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1989	R.M.Cu

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Graduate Student Competition II

Breeding, Biotechnology, And Genetics II

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Production I

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Plant Pathology and Nematology II/Mycotoxins

Physiology and Seed Technology/Harvesting, Curing, Shelling, Storing, and Handling

Production II

Extension Techniques and Technology

Plant Pathology and Nematology III

Poster Session

ENTOMOLOGY

Association of a Burrower Bug, *Pangaeus bilineatus* (Say) (Heteroptera: Cydnidae) with Aflatoxin Contamination of Peanut Kernels. J.W. CHAPIN*[1], J.W. DORNER[2], and J.S. THOMAS[1]. [1]Department of Entomology, Clemson University, Edisto REC, 64 Research Road, Blackville, SC 29817. [2]USDA, ARS, National Peanut Research Laboratory, 1011 Forrester Drive, Dawson, GA 31742.

Aflatoxin contamination of peanut kernels, *Arachis hypogaea* L., was associated with feeding by a burrower bug, *Pangaeus bilineatus* (Say). Kernel samples were divided into three grade categories: total sound mature kernels (TSMK), other kernels (OK), and damaged kernels (DK); and each of these grade categories was subdivided based on evidence of burrower bug feeding. Within TSMK, 100% of detectable aflatoxin contamination was associated with burrower bug kernel feeding, and fed-on kernels had a significantly higher concentration of aflatoxin than kernels without feeding sites (7.5 vs. 0.0 ppb). Within the OK grade category, differences in aflatoxin contamination were not significant due to the inability to conclusively examine these kernels for feeding sites. Within the DK grade category, aflatoxin concentration was significantly higher in fed-on kernels than in kernels without observable feeding sites (286.5 vs. 0.4 ppb) and 99.9% of contamination was associated with burrower bug feeding. Across all grade categories, aflatoxin levels were 65 times higher in kernels with observable burrower bug feeding, and on average, 93% of all aflatoxin contamination was associated with burrower bug feeding. The DK grade category had the highest concentration of aflatoxin and accounted for 51% of total contamination. Burrower bug-induced aflatoxin contamination of the TSMK grade category is particularly significant because this source would be most difficult to remove from the food supply. Contamination of the DK category is also economically significant because this grade component is specifically examined for *Aspergillus* at the buying point, and growers are severely penalized for detection. Unlike other arthropods associated with aflatoxin contamination of peanut, *P. bilineatus* feeds on a high percentage of otherwise intact pods while leaving no external evidence of injury. We have observed a greater incidence of burrower bug kernel feeding under severe late season drought stress, thus *A. flavus* kernel contamination may increase under the very conditions which would favor subsequent development of mycotoxins.

Efficiency of a Mobile Soil Insect Sampler. N. EROGLU* and S.L. BROWN. Department of Entomology, University of Georgia, Tifton, GA, 31794.

Collection of soil insect data is time consuming, labor intensive and expensive. Several soil insects can seriously impact peanut production resulting in lower yields, reduced grades and increased aflatoxin contamination. Quantification of soil insect populations and pod damage normally requires the collection of large volumes of soil, transportation of that soil to a processing site, followed by hours of tedious sieving. Collaborating entomologists from southeastern peanut-producing states reached a consensus on the basic requirements of a mobile soil sampling machine and a prototype has been built by the University of Georgia. The machine is capable of wet sieving up to 0.5 cubic feet of soil through a series of four screens of decreasing mesh. During the 2002 growing season, the machine was used to evaluate experiments in Georgia, Alabama and South

