, Agricultural and Applied Economics Department, National Center for Peanut Competitiveness, The University of Georgia, Tifton, GA 31793-1209; S.M. FLETCHER, Agricultural and Applied Economics Department, National Center for Peanut Competitiveness, The University of Georgia, Griffin, GA 30223-1797; and N.B. SMITH, Agricultural and Applied Economics Department, The University of Georgia, Tifton, GA 31793-1209.

The passage of the Farm Security and Rural Investment Act of 2002 brought about many changes to the peanut industry. One change brought about by the abolishment of the quota price support system was more equality in peanut prices. This change, in turn, led to greatly increased interest in peanut production in areas that had not traditionally grown peanuts. A shift has also been seen as production has moved from marginal to more productive land. Preliminary analysis of NASS reported planted acreage for the three peanut production regions shows an increase in the Southeast from 53% of the total US acres in 2001, to 59.4% in 2002 and 65.4% in 2003. Trends in the Virginia/Carolina area show a decline from 12.9% in 2001 to 11.7% in 2002 and 10% in 2003. Similarly, in the Southwest acreage has declined from 34.2% in 2001 to 28.9% in 2002 to 24.6% in 2003. Shifts within the regions are also being analyzed to see how the changes are impacting each state.

Examining the Structure of Awareness of Aflatoxin in Groundnuts among Ghanaian Health and Agricultural Professionals and its Influence on their Actions. C.M. JOLLY and B. BAYARD, Auburn University, Auburn, Alabama and R.T. AWUAH and S.C. FIALOR Kwame Nkrumah University of Science and Technology, Kumasi, Ghana.

Groundnuts are often contaminated with Aflatoxin that engenders serious health problems, such as liver cancer and hepatitis among consumers. However, the level of consumers' awareness of such problems has not been elucidated, especially in developing countries. This study examines the degree of awareness of Aflatoxin in groundnuts among professionals in Ghana using a structural equation modeling approach. Data were collected in 2002 through a self-administered questionnaire from a sample of 367 individuals in order to analyze relationships among beliefs and awareness of Aflatoxin in groundnuts among agricultural and health administrators in Ghana. The study examines direct causal effects of perceived susceptibility, seriousness, benefit, and barrier on awareness. The influence of awareness on actions leading to greater awareness is explored. The sociodemographic factors affecting individuals' beliefs, awareness and actions are also examined. Data were analyzed using Lisrel 8.5. Results showed that perceived benefits of good quality groundnuts and/or groundnut products are the most important determinants of awareness of aflatoxin among professionals in Ghana. Awareness, in turn has a significant causal effect on administrators' decisions to take actions to increase the level of

awareness in the society. The study showed that demographic factors such as gender, type of profession, and level of education significantly influence perception of the benefits of good quality nuts. Age and education are significant determinants of awareness of aflatoxin in groundnuts.

Producers Health Perception of Groundnut AF in Benin. S. VODOUHE*, University of the Republic of Benin, B. BAYARD and C.M. JOLLY, Auburn University.

Groundnuts are an important cash crop to Benin farmers. Groundnuts also contribute to plant protein intake of consumers throughout the country, though most of the production takes place in the middle and northern parts of the country. Aflatoxin (AF) levels in groundnuts are high and as a result groundnut exports to European countries are not possible. Most farmers are aware of the problem, but do not think that their production and post harvesting practices contribute to the problem of AF contamination. We conducted a study to examine Benin farmers' awareness of the effects of AF on human and animal health, perceived susceptibility, perceived seriousness of the problem, perceived barriers to reduce the problems and benefits derived from reducing the levels of AF. A survey of 182 farmers was conducted throughout Benin in 2002. Data analysis was conducted using SPSS, EXEL and SAS software packages. Exploratory Factor Analysis was used to evaluate the constructs of awareness, perceived susceptibility, seriousness, barriers, and benefits. The results show that the average age of farmers was 40.4, with an SD of 10.8. Farmers had an average of 18.32 years of farming experience and received an annual income of 708,107 FCFA (550FCFA=U.S. \$1.00). About 46% of farmers had never attended school, 32% had only a primary education, and 19% had attended high school or some training beyond primary school. Approximately 93% of farmers stated that sorting of groundnuts was important or very important, while 77 percent thought that they were sure or definitely sure of the negative effects of AF on human health. About 17% were not sure. The exploratory factor analysis revealed that the susceptibility constructs were health belief and self-confidence, while self-belief and sinicism represented the seriousness construct. The barrier constructs were cost and difficulty encountered in reducing AF. The benefit construct had two factors, hygienic benefits and health improvement factor.

PLANT PATHOLOGY AND NEMATOLOGY I

Comparison of Peanut Yields Following Applications of the Sclerotinia Blight Control Chemicals Omega 500 (Fluazinam) and Endura (Boscalid). M.G. JENNINGS* and T.A. LEE, JR., Texas Cooperative Extension, Department of Plant Pathology and Microbiology, Texas A&M University System, Stephenville, Texas 76401.

Sclerotinia blight of peanut (*Sclerotinia minor*) occurs in about 10% of Texas peanut fields and requires fungicide applications for control. There are presently only two approved fungicides that provide acceptable control of the fungus. Endura (boscalid) and Omega 500 (fluazinam) were tested in replicated plots in Texas Peanut fields in 2003. Since neither of these fungicides has significant activity against peanut leafspots, Endura was alternated with Headline (pyroclostrobin) and Omega 500 was alternated with Bravo 720 (chlorothalonil).

Both the Endura and the Omega 500 plots received applications at 60 and 90 days after planting @ 9oz./A. Untreated control plots averaged \$575/A while Omega 500 plots averaged \$700 and Endura plots averaged \$793/A.

Effect of *Sclerotinia minor* Infection Location on the Peanut Plant on Plant Productivity. K.D. CHENAULT* and H.A. MELOUK. USDA-ARS, Plant Science Research Laboratory, Stillwater, OK 74075.

Sclerotinia blight, a soilborne fungal disease caused by *Sclerotinia minor*, is responsible for increased production costs and yield losses of up to 50% for peanut producers in the Southwest, North Carolina and Virginia. Much has been reported on the pathology, epidemiology, and control of *S. minor* infection of peanut, but documentation of the physical location of infection on the plant under field conditions and its effect on plant productivity is lacking. A field study was initiated in 2002 at the Caddo Research Station near Ft Cobb, OK, to study the effect of the physical location of *S. minor* infection on peanut yield and grade. The thirty-two peanut lines in this study were planted in plots with high sclerotial density to provide above average Sclerotinia pressure with no application of fungicide for management of *S. minor*. Location of initial *Sclerotinia minor* infection was noted as either "crown" or "limb" for each infected plant, and the date of initial onset was also recorded. In general, those plants with initial crown infections had more reduced yield and seed quality as compared to those with initial limb infections. Early date of initial infection had a similar effect on plant productivity as compared to late onset of infection. Early onset of crown infections had the greatest effect on plant productivity, causing a severe decrease in seed quality and yield.

Responses of Peanut Cultivars to Fluazinam and Boscalid for Control of Sclerotinia Blight. J.P. DAMICONE*, K.E. JACKSON, Dept. of Entomology and Plant Pathology, and K.E. DASHIELL, Dept. of Plant and Soil Sciences, Oklahoma State University, Stillwater, OK 74078-3033.

Sclerotinia blight, caused by (*Sclerotinia minor*) remains a destructive disease in Oklahoma. Partially resistant cultivars such as Tamspan 90 and Tamrun 96 are grown in most problem fields. Previous research has shown that for all cultivars except Tamspan 90, yield responses to fluazinam have been sufficient to exceed the cost of the fungicide. However, the reduced value of peanuts resulting from the 2002 farm legislation requires a reexamination of the cost/benefit relationship for fungicide programs for Sclerotinia blight. Moderately resistant (Tamrun 96, Tamrun OL 01), resistant (Tamspan 90), and susceptible (Okrun) cultivars received one applications of fluazinam at 1.0 lb/A, or two or three applications of boscalid at 0.4 lb/A. Over a 3-yr period, disease incidence in untreated plots of Tamrun 96, Tamrun OL 01 was about half of the 80% observed for Okrun. Except for Tamspan 90 which had less than 5% disease, fungicide programs reduced disease incidence and increased yields of all cultivars. Fluazinam and two-applications of boscalid resulted in a 50% reduction in disease incidence. Disease incidence following three applications of boscalid was about 10% or less for each variety. In untreated plots, yield increases above Okrun (2400 lb/A) averaged 800 lb/A for Tamspan 90, 900 lb/A for Tamrun OL 01, and 1400 lb/A for Tamrun 96. Yield increases for fluazinam and two applications of boscalid were similar, averaging about 1200 lb/A for Okrun, 750 lb/A for Tamrun OL 01, and 500 lb/A for Tamrun 96. Three applications of boscalid produced the highest yields for each cultivar, ranging from 4000 lb/A for

Okrun to 4200 lb/A for Tamrun OL 01. Partial economic returns could only be calculated for fluazinam because the cost of boscalid is not yet known. Returns were increased above the untreated control for Okrun (\$100/A) and Tamrun OL 01 (\$50/A). The return for fluazinam on Tamrun 96 was neutral, and negative on Tamspan 90. While the effects of cultivar resistance and fungicide were additive for all cultivars except Tamspan 90, the planting of Tamrun 96 without fungicide for Sclerotinia blight was amongst the most profitable strategies.

Oxalic Acid Production by Isolates of *Sclerotium rolfsii* and their Pathogenicity on Peanut. C.N. SAUDE, H.A. MELOUK*, K.D. CHENAULT and C.B. MEADOR. Department of Entomology and Plant Pathology, Oklahoma State University and USDA-ARS, Stillwater, OK 74078.

Seventeen isolates of *Sclerotium rolfsii* from various vegetables, peanut and wheat were evaluated for their pathogenicity on Okrun, an *S. rolfsii*-susceptible peanut cultivar, and for oxalic acid (OA) production in liquid culture. Okrun peanut was grown in the greenhouse for six weeks at which time organic debris was removed from the soil surface and plants were watered to saturation. A 1-cm disc of filter paper was placed around the base of each stem and three sclerotia were placed on the filter paper adjacent to and touching the stem. Plants were placed in chambers maintained at 28-30 C° and 100% relative humidity for 14 days. Sclerotial germination was recorded four days after inoculation and disease severity was assessed at two day intervals thereafter. A pathogenicity scale of 1-6 was used with 1 being no mycelia on stem and 6 being a dead plant. Oxalic acid production by isolates was measured by growing *S. rolfsii* in liquid culture. Flasks containing 100ml of potato dextrose broth (PDB) were inoculated with three 0.5-cm mycelial plugs from three-day old cultures of *S. rolfsii* and were placed on a rotary shaker for six days. Mycelial mats were removed on day 2 through day 6 and OA concentration was determined in culture filtrates using a diagnostic analysis kit (Sigma). All isolates, except wheat isolate from Oklahoma, were pathogenic to peanut. All isolates produced significant amounts of OA on PDB. Mycelial biomass of isolates was highly correlated to the amounts of OA produced in liquid culture. Our data on pathogenicity of *S. rolfsii* and OA production suggest that OA is not the sole factor determining pathogenicity.

Absence of Single Nucleotide Polymorphisms among Restriction Fragment Length Polymorphisms Identified by R2430E. H. YANG, M.V. KOLOMIETS, and J.L. STARR*, Department of Plant Pathology and Microbiology, Texas A&M University, College Station, TX 77843.

The cDNA clone R2430E identifies a restriction fragment length polymorphism (RFLP) that is tightly linked to a single gene for resistance to *Meloidogyne arenaria* in the peanut cultivars COAN and NemaTAM. Although this RFLP has been useful as a marker for resistance in peanut breeding programs, it would be more efficient to have a marker based on the polymerase chain reaction (PCR). In an attempt to develop such a PCR-based marker for resistance, we gel purified, cloned, and sequenced all seven restriction fragments that hybridize to R2430E in Southern blots using DNA extracted from Florunner and the near-isogenic resistant cultivar NemaTAM. Unfortunately, no sequence polymorphisms were identified that could be used for the development of PCR primers that are specific for the nematode-resistant genotypes.

EXTENSION TECHNIQUES AND TECHNOLOGY/EDUCATION FOR EXCELLENCE

Peanuts in Virginia: A Needed Premium. G.T. ROUNTREE, Associate Extension Agent, Virginia Cooperative Extension, Isle of Wight, Virginia 23397.

Virginia experiences a temperate climate with relatively hot summers, cold winters, and high humidity during the peanut growing season. The high humidity, high temperatures and short crop rotations result in increased pest pressure for Virginia peanuts. Therefore, pesticide costs in Virginia are excessive relative to other peanut producing states. Other regions of the United States that have recently begun producing peanuts, specifically the mid-west, have climates that are less humid, soils with fewer pathogens, and are likely to require less inputs for peanut production. Under the new marketing structure, future research programs to be discussed focus on management practices that minimize overall inputs without sacrificing yield and quality. This will include examinations of the comparisons of inputs between Virginia and the mid-western peanut producing states.

Overview of Texas Cooperative Extension IPM Programs for High Plains Peanut Producers. K.T. SIDERS*, Extension Agent – Integrated Pest Management, Hockley and Cochran Counties, 1212 Houston Street, Suite 2, Levelland, TX 79336.

Integrated Pest Management was launched in Texas over 30 years ago by scientists seeking effective and environmentally friendly ways to control pests that damaged agricultural crops and livestock. This partnership with nature, which employs biological controls among other methods, has provided a range of proven and practical approaches to handling pest problems. IPM serves Texas agriculture by managing pests without relying solely on costly chemical applications. This helps increase profits for producers, improve the environment, and reduce production risks. Research and Extension efforts are complemented by those of agricultural consultants, industry personnel, and participating agencies. Each year, some 25 Extension IPM Agents work with farmers and ranchers across Texas, helping them employ IPM production systems that reap the benefits of years of farming know-how coupled with technology and science. Peanut production on the Texas High Plains has increased dramatically since the mid 1990's. New IPM Programs in Gaines, Terry, Yoakum, Hockley and Cochran Counties were established during this time in the southwest portion of the Texas High Plains. Peanut producers and industry have benefited from the Extension IPM Program. In 2003, educational information was provided to growers, landowners, agribusinesses, and other clientele to help manage production and pest problems. These totaled 302 issues of newsletters sent to a combined 6,000 clientele, 140 radio programs, 17 television interviews and 300 newspaper articles on IPM practices. There were 326 applied research/demonstrations to evaluate new technology with 22 dealing with specific peanuts issues for a cost-effective solution to local problems. IPM Agents provided the latest IPM training to 73 agricultural consultants and 235 scouts who work with producers. IPM Agents also provided over 15,000 farm visits to analyze production or pest problems and to provide management

suggestions. The IPM Program also obtained more than \$600,000 in private and public funds to extend their efforts and provide educational information to Texans.

Nematode Management Trials in Florida Peanuts Without Rotation. W.D. THOMAS*, University of Florida, Columbia County Cooperative Extension Service, Lake City, Florida 32025.

Availability of cropland for rotation in Columbia County, Florida has significantly decreased in the last 10 to 15 years due to several factors. The most prevalent factor is a result of extended low market prices for such commodities as corn, soybean and in the past cattle. This resulted in thousands of acres planted in pines and sold in small tracts for housing. Consequently, the remaining cropland acreage is intensively utilized crop after crop, year after year. Large acreage peanut producers have no choice but produce peanuts on the same land in multi-year sequences without rotation except for some cool season forage crops. The soils in this area of Florida are predominately coarse sands and inherently susceptible to building and maintaining high levels of nematodes. In absence of rotation in the peanut crops Peanut Root knot and Lesion nematodes are quickly becoming serious problems for producers. On-farm demonstration / research trials conducted over the past four years have generated data utilizing contact and fumigant nematicides in peanuts. Obviously, the differential in cost of treatment needs to be coupled to the degree of yield / grade reduction in the peanuts as well as site / soil suitability for the nematicide. For 2004, a demo/research trial was initiated in mid October 2003 to compare the efficacy between fumigation immediately following harvest and fumigation in the spring just prior to planting. Oats for forage were planted November 2003 over the entire field in which the trial is located. Each treatment area consists of 12+ acres and will be harvested with the producers' equipment. The impetus of the trial is to evaluate the possibility of shifting the treatment time to post-harvest rather than pre-plant. For large acreage producers, the shift in equipment and manpower usage fit the operations better by moving the fumigation operation into the period between peanut harvest and cool season forage plantings, thus eliminating additional field time prior to planting.

Interactions of Tillage and Rotation in Peanut-Based Cropping Systems. C. TYSON*, North Carolina Cooperative Extension Service, Nashville, NC 27856; D. JORDAN and D. JOHNSON, Department of Crop Science, North Carolina State University, Raleigh, NC 27695; S. BARNES, Peanut Belt Research Station, NCDA&CS, Lewiston-Woodville, NC 27849; C. BOGLE, Upper Coast Plain Research Station, NCDA&CS, Rocky Mount, NC 27801; G. BULLEN, Department of Agricultural and Resource Economics, North Carolina State University, Raleigh, NC 27695; and D. PARTRIDGE, Department of Plant Pathology, North Carolina State University, Raleigh, NC 27695.

Research was conducted at two locations in North Carolina from 2000 to 2003 to compare yields of peanut, cotton, and corn grown in various rotation sequences in conventional and strip tillage systems. Peanut yield was similar when comparing conventional and reduced tillage systems within similar rotation sequences at one location on a Norfolk loamy sand soil. At a second location on

a Goldsboro sandy loam soil, yield in a short rotation with cotton was lower when peanut was strip tilled into stubble from the previous crop compared with yield in conventional tillage. When a longer rotation between cotton and peanut was established, peanut yield was similar between the two tillage systems. In both trials when peanut was planted in all plots, peanut yield was similar between strip tillage in stale seedbeds (beds established during the early spring prior to planting) and conventional tillage. At one location, peanut yield from both of these tillage systems exceeded that of strip tillage into stubble from the previous crop. It is suspected that peanut pod loss during the digging and inverting operation was greater when peanut was strip tilled into crop stubble than when strip tilled into stale seedbeds. The experiment is being continued for an additional cycle to compare long-term response to tillage and rotation.

Advisory Index for Transitioning from Conventional to Reduced Tillage Peanut.

F. WINSLOW*, North Carolina Cooperative Extension Service, Plymouth, NC 27962; D. JORDAN, R. BRANDENBURG, B. SHEW, and G. NADERMAN, North Carolina State University, Raleigh, NC 27695; and S. BARNES and C. BOGLE, North Carolina Department of Agriculture and Consumer Services, Raleigh, NC 27607.

An advisory index was developed in North Carolina to help growers determine risks associated with planting peanut in reduced tillage systems. This index is modeled after risk advisories developed for management of southern corn rootworm and tomato spotted wilt virus. Points are used to define risks associated with cultivar selection, ability to irrigate, soil series, tillage intensity within the reduced tillage system, presence of a small grain cover crop, and history of tomato spotted wilt virus. Compiling values associated with each of these practices gives an indication of potential for peanut yields in reduced tillage systems to be lower than yields in conventional tillage systems. This index does not consider savings often associated with labor and time in with reduced tillage production, and it does not consider the long-term benefits of reduced tillage production on soil properties. This advisory index is designed to help growers assess risk during the transition from conventional to reduced tillage production.

ECONOMICS II

Economic and Financial Analysis of Peanut Production in Bulgaria.

N. BENCHEVA* Agricultural University in Podiv, Bulgaria, C.M. LIGEON, Auburn University at Montgomery, S. DELIKOSTADINOV, Institute of Plant Genetic Resources in Sadovo, Bulgaria, N. PUPPALA, New Mexico State University, and C.M. JOLLY, Auburn University, Auburn, Alabama.

Agriculture plays an important role in the Bulgarian economy. In 2001 it contributed 13.7% of the GDP and engaged 26.3% of the labor force. The principal crops are wheat, maize, barley, sunflower seeds, potatoes, tomatoes, and melons. Peanut is a secondary crop, but it has great potentials as a farm income earner, and it is one of the few crops that experienced stable output after the period of political transition. In this study, we examine the financial and economic feasibility of producing peanuts in Bulgaria. Data on peanut production were collected from 18 villages in 2002 through personal interviews using a structured questionnaire. The data were analyzed using SPSS and SAS. The

results reveal that the yield per acre is 914kg, with an SD of 137, and range from 617 kg per acre, with and SD of 137 in D. Volden to 1,166kg/acre, SD of 94 kg in Boljrtsi. The production of an acre of peanuts generates positive net returns in most villages, with net returns ranging from negative \$5.00 to a positive \$213 per acre. On average, the breakeven price to cover total cost is \$0.61 per kg, while the average market price received by farmers is \$0.87 per kg. Capital budgeting techniques show that the production of peanuts in Bulgaria is financially feasible. The production of an acre of peanuts generates an internal rate of return of 34% over a seven-year period. The profitability index is 1.68. The study shows that net returns vary inversely with farm size, whereas yield and net returns vary positively. Peanut production competes favorably with the principal crops, such as sunflower, wheat and maize for fixed farm resources.

Benin Farmers' Beliefs of Aflatoxin in Groundnuts: Scale Measurement and Effects of Socioeconomic Factors. C.M. JOLLY, B. BAYARD, Auburn University, Auburn, Alabama, and S. VODOUHE, University of the Republic of Benin, Cotonou.

This study assesses the scale dimensional structure of farmers' beliefs of aflatoxin (AF) in groundnuts. A survey was conducted with 182 farmers in Benin to assess their beliefs of AF effects on human and animal health. Exploratory Factor Analysis was conducted on the scale responses to extract factors eliciting farmers' perceived susceptibility, seriousness, barrier and benefits. Awareness and action factors were also evaluated. Confirmatory factor analysis formally tested the scale measurement of the various belief factors. Relationships of the belief and action factors with socioeconomic variables were evaluated using Multiple Indicators and Multiple Causes (MIMIC) models. The results indicate that the scale of the various constructs is reliable and the validity conforms to expectations. The unifactorial models developed in this study give a satisfactory fit with NFI, CFI and GFI exceeding 0.90. The results reveal that gender, age and years of experience in farming significantly impact farmers' action regarding groundnut production. Male farmers are more likely to be aware of AF problems in groundnuts and feel more susceptible to the problems than their female counterparts. Gender and education seem to be more dominating factors in the perception of barriers to mitigating the effects of AF, and also more likely to perceive the benefit of having good quality groundnuts.

Production Function for Peanuts in Bulgaria. C.M. LIGEON*, Auburn University at Montgomery, N. BENCHEVA, Agricultural University in Plodiv, Bulgaria, S. DELIKOSTADINOV, Institute of Plant Genetic Resources in Sadava, Bulgaria, N. PUPPALA, New Mexico State University, C.M. JOLLY, Auburn University, Auburn.

Bulgaria is the most important producer of peanuts in Europe. In 2001-2002, it contributed 97% of all peanuts produced in Europe. In spite of the increases in area planted in peanuts over the years, peanut yields are still less than that of other European countries. However, very little has been done to determine the factors that influence production of peanuts in Bulgaria. In this study, we develop a production function to determine the factors that affect yield of peanuts in Bulgaria, and determine how changes in these factors will affect production. We conducted a survey of 202 farmers in Bulgaria in 2002. Farm and demographic

data were collected from the farm families operating the farm. EXEL and SAS software were used to analyze the data. A production function was developed where yield per acre was expressed as a function of, capital investment and variable inputs, fertilizer, pesticides, seeds, technology, and labor. A quadratic functional form was used. The R^2 was 0.38 which means that 38 percent of the variation in yield is explained by the various factors. Results show that yield per acre is positively related to the quantity of phosphate, seeds, technology, mechanized and non-mechanized labor, but negatively related to the amount of seeds, technology squared.

Risk Management Strategy for a Producer Shelling Cooperative. R.J. BYRNE, Department of Agricultural and Applied Economics, The University of Georgia, Athens, GA 30602-7509, N.B. SMITH, Department of Agricultural and Applied Economics, The University of Georgia, Tifton, GA 31793, and S.M. FLETCHER, Department of Agricultural and Applied Economics, National Center for Peanut Competitiveness, The University of Georgia, Griffin, GA 30223.

Interest has developed among peanut producers in forming shelling cooperatives. The opportunity to enhance income and adding value to production is driving the interest among producers. Forming a shelling cooperative, however, involves more risk and creates different types of risks for the producer members. A simulation model is developed to analyze risk management strategies for reducing throughput and marketing risk faced by a producer shelling cooperative while maintaining income and equity.

PLANT PATHOLOGY AND NEMATOTOLOGY II

Managing *Cylindrocladium* Black Rot of Peanut in Georgia with Genetic Resistance and Metam Sodium. T.B. BRENNEMAN*, Department of Plant Pathology, The University of Georgia, Tifton, GA 31794.

Cylindrocladium Black Rot (CBR), caused by *Cylindrocladium parasiticum*, is a disease of increasing importance in Georgia, particularly in areas with short crop rotations. Runner peanuts with resistance to CBR have not been available until recently. We evaluated Carver, Georgia-02C, and Georgia Green with and without a preplant application of metam sodium (10 GPA) at two locations with severe CBR in 2002 and 2003. There were no cultivar X treatment interactions so pooled results are presented, all at $P=0.05$. Data for Georgia-02C were deleted for one location due to poor stands. The average pod yield across all tests for Georgia Green was 3075 lb/A. Both Georgia-02C and Carver had higher yields in all tests than Georgia Green by 717-990 and 655-1131 lb/A, respectively. They also both had higher value than Georgia Green by 130-188 and 93-198 \$/A, respectively. Georgia-02C had higher grades (% SMK & SS) than the other cultivars by 2-4 points in two trials, and grade data were statistically similar in the other trials. Metam sodium fumigation resulted in a significant yield increase in only one test (555 lb/A), but soil conditions at time of application were unfavorable at two of the other locations. In 10 trials from 2001-2003, use of metam sodium on Georgia Green increased yield by an average of 484 lb/A. Georgia-02C and Carver are high yielding, medium maturity runner

cultivars with good resistance to CBR and tomato spotted wilt virus. In fields heavily infested with *C. parasiticum*, the use of a fumigant may also be needed to maximize yield, even on these resistant cultivars.