Carolina. The efficiency of the machine to recover different sized and shaped objects from known volumes of soil was tested. Each soil sample was processed in a similar manner and screens were examined for approximately 2 minutes to recover test objects. Approximately 20 minutes was spent on each sample including sample processing and object recovery. For a Tifton sandy loam soil, 2.9, 1.8, 1.2 and 1.6 percent of the total soil weight was caught on each screen respectively. The collection of rocks, stems and other objects on the screens offers opportunities for insects to become lodged and escape detection. Three different objects were placed in soil samples to test for efficiency of recovery, a 15mm long x 4 mm wide plastic fishing grub, a 15 mm long and 1.6 mm wide segment of nylon line, and 4 mm diameter spherical plastic beads. Average recovery rates were 82.6%, 72.6% and 79.8% respectively. Tifton sandy loam soil contains a great deal of pebbles that complicate the recovery of test objects. Efficiency of recovery will likely vary by soil type. Efficiency rates will also vary with the amount of time expended washing and examining each screen. Most unrecovered test objects were found to be trapped in soil debris on the larger screen sizes suggesting that additional search time would probably increase recovery rates. The mobile soil insect sampler offers a method of recovering high percentages of soil insect populations.

The Effects of Three Acaricides on *Tetranychus urticae* (Koch) (Tetranychidae: Acari). D.A. HERBERT, Jr.[1], J.L. ASHLEY*[2], E.E. LEWIS[2], and C. BREWSTER[2], [1]Tidewater AREC, 6321 Holland Rd, Suffolk, VA 23437; [2]Entomology Department, Virginia Tech, Blacksburg, VA 24061.

The two-spotted spider mite, *Tetranychus urticae* (Koch), is a chronic pest of peanut, *Arachis hypogaea* L., in Virginia and other states. We have examined the efficacy and residual toxicity of three acaricides toward the active forms (all but the eggs) of *T. urticae*. We have also determined the efficacy of these same acaricides on *T. urticae* eggs. Two acaricides commonly used by producers (propargite and fenpropathrin) and one experimental product (etoxazole) were evaluated under laboratory conditions. The efficacy of all products tested was significantly different from the controls, but the products were not significantly different from one another. Twenty-four hours after application of any of the materials tested, the residual toxicity toward the mobile stages of *T. urticae* was not different from controls. Egg hatch was significantly reduced by application of etoxazole and propargite; however, fenpropathrin application had no effect on egg hatch. With the knowledge of the stage-specific activity of these materials, predictions can be made on the best strategy to manage mixed populations of *T. urticae*.

Tracer* Naturalyte* Insect Control in Peanuts. V.B. LANGSTON*, L.C. WALTON, G.A. FINN, R.M. HUCKABA, and L.L. BRAXTON; Dow AgroSciences, LLC., 9330 Zionsville Rd., Indianapolis, IN 46268.

Tracer* (spinosad) has been evaluated for control of lepidoptera and thrips insects in peanuts since 1997. The active ingredient in Tracer, spinosad, represents a class of highly effective insect control agents derived as a natural fermentation product expressing a unique mode of action against certain insect pests and having little or no activity against predator insects. Spinosad acts on the insect nervous system by affecting the nicotinic acetylcholine receptor in a unique manner that is different than all other known insecticides. This mode of action makes it ideal for resistance management programs.

Tracer received full federal registration for use on peanuts in 2002. Tracer Naturalyte Insect Control provided effective control of the major lepedotrian worm pests in peanuts including cabbage looper, corn earworm, European corn borer, red-necked peanut worm at use rates of 1.5 to 3 fluid oz per acre. For the armyworm complex (beet, fall, true and yellowstriped), the Tracer rate needs to be increased to the 2-3 fluid oz per acre range.

This presentation will discuss insect control solutions in peanuts with data generated with Tracer in the major peanut growing areas in the United States.

* Trademark of Dow AgroSciences LLC

Lorsban 15G – The Backbone of Insect Control Solutions in Peanuts. L.C. WALTON*, G.A. FINN, W.H. HENDRIX, R.M. HUCKABA, and V.B. LANGSTON, Dow AgroSciences LLC, 9330 Zionsville Rd., Indianapolis, IN 46268.

Lorsban, with the active ingredient chlorpyrifos, is one of the broadest spectrum organophosphate insecticides available for control of chewing, sucking and flying insects. Lorsban is currently registered for use in more than 98 countries with over 350 different labels worldwide. Discovered in 1962, it has now been widely used for almost four decades. Lorsban offers proven broad-spectrum solutions for the control of multiple pests in a number of crops.