Effect of Soil Temperature, Moisture and Rainfall on Performance of Metam Sodium for Control of *Cylindrocladium* Black Rot of Peanut. P.M. PHIPPS*, Tidewater Agricultural Research & Extension Center, Virginia Polytechnic Institute & State University, Suffolk, VA 23437.

Metam 42% 7.5 gal/A was applied 8- to 10-in. under rows spaced 36-in. apart with a coulter and trailing chisel shank for control of CBR in peanuts at various times in the spring of 2001, 2002, and 2003. Trial sites in 2001 and 2003 had Nansemond fine sandy loam with a water holding capacity of ca. 13% (w/w), and Kenansville loamy sand in 2002 with a water holding capacity of ca.10%. Disks and a bed shaper on the Metam applicator produced beds (24-in. wide x 4-in. high) over treated rows. Plots were four, 35-ft rows in 2001 and 40-ft rows in 2002 and 2003. A randomized complete block design was used with seven replications, except for six replications in 2003. A Sensor Instruments, Field Weather Monitor provided records of soil temperature at the 4-in. depth and rainfall in each trial. Soil moisture was determined in soil cores (0.75-in. dia. x 10-in. deep) from beds prior to treating each plot. Applications of Metam were made from April 12 to 7 May 2001, and plots were planted to NC-V11 on May 18. CBR incidence was significantly higher and yields were significantly lower in plots treated on April 24 compared to other treatments (Apr 12, 17, 20, 30, May 7). Yield in the treatment on April 24 averaged 3281 lb/A, whereas yield in other treatments ranged from 3785 to 4139 lb/A. The significant reduction of disease control in plots treated on April 24 was thought to be a result of 1.08 in. of rainfall on day 1 after Metam application. Rainfall was minimal and totaled ≤ 0.64 in. at 7 days after other treatments. Soil moisture was 11% on April 24 and ranged from 9.1 to 13.6% at the time of other treatments. Soil temperatures averaged from 61 to 71 F in the 7-day period after applications. Treatments in 2002 were applied from April 9 to May 9, and plots were planted to VA 98R on May 21. CBR incidence was significantly higher in plots treated on May 1 and 2 in comparison to other treatments (Apr 9, 17, 23, May 7, 9). Yields for treatments applied on May 1 and 2 averaged 2931 and 2779 lb/A, respectively, whereas yields of other treatments were significantly higher (3389 to 3866 lb/A). Rainfall totaled 1.46 in. on May 2. Other treatments received 0 to 0.54 in. by day 1 and up to 1.10 in. in the 7-day period after treatment. Soil moisture ranged from 10.2 to 13.2% when treatments were applied. Soil temperatures averaged from 63 to 71 F in the 7-day period after applications. Heavy rainfall within 36 hrs after application was thought to account for the reduced disease control and yield in treatments applied on May 1 and 2. Applications of Metam in 2003 were made from March 19 to May 7, and plots were planted to VA 98R on May 21. Treatments applied on March 19, 24, and April 17 had significantly higher incidence of CBR and lower yields than treatments applied on April 29 and May 7. Soil moisture ranged from 10.95 to 15.92% on treatment dates, and soil temperatures averaged from 51 to 69 F in the 7-day period after applications. Rainfall in April and May was 3.9 and 3.3 in. above normal, and totaled 6.6 in. and 7.14 in., respectively. The excesses of rainfall and cool soil temperatures in March and parts of April may have minimized differences among treatments in 2003, since Metam should perform best when soil moisture is below field capacity and soil temperature is above 60 F.

Influence of Peanut Cropping Frequency on the Severity of Leaf Spot Diseases, Incidence of Southern Stem Rot, and Pod Yield. A.K. HAGAN*, L.C. CAMPBELL, J.R. WEEKS, M.E. RIVAS-DAVILA, K.L. BOWEN, Department of Entomology and Plant Pathology, Auburn University, AL 36849; and B. GAMBLE, Wiregrass Research and Extension Center, Headland, AL 36345.

Beginning in 1988, the effect of cropping frequency on the severity of early leaf spot and incidence of southern stem rot (SSR) on peanut 'Georgia Green' was evaluated at the Wiregrass Research and Extension Center (WGREC) in Headland, AL. One year of peanut following one, two, and three years of cotton, corn, or one year of each of the former crops, as well as one, two, three, four, and five years of bahiagrass were among the most notable of the 34 cropping patterns included. Fertility, weed, and insect control recommendations of the Alabama Cooperative Extension System were followed. To control leaf spot diseases, Bravo Ultrex at 1.4 lb/A was applied at 2-wk intervals beginning about 35 days after planting until 2-wk before the expected digging date. Plots were irrigated as needed. Highest early leaf spot ratings were recorded in plots maintained in a peanut monoculture for a minimum of three years. Disease severity, where peanut was cropped after two or more years of corn, cotton, bahiagrass, or behind a corn/cotton cropping pattern was significantly lower than for that recorded in the peanut monoculture. In one of the two years that leaf spot ratings were recorded, early leaf spot severity was higher in the peanut monoculture than the ratings for peanut following one year of corn. Significant reductions in the level of leaf spot damage was also noted where peanut followed one year of winter rye and then pearl millet or velvetbean. The impact of peanut cropping frequency on the SSR incidence was not as great as it was for early leaf spot. In the last three years, SSR incidence was similar and in some cases significantly higher where peanut followed one or two years of another crop than in a monoculture. Among the one-year cropping patterns in 2002, peanut cropped after one year of corn had lower SSR loci counts than did those grown after one year of cotton, velvetbean, or pearl millet. Peanut produced after two or three years of corn, cotton, or bahiagrass, often suffered similar SSR damage as those kept for 15 consecutive years in peanut. Generally, peanut yields increased as the interval between peanut crops lengthened. When compared to the peanut monoculture, yield was often significantly higher when peanut were grown after two or three years of corn, three years of cotton, cotton and corn in successive years, and three or four years of bahiagrass. Generally, peanut produced after one year of corn or winter rye/velvetbean but not bahiagrass yielded significantly higher than the plots in the peanut monoculture. Moreover, yield of peanut grown after one year of corn was often comparable to those where peanut was cropped after two years of the same crop, cotton, and bahiagrass.

Comparison of Fungicide Band and Broadcast Sprays by Advisory on Peanut in South Texas. A.J. JAKS* and W.J. GRICHAR. Texas Agricultural Experiment Station, Beeville, TX 78102.

South Texas growers often apply early fungicide sprays over the row as a band application, when peanut plants are small, to save on application cost. Using this

concept, a study was conducted comparing band versus broadcast treatments used season-long, as timed applications by the AU-Pnut advisory. Echo 720 (1.5 pt./A) was used at 48 (Spray 1) days after planting (DAP) and again at 118 DAP (Spray 4). Folicur 3.6F (7.2 fl. oz./A), Abound 2.08 SC (21.5 fl. oz./A) and Headline 2.08 EC (15.0 fl. oz./A) were used at 62 (Spray 2) and 86 DAP (Spray 3). Untreated plots were included as a check. Plots of Tamrun 96 were sprayed with a CO₂ pressurized (56 psi) belt-pack sprayer equipped with a hand-held boom with three nozzles (D2 tips, #23 cores and slotted strainers) per row for the broadcast sprays. The two outside nozzles per row were blocked for the band sprays. Sprays were applied at 15 gallons/A at a 3 mph walking speed. Leaf spot pressure (80% early leaf spot and 20% late leaf spot) was severe with a 9.8 rating out of a possible 10 (Florida scale) in unsprayed plots. Overall, the broadcast sprays resulted in slightly better control of leaf spot with the exception of the broadcast treatment with Folicur, which was not different from the band treatment with Abound. All broadcast and band sprays had significantly less leaf spot and soilborne disease than the untreated plots. There was no significant difference between broadcast treatments for soilborne disease control (90% southern blight and 10% *Rhizoctonia* observed following digging). Between band treatments, Abound and Headline provided better control than Folicur plots and were equal. Yields between broadcast and band treatments were similar except that the broadcast Abound and Headline treatments and the band Headline treatment were significantly higher than the band Folicur treatment. Peanut grade was similar for all treatments except there was no significant difference between the Abound broadcast and band treatments and the untreated plots. Dollar per acre values were similar for broadcast and band treatments except that the broadcast Abound and Headline treatments and the band Headline treatment had significantly higher value than the band Folicur treatment. The study should be repeated in a field with elevated levels of soilborne disease.

Development and Field Evaluation of a Fungal Disease Risk Index for Peanuts in Georgia. R.C. KEMERAIT, JR.*, T.B. BRENNEMAN, A.K. CULBREATH, J.E. WOODWARD, Department of Plant Pathology, The University of Georgia, Tifton, GA 31794; E.L. ANDREWS, Cooperative Extension Service, Lakeland, GA 31635; M. FOURAKERS, Cooperative Extension Service, Valdosta, GA 31603; and M.L. WELLS Cooperative Extension Service, Albany, GA 31706.

Options for peanut production in Georgia have undergone changes in the last decade. To manage spotted wilt disease, current varieties, such as 'Georgia Green' and 'C-99R', have replaced older varieties such as 'Florunner'. Many growers are now planting on twin-row patterns and may consider adopting conservation tillage. Such changes effect common fungal diseases that occur in production fields, such as southern stem rot (*Sclerotium rolfsii*), *Rhizoctonia* limb rot (*Rhizoctonia solani*), early leaf spot (*Cercospora arachidicola*) and late leaf spot (*Cercosporidium personatum*). Also, disease history in a field and production practices such as planting date, crop rotation and use of irrigation, all have impact on the potential severity of disease. In 2003, a fungal disease risk index for peanut production was developed and released to growers in Georgia. Revised in 2004, it allows a grower to evaluate the potential for leaf spot diseases, southern stem rot, and *Rhizoctonia* limb rot in a field as "high risk", "moderate risk", or "low risk". Totalling points assigned to the seven variables

above estimates risk associated with each disease. Points assigned to each variable depend on the magnitude of impact each has on disease. For example, responses to “crop rotation” and “southern stem rot” vary between “0” and “25” points; the points assigned to irrigation for the same disease vary between “0” and “5”. The grower then totals the points for each disease and determines a risk category. Knowledge of risk allows the grower to evaluate the effect of production practices on fungal disease and to consider how disease risk may influence choices in disease management programs. In 2003, field trials were conducted in two production fields where risk for fungal diseases was determined to be low-to-moderate based on the 2003 risk index. Full-season fungicide programs (14-day spray schedule) were compared to reduced input programs (21-day interval and longer). In these fields, leaf spot was effectively controlled with fewer than seven fungicide applications. Soilborne diseases were effectively controlled with full-season and select extended interval programs. Some amount soilborne fungicide was needed even in situations where the risk of soilborne disease had been calculated as “low” to maintain optimum yields.

Development and Validation of Web-Based Peanut Disease Forecasts. B.B. SHEW*, T.B. Sutton, Department of Plant Pathology, R.D. MAGAREY, Department of Entomology, and D.L. Jordan, Department of Crop Science, North Carolina State University, Raleigh, NC 27695

Disease forecasters can reduce the number of fungicide applications needed for peanut disease control while improving their efficacy. Forecasters previously used in NC relied on weather monitoring hardware placed in grower fields. Disadvantages of this approach are: 1) equipment is expensive and must be maintained and calibrated, 2) equipment and software must be updated or replaced when models are improved and 3) the availability of recent or real-time data is dependent on the individuals operating each station. Two approaches have been used at NCSU to overcome these difficulties. For the first approach, a collaborative research project with ZedX, Inc., resulted in the development of an Internet-based product known as Peanut GUI-ADS. This system eliminates the need for weather monitoring equipment by modeling data from the National Weather Service, the FAA, and the U.S. military to obtain estimates of temperatures, relative humidity, rainfall, and other variables. Disease forecasting models are linked to these simulated weather data to produce disease advisories. Users can view advisories via a graphical user interface (GUI), in this case a map of the Southeastern US. Different levels of disease risk are indicated by color codes; clicking on the map allows the user to zoom to progressively higher levels of resolution (currently 10 km²) for a specific location. This system was made available to NC State personnel and county agents in the summer of 2003. Following favorable weather, models tended to underestimate disease development, possibly indicating that a conservative approach is needed in interpreting grid-based forecasts compared to point forecasts. In the second approach, disease advisories were produced using weather data available from the State Climate Office of North Carolina. Data were downloaded into spreadsheets and disease risk was calculated from on published models. Leaf spot and Sclerotinia blight advisories, in the form of last effective spray dates, were determined for six weather stations (Rocky Mount, Lewiston, Whiteville, Plymouth, Williamston, and Kinston) in the summer of 2003. Advisories were delivered daily to county agents via e-mail and were posted on the GUI-ADS web site.

The Progression of *Tomato spotted wilt virus* Through Peanut Tissue Types and the Resultant Physiological Effects as Related to Severity of Viral Infection.

D. ROWLAND*, J. DORNER, R. SORENSEN, USDA-ARS, National Peanut Research Laboratory, 1011 Forrester Dr. SE, Dawson, GA 39842; J. BEASLEY and J. TODD, University of Georgia, P.O. Box 1209, Tifton, GA.

Much has been speculated about whether certain physiological characteristics in peanut varieties enable more resistant varieties to withstand tomato spotted wilt virus (TSWV) infection better than others. In order to address this question, we grew three peanut varieties, Georgia Green, NC-V11, and ANorden, using production practices that favored the development of TSWV. We examined the progression of TSWV infection at 2-3 week intervals through the season using ELISA tests in different tissue types: roots, leaves, and pods. We then correlated physiological function at various growth stages with the extent of TSWV infection within a plant. Plants were classed into three severity categories: 1) no TSWV symptoms or previous positive ELISA tests; 2) less than 50% of leaf tissue exhibiting TSWV symptoms; and 3) greater than 50% of leaf tissue symptomatic. Further, we examined gas exchange physiology in both symptomatic and asymptomatic leaves on a single plant. Photosynthesis was reduced by an average of 22% in the mid-severity class and by 34% in the high-severity class as compared to non-infected plants across all three varieties. Symptomatic leaf tissue had 51% lower photosynthetic rates than healthy leaves. There were differences among varieties within symptomatic classes with ANorden and NC-V11 maintaining higher average photosynthetic levels than Georgia Green. This ability to maintain high assimilation physiology may help varieties withstand TSWV infection and maintain final yields.

PHYSIOLOGY AND SEED TECHNOLOGY/HARVESTING, CURING, SHELLING, STORING, AND HANDLING

Elevation and Slope Effects on Peanut Yield in Circular Crop Rows. J.D. REED*, G.S. TOWNER, A.M. SCHUBERT, D.O. PORTER, Texas Agricultural Experiment Station, Lubbock, TX 79403-9803 and J.S. JENNESS, Jenness Enterprises, GIS Analysis and Application Design, Flagstaff, AZ 86004.

Water runoff from center-pivot irrigation systems is often observed but is difficult to quantify and predict. In order to measure the efficiency of various irrigation methods in peanuts, slope and elevation change with the row must be considered. We have developed a method to define the relationship between slope and elevation change with the row with yield using existing topography and yield maps. Three irrigation methods—Low Energy Precision Application (LEPA), Low Energy Spray Application (LESA) and Wobbler (IWOB)—were examined and compared to three years of yield data at the Western Peanut Growers Research Farm near Seminole, TX and the Agricultural Complex for Advanced Research and Extension Systems (AG-CARES) in Lamesa, TX. Using ArcView GIS 3.2 software, equally sized circular sample areas within each irrigation method were selected and high and low points of the sample border

were calculated using existing elevation data. Two vectors were then drawn—one from the high point to the low point, and one from the high point toward the pivot center for each sample area. Using vector mathematics, the angle between the two vectors in each sample was calculated. A value of zero degrees indicated the slope of the sample circle moved against the rows and a value of ninety degrees indicated the slope of the sample circle moved with the crop rows. Since we were concerned only with how slope relates to the rows, angle values greater than ninety degrees were corrected to a number less than ninety. Angles were then divided by ninety to assign each sample circle a Slope Factor (SF). SF's of zero represented slope against the row and SF's of one represented slope with the row. The degree of slope and orientation to crop rows was then determined by multiplying each sample circle's SF by its change in elevation from high to low points. The resulting values were the Elevation Slope Factor (ESF) for each circle. Average yields for each sample circle were then calculated and the relationships between ESF and yield in differing irrigation methods were examined. Results indicate that ESF and soil type for an area can help predict the efficiency of various irrigation methods for specific peanut fields under center-pivot irrigation with circular crop rows.

Using Precision Agriculture Tools in Field-Level Peanut Research. A.M. SCHUBERT, D.O. PORTER, T.A. WHEELER, and K.E. BRONSON. Texas A&M University Agricultural Research & Extension Center. Lubbock, TX 79403-9803.

We began peanut precision agriculture (PA) research in 1998 at the Agricultural Complex for Advanced Research and Extension Systems (AG-CARES) farm near Lamesa, TX. This is a cotton-based site provided by Lamesa Cotton Growers Association, at which the cotton research group supplied a majority of the base site-specific information. In 2000, we began peanut PA research at the Western Peanut Growers Research Farm on land provided by Western Peanut Growers Association, which is located in northern Gaines County. Base soil chemical and physical properties were determined for samples on a ½ -acre grid in the east 120-acre circle. Soil parameters were determined at 0-6", 6-12", 12-24", and 24-36" depths at all sites. Other soil samples were collected and analyzed as needed. USDA-NRCS cooperators supplied a detailed GPS-referenced elevation map. Assorted imaging strategies have been used to identify crop condition and problem areas in the field. GPS-referenced yield maps were used in much of the research using a commercial peanut combine equipped with a peanut yield monitoring system (PYMS) designed by engineers at the University of Georgia at Tifton. Yield mapping allows many more data points in the analysis of site-specific or imposed experimental effects than are possible with small plot experiments with only a few replications. Relationships of soil chemical and physical properties with yield will be presented. Existing and imposed nutrient levels and combinations allow for more real-world comparisons than could be set up with conventional small plot experiments. Effects of irrigation amount and application methods on yield, quality, and disease distribution will be presented. Association of imaging data with irrigation and disease issues will be discussed, as will associations with elevation and slopes.

Nondestructive Moisture Content Determination in Single Kernels of Corn, Popcorn and Peanuts by Dual Frequency RF Impedance Method. C.V.K. KANDALA* and C.L. BUTTS. National Peanut Research Laboratory, Dawson, GA 39842.

A method developed earlier to estimate the moisture content in single kernels of field corn from radio-frequency (RF) measurements was found to be applicable to single kernels of popcorn and peanuts also. Capacitance, phase angle and dissipation factor were measured with an impedance analyzer at 1 and 5 MHz on a parallel-plate capacitor holding the kernel between the plates. These values were used in a semi-empirical equation and the moisture contents were predicted successfully within 1% of their air-oven values for over 90% of the samples tested in each case. The moisture contents of the corn samples tested were in the range from 9 to 26%, the popcorn samples from 11 to 25% and the peanut kernels from 5 to 15%. The method is rapid and nondestructive.

Managing Farmer Stock Aeration and Ventilation Systems in the Southeast. C.L. BUTTS*, USDA, ARS, National Peanut Research Laboratory, Dawson, GA 39842, S.L. BROWN, Department of Entomology, University of Georgia, Tifton, GA 31793, and F.H. ARTHUR, USDA, ARS, Grain Marketing and Production Research Center, Manhattan, KS 66502.

A two-year study was conducted to determine acceptable management schemes for aeration and ventilation systems for farmers stock peanut warehouses. Four 1/10th scale warehouses with a north/south ridge orientation were equipped with overspace ventilation and in-floor aeration systems. One warehouse had only overspace ventilation with fans providing approximately 1 air change of the headspace every 2 minutes. The second warehouse had overspace ventilation and a single tunnel for forcing air up through the peanuts at a rate of 0.12 m³/min/t. The third and fourth warehouses had no overspace ventilation and were aerated using three ducts on the floor. Aeration fans pushed air up through the peanuts in one and pulled air down through the peanuts in the other. The aeration rate in these last two houses was 0.4 m³/min/t. All fans were controlled by a single microprocessor based on temperature and/or humidity conditions in each warehouse. The automated controller measured temperature of the ambient air (T_a), the overspace (T_{os}), the roof (T_r), and peanuts on the east (T_e) and west (T_w) sides of the peanut pile and relative humidity in the over space (RH_{os}) and ambient air (RH_a). Twelve samples were placed in each warehouse, six of which had dataloggers to record temperature and relative humidity in the samples. Overspace ventilation fans were automatically turned on when any one of the following three conditions were true: (1) T_{os} , 21°C, (2) RH_{os} , 80%, (3) $RH_{os} \geq 60\%$ and $T_{os} - T_r \geq 7.2^\circ\text{C}$. Aeration fans were managed in two different stages; 1) cool down and 2) maintenance. During the cool down phase, aeration fans were on if $(T_e + T_w)/2 \geq T_a$ and $RH_a \leq 80\%$. During the maintenance phase, fans were on when if $(T_e + T_w)/2 \geq T_a$ and $60\% \leq RH_a \leq 80\%$. Warehouses were fully loaded over a two-day period from mid-September to mid-October and unloaded in two days in late March or early April. Total peanut weight was recorded as each warehouse was loaded and unloaded. Fifteen random samples were obtained from each wagon used to load the warehouses. Three were used to determine the initial quality while three samples were placed in each warehouse. Samples were retrieved during unloading and their quality determined. Quality measures included percent foreign material and LSK, kernel size distribution, moisture content, and aflatoxin concentration.

PRODUCTION TECHNOLOGY

Influence of Application Variables on Efficacy of Apogee. D. JORDAN*, D. JOHNSON, S. HANS, J. LANIER, and J. BEAM, Department of Crop Science, North Carolina State University, Raleigh, NC 27695-7620.

The plant growth regulator prohexadione calcium (Apogee) is registered for use in peanut, apple, and several other crops to manage vegetative growth. In peanut, the high cost of Apogee limits use. Research was conducted to develop possible methods to reduce application costs. In one set of experiments, banded and broadcast applications of Apogee were compared. In a similar set of experiments, spray nozzles spaced 18 inches apart (8004 and 8001 regular flat fan nozzles, Spraying Systems Co., Wheaton, IL) were alternated on a broadcast spray boom. Peanut response was compared holding the spray solution over the main stem or between row middles (experiments evaluating banded applications) or alternating the different spray nozzles over row middles or main stems (different spray nozzle configurations). Applying Apogee to the lateral branches (row middles) only increased row visibility over applications to main stems or broadcast applications. Similarly, greater row visibility was noted when Apogee was applied with the highest rate delivered over the lateral branches (row middles) compared with broadcast applications of a uniform rate across all spray nozzles or when the highest rate was delivered to main stems. The cultivars NC 12C and Perry were more responsive to broadcast applications of Apogee in terms of pod yield than the cultivars NC-V 11 or VA 98R, even though row visibility was improved for all cultivars. Delaying the first of two sequential applications of Apogee several weeks after row closure resulted in poorer row visibility regardless of application when compared with sequential applications initiated at row closure.

Effect of Bahiagrass or Corn Rotation and Tillage on Yield and Grade of Peanut. J.A. Baldwin*. Department of Crop and Soil Sciences, University of Georgia, Tifton, GA 31793.

Studies were conducted during 2003 to compare corn (*Zea mays* L.) to Tifton 9 bahiagrass (*Paspalum notatum* L.) as rotational crops for peanut. The first study compared a one or two-year bahiagrass sod to every other year peanut/corn rotation. The plots were in a randomized complete block design with four replications. 'Georgia Green' peanut was planted in single rows by strip-tillage methods directly into the bahiagrass sod or into oat cover crop following corn. The peanut yield following the two year old sod was greater than either the one year sod rotation or the corn rotation with oat (*Avena sativa* L.) cover (3500lb./A, 2500 lb./A., and 2570 lb./A). Total Sound Mature Kernels (TSMK), was greater for both sod based rotations than for the corn/oat rotation (74 vs. 72%). The second study compared a four-year corn rotation to two years of corn followed by two years of 'Tifton 9' bahiagrass. The tillage treatments were conventionally turned sod, strip-tilled into sod, strip-tilled into corn stubble, strip-tilled into corn stubble with rye (*Secale cereale* L.) cover, or moldboard plowed following corn. The plots were a split plot design with tillage being whole plots and row pattern (single vs. twin) being the split plot. There was no difference in yield (5620 lb./A –5900lb./A) or % TSMK (76.5-78%) for any of the tillage treatments or rotations. Twin row yield and %TSMK was better than single row patterns when averaged across tillage and rotation ($p \leq .10$) 5840 lb./A vs. 5670 lb./A for yield and 77.5 vs. 76.6% for TSMK.

Is Double-Rate *Bradyrhizobium* Inoculation in West Texas Peanut Justified? C.L. TROSTLE* and K. LONG, Texas Cooperative Extension, Texas A&M—Lubbock, Lubbock, TX 79403.

Numerous West Texas producers believe peanut *Bradyrhizobium* inoculant rates higher than the recommended 1X rate will improve peanut production. The objective is to evaluate a range of inoculant rates for nodulation and peanut yield response among commercial granular and liquid inoculants used in the Texas Southern High Plains. Test inoculant rates included 0X (uninoculated), 1X (standard), and 2X (double) applied in-furrow. *Bradyrhizobium* nodule counts per plant were recorded in June and again in August. Also, inoculant rates were evaluated in the presence of up to 80 lbs./A surface-applied N fertilizer. For liquid inoculants no consistent trend was observed for increased nodulation or peanut yield with 2X inoculant application vs. 1X rates. For granular inoculants, a yield increase was more likely in response to 2X application rates compared to 1X. In addition, mid-season N applications often decreased peanut nodulation. The results overall suggest that unless a producer anticipates a particular field problem unfavorable to inoculation and nodulation then double rate *Bradyrhizobium* inoculant application is probably not justified.

Long Term Impacts of Cotton and Peanut Cropping Systems on the Microbial and Biochemical Properties of a Sandy Soil of Georgia. V. ACOSTA-MARTINEZ*, USDA-ARS, Lubbock, TX 79415, D. ROWLAND, USDA-ARS, Dawson, GA 31742; and R. SORENSEN, USDA-ARS, Dawson, GA 31742.

Little is known about the impacts of cotton (*Gossypium hirsutum* L.) and peanut (*Arachis hypogaea* L.) cropping systems on the soil chemical, microbial and biochemical properties. This information is important to understand the crop-soil system sustainability and environmental impacts. This study investigated the impacts of cotton (=Ct) and peanut (=Pt) cropping systems on a Tifton sandy loam soil (fine-loamy, kaolinitic, thermic Plinthic Kandiodults) after 5 years of the establishment of the plots in Georgia, USA. Soil surface samples (0-22.5 cm) were taken in April, June, and September of 2002 from plots under PtPtPt, CtCtPt, and PtPtCt. The soil contained 80% sand, 13% clay, and 8% silt with an average pH of 6.3. Our study found that soil organic C was higher under PtPtPt (avg: 8.7 g C kg⁻¹ soil) and PtPtCt (avg: 7.7 g C kg⁻¹ soil) compared to CtCtPt (avg: 4.7 g C kg⁻¹ soil). A similar trend was found for soil total N content. Enzyme activities, involved in nutrient cycling, such as -glucosidase, -glucosaminidase, acid phosphatase, alkaline phosphatase, and phosphodiesterase activities were higher in soils under PtPtPt than in PtPtCt and CtCtPt in April. In June and September, most of the enzyme activities showed this significant (P<0.05) trend: PtPtPt> PtPtCt> CtCtPt. The soil microbial biomass C and N were generally higher in PtPtPt and PtPtCt compared to CtCtPt. For this soil, in contrast to soils with lower sand content, the continuous monoculture system (PtPtPt) tended to promote soil chemical, microbial, and biochemical properties compared to crop rotations. These results are not in agreement with the sustainability problems of continuous monoculture systems. However, there was also an enhancement of the soil microbial and biochemical properties in the crop rotation that involved two consecutive years of peanut (PtPtCt) compared to the crop rotation with only one year of peanut (CtCtPt).

Response of Peanut Planted in Single, Twin and Triple Row Patterns. J.P. BEASLEY, JR.*, J.A. BALDWIN, Crop and Soil Sciences Dept., University of Georgia, Tifton, GA 31793; E.J. WILLIAMS, Biological and Agricultural Engineering Dept., University of Georgia, Tifton, GA 31793; D.L. HARTZOG, Agronomy and Soils Dept., Auburn University, Headland, AL 36349; and E.B. WHITTY, Agronomy Dept., University of Florida, Gainesville, FL 32611-0500.

Previous research has shown the advantages of planting peanut, *Arachis hypogaea*, L., in the twin-row planting pattern compared to the conventional single-row pattern. These advantages include approximately 450 kg ha⁻¹ or more in yield increase, one to two percent increase in total sound mature kernels (TSMK), and a significant reduction in losses to spotted wilt disease, caused by the tomato spotted wilt tospovirus (TSWV). Research was initiated to determine if there were similar advantages if peanut was planted on a triple-row pattern when compared to the twin-row pattern. Trials were conducted in crop years 2001-2003 at several locations in the southeast U.S. peanut producing region. These locations included research sites near Tifton, Plains, and Midville in Georgia; Headland, Alabama; and Marianna, Florida. In 2001 and 2002, 'Georgia Green', 'AgraTech 201', and 'C-99R' cultivars were planted on single, twin and triple-row patterns at each location. In 2003, 'Georgia Green', 'Georgia-02C', and 'Carver' cultivars were planted on the three row patterns. Single rows were spaced 91.4 cm apart; twin rows were spaced 19.0 cm apart with the outside rows spaced 91.4 cm apart; and triple rows were spaced 15.2 cm apart with the two outside rows spaced 91.4 cm apart. Seed population on a per hectare basis was constant across all three, row patterns with the single-row pattern planted at 19.7 seed m⁻¹, the twin-row pattern at 9.9 seed m⁻¹ on each twin, and 6.6 seed m⁻¹ on each triple row. Data collected included yield, grade factors, and, where possible, spotted wilt disease severity ratings. All data were analyzed using SAS Proc Mixed. When averaged over years, locations, and cultivars, there was no difference ($p \leq 0.05$) in yield among the three row patterns. Yields were 4343, 4555, and 4542 kg ha⁻¹ for single, twin, and triple-row patterns, respectively (LSD, 0.05 = 225). Georgia Green was the only cultivar planted at all locations in all three years. Analysis of Georgia Green planted in the three row spacings indicated there was no difference in yield between the twin and triple row patterns (4398 and 4513 kg ha⁻¹, respectively), but both of those patterns had a significantly higher yield (LSD = 252) than the single row pattern (4006 kg ha⁻¹). Data analysis for grade factors indicated no difference among row spacings. Conclusions drawn from this study indicate there is no advantage to switch from planting in the twin-row pattern to a triple row pattern.

Preliminary Evaluation of Hyper Spectral Imaging to Manage Peanut. D. CARLEY and D. JORDAN*, Department of Crop Science, North Carolina State University, Raleigh, NC 27695; C. DHARMASRI, Syngenta Crop Protection Inc., Greensboro, NC 27419; T. SUTTON, Department of Plant Pathology, North Carolina State University, Raleigh, NC 27695; R. BRANDENBURG, Department of Entomology, North Carolina State University, Raleigh, NC 27695; and M. BURTON, Department of Crop Science, North Carolina State University, Raleigh, NC 27695-7620.

Preliminary research using hyper-spectral imaging to improve disease forecasting and determining crop maturity was initiated in 2003 in North Carolina. Although cloudy conditions persisted for much of the summer and early fall, hyper spectral data were recorded in trials evaluating planting dates; cultivars and planting patterns; interactions among damage from tobacco thrips, paraquat injury, and Apogee applications; and foliar disease development. Preliminary results from these trials will be discussed.

PLANT PATHOLOGY AND NEMATOLOGY III/MYCOTOXINS

Dynasty™ PD: A New Option For Early Season Disease Control. G.L. CLOUD*, S. RIDEOUT, and D.H. LONG, Syngenta Crop Protection, Greensboro, NC 27904.

Early season disease protection against seed and soil-borne pathogens are critical components of an overall disease control program. Peanut seed and seedling diseases have long been responsible for reductions in stand establishment, vigor, and ultimately yield in all peanut production areas of the U.S. SYNGENTA CROP PROTECTION has designed and developed a broad spectrum fungicide seed treatment that contains three reduced risk compounds, Fludioxonil (Maxim®), Mefenoxam (Apron XL®), and Azoxystrobin (Dynasty®) formulated into a soon to be registered product called Dynasty™ PD. This innovative combination of systemic and contact fungicides offers superior early season disease protection that rivals that of an in-furrow fungicide application. In 2002 and 2003, Dynasty™ PD was evaluated on both runner and Spanish peanut varieties in Texas, Oklahoma, Alabama, Georgia, North Carolina, and Virginia. Results from both years showed excellent control of *Rhizoctonia solani*, *Aspergillus niger*, *Sclerotium rolfsii*, seed-borne *Cylindrocladium* Black Rot and reductions in the incidence of Tomato Spotted Wilt Virus. An average over 7 trials showed stand counts of 16.4, 26.4 and 28.2 per 10 ft of row for untreated, Vitavax™ PC, and Dynasty™ PD, respectively. Yields from these 7 trials were 2576.8, 3658.1, and 3900.7 lbs/A for untreated, Vitavax™ PC and Dynasty™ PD, respectively. These results indicate Dynasty™ PD delivers superior early season disease protection resulting in consistent vigorous stands and higher peanut yields at the end of the season.

Prothioconazole for the Control of Foliar and Soil-borne Diseases in Peanuts.

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Prothioconazole (tested under the code JAU 6476 and AMS 21619) is a novel broad-spectrum fungicide belonging to the new chemical class triazolinthiones, discovered and developed worldwide by Bayer CropScience. It is a systemic sterol biosynthesis inhibitor showing excellent efficacy against a broad range of diseases in a variety of crops. In peanuts, it provides activity against most major foliar and soil-borne diseases including; early and late leaf spot (*Cercospora arachidicola* and *Cercosporidium personatum*), white mold (*Sclerotium rolfsii*), web blotch (*Phoma arachidicola*), limb rot (*Rhizoctonia solani*), and rust (*Puccinia arachidis*). Multiyear trial results indicate that prothioconazole provides outstanding peanut disease control along with excellent crop safety and higher yields. Efficacy data including CBR (*Cylindrocladium crotalariae*) trial results will be presented.

CROPGRO-Peanut Aflatoxin Model: A Tool For Predicting Pre-Harvest Aflatoxin Contamination in Peanut. P.V.V. PRASAD, K.J. BOOTE*, Agronomy Department, University of Florida, Gainesville, FL 32611; F. WALIYAR, ICRISAT, India 502 324; and P.Q. CRAUFURD, University of Reading, RG2 9AD, UK.

Aflatoxin contamination is an important problem in peanut production that has serious health and economic concerns. Prediction of pre-harvest aflatoxin contamination would be useful to determine management practices that can minimize risk. CROPGRO-peanut is a mechanistic crop growth model that can simulate water balance, pod zone soil temperatures, foliar temperature and plant water deficits in response to weather inputs, soil traits, plant growth traits, and crop management practices. The relationships between environmental factors (temperature and soil water deficits) and sensitive stages of pod development to aflatoxin contamination were incorporated into the CROPGRO-peanut model. The data structure in the model was modified such that it can track addition and growth of individual pod cohorts and the environmental conditions to which they were exposed. Thus, it can address pods which were exposed to favorable conditions for *Aspergillus* growth and aflatoxin production. These individual cohorts of pods and seeds can later be aggregated over all pods and seeds to estimate percent seeds infected and concentration of aflatoxin, which are the two common variables measured under field conditions. The mechanistic CROPGRO-peanut aflatoxin prediction model was used to predict percent seed infection and aflatoxin concentration from data obtained from field experiments in Niamey, Niger over multiple years (1991 to 1995) which included variable sowing dates and irrigation management practices. Details of modeling approach and various outputs from the CROPGRO-peanut aflatoxin prediction model and comparisons with field data will be presented and discussed.

Perceived Beliefs of the Health Effects of Aflatoxin by Ghanaian Health and Agricultural Administrators. R.T. AWUAH*, S.C. FIALOR, Kwame Nkrumah University of Science and Technology, Kumasi, Ghana, B. BAYARD and C.M. JOLLY, Auburn University, Auburn, Alabama.

Groundnuts contribute substantially to the daily plant protein consumption of most Ghanaians. However, stored groundnuts are usually heavily contaminated with Aflatoxin (AF), a group of extremely toxic, ubiquitous metabolites produced by fungi *Aspergillus flavus* and *A. parasiticus*, sometimes associated with diseases in humans, such as liver cancer and hepatitis. Previous research conducted in Ghana showed that 50-80% of the groundnut samples were contaminated with AF. A disturbing factor is that most consumers, producers and decision makers in agriculture and health, who should be educating the public about this problem, seem to be unaware of the effects of AF on crops, and human and animal health. In this study, we use a health belief model to determine administrators (Agriculturists, and Health Professionals) degree of awareness, perceived susceptibility, perceived seriousness of the problem, perceived barriers placed to impede treatment of the problem, and perceived benefits from reducing AF levels in groundnuts. A survey of 367 professionals in the agricultural and health sectors was conducted using a self-administered questionnaire. The survey data were analyzed using SAS, EXEL and SPSS. Exploratory Factor Analysis was used to select the factors represented by the various constructs. The data showed that the mean age group of the

professionals was 41, with an SD of 7.9. Males represented 80.11% and females 19.89%. About 27.52% were educated up to the certificate level and at least 47.96% had a Bachelor degree, or Diploma. Approximately 27% ate groundnuts less than once per week, 42.2% ate between one and two times per week, and 30.2% ate three or more times per week. Approximately 45% indicated that they were not sure that they previously heard of the term AF, 38.9% were sure, or definitely sure that they had heard of AF. Approximately 29.7% of the administrators were not sure that they were aware of the harmful effects of AF on human health, 10.08% stated may be, whereas 16.89% said they were somewhat sure. However, 43.3% said that they were sure or definitely sure of the harmful effects of AF on human health. About 81.8% thought that sorting of groundnuts to reduce AF was important, or very important. Exploratory factor analysis results revealed three susceptibility constructs: health-belief, sinicism and self-confidence. Seriousness of AF was divided into health risks and product quality. The barrier construct was divided into cost barrier, storage problems, and groundnut quality. The benefit construct comprised of two sub-constructs, hygiene and disease reduction. The knowledge construct was divided into, health effects, education, groundnut quality and mold reduction. A single awareness factor, with nine factor loadings, was identified.

Influence of Field and Soil Characteristics on Aflatoxin Contamination in the Southeastern U.S. K.L. BOWEN*, Dept. Entomology and Plant Pathology, Auburn University, AL 36849.

Several field and soil conditions are known to contribute to the risk of aflatoxin contamination. Reduced soil calcium levels, for example, have been shown to increase the risk of aflatoxin contamination. Over two survey years, a number of factors were characterized in 32 peanut production fields in Alabama and Georgia in 2002 and in 23 fields in 2003. Soil calcium, potassium, pH, soil type, degree of slope and terracing, weed competition, and populations of nematodes in soil samples were evaluated in each field. Pod samples were collected within 2 weeks of inversion and assayed for aflatoxin levels. Spearman correlation coefficients were calculated between aflatoxin levels and data on other characteristics. In both years, aflatoxin was found to be positively related to populations of several genera of plant parasitic nematode as well as rainfall amounts during the period 12 to 16 wks after planting. Aflatoxin levels were also consistently found to be negatively related to weed populations and late season moisture in both years. These relationships indicate that mid-season moisture and several plant parasitic nematodes contribute to higher risk of aflatoxin contamination, while late season moisture can decrease that risk.

Physiological Processes of Pre-harvest Aflatoxin Contamination in Groundnut. D.

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The understanding of the relation between the plant and soil water status and the contamination by *A. flavus* (AF) constitutes one of the critical points in the management of aflatoxin risk especially in Sub-Sahel conditions where erratic rainfall causes frequently end-of-cycle water deficit. The work aimed to the determination of water regime, soil water status and variety characters related to infection by AF and Aflatoxin. Glasshouse and field experiments were conducted on two drought adapted cultivars, 55-437 (Aflatoxin resistant) and Fleur 11 (Aflatoxin susceptible). Both cvs are released in Senegal and Fleur 11 shows generally higher yields than 55-437 even under stress conditions. Late water deficit was ensured in the field by delaying the planting date and induced in the glasshouse by withholding partially the water supply. Measurements have concerned the control of the leaf water status during water stress, pod yields, quality, maturity of pods, soil contamination, seed moisture contents and water activity, AF and aflatoxin seed contamination. Variety differences established at the field level for agronomic and physiological traits and concerning the sensitivity to AF have been recovered in greenhouse. Difficulties of maturation and an intrinsic sensitivity to contamination were observed on the susceptible cv, Fleur 11: all classes of maturity of pods on this cv were more attacked than those from the corresponding categories on the other cvs. The end-of-cycle water deficit had small effect on the pod maturity of the resistant cv, 55-437 and the immature seeds of 55-437 were more resistant than those of Fleur 11. From the observations achieved on these two cvs, it was concluded that the adaptation of groundnut to drought in terms of productivity is not necessarily linked to the level of resistance to the invasion by the fungus but rather to the capacities of drought avoidance of genotypes. It has been established clearly that the process of maturation is well one of the key-factors of the variety susceptibility: the strong vulnerability to the fungal attacks of immature seeds of both cv has been observed whatever the conditions of culture, the intensity of stress, its modes of application and the importance of fungal pressure.

POSTER SESSION

Peanut: Chemical and Organic Foliar Fertilization Under Rainy Season in

Southern Mexico. S. SÁNCHEZ-DOMÍNGUEZ*, Depto de Fitotecnia, Universidad Autónoma Chapíngo, Chapíngo Méx. 56230; and D. SÁNCHEZ DOMÍNGUEZ, Centro de Bachillerato Tecnológico Agropecuario # 8, Xoxocotla, Mor, México.

Neither peanut edaphic and foliar fertilization are common agricultural practices in southern Mexico. The agronomic peanut responses to foliar applications of inorganic and organic fertilizers were studied. Two experiments were carried out

during summer of 2001 and 2002 at the Ejido of Cuauchichinola State of Morelos, Mexico (800 m above sea level, 24.5° C, and 600-700 mm of rain). The foliar fertilizers tested were: Green World (Organic, 8-8-8, 15 cc L⁻¹ of water), Stemplex (BASF Corp, 10 cc L⁻¹ of water), Gro-Green (10 g L⁻¹ of water), Bayfolán (Bayer, 10 g L⁻¹ of water). Agromil Plus at a dosage of 5 cc L⁻¹ was included only in 2002 trial. The control was the untreated plants. All were sprayed starting at the beginning of blooming, and another two applications 15 and 30 days later. Peanut pod yield and other yield components were recorded at the harvest date. In 2001 trial, statistical differences were found among treatments. Bayfolán was the best treatment in 2001 experiment. It increased the peanut pod yield by 50.9%. Absolute values were: Control, 195.9 g/ 12 plants; Bayfolán, 295 g/ 12 plants. Green World, the organic fertilizer, was the second. It increased pod yield by 26.8%. Gro-Green application produced the highest seed weight (71.2 g 100 seeds⁻¹). In 2002 trial, statistical differences were not found among treatments for any of the traits measured. This is because, perhaps, the location (plots) where the experiment was carried out, in 2001, after harvest the sorghum crop, cows and horses feed the rest of the plants, increasing the manure levels in the soil. However among treatments, Gro-Green underlain in two traits; mature pod number (253.5) and mature pod weight (430.8 g), 16.3 and 8.7% more than the control, respectively. The data of these experiments suggest a very high level of interaction between foliar fertilizer and locality. This is a good reason for not recommending only one foliar fertilizer in all localities.

Evaluating Irrigation Management Strategies for Peanut Production in the Texas Southern High Plains. D.O. PORTER*, A.M. SCHUBERT, J.D. REED, and G.S. TOWNER. Texas Agricultural Experiment Station. Texas A&M Agricultural Research and Extension Center, Lubbock, TX 79403.

Irrigation technologies and management strategies were evaluated in a multi-year study at the Western Peanut Growers Association Research Farm in Gaines County, Texas. Low energy precision application (LEPA), low elevation spray application (LESA), and mid-elevation spray application (MESA) irrigation methods were compared for relative crop response (yield and quality). After initial apparent mixed results between cropping seasons, an additional "LEPA/LESA" irrigation strategy was incorporated into the study; this strategy was designed to take advantage of both the higher application efficiency of LEPA and the improved near-surface soil moisture conditions (to support pegging and pod development) afforded by LESA irrigation. Multiple varieties of peanut were included in this study; varietal differences in response to the irrigation treatments were observed. This study has expanded upon and complemented previous related irrigation studies, providing opportunity to evaluate irrigation tools under more severe conditions, including coarser soils, steeper and more variable topography.

Impact of Various Cover Crops in a Minimum Tillage Production System on Insect Pests, Diseases, Nematodes, and Yield of Peanut. J.R. WEEKS* and H.L. CAMPBELL. Dept. of Entomology and Plant Pathology, Auburn University, AL 36849 and B.E. GAMBLE, Wiregrass Research and Extension Center, Headland, AL 36345.

A research project is ongoing at the Wiregrass Research and Extension Center in Headland, AL to evaluate the impact of various cover crops in a minimum tillage planting system compared to conventionally planted peanuts with no winter cover crop and their effect on insect pests, diseases, nematodes, and yield of peanuts. From 1998 through 2002 the eight cover crops consisted of wheat, rye, oats, fallow, ryegrass, wheat/ryegrass, rye/ryegrass, and oats/ryegrass. In 2003, the rotation was adjusted to include only wheat, rye, oats, and conventional tillage with no winter cover crop with and without Lorsban 15G treatments at pegging. Until 2003, the eight cover crops also had subplots with four rows treated with Lorsban 15G and four untreated. Stand counts, *Tomato spotted wilt virus* (TSWV) ratings, southern stem rot (SSR) incidence were taken from each plot. Terminal samples were also taken from each plot prior to inversion and three-cornered alfalfa hopper (TCAH) damage was measured. Soil samples were taken to determine peanut root-knot nematode populations in the soil prior to inversion and nematode root ratings were made at inversion. In 2002 and 2003, soil sieve samples were taken in late season to count and identify soil insects. Pod damage was also evaluated from a 100 pod sample taken in each plot. Yields were also recorded from the middle four rows of each plot. In 1999 and 2000 only yield data were collected. Beginning in spring 2001, data were collected for insect populations and disease control and in 2002 and 2003, nematode evaluations were made. In 2002, significantly more burrowing bugs were found by soil sieving in the untreated plots compared to the Lorsban treated peanuts. Insect damaged pods were also significantly greater in plots with high burrowing bug numbers. In 2003, soil sieve results were negative for burrowing bugs. Low numbers of wireworms, white grubs, lesser cornstalk borers, and southern corn rootworms were found both years with no differences among treatments. Girdling damage from TCAH also showed little differences among plots. For TSWV and SSR, there were also very little differences among treatments. However, when nematode counts were made, the conventional tillage plots in both 2002 and 2003 had lower nematode numbers than all minimum till treatments and the highest numbers were seen in the minimum till plots with rye winter cover. Yield when averaged over a four-year period showed no significant differences among the plots. Yield differences were seen in individual years. In 2002 peanuts planted into oat cover had lower yields. In 2003, the conventionally planted peanuts had higher yields than all the minimum tilled peanuts.

A Compatibility Guide for Applying Agrichemicals to Peanut. S. HANS, D. JORDAN*, R. BRANDENBURG, B. ROYALS, B. SHEW, J. BAILEY, V. CURTIS, A. YORK, J. WILCUT, and J. BEAM, North Carolina State University, Raleigh, NC 27695; E. PROSTKO, S. CULPEPPER, T. GREY, C. JOHNSON, III, and R. KEMERAIT, University of Georgia, Tifton, GA 31793; J. GRICHAR, Texas A&M University, Yoakum, TX 77995; T. BAUGHMAN, Texas A&M University, Vernon, TX 76385; P. DOTRAY, Texas Tech University, Lubbock, TX 79409; B. BRECKE, G. MacDONALD,

and J. TREDAWAY-DUCAR, University of Florida, Gainesville, FL 32611;
and B. WALLS, North Carolina Department of Agriculture and Consumer
Services, Raleigh, NC 27607.

A compatibility guide was developed by research and extension personnel from across the peanut belt of the United States to help growers and their advisors make informed decisions on mixing agrichemicals. The compatibility guide includes a brief discussion of potential positive and negative aspects of applying combinations of agrichemicals to peanut. Trade name, active ingredient, agrichemical classification (herbicide, fungicide, insecticide, plant growth regulator, or foliar fertilizer), target pests, adjuvant requirement, spray volume, preharvest interval, and specific comments from product labels are included. Information from replicated research trials is also included that indicates potential for not specific fungicides, insecticides, plant growth regulators, or foliar fertilizer to reduce herbicide efficacy. This guide will be published online and will be modified as additional products receive registration for peanut and as more information is gained on compatibility.

Peanut Response to the Plant Growth Regulator Messenger. D. JORDAN*, S. HANS, J. LANIER, and D. JOHNSON, Department of Crop Science, North Carolina State University, Raleigh, NC 27695.

Research was conducted in North Carolina from 2001 to 2003 to determine peanut response to the plant growth regulator Messenger (containing harpin protein) applied 30 or 60 days after peanut emergence at rates of 2.25 or 4.5 ounces product/acre in distilled water (15 gallons/acre). A sequential application of 2.25 followed by 2.25 ounces/acre and a non-treated control were also included. Two experiments were conducted in 2002 with the cultivars NC 12C (Lewiston-Woodville) and VA 98R (Rocky Mount) and four experiments in 2003 with the cultivars NC 12C (Rocky Mount) and VA 98R (Rocky Mount, Lewiston-Woodville, and Edenton). Messenger did not affect visible growth, main stem height, and pod yield regardless of year, environmental and edaphic conditions, cultivar selection, and application rate or timing. Results from these trials indicate that peanut will not benefit from foliar applications of Messenger.

A Turbo-blaster for Peanut Pod Maturity. E.J. WILLIAMS*, Department of Biological & Agricultural Engineering and J.A. BALDWIN and J.P. BEASLEY, Department of Crop and Soil Science, University of Georgia, Tifton, GA 31793.

A new peanut pod blasting method was developed to strip away the outer pod layer to expose colors indicative of the stage of pod maturity. A high pressure washer and an easily fabricated basket served as a portable, inexpensive, and quick, alternative to blasters that use glass beads, water, and compressed air. The key to the pressure washer's effectiveness for blasting peanuts was the new rotating turbo nozzle. A turbo nozzle takes a 0-degree jet stream which has the highest stripping power of any nozzle, rotates it, and spreads it out over a wide area. It provided superior stripping action compared to a flat fan nozzle at a pressure low enough not to damage the pods. An electric pressure washer providing 1.5 gallons per minute (5.7 L/min) at 1300 pounds per square inch (8.96 MPa) proved quite adequate. In higher capacity, engine-driven models, the pressure was reduced to approximately 1000 pounds per square inch (6.89 MPa)

with the pressure regulator or by throttling down the engine. A cylindrical basket to hold the pods for blasting was built from 1/4 inch (6.35 mm) mesh hardware cloth. The basket was 24 inches (0.61 m) tall by 9 ¼ inches (0.23 m) in diameter, and the floor was offset 4 inches (0.1 m) from the bottom of the cylinder. This provided a sturdy basket to keep the pods inside when being blasted or agitated. Pods were placed in the basket and the basket placed in a 5-gallon (18.9 L) bucket to prevent splashing. The turbo nozzle was held about 12-inches (0.3 m) away while vigorously shaking the basket. Blasting was stopped in approximately 30 seconds to remove the immature pods (yellow pods) before they disintegrated. The more advanced pods (orange to black pods) were replaced back into the basket and blasted until the entire outer pod layer had been removed. The uniqueness of this method is its versatility. Growers can blast peanuts almost anywhere quickly, then classify and rank the fields to harvest. Plus, the pressure washer also can be used to clean the digger to prevent disease transmission between fields.