For many years, Lorsban 15G has been the commercial standard for control of soil insects that cause yield and quality reductions in peanut. Lorsban 15G granular insecticide is a broad-spectrum soil insecticide effective against peanut pest insects including southern corn rootworm, lesser cornstalk borer, cutworms, burrowing bugs, wireworms, and potato leafhopper (NC and VA 2ee labels). Lorsban 15G will also inhibit the growth and development of white mold (southern blight) disease caused by *Sclerotium rolfsii*. Lorsban 15G delivers broad-spectrum control of damaging pests through direct contact, ingestion and fuming action. This three-way mode of action makes Lorsban 15G an ideal choice for use in a resistance management program. Applications of Lorsban 15G can be applied to peanuts as an at-plant preventative, postplant preventative, band rescue or broadcast rescue treatments.

This presentation will discuss data generated from postplant preventative applications of Lorsban 15G to peanuts in the early flowering to pegging stage of growth in university/extension peanut research programs from the southeastern U.S. for the past decade. Insect control, pod damage and yields will be discussed. These data consistently show benefits from application of Lorsban 15G both to yields and to the farmer's bottom line.

Assessment of Cultural Controls to Reduce the Incidence of Tomato Spotted Wilt Virus in Peanut in North Carolina. C.A. HURT*[1], R.L. BRANDENBURG[1], and D.L. JORDAN[2], [1]Department of Entomology, North Carolina State University, Raleigh, NC 27695-7613, [2]Department of Crops Science, North Carolina State University, Raleigh, NC 27695-7620.

Tomato Spotted Wilt virus (TSWV) has recently become one of the most devastating pathogens of peanut in North Carolina. North Carolina peanut growers saw a dramatic increase in infestations of TSWV in 2002. Certain cultural techniques in Georgia have been shown to lessen the amount of virus, and these were evaluated to determine their effect on TSWV incidence. The production systems are discrete between the runner-type peanuts grown in GA and the virginia-type peanuts in NC, thereby requiring that these practices be evaluated in our region. Treatments in NC included plant populations, varieties, twin- and single-row plantings, reduced tillage, planting dates, and in-furrow insecticides. During the growing seasons of 2001 and 2002, we compared plant populations of 2, 4, and 5 plants per row of foot; varieties Gregory, NC V-11 and Perry, twin- and single-rows; conventional tillage and strip tillage, early and late planting dates; and Thimet and Temik. We scouted research plots for visual symptoms of TSWV monthly in 2001, and weekly in 2002. For each year color-coded flags were used to indicate the time of appearance of visual symptoms. In 2001, flagged plants were tested for presence of the virus using the ImmunoStrip test system (AgDia, Elkhard, IN). High plant populations had less virus than lower plant populations, Gregory was infected with less virus than either NC V-11 or Perry, twin-rows had a lower amount of virus compared to single-rows, preliminarily strip-tillage has had less virus than conventional tillage, and peanut treated with in-furrow Thimet had less incidence of virus than those treated in-furrow with Temik.

<u>Cultural Practices for Control of Spotted Wilt Disease in Peanut.</u> J.W. TODD*[1], A.K. CULBREATH[2], J.A. BALDWIN[3], and D.W. GORBET[4], [1]Dept. of Entomology, [2]Dept. of Plant Pathology, [3]Dept. of Crop and Soil Science, University of Georgia, Coastal Plain Station, Tifton, GA 31793 and [4]Dept. of Crop and Soil Science, Univ. of Florida, North Florida Research and Education Center, Marianna, FL 32446.