Management of Peanut Diseases with Metam Sodium and Fungicides. E.L. JORDAN*, Baker County Extension Service, The University of Georgia, Newton, GA 39870; and T.B. BRENNEMAN, Plant Pathology Department, The University of Georgia, Tifton, GA 31793.

Severity of *Sclerotium Rolfsii* (Stem Rot), *Cylindrocladium* Black Rot (CBR), and *Rhizoctonia* (L. Rot) was estimated from Metam Sodium treated plots using two different fungicide programs over a two year period - - Folicur-Metam Sodium, Moncut-Metam Sodium, Folicur-no Metam Sodium, and Moncut-no Metam Sodium. Cost per acre was estimated for each treatment compared to the level of disease control that was achieved. Metam Sodium (VAPAM) reduced CBR incidence an average of 42%. VAPAM significantly increased peanut yield both years by an average of 281 lb/acre. VAPAM increased crop value \$49.88 and cost \$42.00 per acre (chemical cost only). Because of the cost of VAPAM, a peanut variety trial to evaluate CBR control is being conducted. Folicur and Moncut provided equivalent control of stem rot and limb rot, and gave similar yields.

Identification of Peanut Seed-storage Proteins Associated with Resistance against *Aspergillus flavus* Infection and Aflatoxin Production. X.Q LIANG , B.Z. GUO, USDA-ARS, Crop protection and Management Research Unit, and University of Georgia, Tifton, GA 31793; and C.C HOLBROOK, USDA-ARS, Crop Genetics and Breeding Research Unit, Tifton, GA 31793.

Peanut germplasm has been evaluated in the laboratory and the field for resistance to *Aspergillus flavus* infection and aflatoxin production. Protein profiles of 4 genotypes, Georgia Green, A-100, GT-C20, and GT-C9, have been analyzed using 2-D gel electrophoresis. Laboratory bioassay shows that GT-C20, a genotype from China, has resistance to fungal colonization and sporulation in comparison with Georgia Green and A-100. In one year field test, GT-C20 had significant lower aflatoxin concentration than Georgia Green. Total seed protein was extracted from 4 genotypes (Georgia Green and A100, GT-C20, and GT-C9), which had different fungal growth/colonization and aflatoxin production in the laboratory and the field. Six protein spots were identified unique or up- or down-regulated in resistant genotypes. These 6 major protein

spots are labeled as P-1 (35 kD, pI 4.7), P- 2 (22.5 kD, pI 4.1), P-3 (22.5 kD, pI 8.2), P-4 (22.5 kD, pI 7.3), P-5 (23.8 kD, pI 5.9) and P-6 (23.5 kD, pI 7.0). GT-C20 has P-1 to P-5 with P-4 at a trace level, and misses P-6. The protein profiles are almost identical for Georgia Green and A-100, in which both have P-4 and P-6, and miss P-2, P-3 and P-5. GT-C9 has only P-3 with trace level and P-1 to P-5 could be induced in the seeds by imbibition of water or inoculation of *A. flavus* in the laboratory. The major qualitative differences are that protein P-2, P3, and P5 are unique in resistant genotypes and P-4 and P-6 are unique in susceptible genotypes. Protein spot P-4 is much higher in susceptible genotypes than in resistant genotypes. Further characterization of these proteins in association with resistance/susceptibility to *A. flavus* will be needed.

Identification of Transcripts in Peanut Cultivars Resistance to Late Leaf Spot *Cercosporidium personatum*. M. LUO*, R.D. LEE, University of Georgia, Coastal Plain Experiment Station, Tifton, GA 31793; X.Q. LIANG, B.Z. GUO, USDA-ARS, Crop Protection and Management Research Unit, Tifton, GA 31793; C.C. HOLBROOK, USDA-ARS, Crop Genetics and Breeding Research Unit, Tifton, GA 31793.

Two expressed sequence tag (EST) libraries for cultivated peanut were constructed using mRNA prepared from leaves of peanut line C34-24 (resistant to leaf spots and tomato spotted wilt virus) and immature pods of peanut line A13 (drought tolerance and lower preharvest aflatoxin contamination). We had selected 384 genes with most known function related with adversity tolerance for making microarray chips. Peanut genotype C34-24 as resistant line and Florunner as susceptible line were used for microarray analysis. Plants were grown in the greenhouse, and challenged by *Cercosporidium personatum* or not challenged as control. About 112 spots (about 56 genes) were found to be up-regulated in fungal challenged plants as shown by microarray analysis (Log2 ratio>1), and 33 genes with known functions were proteins in secondary metabolism, stress proteins, heat shock proteins, signaling components, control of transcription, defense response, and unclassified proteins. Top 20 genes with higher expressions were chosen for further analysis using real-time PCR, and five genes were unknown function. The real-time PCR analyses show: 1) the expressions of some genes in real-time PCR were similar to microarray analyses, including cell-autonomous heat shock cognate protein 7, glycosyltransferase family, calcium binding protein, allergen Arah3/Arah4, protein kinase ATN1, cytochrome P450, auxin-induced protein 10A5, glycosyl hydrolase family 19, glutathione S-transferase GST 8, and superoxide dismutase [Cu-Zn]; 2) some genes were not significantly different between C34-24 challenged by *C. personatum* and control, such as Bax inhibitor-1 like protein, hypothetical protein p85RF, leucine-rich repeat protein; 3) although some gene expressions were significantly different between plants challenged and control, no differences were found between resistant line C34-24 and susceptible line Florunner, such as calcium binding protein. The disagreement between microarray analysis and real-time PCR is mainly due to gene cross hybridization. Although microarray technique has been proved to be an efficient way to screen transcripts in high throughput, other methods should be used to validate the data from cDNA microarray.

Yield and Reaction of Runner Peanut Lines to Diseases in a Dryland Production System in Southwest Alabama. M. FAVER*, Alabama Cooperative Extension System, Bay Minette, AL 36507; A.K. HAGAN, and H.L. CAMPBELL, Department of Entomology and Plant Pathology, Auburn University, AL 36849.

In 2002 and 2003, selected commercial runner peanut lines were evaluated at the Gulf Coast Research and Extension Center in Fairhope, AL for their sensitivity to late leaf spot, peanut rust, TSWV, as well as yield potential. Study sites were maintained in a cotton-cotton-peanut rotation and were prepared using conventional tillage practices. Peanuts were planted on 15 May 2002 and 28 May 2003 at a rate of approximately six seed per row foot. Temik 15G at 6.7 lb/A was applied in furrow for thrips control. Fertility and weed control recommendations of the Alabama Cooperative Extension System were followed. To control leaf spot diseases and rust, applications of Bravo Ultrex at 1.4 lb/A were made on a 14-d digging date. Ratings for late leaf spot and peanut rust, as well as counts of TSWV loci were recorded within one week of the expected digging date for each cultivar. Loci counts for SSR were made immediately after the plots were inverted. In 2003, inversion of the group 4 intermediate maturity peanut lines were delayed by very heavy rainfall that fell from mid-September until mid-October. Late leaf spot and peanut rust destroyed these peanut lines and no yields were recorded. In addition, digging of the late maturing group 5 lines was delayed and severe defoliation due to a combination of late leaf spot and rust was seen. In 2002, Norden, Virugard, AG 1-1, and Georgia Green, which were dug immediately before a tropical storm suffered the least spotting and defoliation from late leaf spot. While the least rust damage was noted on Virugard and Andru 93, extensive rusting of the leaves was seen on the late maturing Hull and DP-1 peanuts. While overall TSWV pressure was relatively low, significant differences in the incidence of TSWV were observed. Andru 93 had the highest incidence of TSWV. SSR damage was negligible. Of the cultivars that were harvested, Hull yielded significantly less than AG-1-1, DP-1, Florida C-99R, Georgia Green, Southern Runner, and Virugard. In the following year, rainfall totals reached or exceeded the historical average for the period for May through September but conditions were dry in October. As was seen in the previous year, TSWV pressure were low. The highest number of TSWV loci were found in Norden and Georgia Green, while the fewest were recorded in AP-3 and GA 02C. The incidence of late leaf spot was higher on Carver compared with Florida C-99R, DP-1, GA 02C, Georgia Green, Hull, and Norden but similar to the ratings for Andru II and AP-3. The rust rating for Carver was higher than those noted for Florida C-99R, DP-1, Hull, and Norden and did not significantly from the rating for Andru II, AP-3, and Georgia Green. While SSR damage levels again were low, Georgia Green had higher SSR levels compared with those of most of the other peanut cultivars. Despite high ratings for late leaf spot and peanut rust, Carver had higher yields than several cultivars including Andru II, DP-1, Georgia Green, and Hull. Yield for Andru II was significantly lower than were those of the other lines.

Maturity and Yield Evaluation of Ten Runner and Virginia Peanut Varieties, and Thirty-Five Bolivian Accessions at Two Locations in West Texas. J.L. AYERS* and M.D. BUROW, Texas Agricultural Experiment Station, Lubbock, TX 79403.

In 2003, we evaluated ten different runner and Virginia peanut varieties at the Western Peanut Growers Research Farm, in Gaines county, Texas, and at Earth in Lamb county, Texas. These locations were used to represent Texas #1 peanut producing county, as well as a cooler area where plants would be under more stress for maturity. Maturity and yield results for these varieties will be used to identify possible varieties for use in West Texas, as well as early maturing, high yielding parents for use in crosses in our breeding program. We also evaluated Bolivian peanut accessions, which mature in seventy days in Bolivia. These were grown at cooler sites which included the Helms Research Farm in Hale county, Texas, as well as at the North Plains Research Field in Moore county, Texas in order to put stress on plants for maturity. Growth of these accessions started off well early in the season, and were accelerated compared to that of Spanish varieties at the same locations, however they tended to slow down as we got further into the growing season. Accessions at the Helms Farm were slightly ahead of those at Etter in terms of growth, probably due to latitude. More information is needed on flowering of these accessions, and this will be evaluated in 2004. The earliest maturing varieties at Etter were those of our checks (New Mexico Valencia A, New Mexico Valencia B, and BSS56), which were on average twice as mature as the earliest maturing Bolivian accessions. Further evaluation is needed on these lines grown at the Helms Farm, in order to compare maturities for both sites.

Performance of Crosses Between Bulgarian and Valencia Peanut Varieties. N. MANIVANNAN*, N. PUPPALA, New Mexico State University, Agricultural Science Center at Clovis, Star Route Box 77, Clovis – NM 88101; and S.G. DELIKOSTADINOV, Institute for Plant Genetic Resources, Sadovo – Bulgaria.

The New Mexico State University breeding program has centered around the Valencia peanut (*Arachis hypogaea* ssp. *fastigiata* var *fastigiata*) because of the large scale cultivation of this type in eastern New Mexico. The efforts to improve the yield potential are limited due to the lack of potential donors. Inclusion of exotic cultivars in the breeding program is one of the ways to improve the yield potential. In the present study, crosses were made between two USA varieties, Valencia A and Valencia C and two Bulgarian varieties Kalina and Rossitza and the performance assessed. Both direct and reciprocal crosses were done. All the eight F1s along with four parents were evaluated in a randomized block design with two replications at Puerto Rico from November 2003 to March 2004. Each entry was sown in two rows of 1.5 m length. Observations were recorded for number of pods /plant, pod weight/ plant, number of kernels/ plant, kernel weight/plant, 100-kernal weight and shelling (%). The results indicated that (1) Parents Val C and Kalina rated as superior when compared to other parents for yield, (2) Crosses Val C X Kalina, Kalina X Val C and Val C X Rossitza are selected as superior when compared to other crosses for yield and yield component traits. These crosses could be utilized for a yield improvement program. (3) Parents with differential hundred kernel weight, care should be taken in the direction of crosses and (4) Crosses had less mid parental heterosis.

Instead of using Valencia varieties alone in a crossing program, utilization of parents from Spanish, Virginia bunch and Virginia runner groups will improve the chances of getting superior progenies.

Genotype * Environment Interactions for Development and Growth Traits of Peanut. N. PHAKAMAS*, A. PATANOTHAI, K. PANNANGPETCH, S. JOGLOY, Department of Agronomy, Faculty of Agriculture, Khon Kaen University, Khon Kaen 40002, Thailand; and G. HOOGENBOOM, Department of Biological and Agricultural Engineering, The University of Georgia, 1109 Experiment Street, Griffin, GA 30223-1797, USA.

There is an increasing interest in using physiological traits in plant breeding, but detailed information on the interaction between genotype and environment and the impact on physiological traits is limited. The goal of this study was to determine the genotype * environment interaction for development and growth traits of peanut (*Arachis hypogaea* L.). Seventeen peanut lines, including 13 lines with large seeded types, four high yielding lines, nine moderate and low yielding lines, and four standard cultivars, were evaluated at Khon Kaen University in Khon Kaen, Thailand during the 2002 rainy and dry seasons and the 2003 rainy season. Growth and development characteristics that were recorded included vegetative growth duration, pod filling duration, seed filling duration and physiological maturity. Final pod yield and total biomass were measured at harvest maturity. The crop growth rate (CGR), shelling percentage (SH%), leaf area index (LAI), and specific leaf area (SLA) pod growth rate (PGR), harvest index (HI), and partitioning coefficient (PC) were also determined. The developmental characteristics of all peanut lines differed among the three growing seasons. For instance, the low temperatures during the vegetative period of the dry season caused a delay in flowering and extended the physiological maturity date. During the dry season, biomass, CGR, PC, HI, LAI, and SLA were significantly different, while pod yield and PGR were not significantly different. During the two rainy seasons, pod yield, biomass, CGR, PC, SH%, LAI, and SLA were significantly different, while PGR was similar. The outcomes from this study can be useful for the identification of superior breeding lines. Ultimately this could make peanut breeding more efficient if these traits were used together with final pod yield.

Using Bioinformatic Tools for Mapping Peanut Genomic Data. A.M. JESUBATHAM*, Department of Computer Science, Texas Tech University, Lubbock, TX 79409; and M.D. BUROW, Department of Plant and Soil Science, Texas Tech University, Lubbock, TX 79409.

In the recent past, considerable genomic information has been generated for several of legume species. Much of this data, however, remains isolated in several species-oriented databases. Because the genomic information generated is very large and complex, it is important to compare this information and to leverage insights gained from one species to the others. Peanut is one species that will definitely benefit from comparative genomics. CMap is a web-based tool that allows users to view comparisons of genetic and physical maps. The tool provides a web-based interface for viewing comparative maps based upon a set of marker correspondences, a web-based interface for uploading datasets, and a simple schema currently compatible with a lot of databases. We

use MYSQL since it is open-source, free and easy to use. We have initiated the development of a database for comparative mapping of the peanut genome with other species in the family Fabaceae and *arabidopsis* using Cmap. CMap includes the ability to display multiple maps, to find maps based on a known map study, their containing a particular feature, or by the number of contact points in common between two maps. Other features include the ability to display detailed pages within CMap, and external links to databases such as Genbank or Gramene can be provided. For the data provider, features of CMap include reliance on readily available open source components, simple installation, flexible configuration, and easy integration with other components of a model organism system web site. We expect that by using comparative genomics, we will speed up the development of superior peanut varieties.

Transferability of Sequence Tagged Microsatellite Site (STMS) Primers from Pulses to Peanut. G. KRISHNA and N. PUPPALA. New Mexico State University, Agricultural Science Center at Clovis, Star Route Box 77, Clovis NM 88101.

Cultivated peanut is an important crop for oil and protein source. The extensive polymorphism of microsatellite markers makes these genetic markers ideal choice for studies in population genetics, diversity analysis and linkage mapping and marker development. The wide spread application of microsatellite markers are limited due to requirement for species-specific primers and development of novel microsatellites remain a costly and lengthy process despite its continuous improvements in its efficiency. Transfer of primers across genera (cross-taxa application) can offer an alternative to de novo development in plants with transfer rates ranging from 35-90% and potential polymorphism between 58 to 78%. There are also presently few studies that have used cross-transferred microsatellite loci to address questions with in plant populations. In the present study we explore large number of microsatellite available in common bean and *Vigna* species to examine the transferability and validity. The study results reveal that the cross-taxa microsatellite primers amplified PCR products in peanut and also the sequences revealed that the amplified bands contained microsatellite repeats in them.

Molecular Marker for Resistance to Seed Infection by *Aspergillus flavus* in Peanut. Y. LEI, B. LIAO, S. WANG, H. JIANG, Oil Crops Research Institute of Chinese Academy of Agricultural Sciences, Wuhan, Hubei Province, 430062, China, C. HOLBROOK*, and B. GUO, ARS-USDA, Coastal Experimental Station, Tifton, GA, 31793.

Aflatoxin contamination is an important constraint to the peanut industry throughout the world. Genetic improvement for host resistance to fungal infection and aflatoxin production has been among the approaches for integrated management of the problem. However, progress in breeding for resistance has been slow. One of the main constraints has been the lack of a cost-effective method for identification of resistance in breeding materials or segregating progenies. Hence there is a need to develop a rapid and reliable screening method for selecting *Aspergillus flavus* infection resistance in peanut. Here we report a DNA marker closely linked with resistance to *A. flavus* infection using AFLP technique on bulked segregant pools derived from F₂ progeny of

Zhonghua No.5 × J11. The two parents and their 108 F₂ were tested for their reaction to *A. flavus* infection by inoculation under laboratory conditions. The infection index ranged from 0.205 to 0.913. The resistant parent, J11, was confirmed as resistant with an infection index as 0.231, while the susceptible Zhonghua No.5 had an infection index as 0.894. The DNAs of the two parents were extracted and tested with AFLP protocol. From the 256 primers pairs (EcoRI/MseI) tested, twenty-four pairs showed polymorphism between the two parental lines. Then, the DNAs of 12 F₂ segregating lines extremely resistant and susceptible to seed infection in the resistance identification were pooled and analyzed by the previously identified polymorphism primers and four primers pairs generated special bands in the resistant group. The polymorphic loci were further analyzed in all the F₂ single plants. Two polymorphic markers linked with seed infection resistance were identified, one was about 440bp and the other was about 520bp. Based on analysis using MAPMAKER/EXP3.0, the former marker linkage distance to the resistant gene is 3.5cM while the latter was 9.4cM.

Determination of Polyamines in Peanuts and Their Allergenic Properties. S.Y. CHUNG and E.T. CHAMPAGNE, USDA-ARS, SRRC, New Orleans, LA 70124.

Polyamines are nitrogen-containing compounds widely distributed in plants. Due to their role in the development of the digestive system, polyamines have been implicated in preventing food allergies in early life. In addition, polyamines have been reported to be able to bind to immunoglobulin E (IgE) antibodies *in vitro*. This indicates that polyamines may possess allergenic properties. The objectives of this study were to determine if polyamines such as putrescine, spermidine and spermine exist in peanuts and if they bind *in vitro* to IgE antibodies from patients who are allergic to peanuts. Polyamines from peanut extracts were separated and measured using ion-exchange chromatography. Binding of polyamines to IgE antibodies from a pooled serum of peanut-allergic patients was determined in a competitive enzyme immunosorbent assay (ELISA). Results showed that levels of putrescine and spermine decreased during curing of peanuts while level of spermidine increased. Overall, peanuts have a highest level of spermidine (92 µg/g dry defatted meal), followed by spermine (21 µg/g) and putrescine (4 µg/g). In ELISA, IgE antibodies from peanut-allergic patients did not bind to putrescine, spermidine, or spermine. It was concluded that polyamines from peanuts, unlike peanut proteins, are not allergenic or an additional threat to patients who are allergic to peanuts.

Performance Evaluation of Peanut Genotypes for Drought-Tolerance and Yield Characteristics in Bangladesh. S.M. BASHA*, S.A. ALAM, B.L. CHOWDHURY and S.B. SHEIKH. Florida A&M University, Tallahassee, FL 32307; Bangladesh Agricultural University, Mymensingh, Bangladesh.

Pre-harvest invasion of *Aspergillus* occurs primarily under drought stress and is associated with elevated soil temperature and reduced moisture level. Under drought stress, susceptibility of peanuts to fungal invasion increases due to reduced metabolic activity and decline in pod water content. No known peanut genotype appears to be resistant to drought-induced pre-harvest aflatoxin contamination. Hence, developing a drought-tolerant cultivar appears to be the

choice for reducing aflatoxin contamination of peanut. One of the strategies in developing aflatoxin-tolerant peanut genotype is to identify biochemical/molecular markers linked to drought/aflatoxin tolerance. Drought stress alters plant genetic expression, which may be specific for either drought tolerance or susceptibility. Hence, the drought-tolerant and drought-susceptible genotypes respond differentially to drought stress. The response includes changes in mRNA transcripts and metabolite content and composition. In Bangladesh, peanuts are primarily grown in dry river beds, and drought stress seems to adversely affect peanut yield and quality. The objective of this study was to determine performance of drought-tolerant and drought-susceptible peanut genotypes in Bangladesh under drought stress. About 60 peanut genotypes with varying levels of drought tolerance were procured from ICRISAT and grown at the Bangladesh Agricultural University. Peanut plants were subjected to water stress using rainout shelter. Leaf and seed samples were collected from the irrigated and drought stressed plants and subjected to biochemical analysis. The results showed that drought stress increased soluble sugars (0 to 126% over control) and free proline (0 to 28-fold) levels in the peanut leaves. Proximate analysis showed wide variation in the protein (21 to 28%) and fat (38 to 50%) levels among the genotypes. In addition, fatty acid and methionine (2 to 5.2%) composition of peanuts also varied widely among the peanut genotypes. Mean performance of yield and yield contributing characters also varied among the genotypes. Data on 13 different characters were recorded and 8 most important yield and yield contributing characters were analyzed. Significant differences among the genotypes were found for all the characters. Individual performance of the genotypes was ranked by DMRT. The overall results showed that certain genotypes viz. ICGV-95386, ICGV-94173, ICGV-87846, ICGV-97182, ICGV-97232, ICGV-96318, ICGV-86707, and ICGV-93277 produced very good yield with maximum number of branches, pods, kernels per plant as well as highest mature pods and shelling percentage. Out of the 8 best performing genotypes only ICGV-93277 was identified as drought tolerant based on biochemical tests. Among the other drought tolerant genotypes, 3203 showed better performance followed by ICGV-93269 and ICGV-88388. Supported by Peanut CRSP/USAID.

MINUTES OF THE BOARD OF DIRECTORS MEETING
36th Annual Meeting, Hyatt Regency Hotel
San Antonio, Texas
July 13, 2004

The Board of Directors' meeting for the 36th annual meeting of the American Peanut Research and Education Society was called to order by President Ben Whitty at 7:05 p.m.

President Whitty opened the meeting with a welcome and general comments.

President Whitty called on Executive Officer, Ron Sholar, to read the minutes of the last Board of Directors meeting held in Clearwater Beach, FL. The minutes were approved as published in the 2003 Proceedings.

The following reports were made and approved by the Board of Directors:

(Editor's Note: Some of the oral reports given during the Board of Director's Meeting are identical to the official written report for the Proceedings. Where this is the case, the oral report is not presented in the minutes below. For the complete report, see the written report of the committee in the committee reports).

Executive Officer Report – Ron Sholar

The minutes of the 2003 Board of Directors' Meeting were accepted as published.

Dr. Sholar reported that our society is in good condition financially. However, APRES is changing as the industry changes and there continues to be an annual decline in membership. This reflects the fact that there are now fewer companies and individuals involved in the peanut industry.

Public Relations Report – Bob Sutter

The committee feels that cooperation between APRES and the State grower groups and the National Peanut Board should be encouraged. Also, in future years, thought should be given to joint meetings with the Southern Peanut Farmers Federation. The National Peanut Board holds their grower summit at this meeting and a joint meeting could result in greater attendance at all three meetings.

As the number of people involved in peanut research declines, maintaining or increasing membership becomes difficult. Communicating with potential members is important. The committee feels that a web-based newsletter would help generate interest and should be pursued. The committee urges board members to communicate any necrology information to committee members during the APRES meeting so they can be recognized. In the context of membership and cooperation the committee feels that it is important to make long range plans concerning executive leadership, Peanut Science publications and administrative support for these areas.

Members of the committee reported that they had sent newsletters to news outlets in their states and had communicated with the industry in their area requesting APRES related information.

American Society of Agronomy Liaison Report – Tom Stalker

Dr. Stalker reported that the joint meetings of the American Society of Agronomy, Crop Science Society of America and Soil Science Society of America were held in Denver, Colorado, from November 3-6, 2003. Approximately 3,400 oral and poster presentations were made at the meeting, of which about 15 were presented on peanut. The next meeting of the ASA-CSSA-SSSA will be from October 31 – November 6, 2004, in Seattle, Washington.

Dr. Stalker reported that he had served on this committee for more than 10 years and reported that he felt it would be in the best interest of the Society to have another member serve as the liaison.

President Whitty thanked Dr. Stalker for his decade of service but no action was taken on replacing Dr. Stalker in this role.

Council for Agricultural Science and Technology – Stan Fletcher

Dr. Fletcher reported that he will be the President of CAST starting in FY 05. He reported that CAST now totals 38 member scientific societies with more than 173,000 member scientists. The CAST theme is to have an unbiased and sound basis for reporting research results and on proper science and not on politics. APRES has always been one of the strongest supporters of CAST on a per capita basis. APRES has been a strong supporter of CAST's Biotechnology initiative and communications. He reported on a joint project with China and their acceptance of GMO commodities.

CAST has been working on cultivating leadership for a changing agricultural program. Societies such as APRES have been working on developing leadership programs.

President Whitty has appointed Dr. John Beasley to fill a one year assignment on CAST as a result of Dr. Fletcher's selection as CAST President. A new society member representing APRES on the CAST Board of Directors will be selected at the 2005 annual meeting.

Dr. Fletcher reported that the CAST Board has been going through the exercise of developing an annual action plan. This started from last fall's Benchmarking activity. Next year's budget will be developed from the approved action plan. This will help determine what CAST should do to help its member organizations such as APRES.

Nominating Committee – Tom Isleib

Dr. Isleib reported that the Nominating Committee was charged with making nominations for four leadership positions in the society. The Nominating

Committee presented the following slate of nominees:

President-Elect, 2004-2005, from the state of Virginia: Pat Phipps of Virginia Tech's Tidewater Agricultural Research and Extension Center.

Board of Directors, representative from the Virginia-Carolina area, replacing David Jordan: Barbara Shew of the Department of Plant Pathology, North Carolina State University.

Board of Directors representative from the USDA, replacing C. Corley Holbrook: Ron Sorensen of the National Peanut Research Laboratory at Dawson, Georgia.

Board of Directors representative from industry (shelling, marketing, and storage), replacing Max Grice: Fred Garner of Birdsong Peanut Company, Suffolk, Virginia.

All the nominees are eligible members of APRES, have been contacted, and have agreed to serve if elected.

Additional nominations may be made from the floor during the business meeting scheduled for Friday, July 16, 2004. Those elected will serve 3 year terms starting immediately upon election.

Publications and Editorial Committee – Chris Butts

The committee met and went over the Peanut Science Editor's report. Volume 30 of Peanut Science (the 2003 issues) has been delayed. During the past two years there were only 52 manuscripts submitted, with 21 from July 1, 2002 to June 30, 2003 and 31 from July 1, 2003 to June 30, 2004. At least 24 manuscripts are needed to be printed per year as a breakeven point for publication for the two issues.

As it stands now, Volume 30, no. 1 will have 13 manuscripts that will be published and they have received galley proofs from the printer. The issue should be sent to the membership in August. Thirteen manuscripts have also been accepted for issue no. 2, and they are currently being formatted for the printer. This issue should go out about a month after issue no. 1. One manuscript has been accepted for Volume 31.

A copy of the budget was in the Proceedings for last year. The proposed budget for Peanut Science will be included in the report.

There was significant discussion about publishing an electronic version of Peanut Science. The Publications Committee will look into getting a service for on-line submissions and review and also research on-line publishing. These are separate steps and a vendor for each service would have to be found. The committee talked to one provider of services for on-line submissions and reviewing. That process only gets the journal articles ready for on-line publication (this is not the actual on-line publication which must be provided by another vendor). This vendor said the start up fee would be about \$2000 for an initial startup/setup fee and then there would be a fee of about \$4000 per year for

use of the system and user support. Electronic submission should reduce the time from submission to actual publication.

The committee is going to get bids from at least two vendors for on-line submission services and bids from at least two vendors for on-line publishing and will submit this information to the board at a later date. The committee expects to have this done within three months.

The committee also wants to look at on-line publishing of the Proceedings. With on-line publishing, the Proceedings should be more available.

A question was asked about when the actual publications would be available. The answer was that it would depend on who the vendor is. Details will be obtained with the bids.

Dr. Holbrook commented that a service should be obtained that gets APRES publications into one of the major on-line data base subscription services such as Agricola.

There was much discussion about whether access to APRES on-line publications should be free or whether membership would be required (password based).

Tom Stalker commented that if we go to on-line publishing, eventually we will have to come to grips with what to do with the hard copy publications we now have. Will they need to be put on line?

There was a review of the report on electronic publishing from the 2003 meeting.

Peanut Quality Committee – Mark Burow

The Committee hosted a "Peanut Seed Quality Summit" with 40 people in attendance. The goal was to facilitate communications between breeders, shellers, and processors with regard to UPPT data. Speakers talked about current testing programs, and two speakers discussed germination quality. The importance of edible seed quality and stability of quality were emphasized. An industry consensus was presented that quality parameters (flavor, oil consistency, blanchability, seed size distribution) similar to the historical average for Florunner are acceptable to industry. A quantitative range of values was requested and may be forthcoming. Desired values for oil composition and sugar content were also given.

The quantity and types of seed quality data taken in the UPPT test were also discussed for the needs of breeders, industry, and the USDA. Bill Branch conducted a survey with breeders prior to the meeting and with industry members during the meeting for the purpose of tabulating their needs. The survey results will be tabulated for the basis of a future recommendation.

Bailey Award Committee – Todd Baughman

From the 2003 meeting, 15 papers were nominated for the Bailey Award competition and nine papers were submitted for actual consideration. These

were sent to the committee members for evaluation and the winning paper will be announced at the Friday business meeting. The winning paper is "Improving Shelf Life of Roasted and Salted Inshell Peanuts Using High Oleic Acid Chemistry." R.W. Mozingo, S.F. Okeefe, T.H. Sanders and K.W. Hendrix.

Fellows Award Committee – Chip Lee

There were six nominations for Fellowship in the society. Two of the nominees are on the Board of Directors and are ineligible for election to Fellowship at this time. The Fellows Committee found four of the nominees were fully qualified and rated them from one to four and submitted these names to the Board of Directors. From this list, the Board of Directors selected the following for Fellowship: Stanley Fletcher, University of Georgia; Paul Blankenship, USDA; and Bobby Walls, North Carolina Department of Agriculture. The new Fellows will be announced at the business meeting.

Site Selection Committee – James Grichar

The following is the location schedule for upcoming meetings:

July 11-15, 2005 Portsmouth, Virginia

July 10-14, 2006 – Savannah, Georgia (\$115/day)

2007 – Alabama

Bob Kemerait of the University of Georgia reported on potential sites for the 2006 meeting. The Site Selection Committee recommended the Hyatt Regency in Savannah, GA. The Board of Directors approved the recommendation and directed the Executive Officer to negotiate and sign a final contract with the hotel. The dates for the 2006 meeting will July 8-16.

Coyt T. Wilson Distinguished Service Award Committee – Eric Prostko

See complete report as published.

Joe Sugg Graduate Student Award Committee – Bob Kemerait

Seven students have entered the 2004 competition. Prior to this APRES meeting, electronic copies of the evaluation form used to judge presentations were emailed to each of the participating students.

The Joe Sugg Committee would like to propose the creation of a second tier of student competition, specifically a "poster contest" for graduate students. It is believed that the additional emphasis on such a session would benefit students within APRES because:

1. Poster presentations are becoming increasingly important at scientific meetings around the country.
2. The quality of presentation of scientific results in a poster format will benefit from the same judging and critique given to oral presentations.
3. The option of a poster presentation would likely increase the

participation among students.

4. Students who speak English as a second language are sometimes at a disadvantage and this is not the only reason to do this but would give these students a better venue for their presentation.

The committee envisions that a student could participate in only one of the two methods of presentation (oral or poster). The committee reported that they did consider that emphasizing poster presentations might detract from the number of oral presentations. There was concern expressed that with only seven student presentations that if half went to a poster presentation, then the result would be a very small number left for the oral competition. The committee hopes that adding the poster competition would result in more presentations and not just a division of the current number of presentations. The committee also indicated that if approved, the committee would seek funding to support awards for the new award category.

The Board of Directors directed the Joe Sugg Committee to conduct further study on the issue and come back to the 2005 meeting with a concrete proposal on how to proceed with this program.

Dow AgroSciences Award Committee – John Baldwin

There was a total of four nominations for the two awards. The recipient of the 2004 Dow AgroSciences Award for Excellence in Research is Dr. Stanley Fletcher, Department of Agricultural and Applied Economics the University of Georgia, Griffin. The recipient of the Dow AgroSciences Award for Excellence in Education is Dr. Steve L. Brown, Department of Entomology, University of Georgia, Tifton.

The committee would like to encourage nomination of qualified APRES members. All members of APRES from all segments of the peanut industry should be considered for nomination for these prestigious awards. The committee thought that it was important to carry forward qualified nominations from one year to the next.

Program Committee – James Grichar

James Grichar reported that the Program Committee received 108 papers. This is comparable to recent years. Registration included 227 members and 153 spouses and children.

Finance Committee – Marshall Lamb

The committee met and reviewed the budget with the Executive Officer and found the society in sound condition but finances in need of some attention.

The Finance Committee presented a proposed budget for 2004-05 that has a projected deficit of \$22,628 (income of \$99,050 and expenses of \$121,678). In 2003-04, the society had a budget deficit of \$18,293. These losses and these trends are eroding the financial stability of the society. Our membership is dropping perhaps by as much as 5-7% per year. To fill this gap, continually

raising membership dues or registration fees is not a sustainable answer. If we keep raising those but keep losing members then the gap just widens. Something must be done to bring revenues generated and expenses more in balance. That was the consensus of the Finance Committee. The society currently has a net fund balance of \$135,965 and with the continued loss of \$23,000/year, the society will run out on money in 5-6 years. Each year the society is losing a little bit more money than in the previous year.

Richard Rudolph moved that the President appoint an ad hoc committee to look for ways to improve revenues (increase revenues and decrease expenses) for the society. There was much discussion on this topic.

Marshall Lamb pointed out that the society has approximately \$70,000 per year going to the four paid positions but that all that can not be eliminated but that a way to do it more cost effectively must be found. An analysis shows that decreased revenue generated is less of a problem than is the fact that society expenses have been rising due to salaries.

Howard Valentine pointed out that when the new dues structure and meeting registration fee increases fully kick in then our current financial problems would be reduced at least for a while. Also if we get back on track with publishing Peanut Science, significant additional revenue will be generated.

Corley Holbrook pointed out that in addition to the decline in the industry there is also a shift in the industry and that he would like to see the ad hoc committee address how the shift in the industry will affect APRES in the next 5 years. He also urged that a definite timeline be followed for the report of the ad hoc committee.

There was discussion about the large amount of money being spent for salaries for Peanut Science and the fact that there were no publications for 2003. There have been many complaints due to the fact that members are not getting what they have paid for.

There was discussion about the potential for savings that would result from on-line publication and the consolidation of both offices and all employees into one location. Corley Holbrook pointed out that being an editor requires a certain skill set as does being the Executive Officer and that these are necessarily the same skills.

Howard Valentine pointed out that the projected deficit in the budget could be less than anticipated with good attendance at the 2005 meeting and maintaining membership. The Peanut Foundation has provided \$5,000 in funding to APRES which will show up in the 04-05 budget. He indicated that the Peanut Foundation would entertain the possibility of providing funding of a similar level in the coming year. He also thinks that there may be other organizations out there that might provide funding. He also indicated that it might be difficult to find a person who would have the skills to be both Executive Officer and Editor.

There was discussion about the change in revenue that will result when we go to electronic publication. Some organizations make page charges for publishing while others do not. Chris Butts pointed out that on-line submissions should cut

down on administrative costs and that would be a source of improving revenues. On-line submissions might make it possible to eliminate the administrative assistant for the Editor due to going to on-line submissions. It was pointed out that eliminating author page charges would create a large hole in the budget that would have to be filled.

Corley Holbrook pointed out that for on-line publications, you have to enter a contract with a company and that company will want a cut of the revenue. It was also discussed that we already have significant costs for publishing.

The Board of Directors voted to direct the President to appoint an ad hoc committee which would be charged with recommending ways to bring revenue and expenses in balance. The ad hoc committee will report to the Board of Directors not later than 90 days after the committee is appointed. The ad hoc committee will be appointed by the incoming President James Grichar.

Other Business

James Grichar asked why dues and registration fees cannot be combined into one single amount.

There was discussion about whether APRES could meet with another peanut group but despite previous efforts, nothing has ever been worked out. The membership has never really gotten behind a joint meeting with another peanut organization.

Tom Isleib reported that he is the outgoing chair of the Peanut Crop Germplasm Committee and that the purpose of that committee is to foster interaction on germplasm improvement activities such as the breeders are doing. The committee wants to continue the "Varietal Quality Summit" but desire for it to be separate from the Peanut Quality Committee. APRES is a good venue for discussions of varieties that are coming along and the committee wants to recommend that this be continued. The UPPT Committee meets on Monday evening and it is likely that just prior to the UPPT meeting would be a good time for the Peanut Crop Germplasm Committee to meet. Discussion indicated that there are other times that would also be acceptable for this meeting and that it should not be tied to a specific date and time during the APRES meeting. It is desirable for this to be an APRES supported event. The Varietal Quality Summit would be for all interested in these topics. The Board of Directors approved the proposal and Varietal Quality Summit will be a regular event at the APRES annual meeting. The chair for this committee will coordinate with the host state technical committee to ensure that this meeting is scheduled.

The meeting was adjourned at 9:32 pm by President Whitty.

**OPENING REMARKS BY THE PRESIDENT AT THE 2004 BUSINESS
MEETING of APRES – President E. Ben Whitty
July 16, 2004**

State of the Society

Welcome to the Awards and Business Program of the 2004 Annual APRES meeting. Before we get to the awards, I would like to thank James Grichar and the other Texas members for planning and conducting such a successful meeting. A special recognition goes to them for the ease and efficiency that the presentations were conducted. You may recall that at last year's meeting, it was announced that power point or electronic methods would replace slides as the means of presenting oral papers in 2004. The Texas delegation handled this transition with great expertise and professionalism. I don't see how it could have been done any better.

In addition to their usual efficiency, I would like to thank Ron Sholar, our Executive Officer, and Irene Nickels, his (our) Administrative Assistant, for easily adopting the electronic method of providing the 2003 Proceedings to the members. Again you may recall that this method was selected last year as a means of distributing the Proceedings rather than in the printed form. If I had been more timely in providing my input into the publication, the Proceedings would have been available quite a bit earlier.

There is a special recognition that I would like to make at this time. As many of you may know, APRES, or APREA as it was first formed, had their first annual meeting in 1969. Our current annual meeting is the 36th. APRES was formed because members of our parent organization, the Peanut Improvement Working Group (PIWG) decided that the complete interest of the peanut industry, research workers, educators, and related agencies could be best served by the formation of a new organization. PIWG was formed in 1957 as it was recognized that a formal organization or association in some form was needed to promote research and education in the peanut industry. We are fortunate to have charter members of APRES (APREA) still active in the organization. Four of these members were an important part of the current meeting. Walt Mozingo of Virginia, Harold Pattee of North Carolina, Charles Simpson of Texas, and Jay Williams of Georgia were charter members of this organization as it was formed from PIWG. There were others of us that attended the first meeting of this organization, but we had no PIWG affiliation. I note that at this current meeting, Charles was a co-author on four papers, Harold presided over one session and presented a paper, Jay presented a poster about a new method of pod blasting for maturity determinations, and Walt will receive a major APRES award in a few minutes.

Due to the contributions of not only these four members, but also of the hundreds of others, APRES has a proud record of providing research and education services to the peanut industry. The 2003 crop in the United States was one of the best on record in terms of total production, yield per acre, and quality. The 2004 crop may also be in the excellent category. This is important because changes in the federal peanut program made in response to trade agreements has required the industry to compete on a global scale. If these recent advances

in production can be maintained and improved, it appears that the United States can remain a leader in the international peanut industry. A healthy peanut industry will require the continuation of strong research and education programs.

Despite the current strength of APRES, we do have to recognize that there are problems that must be addressed if we are to remain a viable organization for the future. Our membership has declined similar to that of comparable organizations because of reduced staffing in universities and industries. If we can persuade all potential members to become active dues-paying members of APRES, we can maintain as strong an organization as is possible. We also need more manuscripts submitted to PEANUT SCIENCE if it is to remain as a highly respected journal in the scientific community. A third problem could be our financial situation, which is currently strong, but is weakening due to less income and more expenses. Your Board of Directors recognize these emerging problems and is taking action to solve them. Your support and participation in correcting these problems is essential.

**BUSINESS MEETING AND AWARDS CEREMONY
AMERICAN PEANUT RESEARCH AND EDUCATION SOCIETY
Hyatt Regency Hotel
San Antonio, Texas
July 16, 2004**

The following reports were made:

1. President's Report – Ben Whitty
2. Awards Reports
 - a. Coyt T. Wilson Distinguished Service Award Report – Eric Prostko
 - b. Fellow Award Report – Chip Lee
 - c. Bailey Award Report – Todd Baughman
 - d. Joe Sugg Graduate Student Competition Award Report – Bob Kemerait
 - e. Dow AgroSciences Awards for Research and Education – John Baldwin
 - f. Past President's Award – Ben Whitty
3. Committee Reports
 - a. Reading of the minutes from 2003 meeting – Ron Sholar
 - b. Publications and Editorial Committee Report – Chris Butts
 - c. Public Relations Committee Report – Bob Sutter
 - d. Finance Committee Report – Marshall Lamb
 - e. Nominating Committee Report – Tom Isleib
 - f. Peanut Quality Committee Report – Mark Burow
 - g. Site Selection Committee Report – James Grichar
 - h. Program Committee Report – James Grichar

New Business Items:

Two items of business were brought before the membership during the business meeting.

1. The Board of Directors proposed a new dues schedule for all membership categories. This requires a change to the By Laws since dues are set in the By Laws. The Board of Directors recommended the following dues schedule:

	Old	New
Individual Memberships:	\$40	\$80
Institutional Memberships:	40	80
Organizational Memberships:	50	100
Sustaining Memberships:	150	300
Student Memberships:	10	20

The membership voted to approve the new dues schedule which will go into effect on July 1, 2005.

2. The Board of Directors proposed that the By Laws be amended relative to Article IV. Dues and Fees. Currently, the By Laws specify minimum annual dues by membership category. The Board proposed that the By Laws be

amended by removing the wording related to specific dues amounts.

Current Article IV:

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 meeting. Minimum annual dues shall be:

Individual Memberships:	\$40.00
Institutional Memberships	40.00
Organizational Memberships:	50.00
Sustaining Memberships:	150.00
Student Memberships:	10.00

Proposed (Amended) Article IV:

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 meeting.

The membership voted to amend the By Laws by removing the wording relating to specific dues amounts.

The minutes of this business meeting will serve as the official documentation for the change in membership dues and these minutes will be published in the Proceedings of the 2004 annual meeting. In addition, members will be made aware of the new dues structure both through an electronic mailing and through dues notices for 2005-06.

FINANCE COMMITTEE REPORT

The APRES Finance Committee met at 4:00 p.m. on July 13, 2004. Members present: Marshall Lamb, chair, John Beasley, Hassan Melouk, Richard Rudolph, Fred Shokes, and Ron Sholar (ex-officio). With regret and after much deliberation, we brought forward a proposed budget for the 2004-05 year with projected revenue of \$99,050 and projected expenses of \$121,678, leaving a deficit projection of \$22,628. It is important to note that the raised registration charges and better than budgeted meeting attendance in Virginia should improve the projected deficit. However, it will not eliminate the deficit. The society currently has a net fund balance of \$135,965, which places it in a good financial position. With membership dropping 5-7% per year, continually increasing membership dues or registration fees is not a long-term sustainable answer. Expenses must be brought in line with revenues and we will aggressively pursue corrective methods to do so.

Respectfully submitted by,
Marshall C. Lamb, Chair

2004-05 BUDGET

RECEIPTS

Registration	\$ 25,000
Membership Dues	20,000
Special Contributions	26,000
Other Income (Spouses program)	0
Differential Postage	1,000
Peanut Science & Technology	300
Quality Methods	0
Proceedings	0
Peanut Science & Page Charges	25,100
Peanut Research	0
Interest	1,250
Advances in Peanut Science	400

Total Receipts	<u>\$99,050.00</u>
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EXPENDITURES

Annual Meeting	\$ 17,500
Spouse Program	0
Awards (Coyt Wilson, Dow AgroScience, Joe Sugg)	4,500
CAST Membership	1,000
CAST BioTechnology Initiative	0
CAST Travel	0
Office Supplies	1,500
Professional Services – Executive Officer	17,864
Professional Services – Peanut Science Editor	17,864
Secretarial Services	17,700
Postage	2,500
Travel – Officers	1,500
Bayer – Expense reimbursement to Extension Agents	4,000
Legal Fees (tax preparation)	700
Proceedings	500
Peanut Science	34,150
Peanut Science & Technology	0
Peanut Research	0
Quality Methods	0
Bank Charges	100
Advances in Peanut Science	0
Corporation Registration	300

Total Expenditures	<u>\$121,678</u>
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2003-04 BALANCE SHEET

<u>ASSETS</u>	<u>June 30, 2003</u>	<u>June 30, 2004</u>
Petty Cash Fund	\$ 683.28	\$101.58
Checking Account	34,080.73	47,096.68
Certificate of Deposit #1	31,016.73	0.00
Certificate of Deposit #2	0.00	0.00
Certificate of Deposit #3	10,613.62	10,741.51
Certificate of Deposit #4	13,867.92	14,034.90
Certificate of Deposit #5	0.00	0.00
Certificate of Deposit #6	15,080.77	15,314.66
Certificate of Deposit #7	12,908.57	13,166.49
Certificate of Deposit #8	5,755.16	5,861.37
Money Market Account	1,856.51	1,861.25
Savings Account (Wallace Bailey)	596.81	426.52
Bayer Account	12,425.65	12,020.90
Computer and Printer	107.91	1,445.16
Peanut Science Account (Wachovia Bank)	3,817.05	3,784.05
Inventory of PEANUT SCIENCE & TECHNOLOGY Books	2,980.00	2,650.00
Inventory of ADVANCES IN PEANUT SCIENCE Books	<u>7,830.00</u>	<u>7,460.00</u>
TOTAL ASSETS	\$153,620.71	\$135,965.07
<u>Liabilities</u>		
No Liabilities	0.00	0.00
<u>Fund Balance</u>	\$153,620.71	\$135,965.07
<u>TOTAL LIABILITIES & FUND BALANCE</u>	\$153,620.71	\$135,965.07

STATEMENT OF ACTIVITIY FOR YEAR ENDING 06/30/03

RECEIPTS	<u>June 30, 2003</u>
Advances Book	\$ 702.50
Ann Mtg Reg	22,550.00
Award Income	0.00
Contributions	16,200.00
Differential Postage	1,362.50
Dues	18,231.00
Interest	3,260.66
Peanut Science	1,315.50
Peanut Research	0.00
Peanut Science Page Charges	22,512.30
Peanut Science & Technology	325.00
Proceedings	13.00
Quality Methods	32.50
Spouse Reg	615.00
Transfer	0.00
TOTAL RECEIPTS	<u>\$87,119.96</u>
EXPENDITURES	
Advances in Peanut Science	\$ 0.00
Annual Meeting	14,321.85
Bank Charges	83.25
CAST Membership	556.00
Corporation Registration	15.00
Exec Off	12,675.96
Federal Withholding	2,364.00
FICA	3,851.47
Legal Fees	2,376.00
Medicare	900.76
Miscellaneous	0.00
Office Expenses	2,176.94
Oklahoma Withholding	594.00
Peanut Research	0.00
Peanut Science	40,379.34
Peanut Science & Technology	0.00
Postage	3,922.69
Proceedings	5,072.31
Refund	5.00
Sales Tax	1.30
Secretarial Services	12,743.88
Spouse Program Expenses	565.50
Travel, Exec Off, Sec	504.76
Travel, Bayer	2,691.22
Transfer	0.00
TOTAL EXPENDITURES	<u>\$105,801.23</u>
2003 EXCESS EXPENDITURES OVER RECEIPTS	<u>-\$ 18,681.27</u>

STATEMENT OF ACTIVITIY FOR YEAR ENDING 06/30/04

Receipts

Advances Book	\$ 415.52
Ann Mtg Reg	33,200.00
Award Income	0.00
Contributions – General	9,350.00
Contribution – Dow AgroSciences	5,500.00
Contribution – Bayer CropScience	3,281.93
Contribution – NPF	5,000.00
Differential Postage	1,088.00
Dues	15,532.00
Interest	1,457.54
Misc Income (return batteries/extra cash from mtg reg)	16.37
Peanut Research	0.00
Peanut Science Page Charges	6,392.60
Peanut Science & Technology	374.02
Proceedings	0.00
Quality Methods	60.00
Spouse Reg	0.00
Transfer	0.00
TOTAL RECEIPTS	<u>\$81,667.98</u>

Expenditures

Advances in Peanut Science	\$ 0.00
Annual Meeting	16,056.15
(Packet – 217.76, Reg Refund – 100.00, Program – 643.24	
Supplies/Equip – 2,774.12, Breaks/Meals – 12,321.03,	
Awards (Dow, Coyt Wilson, Sugg)	4,308.98
Peanut Science	33,448.00
Proceedings	300.00
Peanut Research	0.00
CAST Membership	1,001.64
Corporation Registration	230.00
Legal Fees	626.00
Prof Services - Exec Off	15,999.96
FICA/Medicare	1,224.00
Prof Services – Admin Assist	15,790.65
FICA/Medicare	1,208.02
Oklahoma Withholding	375.00
Travel (Exec Off, Admin Assist)	1,282.23
Office Expenses	2,739.12
Postage	1,339.41
Bank Charges	90.00
Travel, Bayer	3,709.96
Sales Tax	231.75
TOTAL EXPENDITURES	<u>\$99,960.87</u>
2004 EXCESS EXPENDITURES OVER RECEIPTS	- \$18,292.89

PEANUT SCIENCE BUDGET 2004-2005

INCOME

Page and reprint charges	\$25,000.00
Journal orders	100.00
Foreign mailings	1,000.00
APRES member subscriptions	8,000.00
Library subscriptions	<u>2,000.00</u>
TOTAL INCOME	\$36,100.00

EXPENDITURES

Printing and reprint costs	\$14,000.00
Editorial assistance	16,224.00
Office supplies	0.00
Postage	2,500.00
Editor compensation	<u>17,224.00</u>
TOTAL EXPENDITURES	\$49,948.00

ADVANCES IN PEANUT SCIENCE SALES REPORT AND INVENTORY ADJUSTMENT 2003-04

Beginning Inventory (Adjusted – after physical count)		783
1st Quarter	29	754
2nd Quarter	8	746
3rd Quarter	0	746
4th Quarter	0	746
TOTAL	37	

746 REMAINING BOOKS X \$10.00 (BOOK VALUE) = \$7,460.00 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

PEANUT SCIENCE AND TECHNOLOGY SALES REPORT AND INVENTORY ADJUSTMENT 2003-04

Beginning Inventory (Adjusted – after physical count)		298
1st Quarter	26	272
2nd Quarter	7	265
3rd Quarter	0	265
4th Quarter	0	265
TOTAL	33	

265 remaining books x \$10.00 (book value) = \$2,650.00 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

PUBLIC RELATIONS COMMITTEE REPORT

The Public Relations Committee met at 2:00 p.m. in the Frio Room on July 13, 2004. Members present were Dan Gorbet, Joe Dorner and Bob Sutter.

The committee feels that cooperation between APRES and the State grower groups and the National Peanut Board should be encouraged. Also, in future years, thought should be given to joint meetings with the Southern Peanut Farmers Federation. The National Peanut Board holds their grower summit at this meeting and could result in greater attendance at all three meetings.

As the number of people involved in peanut research declines, maintaining or increasing membership becomes difficult. Communicating with potential members is important. The committee feels that a web-based newsletter would help generate interest and should be pursued. The committee urges board members to communicate any necrology information to committee members during the APRES meeting so they can be recognized. In the context of membership and cooperation the committee feels that it is important to make long range plans concerning executive leadership, Peanut Science publications and administrative support for these areas.

Members of the committee reported that they had sent news releases to news outlets in their states and had communicated with the industry in their area requesting APRES related information.

The meeting concluded at 3:00 p.m.

Respectfully submitted by,
Bob Sutter, Chair

PUBLICATIONS AND EDITORIAL COMMITTEE REPORT

The Publications and Editorial Committee of the American Peanut Research and Education Society met from 2:00 – 3:00 p.m. on Tuesday, July 13th in San Antonio, Texas. Members present at the meeting included Jay Chapin, Michael Franke, Marie Fenn and Chris Butts. Visitors attending the meeting were Chari Kandala, James Grichar, and Wes Shannon. Chris Butts moderated the meeting in the absence of Committee Chairman, Kenton Dashiell.

A written report (attached) from the Peanut Science Editor, Thomas Stalker was submitted, read and discussed. It was noted that Volume 30 of Peanut Science had not been published in 2003 due to several factors including the death of the editorial assistant, Peggy Brantley, and the lack of submissions. It was noted that only 52 articles were submitted during the two year period from July 1, 2002 to June 30, 2004. Excessive time from submission to acceptance was noted as a major factor in reduced submissions. Another reason suggested was the downward trend within the peanut research community, APRES membership, and the peanut industry in general.

The committee also discussed a proposal submitted by Lori Barber of ScholarOne, Inc., to use Manuscript Central for on-line submission, review, and editorial processing of manuscripts for Peanut Science. A conference call with Lori Barber was held for the committee to ask questions and discuss the advantages of on-line manuscript review and processing. This proposal was a preliminary proposal with an estimated cost of approximately \$2,000 initial setup and \$4,000 annual subscription to Manuscript Central. The annual fee included on-line document processing and customer support for up to 100 submissions. Ms. Barber stated that many publications the size of APRES had noticed an increase in submissions and a reduction in administrative costs such as postage and copying. On-line document processing also reduced the time from submission to decision. It was emphasized that this proposal was only for on-line submission, review, and decision to accept/reject for publication with minimal post acceptance processing. On-line publication is a separate service provided by ScholarOne and other vendors.

The Publications and Editorial Committee will solicit bids from other providers of (1) the on-line submission and review process and from (2) on-line publishers within 90 days of the annual meeting and report to the Board of Directors.

The meeting was adjourned at 3:00 p.m.

A moment of silence was observed in honor of Peggy Brantley, who passed away July 2003, she had a long work service history with APRES.

Respectfully submitted by,
Chris Butts, Acting Chair

PEANUT SCIENCE EDITOR'S REPORT

Volume 30 of Peanut Science has been delayed in large part due to my editorial assistant, Ms. Peggy Brantley passing away, and partially due to few manuscripts being submitted for publication. During the past two years there were only 52 manuscripts submitted, with 21 from July 1, 2002 to June 30, 2003 and 31 from July 1, 2003 to June 30, 2004. A minimum of 24 manuscripts need to be printed per year in order for the journal to be financially solvent; and this number is difficult to reach in a timely manner since there are manuscripts rejected and others that are not corrected and returned by authors.

Volume 30, issue no. 1 will have 13 manuscripts published and we have received galley proofs from the printer. The issue should be sent to the membership in August. Thirteen manuscripts have also been accepted for issue no. 2, and they are currently being formatted for the printer. This issue should be sent to the membership about a month after issue no. 1. One manuscript has been accepted for Volume 31.

Last year's budget has been itemized and a proposed budget for the coming year has been completed. Both budgets can be found in the Proceedings of APRES. The journal experienced a financial loss during each of the past three years, and a new business plan is needed to be financially solvent, including a larger distribution to membership and libraries. The proposed web-based publishing of

the journal should help financially, but there will be significant costs to initiate the process.

All of the Associate Editors will be remaining in their current position during the coming year. Sincere thanks is expressed to each of these Associate Editors for service to the journal and to APRES.

Respectfully submitted by,
H. Thomas Stalker, Editor, Peanut Science

NOMINATING COMMITTEE REPORT

The Nominating Committee executed its charge prior to its scheduled meeting at 3:00 p.m. on July 13 in the Nueces Room of the Hyatt Regency Riverwalk Hotel in San Antonio, Texas. The committee was charged with nominating candidates for four positions in the society. The nominees are as follows:

President-Elect, 2004-2005, from the state of Virginia: Pat Phipps of Virginia Tech's Tidewater Agricultural Research and Extension Center.

Board of Directors, representative from the Virginia-Carolina area, replacing David Jordan: Barbara Shew of the Department of Plant Pathology, North Carolina State University.

Board of Directors representative from the USDA, replacing C. Corley Holbrook: Ron Sorensen of the National Peanut Research Laboratory at Dawson, Georgia.

Board of Directors representative from industry (shelling, marketing, and storage), replacing Max Grice: Fred Garner of Birdsong Peanut Company, Suffolk, Virginia.

All the nominees are eligible members of APRES, have been contacted, and have agreed to serve if elected.

Respectfully submitted by,
Thomas G. Isleib, Chair

FELLOWS COMMITTEE REPORT

The Fellows Committee did not formally meet at San Antonio, Texas. Prior to the meeting in San Antonio, the committee met several times by telephone to discuss the candidates. After all six candidates were reviewed, it was noted that only four met all requirements. These four were unanimously approved by the committee and their names forwarded the Board of Directors. The Board then selected the three, which were ranked highest numerically by the Fellows Committee. These three are as follows: Paul D. Blankenship, Stanley M. Fletcher, and F. R. "Bobby" Walls, Jr.

Respectfully submitted by,
Chip Lee, Chair

BIOGRAPHICAL SUMMARIES OF FELLOWS RECIPIENTS

Dr. Stanley M. Fletcher has indeed had a very productive and significant career as a researcher and expert in the areas of peanut production economics and policy development relative to domestic and international marketing and trade as well as governmental policy relative to peanut farm programs through the United States Department of Agriculture. He was named the first Director of the National Center for Peanut Competitiveness which was established by the United States Congress to promote U.S. produced peanuts as a commodity in the world market, and to work toward improved competitiveness of the U.S. producer in the world marketplace. He served as the APRES representative on the Board of Directors of the Council for Agricultural Science and Technology (CAST) where he serves as the Chairman of the Standing Committee of National Concerns of CAST. After being nominated for President-Elect in 2002, he served the organization in that position in 2003 and is the new President of CAST for 2004. He has served for the last three years as one of two Georgia representatives on the research review panel for the National Peanut Board under which review and evaluation of research proposals are recommended to the Board for yearly funding. Additionally, he serves the peanut industry as well as the University of Georgia through his duties as liaison between the Georgia Commodity Commission for Peanuts and the Dean of the College of Agricultural and Environmental Sciences at the University. He has presented numerous invited keynote addresses to national and international peanut industry and research groups and has received numerous awards for his service to the industry as well as to the academic and governmental groups he so ably serves.



Paul Blankenship has contributed original and influential research in many pivotal areas in peanut production. His groundbreaking scientific contributions to foreign material removal, aflatoxin amelioration, and drying have not only changed the way these problems are currently handled in the peanut industry, but have also served to greatly advance the pace of subsequent scientific discoveries in these areas. Paul Blankenship's novel and creative approaches to research problems in peanut science have culminated in various advancements in machinery and production methods that are currently being utilized by most sections of the peanut industry, including growers, shellers, and manufacturers.



Paul Blankenship has never been satisfied to provide scientific information alone

to the peanut industry, but has always responded to their needs through service. This service has always extended to the development of his research discoveries into usable and applicable technologies that he has helped implement on an industry scale. The industry has also relied on Paul Blankenship as a strong advocate and consultant. This fact is evident from the requests by industry for collaboration and the industry's dependency on him for leadership on issues that they deem imminent.

Lastly, Paul Blankenship has been an exemplary leader at the National Peanut Research Laboratory and an outstanding mentor and colleague. He has expanded the scientific staff at the laboratory to full capacity through his tireless efforts in advocating and promoting ongoing research at the lab to the USDA bureaucracy and beyond. He has also instrumented extensive collaborative networks between the lab and industry, universities, and other federal agencies. His significant efforts will assure the strength and research quality of the laboratory for many years to come.

On his own initiative, **Bobby Walls** became an active member of APRES during the mid 1980's. He served on various committees, attended all the annual meetings, and served as an emissary for peanut research within the crop protection industry. In 1992 when budgets were being constricted, he persuaded the management of American Cyanamid of the value in sponsoring a function at the annual APRES meeting. As part of his legacy with American Cyanamid, this sponsorship is continuing today with BASF who later purchased American Cyanamid.



Throughout his career, Mr. Walls has championed many research and development projects on peanuts. He has developed a high level of technical knowledge and competency in working towards providing pest control, plant nutrition and soil fertility solutions for the peanut producer. His leadership and creative abilities have resulted in several key achievements, including the discovery, development, and commercialization of Cadre, Prowl, and Pursuit herbicides for weed control in peanuts. Mr. Walls was also granted a patent for the development of Cadre as a peanut herbicide. In addition, his expertise as a research specialist was utilized by American Cyanamid to lead similar efforts in Canada, Brazil, Argentina and Mexico.

Mr. Walls' commitment to the research and development process goes beyond that of simply conducting the research. He has taken his efforts to the "next level" by sharing that research with the entire peanut industry by means of authoring or co-authoring several professional journal articles and conducting informative and timely training sessions for growers, research and extension specialist, and crop protection industry representatives.

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 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 shall be returned to the nominators and may be resubmitted the following year.

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."

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

From the 2003 meeting, 15 papers were nominated for the Bailey Award competition and nine papers were submitted for actual consideration. These were sent to the committee members for evaluation and the winning paper will be announced at the Friday business meeting. The winning paper is "Improving Shelf Life of Roasted and Salted Inshell Peanuts Using High Oleic Acid Chemistry." R.W. Mozingo, S.F. Okeefe, T.H. Sanders and K.W. Hendrix.

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 at 3:00 p.m., 13 July 2004. Members in attendance were Tom Isleib, Kelly Chenault, and chair Bob Kemerait. Members Brent Bessler and Austin Hagan were not able to attend the meeting, but were contacted later.

Eight students have entered the 2004 competition. Prior to this APRES meeting, electronic copies of the evaluation form used to judge presentations were sent to each of the participating students.

At the conclusion of the student session, it was determined that Damon Smith from North Carolina State University took first place and Sara Gremillion from the University of Georgia took second place.

The current Joe Sugg Committee would like to propose the creation of a second tier of student competition, specifically a "poster contest" for graduate students. It is believed that the additional emphasis on such a session would benefit students within APRES because:

5. Poster presentations are becoming increasingly important at scientific meetings.
6. The quality of presentation of scientific results in a poster format will benefit from the same judging and critique given to oral presentations.
7. The option of a poster presentation would likely increase the participation among students.
8. Students who speak English as a second language would not worry that their accents and difficulty with the spoken language would not detract from the quality of their research presentation.

The Committee has agreed to study this possibility in the coming year and make a report of their findings to the Executive Board in 2005.

Respectfully submitted by,
Bob Kemerait, Chair

COYT T. WILSON DISTINGUISHED SERVICE AWARD REPORT

The Coyt T. Wilson Distinguished Service Committee met in the Llano Room from 1:00 to 2:00 p.m., July 13, in San Antonio, Texas. Committee members present: James Hadden, Pat Phipps, Charles Simpson, John Damicone, David Jordan and Eric Prostko, Chairman.

Two applications for this award were received. Applications were mailed to committee members for voting. Richard Rudolph of Bayer CropScience was chosen the winner.

Respectfully submitted by,
Eric Prostko, Chair

BIOGRAPHICAL SUMMARY OF COYT T. WILSON DISTINGUISHED SERVICE AWARD RECIPIENT

Dr. Richard Rudolph is a native of Kentucky. He earned his B. S. in Agriculture from Murray State University, and his MS and PhD in Crop Science and Crop Physiology, respectively, from the University of Arkansas. Dr. Rudolph has been affiliated with Bayer Corporation since 1974, where he has held various positions ranging from Senior Research Biologist to Regional Development Manager in Atlanta, Kansas City, and Pensacola.

Dr. Rudolph has been an active member of APRES since 1983. He has served the Society as member of the Local Arrangements committee twice and six years on the Coyt T. Wilson Distinguished Service Committee. Three years, he served as the chair of the Coyt T. Wilson Distinguished Service Award Committee. Richard is currently serving as a member of the finance committee and APRES Board of Directors. Richard has presented or co-authored 11 papers in the Plant Pathology and Nematology sessions. Perhaps the most significant contributions Richard has made to APRES are in the area of financial support.

Dr. Rudolph also has served the peanut industry in areas other than APRES. As an Associate member of the American Peanut Shellers Association Board of Directors, he was active in planning and conducting fund raising activities for the Peanut Institute to provide funding in support of research efforts to encourage increased peanut consumption by American consumers. Richard arranged Bayer CropScience funding to partially support a Georgia Peanut Commission pilot program with the fast food industry designed to increase peanut consumption. He has encouraged industry cooperative research projects with University peanut disease control programs and provided financial support to these projects. Through Bayer CropScience, Richard organizes and sponsors an annual meeting of University scientists involved in peanut disease control, providing an opportunity for them to discuss any topic of interest or concern.

Dr. Rudolph for over 30 years has conducted or coordinated research projects on crops common to the Northeast, Southeast, and Southern U.S. In addition, research responsibilities have included tropical agriculture in Puerto Rico, Jamaica, Trinidad, and Guyana. During this time, Richard was directly involved in the development of numerous herbicides, insecticides, and fungicides currently available for southern crops. Research on peanut has focused on disease control and made significant contributions to the development and registration of FOLICUR fungicide to control both foliar and soil borne diseases. In 1994, Dr. Rudolph received the Bayer CropScience Excellence in Research Award in recognition of his success in providing solutions to issues involving the E.P.A. registration of FOLICUR fungicide. Richard also was influential in the introduction of STRATEGO fungicide for foliar diseases. Dr. Rudolph has achieved international recognition in peanut disease control within Bayer CropScience, providing advice to colleagues in Australia, Argentina, and Nicaragua.

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.

Award and Presentation

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

DOW AGROSCIENCES AWARDS COMMITTEE REPORT

The Dow AgroSciences Awards Committee consisted of six members in 2004. They were as follows:

John Baldwin, Chair (2004)	Thomas Lee (2005)
Roy Pittman (2006)	Mike Kubicek (2004)
Rick Brandenburg (2005)	Bo Braxton (Dow AgroSciences 2006)

Nominations were received and found to meet all the guidelines for acceptance. Copies of each nomination were mailed to all committee members for review and scoring. Each committee member voted for the Awards by ranking the nominees from 1st, 2nd, etc. These rankings were sent to the Chair who tabulated the scores. The winners were the nominees with the lowest scores where 1 equaled first place.

The recipient of the 2004 Dow AgroSciences Award for Excellence in Research is Dr. Stanley Fletcher, Department Agricultural and Applied Economics the University of Georgia. The recipient of the Dow AgroSciences Award for Excellence in Education is Dr. Steve L. Brown, Department of Entomology, the University of Georgia. Biographical summaries for each winner is published in the APRES Proceedings and available as press releases.

The committee would like to encourage nomination of qualified APRES members. All members of APRES from all segments of the peanut industry should be considered for nomination for these prestigious awards. The 2004 committee further recommends that qualified nominees not receiving the award be allowed to be considered for one additional year with the current package and have the option to update the application by the deadline if desired. Also the wording on page 121 of the 2001 proceedings "A nominator's submittal letter summarizing the significant professional achievements and their impact on the peanut industry may be submitted with the nomination" should read "must be" instead of "may be". The final recommendation is that the committee would prefer electronic submission of the nominations and supporting letters to the committee Chair for ease of transfer to other committee members.

Respectfully submitted by,
John Baldwin, Chair

BIOGRAPHICAL SUMMARY OF DOW AGROSCIENCES AWARD FOR EXCELLENCE IN RESEARCH RECIPIENT

Dr. Stanley Fletcher is a research economist with the University of Georgia, and is the director for the Center for Peanut Competitiveness.

The foundation that Dr. Fletcher has laid for the economic and policy analysis in peanuts has had an impact on our industry that is both profound and invaluable. Dr. Fletcher has been called many times to Washington, D.C. to present expert testimony or give special counsel on the impact of Trade Agreements and domestic peanut policy on U.S. peanut farmers. His analysis and information has not only been invaluable in dealing with trade negotiations and issues, his work has represented a cornerstone effort in the policy debate in the last several Farm Bills. Dr. Fletcher's research on the tariff impacts during the GATT and NAFTA trade negotiations provided the peanut leadership the critical information needed to convince the U.S. trade negotiators to significantly increase the tariff levels. Without this research, the tariff level was going to be set at a level where the peanut industry that we know today would not have existed after 1996. Dr. Fletcher's recent research on the payment limitation issue provided hard irrefutable data that allowed the peanut farmers to win the debate to keep separate payment limitations for peanuts in the new 2002 Farm Bill. Without this provision, the new peanut program would have been meaningless. His efforts have not only helped Georgia but also the 20,000 plus peanut farmers around the nation. Dr. Fletcher has indeed quite possibly become the world's leading peanut policy analyst. How do you place a value on the work of Dr. Fletcher? It is really simple! Use the value you would place on the importance of peanut production to our nation's peanut growers and the rural economy they support. He has been an avid supporter and participant in APRES and has helped to develop and implement numerous symposia in previous years.

BIOGRAPHICAL SUMMARY OF DOW AGROSCIENCES AWARD FOR EXCELLENCE IN EDUCATION RECIPIENT

Dr. Steve Brown is a Professor and Extension Entomologist with the University of Georgia. He has 23 years of experience in Extension education, 14 of which with responsibility for peanut insect control. He currently serves as Extension Coordinator for the University of Georgia Department of Entomology.

Dr. Brown has supported county-level programs addressing many significant insect problems facing peanut producers. He proposed the concept of the University of Georgia Spotted Wilt Risk Index to help producers deal with the thrips-vectored virus that began to threaten the Georgia peanut industry in the mid-1990's. The concept grew into a multi-disciplinary, multi-state, research and extension program that has successfully identified high-risk production practices and shown growers how to avoid them.

Pod-feeding insects such as wireworms, southern corn rootworms, burrower bugs and lesser cornstalk borers reduce yields and increase the threat of aflatoxin contamination. Dr. Brown has worked to identify the conditions that favor soil insect problems and determine when soil insecticide applications are

justified. His efforts to develop a new mobile soil insect sampling machine have improved the difficult task of collecting soil insect data.

Insect problems do not stop with peanut harvest but continue into the storage environment. Dr. Brown is one of the few entomologists that work on stored peanut entomology. He has been active in training employees of peanut shelling companies and commercial pesticide applicators in effective integrated pest management and pesticide application techniques. He has also done extensive training on warehouse fumigation and is currently helping shellers comply with new federal regulations regarding warehouse fumigation.

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. 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.

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.

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

Members present: Mark Burow, chair, Mac Birdsong, Max Grice, Yolanda López, Emory Murphy, Victor Nwosu, Howard Valentine.

Others present: Michael Baring, Todd Baughman, Bill Brown, Chris Butts, Terrie Cea, Rodney Coe, Pat Donahue, Jim Elder, R. Marie Fenn, Kim Franke, Michael Franke, Frank Garner, Keith Hendrix, Corley Holbrook, Mike Jackson, Otis Lee Johnson, Julie Marshall, Kim Moore, Walt Mozingo, Shelly Nutt, Victor Nwosu, Steve Ortloff, Roy Pittman, Dave Prybylowski, Chuck Rowland, Mike Schubert, Jimmy Seay, Charles Simpson, Jack Simpson, Clifton Stacy, Minghui Sun, Barry L. Tillman, Calvin Trostle, Justin Tuggle, Larry Vance.

The Peanut Quality Committee met from 3:00 p.m. to 5:40 p.m. on July 13, 2004. The Committee hosted a "Peanut Seed Quality Summit" with 40 people in attendance. Six invited speakers gave views on current testing programs, and needs of consumers and manufacturers. Two speakers also discussed germination quality. The importance of edible seed quality and stability of quality were emphasized. An industry consensus was presented that quality parameters (flavor, oil consistency, blanchability, seed size distribution) similar to the historical average for Florunner are acceptable to industry. A range of values was requested and may be forthcoming. Desired values for oil composition and sugar content were also given.

The quantity and types of seed quality data taken in the UPPT test were also discussed for the needs of breeders, industry, and the USDA testing labs. A survey was collected from breeders prior to the meeting, and from industry during the meeting for the purpose of tabulating their needs. It was noted that the time and effort required for the current numbers of samples (approx. 200 to 300 per year for the past 3 years) prevented an increase in the number of samples to 500 per year. The care taken for flavor analysis was commended. The possibility of shifting resources from some tests to flavor analysis was discussed, but this could only be accomplished if a second flavor panel could be set up. The survey results will be tabulated for the basis of a future recommendation.

Respectfully submitted by,
Mark Burow, Chair

PROGRAM COMMITTEE REPORT

The Texas APRES membership worked to develop the program for the 2004 annual meeting. Local arrangements were headed up by Mark Black and technical program was headed up by Peter Dotray. Shelly Nutt was instrumental in coordinating speakers for the general session. APRES Executive Officer, Ron Sholar and office administrator, Irene Nickels, provided invaluable assistance. Todd Baughman and Peter Dotray provided the technical expertise for the initiation of Powerpoint presentations. Barbara Lee, Dimple Grichar, Linda Sholar and others staffed the registration desk and spouse programs.

Bayer CropScience and BASF provided funding for the Wednesday reception/meal while Dow AgroSciences supported the Friday morning Awards Breakfast. Syngenta provided funding for the breaks. The ice cream social was graciously funded by the various companies listed on the inside cover of the program. Also, Richard Rudolph for the tireless solicitation of funds, state peanut producer groups and companies provided peanut products. A big "thank you" to all these individuals and companies for their support.

Registration included 227 members and 153 spouse/children. 90 technical papers and 18 posters were presented.

Respectively submitted by:
James Grichar

2004 PROGRAM

Contributors to 2004 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/Meal
BASF – Wednesday Reception/Meal
Dow AgroSciences – Awards Breakfast
Syngenta - Breaks

Ice Cream Social

Amvac
Chem Nut Inc
Circle One Global Inc
Coastal AgroBusiness Inc
Gowan Company
Gustafson LLC
Helena Chemical Company
J Leek & Associates
Nichino America Inc
Nitragin Inc
Peanut Farmer Magazine
Peanut Grower Magazine
Sipcam Agro USA, Inc
Triangle Company
United Phosphorous, Inc
Valent U.S.A.
Vicom

Products

Alabama Peanut Producers Association
Anderson's Peanuts
Becker Underwood
BestFoods
Birdsong Peanuts
Borden Peanut Company, Inc
Ferrara Pan Candy Company
Florida Peanut Producers Association
Georgia Peanut Commission
Golden Peanut Company
Griffin, LLC
Hershey Foods Corporation
John B. Sanfilippo & Son, Inc
J.M. Smucker Company
M&M/Mars
Nature Kist Snacks
Nestle USA
North Carolina Peanut Growers Association
Oklahoma Peanut Commission
Sessions Company, Inc
Severn Peanut Company, Inc
Southern Peanut Farmers Federation
Tara Foods
Texas Peanut Producers Board
The Clint Williams Company
The Planters Company
The Procter & Gamble Company
Tom's Foods, Inc
Virginia Peanut Growers Association
Western Peanut Producers Association

**THIRTY-SIX ANNUAL MEETING
AMERICAN PEANUT RESEARCH AND EDUCATION
SOCIETY
San Antonio, Texas
JULY 13-16, 2004**

BOARD OF DIRECTORS

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**PROGRAM COMMITTEE
James Grichar, Chair**

Local Arrangements

Mark Black, Chair	Bill Odle
Michael Baring	Charles Simpson
A. J. Jaks	Justin Tuggle
T. A. "Chip" Lee, Jr.	Kurt Warnken
Shelly Nutt	

Technical Program

Peter Dotray, Chair	Vernon Langston
Scott Asher	Shelly Nutt
Todd Baughman	Mike Schubert
Brent Besler	Jim Starr
Mark Burow	Calvin Trostle

Spouses Program

Barbara Lee, Co-Chair
 Dimple Grichar, Co-Chair

Tuesday, July 13

**APRES Golf Tournament
Course**

8:00 am

Olympia Hills Golf

Committee, Board, and Other Meetings

8:00-12:00	Crops Germplasm Committee	Live Oak
12:00- 7:00	APRES Registration	Los Rios Foyer
1:00- 5:00	Spouses' Hospitality	Chula Vista
1:00- 5:00	Poster Set-up	Medina
1:00- 5:00	Exhibitor Setup.. Los Rios Foyer/Spectradyne Wall/Regency East	Ballroom Foyer
1:00- 2:00	Associate Editors, Peanut Science.....	Nueces
1:00- 2:00	Site Selection Committee	Frio
1:00- 2:00	Fellows Committee.....	Blanco
1:00- 2:00	Coyt T. Wilson Distinguished Service Award	Llano
2:00- 3:00	Publications and Editorials Committee	Nueces
2:00- 3:00	Public Relations Committee	Frio
2:00- 3:00	Bailey Award Committee	Blanco
2:00- 3:00	Dow AgroSciences Awards Committee	Llano
3:00- 6:30	Presentation Loading	Los Rios Foyer
3:00- 4:00	Nominating Committee.....	Nueces
3:00- 4:00	Joe Sugg Graduate Student Award Committee	Frio
3:00- 5:30	Peanut Quality Committee	Blanco
4:00- 5:00	Finance Committee	Llano
7:00-11:00	Board of Directors	Live Oak
7:00- 9:00	Ice Cream Social.....	Regency Ballroom East

Wednesday, July 14

8:00- 4:00	APRES Registration	Los Rios Foyer
8:00- 5:00	Spouses' Hospitality	Chula Vista
8:00- 9:45	General Session.....	Regency Ballroom East
9:45-10:00	Break	Los Rios Foyer
9:45- 5:00	Poster Session	Medina
10:00-11:15	Entomology	Blanco/Llano
10:00-12:00	Graduate Student Competition	Nueces/Frio
1:15- 3:00	Breeding, Biotechnology, and Genetics I	Blanco/Llano
1:30- 3:00	Weed Science	Nueces/Frio
3:00- 3:30	Break	Los Rios Foyer
3:30- 5:15	Breeding, Biotechnology, and Genetics II	Blanco/Llano
3:30- 5:00	Weed Science Symposium	Nueces/Frio
5:00- 6:00	Presentation Loading	Los Rios Foyer
6:00- 9:00	Dinner	Regency Ballroom East Bayer CropScience and BASF

Thursday, July 15

8:00-12:00	APRES Registration	Los Rios Foyer
8:00-12:00	Spouses' Hospitality	Chula Vista
8:00- 8:45	Breeding, Biotechnology, and Genetics III	Rio Grande Center
8:45-10:15	Processing and Utilization	Rio Grande Center
8:30- 9:30	Extension Techniques and Technology.....	Rio Grande West
8:15- 10:00	Economics I.....	Rio Grande East
9:45- 11:00	Poster Session with authors	Medina
10:15-10:30	Break	Los Rios Foyer
10:30-12:00	Plant Pathology and Nematology I	Rio Grande Center
10:30-11:45	Extension Techniques & Technology/Education for Excellence	Rio Grande West
10:30-11:15	Economics II.....	Rio Grande East
1:15- 3:00	Plant Pathology and Nematology II	Rio Grande Center
1:30- 2:45	Physiology and Seed Technology/Harvesting, Curing, Shelling, and Handling	Rio Grande East
1:30- 3:00	Production Technology.....	Rio Grande West
3:00- 3:30	Break	Los Rios Foyer
3:30- 5:00	Plant Pathology and Nematology III/Mycotoxins.....	Rio Grande Center

Dinner on your own

Friday, July 16

7:00-8:00	Awards Breakfast	Regency Ballroom West Dow AgroSciences
8:00-10:00	APRES Awards Ceremony and Business Meeting	Regency Ballroom West
10:00-12:00	Peanut CRSP Project.....	Directors Room

Wednesday, July 14 - Morning Regency Ballroom East

8:00	Call to Order	James Grichar APRES President-Elect
8:05	Welcome to Texas	Shelly Nutt Executive Director, Texas Peanut Producers Board, Lubbock
8:15	A Grower's Perspective on Growing Peanuts in Texas.....	Ted Higginbottom Peanut Grower, Seminole
8:45	Thinking Outside the Shell	Raffaella Marie Fenn President and Managing Director, National Peanut Board
9:15	Announcements.....	Peter Dotray Chair, Technical Program Mark Black Chair, Local Arrangements

Morning

ENTOMOLOGY

Blanco/Llano

Moderator: Steve Brown, University of Georgia, Tifton, GA

- 10:00 (1) Evaluation of Peanut Production Practices on the Incidence of *Tomato spotted wilt virus*. R.L. BRANDENBURG*, B.M. ROYALS, Department of Entomology, North Carolina State University, Raleigh, NC 27695-7613, D.L. JORDAN, Department of Crop Science, North Carolina State University, Raleigh, NC 27695-7620 and D.A. HERBERT, JR. Department of Entomology, Virginia Polytechnic Institute and State University, Suffolk, VA 23437.
- 10:15 (2) Effect of Insecticide Treatments on Incidence of *Tomato spotted wilt virus*, and Soil Insect Studies in Virginia Type Peanut. D.A. HERBERT, JR.* , S. MALONE, and P.M. PHIPPS. Department of Entomology and Department of Plant Pathology, Physiology, and Weed Science, Virginia Tech, Tidewater Agricultural Research and Extension Center, Suffolk, VA 23437.
- 10:30 (3) Evaluation of Peanut Cultivars for Three-Cornered Alfalfa Hopper Damage and Implications on the Reproductive Rate, Use of Foliar Insecticides, Yield and Southern Stem Rot Incidence. S.L. BROWN*, S. KOMAR, W. DUFFIE, and N. EROGLU. Department of Entomology, University of Georgia, Tifton, GA 31793.
- 10:45 (4) Effect of Kernel Feeding by a Burrower Bug, *Pangaeus bilineatus* (Say), on Peanut Flavor and Oil Quality. J.W. CHAPIN*, T.H. SANDERS, and J.S. THOMAS. Department of Entomology, Soils, and Plant Sciences, Clemson University, Edisto REC, 64 Research Road, Blackville, SC 29817. USDA, ARS, Market Quality and Handling Research Unit, Box 7624, North Carolina State University, Raleigh, NC 27695-7624.
- 11:00 (5) Field Screening for Insect Resistance Among Peanut Genotypes. W.D. BRANCH* and J.W. TODD. Department of Crop and Soil Sciences and Entomology, respectively, University of Georgia, Coastal Plain Experiment Station, Tifton, GA 31793-0748.

GRADUATE STUDENT COMPETITION

Nueces/Frio

Moderator: Bob Kemerait, University of Georgia, Tifton, GA

- 10:00 (6) Biological Control of *Sclerotinia minor* in Peanut with

Coniothyrium minitans. D.E. PARTRIDGE*, T.B. SUTTON, D.L. JORDAN, and V.L. CURTIS. Departments of Plant Pathology and Crop Science, North Carolina State University, Raleigh, NC 27695.

- 10:15 (7) Infection Cushion Formation on Weed Species and Peanut following Inoculation with *Sclerotinia minor*. C.B. MEADOR* and H.A. MELOUK. Department of Entomology and Plant Pathology and USDA-ARS. D.S. MURRAY. Department of Plant and Soil Science, Oklahoma State University, Stillwater, OK 74078.

- 10:30 (8) Predicting Incidence of Sclerotinia Blight in North Carolina from Modeled Weather Data. D.L. SMITH* and B.B. SHEW. Department of Plant Pathology, NC State University, Raleigh, NC 27695.

- 10:45 (9) Morphological Characterization of *Arachis pintoi* Germplasm. M.A. CARVALHO*, K.H. QUESENBERRY, Agronomy Department, The University of Florida, Gainesville, FL 32611-0300.

- 11:00 (10) Development of Peanut Varieties with Drought and Heat Tolerance with the Use of Molecular Methods. J.R. WALLACE*, J.J. BURKE, A.M. SCHUBERT, M.D. BUROW, Dept. of Plant and Soil Science, Texas Tech Univ., Lubbock, TX 79409; D.L. ROWLAND, National Peanut Research Laboratory, USDA-ARS, Dawson, GA 31742; J. AYERS, D. PORTER, Texas Agric. Experiment Station, A&M University, Lubbock TX 79403; and C. HOLBROOK, U.S. Department of Agriculture, ARS-SAA, Tifton, GA 31793.

- 11:15 (11) Economic Analysis of Integrated Disease Management of Peanut. E.G. CANTONWINE*, A.K. CULBREATH, University of Georgia, Department of Plant Pathology, Tifton, GA 31793; and N.B. SMITH, University of Georgia, Department of Agricultural and Applied Economics, Tifton, GA 31793.

- 11:30 (12) Effects of Irrigation Timing on the Redistribution of Tebuconazole and Azoxystrobin on Peanut. J.E. WOODWARD* and T.B. BRENNEMAN, Department of Plant Pathology, The University of Georgia, Tifton, GA 31794.

- 11:45 (13) Investigation of New Breeding Lines and Tillage Practices on Management of Peanut Rust (*Puccinia arachidis*). S. GREMILLION*, A. CULBREATH, J. TODD, Univ. of Georgia, Coastal Plain Experiment Station, Tifton, GA, R. PITTMAN, USDA-ARS, Georgia Experiment Station, Griffin, GA, and T. KUCHARAK, Univ. of Florida, Gainesville, FL.

Afternoon

BREEDING, BIOTECHNOLOGY, AND GENETICS I Blanco/Llano

Moderator: Michael Baring, Texas A&M University, College Station, TX

- 1:15 (14) Development and Validation of CAPS Markers for the High Oleic Trait in Peanuts. Y. LÓPEZ* and M.D. BUROW. Texas Agricultural Experiment Station, Texas A&M University, Lubbock, TX 79403.
- 1:30 (15) Transfer of *Medicago* EST-SSRs to Peanut for Germplasm Evaluation and Cross-species Cloning. M.L. WANG, N. BARKLEY, R. DEAN, C. HOLBROOK, and R.N. PITTMAN*. USDA-ARS, Plant Genetic Resources Conservation Unit, Griffin, GA 30223, University of Georgia, Plant Genetic Resources Conservation Unit, Griffin, GA 30223, and USDA-ARS, Coastal Plain Experiment Station, Tifton, GA 31793.
- 1:45 (16) Genetic Engineering of Peanut for Disease Resistance. P. OZIAS-AKINS*, Y. CHU, C. NIU, X.Y. DENG, H. YANG, and S. HAZRA, Department of Horticulture, The University of Georgia Tifton Campus, Tifton, GA 31793-0748.
- 2:00 (17) Identification of Molecular Markers Associated with *Tomato spotted wilt virus* (TSWV) Resistance in a Genetic Linkage Map of *Arachis kuhlmannii* x *A. diogeni*. S.R. MILLA*, S.P. TALLURY, T.G. ISLEIB, and H.T. STALKER. Dept. of Crop Science, Box 7629, N.C. State Univ., Raleigh, NC 27695.
- 2:15 (18) WITHDRAWN.
- 2:30 (19) Shade Avoidance Response as a Tool in Peanut Breeding. I.S. WALLERSTEIN*, and S. KAHN, Department of Field Crops and Natural Resources, I. WALLERSTEIN Department of Ornamental Horticulture, Agricultural Research Organization the Volcani Center, P.O.B. 6, Bet Dagan, 50 250 Israel.
- 2:45 (20) Characterization of Five Seed-Proteins Missing in One Peanut Genotype and the Allergic Nature of these Proteins. B.Z. GUO*, X.Q. LIANG, USDA-ARS, Crop Protection and Management Research Unit, Tifton, GA 31793; S.J. MALEKI, S.Y. CHUNG, USDA-ARS, Southern Regional Research Center, New Orleans, LA 70709; C.C. HOLBROOK, USDA-ARS, Crop Genetics and Breeding Research Unit, Tifton, GA 31793; P. OZIAS-AKINS, University of Georgia, Coastal Plain Experiment Station, Tifton, GA 31793.

WEED SCIENCE

Nueces/Frio

Moderator: Todd Baughman, Texas Cooperative Extension and Texas Agricultural Experiment Station, Vernon, TX

- 1:30 (21) Weed Management in Twin-Row vs. Conventional Row Spacing Peanut. B.J. BRECKE*, University of Florida, Jay, FL.
- 1:45 (22) Physiological Behavior of Root-Absorbed Flumioxazin in Peanut, Ivyleaf Morningglory, and Sicklepod. J.W. WILCUT*, A.J. PRICE, and S.B. CLEWIS, Crop Science Department, North Carolina State University, Raleigh, NC 27695-7620; and J.R. CRANMER, Valent USA Corp., Cary, NC 27511.
- 2:00 (23) Strongarm Applied Postemergence in Georgia Peanut. E.P. PROSTKO*, Department of Crop & Soil Sciences, The University of Georgia, Tifton, GA 31793; J.T. FLANDERS, Grady County Extension Service, Cairo, GA 39828; S. KOMAR, Randolph County Extension Service, Cuthbert, GA 39840; and E. HARRISION, Mitchell County Extension Service, Camilla, GA 31730.
- 2:15 (24) Addressing Compatibility Issues Associated with Agrichemicals Applied to Peanut. S. HANS, D. JORDAN*, J. WILCUT, and A. YORK, Department of Crop Science, North Carolina State University, Raleigh, NC 27695; and D. MONKS, Department of Horticulture, North Carolina State University, Raleigh, NC 27695.
- 2:30 (25) Spanish Peanut Recrop Tolerance to Herbicides Applied Preemergence to Cotton. T.A. BAUGHMAN* and P.A. DOTRAY, Texas Cooperative Extension, Vernon and Texas Tech University, Lubbock, TX.
- 2:45 (26) Herbicide Reduced Rates for Weed Control in Peanut. P.A. DOTRAY*, T.A. BAUGHMAN, and W.J. GRICHAR. Texas Tech University, Texas Cooperative Extension, and Texas Agricultural Experiment Station, Lubbock, Vernon, and Beeville, TX.

3:00 Break

BREEDING, BIOTECHNOLOGY, AND GENETICS II

Blanco/Llano

Moderator: Mark Burow, Texas Agricultural Experiment Station, Lubbock, TX

- 3:30 (27) Development of a Core Collection of Peanut Germplasm in China. H. JIANG, B. LIAO, N. DUAN, Oil Crops Research Institute of Chinese Academy of Agricultural Sciences, Wuhan,

Hubei Province, 430062, China, X.Q. LIANG, Crop Research Institute of Guangdong Academy of Agricultural Sciences, Guangzhou, Guangdong Province, 510640, China, C. HOLBROOK*, and B. GUO, ARS-USDA, Coastal Experimental Station, Tifton, GA 31793.

- 3:45 (28) Progress Towards Development of Early-Maturing Peanuts. M.D. BUROW*, Y. LOPEZ, M.R. BARING, J.L. AYERS and C.E. SIMPSON. Texas Agricultural Experiment Station, Texas A&M University, Lubbock, TX 79403; Department of Soil & Crop Sciences, College of Agriculture and Life Sciences, Texas A&M University, College Station, TX 77843; and Texas Agricultural Experiment Station, Texas A&M University, Stephenville, TX 76401.
- 4:00 (29) Comparison of Three Techniques for Selection of a Multiple Disease Resistant Peanut. M.R. BARING*, Soil and Crop Sciences Department, Texas A&M University, College Station, TX 77843-2474; C.E. SIMPSON, Texas Agricultural Experiment Station, Stephenville, TX 76401; H.A. MELOUK, USDA, Stillwater, OK 74078; M.C. BLACK, TAMU Texas Cooperative Extension, Uvalde, TX 78802-1849.
- 4:15 (30) A Program of Selection for Multiple Disease Resistance. T.G. ISLEIB*, S.R. MILLA, S.C. COPELAND, and J.B. GRAEBER. Dept. of Crop Science, Box 7629, N.C. State Univ., Raleigh, NC 27695.
- 4:30 (31) Screening Peanut Germplasm for Resistance to Aflatoxin Production by *Aspergillus flavus*. H.Q. XUE*, T.G. ISLEIB, G.A. PAYNE, H.T. STALKER, and G. OBRIAN, Dept. of Crop Science, Box 7629, N.C. State Univ., Raleigh, NC 27695-7629 and Dept. of Plant Pathology, Box 7567, N.C. State Univ., Raleigh, NC 27695-7567.
- 4:45 (32) Performance of Senegalese Seed-Dormant Peanut Lines in Burkina Faso. P. SANKARA, Département de Phytopathologie, Université de Ouagadougou, Burkina Faso, O. NDOYE*, Institut Sénégalais de Recherches Agricoles, ISRA-CNRA Bambey, Senegal, D. ILBOUDO, Département de Phytopathologie, Université de Ouagadougou, Burkina Faso, M. BUROW, Texas A&M Univ. Agric. Research & Extension Center, Lubbock, TX 77403, O.D. SMITH, Department of Soil and Crop Sciences, Texas A&M University, College Station, TX 77843, and C. E. SIMPSON, Texas Agric. Experiment Station, Stephenville, TX 76401.
- 5:00 (33) Selection for Resistance to Early Leaf Spot of Peanut Lines Derived from Crosses Between West African and U.S. Germplasm. P. SANKARA, Département de Phytopathologie, Université de Ouagadougou, Burkina Faso, O. NDOYE*, Institut Sénégalais de Recherches Agricoles, ISRA-CNRA Bambey,

Sénégal, B.M. ZAGRE, Institut de l'Environnement et de Recherches Agronomique, Burkina Faso, M. BUROW, Texas A&M Univ. Agric. Research & Extension Center, Lubbock, TX 77403, O.D. SMITH, Department of Soil and Crop Sciences, Texas A&M University, College Station, TX 77843, and C.E. SIMPSON, Texas Agric. Experiment Station, Stephenville, TX 76401.

- 5:15 (34) Selection from Valencia by Spanish High-Oleic Lines. A. MUITIA*, Department of Plant and Soil Sciences, Texas Tech University, Lubbock, TX 79409, and Instituto Nacional de Investigaç o Agronomica, Lichinga, Mozambique; M.D. BUROW, Texas Agricultural Experiment Station, Texas A&M University, Lubbock, TX 79403, and Department of Plant and Soil Sciences, Texas Tech University, Lubbock, TX 79409; Y. LÓPEZ, M.R. BARING, J. AYERS, Texas Agricultural Experiment Station, Texas A&M University, Lubbock, TX 79403; N. PUPPALA, Agricultural Sciences Center, New Mexico State University, Clovis, NM 88008; and O.D. SMITH, Department of Soil and Crop Sciences, Texas A&M University, College Station, TX 77843.

WEED SCIENCE SYMPOSIUM: WEED CONTROL ACROSS THE PEANUT BELT

Nueces/Frio

Moderator: Peter Dotray, Texas Tech University, Texas Cooperative Extension, and the Texas Agricultural Experiment Station, Lubbock, TX

- 3:30 (35) WITHDRAWN.
- 3:50 (36) Peanut Weed Control in the Southeast – An Overview. E.P. PROSTKO*, W.C. JOHNSON, III, and B.J. BRECKE, University of Georgia Rural Development Center, Tifton; USDA-ARS, Tifton; and University of Florida, Jay, FL.
- 4:10 (37) Peanut Weed Control in the Southwest – An Overview. W.J. GRICHAR*, P.A. DOTRAY, and T.A. BAUGHMAN, Texas A&M Research and Extension Center, Beeville, Lubbock, and Vernon, TX.
- 4:30 Discussion.

Thursday Morning

BREEDING, BIOTECHNOLOGY, AND GENETICS III **Rio Grande Center**

Moderator: Naveen Puppala, New Mexico State University, Clovis, NM

- 8:00 (38) Evaluating the Performance of Bulgarian Peanut Lines for Yield and Disease Resistance. N. PUPPALA* and S.G. DELIKOSTADINOV. New Mexico State University, Agricultural Science Center at Clovis, Star Route Box 77, Clovis, NM 88101; Institute for Plant Genetic Resources, Sadovo, Bulgaria.
- 8:15 (39) Response of New Peanut Cultivars to Seeding Rates and Row Patterns. B.L. TILLMAN*, D.W. GORBET, A.K. CULBREATH, and J.W. TODD. University of Florida, North Florida Research and Education Center, Marianna, FL 32446. The University of Georgia, Coastal Plain Experiment Station, Tifton, GA, 31793.
- 8:30 (40) WITHDRAWN.

PROCESSING AND UTILIZATION **Rio Grande Center**

Moderator: Harold Pattee, USDA-ARS SAA, Raleigh, NC

- 8:45 (41) Fruity/Fermented Odorants in High Temperature Cured Roasted Peanuts. J. DIDZBALIS*, K.A. RITTER, A.C. TRAIL, F.J. PLOG. Masterfoods USA, 800 High Street, Hackettstown, NJ 07840.
- 9:00 (42) Color Sorting to Remove Fruity Fermented Off-flavor in Roasted Peanuts. M. MEHROTRA, Department of Food Science, North Carolina State University, Raleigh, NC 27695-7624; T.H. SANDERS, and K.W. HENDRIX*, USDA, ARS, Raleigh, NC 27695-7624.
- 9:15 (43) Comparison of Peanut Flavor and Shelf-life Characteristics of Peanuts from Argentina, China and the United States. T.H. SANDERS, L.L. DEAN*, and K.W. HENDRIX, USDA, ARS, Raleigh, NC 27695-7624.
- 9:30 (44) Effect of Power Ultrasound on Surface Lipid Removal of Roasted Peanuts. P. WAMBURA, W. YANG* and L. WILLIAMS. Department of Food and Animal Sciences, Alabama A&M University, Normal, AL 35762.

- 9:45 (45) Trends in Sensory Quality of Roasted Peanuts Across 15 Years (1986-2000). H.E. PATTEE*, T.G. ISLEIB, and D.W. GORBET. USDA-ARS and Crop Science Dept., N.C. State Univ., Raleigh, NC 27695-7625; North Florida Research & Education Center, Marianna, FL 32446.
- 10:00 (46) Properties of Dried Plum Supplemented Peanut Muffins Fortified with Calcium. M.J. HINDS*, Nutritional Sciences Department; T. BOWSER, S. REILLY, Food and Agricultural Products Research and Technology Center, Oklahoma State University, Stillwater, OK 74078.
- 10:15 **Break**

EXTENSION TECHNIQUES AND TECHNOLOGY

Rio Grande West

Moderator: Joel Faircloth, Virginia Tech, Suffolk, VA

- 8:30 (47) Peanuts in Virginia: The Dilemma and the Future. J.C. FAIRCLOTH*, Crop, Soil and Environmental Sciences, Virginia Tech, Suffolk, VA 23437.
- 8:45 (48) Continued Investigations on the Control of Tropical Spiderwort. J.T. FLANDERS* and E.P. PROSTKO. Grady County Cooperative Extension Service, Cairo, GA 39828; and Department of Crop and Soil Sciences, University of Georgia, Tifton, GA 31793.
- 9:00 (49) Fungicide Treatment Effects on the Incidence of Soilborne Diseases in Peanut. P.D. WIGLEY*, Calhoun County Extension Service, University of Georgia, Morgan, GA 39866; S.J. KOMAR, Randolph County Extension Service, University of Georgia, Cuthbert, GA 39840; and R.C. KEMERAIT, Department of Plant Pathology, University of Georgia, Tifton, GA 31793-0748.
- 9:15 (50) CBR Response to Metam Sodium and Peanut Cultivar in Southwest Georgia. T.W. MOORE*, Miller County Cooperative Extension Service, Colquitt, GA 39837; and T.B. BRENNEMAN, Coastal Experiment Station, UGA, Tifton, GA 31793.

ECONOMICS I

Rio Grande East

Moderator: Marshall Lamb, USDA-ARS, National Peanut Research Laboratory, Dawson, GA

- 8:15 (51) What Can a Producer Really Pay for Land Rent? T.D. HEWITT*, Department of Food and Resource Economics, University of Florida, North Florida Research and Education Center, Marianna,

FL 32446-7906; and T.D. DAVIS, Department of Applied Economics and Statistics, Clemson University, Clemson, SC 29634-0313.

- 8:30 (52) Impact of Commodity Price on Profitability in Irrigated and Non-Irrigated Cropping Systems in the Southeast. M.C. LAMB*, D.L. ROWLAND, R.B. SORENSEN, and C.L. BUTTS. USDA, ARS, National Peanut Research Laboratory, Dawson, GA 39842.

- 8:45 (53) The Economics of Conservation Tillage and Row Spacing. N.B. SMITH *, V. SUBRAMANIAM, S.M. FLETCHER, J.A. BALDWIN, J.P. BEASLEY, JR. Department of Agricultural and Applied Economics, The University of Georgia, Tifton, GA 31793, Department of Agricultural and Applied Economics, National Center for Peanut Competitiveness, The University of Georgia, Griffin, GA 30223, Department of Crop and Soil Sciences, The University of Georgia, Tifton, GA 31793.

- 9:00 (54) Maximum Bid Price for Peanut Digger-Inverters and Combines. T.D. DAVIS *, Department of Applied Economics and Statistics, Clemson University, Clemson, SC 29634-0313; and T.D. HEWITT, Department of Food and Resource Economics, University of Florida, North Florida Research and Education Center, Mariana, FL 32445-7906.

- 9:15 (55) Peanut Acreage Shift: How has the Farm Security and Rural Investment Act of 2002 Impacted the Distribution of Planted Acres? A.E. McCORVEY*, A.S. LUKE-MORGAN, Agricultural and Applied Economics Department, National Center for Peanut Competitiveness, The University of Georgia, Tifton, GA 31793-1209; S.M. FLETCHER, Agricultural and Applied Economics Department, National Center for Peanut Competitiveness, The University of Georgia, Griffin, GA 30223-1797; and N.B. SMITH, Agricultural and Applied Economics Department, The University of Georgia, Tifton, GA 31793-1209.

- 9:30 (56) Examining the Structure of Awareness of Aflatoxin in Groundnuts Among Ghanaian Health and Agricultural Professionals and its Influence on their Actions. C.M. JOLLY* and B. BAYARD, R.T. AWUAH, and S.C. FIALOR, Auburn University, Auburn, AL and Kwame Nkrumah University of Science and Technology, Kumasi, Ghana.

- 9:45 (57) Producers Health Perception of Groundnut AF in Benin. S. VODOUHE*, B. BAYARD, C.M. JOLLY, University of the Republic of Benin, Cotonou, Benin and Auburn University, Auburn, AL.

PLANT PATHOLOGY AND NEMATOTOLOGY I

Rio Grande Center

Moderator: Hassan Melouk, USDA-ARS, Stillwater, OK

- 10:30 (58) Comparison of Peanut Yields Following Applications of the Sclerotinia Blight Control Chemicals Omega 500 (Fluazinam) and Endura (Boscalid). M.G. JENNINGS* and T.A. LEE, JR., Texas Cooperative Extension, Department of Plant Pathology and Microbiology, Texas A&M University System, Stephenville, TX 76401.
- 10:45 (59) Effect of *Sclerotinia minor* Infection Location on the Peanut Plant on Plant Productivity. K.D. CHENAULT* and H.A. MELOUK. USDA-ARS, Plant Science Research Laboratory, Stillwater, OK 74075.
- 11:00 (60) WITHDRAWN.
- 11:15 (61) Responses of Peanut Cultivars to Fluazinam and Boscalid for Control of Sclerotinia Blight. J.P. DAMICONE*, K.E. JACKSON, Dept. of Entomology and Plant Pathology, and K.E. DASHIELL, Dept. of Plant and Soil Sciences, Oklahoma State University, Stillwater, OK 74078-3033.
- 11:30 (62) Oxalic Acid Production by Isolates of *Sclerotium rolfsii* and their Pathogenicity on Peanut. C.N. SAUDE, H.A. MELOUK*, K.D. CHENAULT and C.B. MEADOR. Department of Entomology and Plant Pathology, Oklahoma State University and USDA-ARS, Stillwater, OK 74078.
- 11:45 (63) Absence of Single Nucleotide Polymorphisms among Restriction Fragment Length Polymorphisms Identified by R2430E. H. YANG, M.V. KOLOMIETS, and J.L. STARR*, Department of Plant Pathology and Microbiology, Texas A&M University, College Station, TX 77843.

EXTENSION TECHNIQUES AND TECHNOLOGY/EDUCATION FOR EXCELLENCE

Rio Grande West

Moderator: Richard Rudolph, Bayer CropScience, Pensacola, FL

- 10:30 (64) Peanuts in Virginia: A Needed Premium. G.T. ROUNTREE*, Associate Extension Agent, Virginia Cooperative Extension, Isle of Wight, VA 23397.

- 10:45 (65) Overview of Texas Cooperative Extension IPM Programs for High Plains Peanut Production. K.T. SIDERS*, Extension Agent – IPM, Texas Cooperative Extension, Hockley and Cochran Counties, TX.
- 11:00 (66) Nematode Management Trials in Florida Peanuts Without Rotation. W.D. THOMAS*, University of Florida, Columbia County Cooperative Extension Service, Lake City, FL 32025.
- 11:15 (67) Interactions of Tillage and Rotation in Peanut-Based Cropping Systems. C. TYSON*, North Carolina Cooperative Extension Service, Nashville, NC 27856; D. JORDAN and D. JOHNSON, Department of Crop Science, North Carolina State University, Raleigh, NC 27695; S. BARNES, Peanut Belt Research Station, NCDA&CS, Lewiston-Woodville, NC 27849; C. BOGLE, Upper Coast Plain Research Station, NCDA&CS, Rocky Mount, NC 27801; G. BULLEN, Department of Agricultural and Resource Economics, North Carolina State University, Raleigh, NC 27695; and D. PARTRIDGE, Department of Plant Pathology, North Carolina State University, Raleigh, NC 27695.
- 11:30 (68) Advisory Index for Transitioning from Conventional to Reduced Tillage Peanut. F. WINSLOW*, North Carolina Cooperative Extension Service, Plymouth, NC 27962; D. JORDAN, R. BRANDENBURG, B. SHEW, and G. NADERMAN, North Carolina State University, Raleigh, NC 27695; and S. BARNES and C. BOGLE, North Carolina Department of Agriculture and Consumer Services, Raleigh, NC 27607.

ECONOMICS II

Rio Grande East

Moderator: Marshall Lamb, USDA-ARS, National Peanut Research Laboratory, Dawson, GA

- 10:30 (69) Economic and Financial Analysis of Peanut Production in Bulgaria. N. BENCHEVA* C.M. LIGEON, S. DELIKOSTADINOV, N. PUPPALA, and C.M. JOLLY Agricultural University in Podiv, Bulgaria, Auburn University at Montgomery Institute of Plant Genetic Resources in Sadavo, Bulgaria, New Mexico State University, Clovis, NM Auburn University, Auburn, AL
- 10:45 (70) Benin Farmers' Beliefs of Aflatoxin in Groundnuts: Scale Measurement and Effects of Socioeconomic Factors. C.M. JOLLY*, B. BAYARD, and S. VODOUHE, Auburn University, Auburn, AL, and University of the Republic of Benin, Cotonou, Benin.
- 11:00 (71) Production Function for Peanuts in Bulgaria. C.M. LIGEON*, N. BENCHEVA, S. DELIKOSTADINOV, N. PUPPALA, C.M. JOLLY,

Auburn University at Montgomery, Agricultural University in Plodiv, Bulgaria, Institute of Plant Genetic Resources in Sadava, Bulgaria, New Mexico State University, Clovis, NM, Auburn University, Auburn, AL.

- 11:15 (72) Risk Management Strategy for a Producer Shelling Cooperative. R.J. BYRNE, Department of Agricultural and Applied Economics, The University of Georgia, Athens, GA 30602-7509, N.B. SMITH, Department of Agricultural and Applied Economics, The University of Georgia, Tifton, GA 31793, and S.M. FLETCHER, Department of Agricultural and Applied Economics, National Center for Peanut Competitiveness, The University of Georgia, Griffin, GA 30223.

PLANT PATHOLOGY AND NEMATOTOLOGY II

Rio Grande Center

Moderator: A.J. Jaks, Texas Agricultural Experiment Station, Beeville, TX

- 1:15 (73) Managing *Cylindrocladium* Black Rot of Peanut in Georgia with Genetic Resistance and Metam Sodium. T.B. BRENNEMAN*, Department of Plant Pathology, The University of Georgia, Tifton, GA 31794.
- 1:30 (74) Effect of Soil Temperature, Moisture and Rainfall on Performance of Metam Sodium (42%) for Control of *Cylindrocladium* Black Rot of Peanut. P.M. PHIPPS*, Tidewater Agricultural Research & Extension Center, Virginia Polytechnic Institute & State University, Suffolk, VA 23437.
- 1:45 (75) Influence of Peanut Cropping Frequency on the Severity of Leaf Spot Diseases, Incidence of Southern Stem Rot, and Pod Yield. A.K. HAGAN*, L.C. CAMPBELL, J.R. WEEKS, M.E. RIVAS-DAVILA, K.L. BOWEN, Department of Entomology and Plant Pathology, Auburn University, Auburn, AL 36849; and B. GAMBLE, Wiregrass Research and Extension Center, Headland, AL 36345.
- 2:00 (76) Comparison of Fungicide Band and Broadcast Sprays by Advisory on Peanut in South Texas. A.J. JAKS* and W.J. GRICHAR. Texas Agricultural Experiment Station, Beeville, TX 78102.

- 2:15 (77) Development and Field Evaluation of a Fungal Disease Risk Index for Peanuts in Georgia. R.C. KEMERAIT, JR.*, T.B. BRENNEMAN, A.K. CULBREATH, J.E. WOODWARD, Department of Plant Pathology, The University of Georgia, Tifton, GA 31794; E.L. ANDREWS, Cooperative Extension Service, Lakeland, GA 31635; M. FOURAKERS, Cooperative Extension Service, Valdosta, GA 31603; and M.L. WELLS, Cooperative Extension Service, Albany, GA 31706.
- 2:30 (78) Development and Validation of Web-Based Peanut Disease Forecasts. B.B. SHEW*, T.B. SUTTON, Department of Plant Pathology, R.D. MAGAREY, Department of Entomology, and D.L. JORDAN, Department of Crop Science, North Carolina State University, Raleigh, NC 27695.
- 2:45 (79) The Progression of *Tomato spotted wilt virus* Through Peanut Tissue Types and the Resultant Physiological Effects as Related to Severity of Viral Infection. D. ROWLAND*, J. DORNER, R. SORENSEN, USDA-ARS, National Peanut Research Laboratory, 1011 Forrester Dr. SE, Dawson, GA 39842; J. BEASLEY and J. TODD, University of Georgia, P.O. Box 1209, Tifton, GA.

PHYSIOLOGY AND SEED TECHNOLOGY/HARVESTING, CURING, SHELLING, AND HANDLING

Rio Grande East

Moderator: Jacob Reed, Texas Agricultural Experiment Station, Lubbock, TX

- 1:30 (80) Elevation and Slope Effects on Peanut Yield in Circular Crop Rows. J.D. REED*, G.S. TOWNER, A.M. SCHUBERT, D.O. PORTER, Texas Agricultural Experiment Station, Lubbock, TX 79403-9803 and J.S. JENNESS, Jenness Enterprises, GIS Analysis and Application Design, Flagstaff, AZ 86004.
- 1:45 (81) Using Precision Agriculture Tool in Field-Level Peanut Research. A.M. SCHUBERT*, D.O. PORTER, T.A. WHEELER, and K.E. BRONSON. Texas A&M University Agricultural Research & Extension Center, Lubbock, TX 79403-9803.
- 2:00 (82) WITHDRAWN.
- 2:15 (83) Nondestructive Moisture Content Determination in Single Kernels of Corn, Popcorn and Peanuts by Dual Frequency RF Impedance Method. C.V.K. KANDALA* and C.L. BUTTS. National Peanut Research Laboratory, Dawson, GA 39842.

- 2:30 (84) Managing Farmer Stock Aeration and Ventilation Systems in the Southeast. C.L. BUTTS*, S.L. BROWN, and F.H. ARTHUR. USDA, ARS, National Peanut Research Laboratory, Dawson, GA 39842, Department of Entomology, University of Georgia, Tifton, GA 31793, and USDA, ARS, Grain Marketing and Production Research Center, Manhattan, KS 66502.

PRODUCTION TECHNOLOGY

Rio Grande West

Moderator: Calvin Trostle, Texas Cooperative Extension, Texas A&M Research and Extension Center, Lubbock, TX

- 1:30 (85) Influence of Application Variables on Efficacy of Apogee. D. JORDAN*, D. JOHNSON, S. HANS, J. LANIER, and J. BEAM, Department of Crop Science, North Carolina State University, Raleigh, NC 27695-7620.
- 1:45 (86) Effect of Bahiagrass or Corn Rotation and Tillage on Yield and Grade of Peanut. J.A. BALDWIN*, Department of Crop and Soil Sciences, University of Georgia, Tifton, GA 31793.
- 2:00 (87) Is Double-Rate *Bradyrhizobium* Inoculation in West Texas Peanut Justified? C.L. TROSTLE* and K. LONG, Texas Cooperative Extension, Texas A&M-Lubbock, Lubbock, TX 79403.
- 2:15 (88) Long Term Impacts of Cotton and Peanut Cropping Systems on the Microbial and Biochemical Properties of a Sandy Soil of Georgia. V. ACOSTA-MARTINEZ*, USDA-ARS, Lubbock, TX 79415, D. ROWLAND, USDA-ARS, Dawson, GA 31742; and R. SORENSEN, USDA-ARS, Dawson, GA 31742.
- 2:30 (89) Response of Peanut Planted in Single, Twin and Triple Row Patterns. J.P. BEASLEY, JR.*, J.A. BALDWIN, Crop and Soil Sciences Dept., University of Georgia, Tifton, GA 31793; E.J. WILLIAMS, Biological and Agricultural Engineering Dept., University of Georgia, Tifton, GA 31793; D.L. HARTZOG, Agronomy and Soils Dept., Auburn University, Headland, AL 36349; and E.B. WHITTY, Agronomy Dept., University of Florida, Gainesville, FL 32611-0500.

- 2:45 (90) Preliminary Evaluation of Hyper Spectral Imaging to Manage Peanut. D. CARLEY and D. JORDAN*, Department of Crop Science, North Carolina State University, Raleigh, NC 27695; C. DHARMASRI, Syngenta Crop Protection Inc., Greensboro, NC 27419; T. SUTTON, Department of Plant Pathology, North Carolina State University, Raleigh, NC 27695; R. BRANDENBURG, Department of Entomology, North Carolina State University, Raleigh, NC 27695; and M. BURTON, Department of Crop Science, North Carolina State University, Raleigh, NC 27695-7620.

3:00 Break

PLANT PATHOLOGY AND NEMATOLOGY III/MYCOTOXINS

Rio Grande Center

Moderator: David Long, Syngenta Crop Protection, Greensboro, NC

- 3:30 (91) DynastyTM PD: A New Option for Early Season Disease Control. G. CLOUD*, S. RIDEOUT, and D.H. LONG, Syngenta Crop Protection, Greensboro, NC 27409.
- 3:45 (92) Prothioconazole for the Control of Foliar and Soil-Borne Diseases in Peanuts. G.H. MUSSON*, J.R. BLOOMBERG, R.A. MYERS, and R. RUDOLPH. Bayer CropScience, Research Triangle Park, NC 27709.
- 4:00 (93) CROPGRO-Peanut Aflatoxin Model: A Tool For Predicting Pre-Harvest Aflatoxin Contamination in Peanut. P.V.V. PRASAD, K.J. BOOTE*, Agronomy Department, University of Florida, Gainesville, FL 32611; F. WALIYAR, ICRISAT, India 502 324; and P.Q. CRAUFURD, University of Reading, RG2 9AD, UK.
- 4:15 (94) Perceived Beliefs of the Health Effects of Aflatoxin by Ghanaian Health and Agricultural Administrators. R.T. AWUAH*, S.C. FIALOR, B. BAYARD and C.M. JOLLY, Kwame Nkrumah University of Science and Technology, Kumasi, Ghana and Auburn University, Auburn, AL.
- 4:30 (95) Influence of Field and Soil Characteristics on Aflatoxin Contamination in the Southeastern U.S. K.L. BOWEN*, Dept. Entomology and Plant Pathology, Auburn University, AL 36849.

- 4:45 (96) Physiological Processes of Pre-harvest Aflatoxin Contamination in Groundnut. D. CLAVEL*, O. DIOUF, N.K. DRAME and A. TRAORE, Centre of International Cooperation in Agronomic Research for Development, Annual Crop Department, TA 70/01, Avenue Agropolis, 34398 Montpellier Cedex 5, France; Regional Centre of Studies for the Improvement of Drought Adaptation, BP 3320, Thiès, Sénégal, Laboratory of Molecular Ecophysiology, UMR 137, University of Paris 12, 64 Avenue du Général de Gaulle, 94010 Créteil Cedex, France; International Crops Research for the Semi-Arid Tropics, BP320, Bamako, Mali.

POSTER SESSION

- (97) Peanut: Chemical and Organic Foliar Fertilization Under Rainy Season in Southern Mexico. S. SÁNCHEZ-DOMÍNGUEZ*, Depto de Fitotecnia, Universidad Autónoma Chapingo, Chapingo Méx. 56230; and D. SÁNCHEZ DOMÍNGUEZ, Centro de Bachillerato Tecnológico Agropecuario # 8, Xoxocotla, Morelos, México.
- (98) Evaluating Irrigation Management Strategies for Peanut Production in the Texas Southern High Plains. D.O. PORTER*, A.M. SCHUBERT, J.D. REED, and G.S. TOWNER. Texas Agricultural Experiment Station. Texas A&M Agricultural Research and Extension Center, Lubbock, TX 79403.
- (99) Impact of Various Cover Crops in a Minimum Tillage Production System on Insect Pests, Diseases, Nematodes, and Yield of Peanut. J.R. WEEKS* and H.L. CAMPBELL. Dept. of Entomology and Plant Pathology, Auburn University, AL 36849 and B.E. GAMBLE, Wiregrass Research and Extension Center, Headland, AL 36345.
- (100) A Compatibility Guide for Applying Agrichemicals to Peanut. S. HANS, D. JORDAN*, R. BRANDENBURG, B. ROYALS, B. SHEW, J. BAILEY, V. CURTIS, A. YORK, J. WILCUT, and J. BEAM, North Carolina State University, Raleigh, NC 27695; E. PROSTKO, S. CULPEPPER, T. GREY, C. JOHNSON, III, and R. KEMERAIT, University of Georgia, Tifton, GA 31793; J. GRICHAR, Texas A&M University, Yoakum, TX 77995; T. BAUGHMAN, Texas A&M University, Vernon, TX 76385; P. DOTRAY, Texas Tech University, Lubbock, TX 79409; B. BRECKE, G. MacDONALD, and J. TREDAWAY-DUCAR, University of Florida, Gainesville, FL 32611; and B. WALLS, North Carolina Department of Agriculture and Consumer Services, Raleigh, NC 27607.
- (101) Peanut Response to the Plant Growth Regulator Messenger. D. JORDAN*, S. HANS, J. LANIER, and D. JOHNSON, Department of Crop Science, North Carolina State University, Raleigh, NC 27695.

- (102) A Turbo-blaster for Peanut Pod Maturity. E.J. WILLIAMS*, J.A. BALDWIN, and J.P. BEASLEY. Department of Biological & Agricultural Engineering and Department of Crop and Soil Science, University of Georgia, Tifton, GA 31793.
- (103) Management of Peanut Diseases with Metam Sodium and Fungicides. E.L. JORDAN*, Baker County Extension Service, The University of Georgia, Newton, GA 39870; and T. BRENNEMAN, Plant Pathology Department, The University of Georgia, Tifton, GA 31793.
- (104) Identification of Peanut Seed-storage Proteins Associated with Resistance against *Aspergillus flavus* Infection and Aflatoxin Production. X.Q. LIANG*, B.Z. GUO, USDA-ARS, Crop protection and Management Research Unit, and University of Georgia, Tifton, GA 31793; and C.C. HOLBROOK, USDA-ARS, Crop Genetics and Breeding Research Unit, Tifton, GA 31793.
- (105) Identification of Transcripts in Peanut Cultivars Resistance to Late Leaf Spot *Cercosporidium personatum*. M. LUO*, R.D. LEE, University of Georgia, Coastal Plain Experiment Station, Tifton, GA 31793; X.Q. LIANG, B.Z. GUO, USDA-ARS, Crop Protection and Management Research Unit, Tifton, GA 31793; C.C. HOLBROOK, USDA-ARS, Crop Genetics and Breeding Research Unit, Tifton, GA 31793.
- (106) Yield and Reaction of Runner Peanut Lines to Diseases in a Dryland Production System in Southwest Alabama. M. FAVER*, Alabama Cooperative Extension System, Bay Minette, AL 36507; A.K. HAGAN, and H.L. CAMPBELL, Department of Entomology and Plant Pathology, Auburn University, Auburn, AL 36849.
- (107) Maturity and Yield Evaluation of Ten Runner and Virginia Peanut Varieties, and Thirty-Five Bolivian Accessions at Two Locations in West Texas. J.L. AYERS* and M.D. BUROW, Texas Agricultural Experiment Station, Lubbock, TX 79403.
- (108) Performance of Crosses Between Bulgarian and Valencia Peanut Varieties. N. MANIVANNAN*, N. PUPPALA, New Mexico State University, Agricultural Science Center at Clovis, Star Route Box 77, Clovis – NM 88101; and S.G. DELIKOSTADINOV, Institute for Plant Genetic Resources, Sadovo – Bulgaria.
- (109) Genotype * Environment Interactions for Development and Growth Traits of Peanut. N. PHAKAMAS*, A. PATANOTHAI, K. PANNANGPETCH, S. JOGLOY, Department of Agronomy, Faculty of Agriculture, Khon Kaen University, Khon Kaen 40002, Thailand; and G. HOOGENDOORN, Department of Biological and Agricultural Engineering, The University of Georgia, 1109 Experiment Street, Griffin, GA 30223-1797.

- (110) Using Bioinformatic Tools for Mapping Peanut Genomic Data. A.M. JESUBATHAM*, Department of Computer Science, Texas Tech University, Lubbock, TX 79409; and M.D. BUROW, Department of Plant and Soil Sciences, Texas Tech University, Lubbock, TX 79409.
- (111) Transferability of Sequence Tagged Microsatellite Site (STMS) Primers from Pulses to Peanut. G. KRISHNA* and N. PUPPALA, New Mexico State University, Agricultural Science Center at Clovis, Star Route Box 77, Clovis, NM 88101.
- (112) Molecular Marker for Resistance to Seed Infection by *Aspergillus flavus* in Peanut. Y. LEI, B. LIAO, S. WANG, H. JIANG, Oil Crops Research Institute of Chinese Academy of Agricultural Sciences, Wuhan, Hubei Province, 430062, China, C. HOLBROOK*, and B. GUO, ARS-USDA, Coastal Experimental Station, Tifton, GA 31793.
- (113) Determination of Polyamines in Peanuts and Their Allergenic Properties. S.Y. CHUNG* and E.T. CHAMPAGNE, USDA-ARS, SRRC, New Orleans, LA 70124.
- (114) Performance Evaluation of Peanut Genotypes for Drought-Tolerance and Yield Characteristics in Bangladesh. S.M. BASHA*, S.A. ALAM, B.L. CHOWDHURY and S.B. SHEIKH. Florida A&M University, Tallahassee, FL 32307; Bangladesh Agricultural University, Mymensingh, Bangladesh.

SITE SELECTION COMMITTEE REPORT

The site selection committee met Tuesday, July 13, at 1:00 p.m. with 5 members and 2 visitors present. The following is the location schedule for upcoming meetings:

July 11-15, 2005 Portsmouth, Virginia
2006 – Savannah, Georgia
2007 - Alabama

Respectfully submitted by,
James Grichar, Chair

AMERICAN SOCIETY OF AGRONOMY LIAISON REPRESENTATIVE REPORT

The joint meetings of the American Society of Agronomy, Crop Science Society of America and Soil Science Society of America met in Denver, Colorado, from November 3-6, 2003. Approximately 3,400 oral and poster presentations were made at the meeting, of which about 15 were presented on peanuts. The next meeting of the ASA-CSSA-SSSA will be from October 31 – November 6, 2004, in Seattle, Washington.

Since I have served on the committee for more than 10 years, I would like to resign from the assignment and give someone else the opportunity to serve as ASA liaison.

Respectfully submitted by,
H. Thomas Stalker, Chair

CAST REPORT

The Council for Agricultural Science and Technology (CAST) Board met in Portland, Oregon fall 2003 and Washington, D.C. spring 2004. Your APRES representative, Stanley Fletcher, was elected President-Elect in the fall of 2003. When you read this report in the APRES proceedings, I will be serving as President of CAST. The new APRES CAST representative is John Beasley. CAST has a core membership of 38 scientific societies that represent over 173,000 member scientists. Besides the Ames, Iowa office, CAST has a Washington, D.C. office that is the base for executive vice president Teresa Gruber.

This year CAST has been examining itself. The Board has been going through the exercise of developing an annual action plan. This started from last Fall's Benchmarking activity. At the Spring Board meeting, the Board of Directors voted on the priority for each action item. Next year's budget will be developed from the approved action plan.

CAST continues to provide the public, scientific societies, the news media and

legislative bodies with science-based information on agricultural and environmental issues. Examples are:

- ❖ Serves as a biotechnology-specific information resource to the public and the media.
- ❖ Continued the work with the U.S. Trade and Development Agency to coordinate a U.S.-China food and agricultural biotechnology training program and dialogue. At the conclusion of this program, China had modified their policy by allowing several biotech crops to be imported.
- ❖ Hosted more than 100 scientists, government representatives, regulators, and non-profit organization representatives for a symposium on *Management of Pest Resistance: Strategies Using Crop Management, Biotechnology and Pesticides*. CAST published an on-line proceeding.
- ❖ Developed a biotechnology web page (<http://www.cast-science.org/cast/biotech/index.htm>).
- ❖ Provides a weekly e-mail update on the current events in Washington, D.C. to all CAST members who provided their e-mail address to CAST.
- ❖ In cooperation with the Institute for Conservation Leadership, received W.K. Kellogg Foundation funding for a program entitled, "Cultivating Leadership for a Changing Agriculture."
- ❖ Continued the program with EPA on the analysis and development of pilot pesticide safety programs and materials.
- ❖ Publication in the work entitled, "Climate Change and Greenhouse Gas Mitigation: Challenges and Opportunities for Agriculture."

I want to express my thanks to John Beasley for coordinating and handling the CAST Display at our San Antonio meetings.

Further information on CAST can be found on their web site (www.cast-science.org).

Respectfully submitted,
Stanley M. Fletcher

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: Individuals who pay dues at the full rate as fixed by the Board of Directors.
- b. Institutional memberships: Libraries of industrial and educational groups or institutions and others that pay dues as fixed by the Board of Directors to receive the publications of the Society. Institutional members are not granted individual member rights.
- c. Organizational memberships: Industrial or educational groups that pay dues as fixed by the Board of Directors. Organizational members may designate one representative who shall have individual member rights.
- d. 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.

- e. 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.

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 State employees' representatives - these directors are those whose employment is state sponsored and whose relation to peanuts principally concerns research, and/or education, and/or regulatory pursuits. One director will be elected from each of the three main U.S. peanut producing areas.
- e. United State 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 Private Peanut Industry representatives - these directors are those whose employment is privately sponsored and whose principal activity with peanuts concerns: (1) the production of farmers' stock peanuts; (2) the shelling, marketing, and storage of raw peanuts; (3) 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
- 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.

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.

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 on or before the date of the annual meeting. 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.

- 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 16, 2004, San Antonio, Texas

MEMBERSHIP (1975-2004)

	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	279	39	32	25	12	387
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