Spotted wilt disease, caused by tomato spotted wilt tospovirus (TSWV), and vectored by at least two species of thrips in peanut has become a major yield and profit limiting factor in the southeastern United States. Major losses began to occur in the late 1980s and peaked in 1997 and again in 2002. Research has shown that although no single practice provides adequate suppression of TSWV in peanut, various combinations of cultural practices can significantly reduce incidence, severity and yield losses resulting from spotted wilt. Extensive collaborative research conducted in Georgia and Florida since 1996 has confirmed the utility of the package approach initially set-forth in the 1996 University of Georgia TSWV Risk Index. This report describes the discrete and interactive effects of various combinations of cultivar, planting date, single and twin row culture, and application of Thimet or Temik, insecticide in-furrow at-planting, under conventional or strip-tillage on disease progress and final spotted wilt severity peanut yield and grade. Six peanut cultivars and four candidate breeding lines were evaluated for impact on spotted wilt disease when grown under various combinations of cultural practices. Outstanding resistance to spotted wilt of peanut was observed in new cultivar releases, DP-1, GA-02C (GA 982508), Hull, AP-3 (FL 98116) and the candidate USDA breeding line C11-2-39. Each of these was as good as or better than the standards, Georgia Green (GG) or C99R. The new high oleic cultivar, Norden, was significantly better than GG. All entries were significantly better than AT-201 for TSWV resistance and yield. Percent reductions in TSWV final severity due to utilization of twin rows versus singles averaged across cultivars and insecticide use were 9.9 % at Tifton and 1.6 % at Marianna, FL. Final severity of TSWV was reduced following in-furrow at-planting application of Thimet insecticide compared to non-treated across cultivars and row patterns by 5.1 % at Tifton and 12.0 % at Marianna. Cultivar totals across twin and single rows and with or without insecticide ranged from lows of 8.8 % and 8.6 % at Tifton and Marianna, in C11-2-39, to highs of 53.4% and 55.2% for 'AT 201' at Marianna, and Tifton, respectively. TSWV resistance levels in 'C99R' are sufficient to allow early planting of this cultivar, particularly when supported by other beneficial cultural practices. Also, the susceptible high oleic cultivar, 'Sunoleic 97R', can be planted in the optimum window if supported by the other index factors, but April planting under conventional tillage and twin rows outside of the optimum "window", showed final severity of 87.3% and 70.8% in tests at Tifton and Midville, GA. Cultivar selection proved to be the most important factor, with planting date, plant populations, and insecticide contributing less, but still giving significant additional reductions in TSWV and resulting in higher yields. These results lend substantial experimental support for an integrated multi-factorial TSWV management system incorporating as many of the following components as possible: (1) use of a "resistant" cultivar, (2) avoid very early and very late planting dates, (3) plant to achieve a minimum final stand of ca. 4 plants per 30 cm of row, (4) use of Thimet® insecticide at-planting (except where other problems dictate otherwise), (5) use of twin rows instead of single, and (6) use strip-till culture instead of conventional. Multi-year surveys of grower fields for final TSWV severity over most of the peanut producing area of Georgia validate the above findings also.

GRADUATE STUDENT COMPETITION I

<u>Characterization and Control of an Undescribed Leaf Spot of Peanut.</u> E.C. CANTONWINE*, A.K. CULBREATH and R.C. KEMERAIT, Jr., Department of Plant Pathology, The University of Georgia, Tifton, GA 31793-0748.

A symptom of peanut, referred to as "funky leaf spot" (FLS), was a concern to peanut growers in Georgia in 2001 and 2002. Two genotypes, Georgia Green and UF-99325, resistant and susceptible to FLS respectively, were used to follow the temporal pattern of symptom occurrence, determine the effect of fungicides and tillage systems on symptom intensity, and assess the impact of FLS on yield. The experiment included conventional and strip-till plots with six fungicide treatments, including a non-treated control. Fungicide treatments began 25 days after planting (DAP), and continued on a 14-d spray schedule. Sprays 1-2 were chlorothalonil, thiophanate, propiconazole + trifloxystrobin, pyraclostrobin or tebuconazole at rates currently recommended or proposed for control of early and late leaf spot. Tebuconazole was used for sprays 3-7 to complete all treatments. The Florida 1-10 rating system for leaf spot was used to assess FLS intensity 6 times throughout the season. Symptoms were noticed at 22 and 29 DAP for UF-99325 in strip-till and conventional till plots respectively, and 36 DAP for Georgia Green. FLS intensity peaked around 43 DAP for all treatments and remained steady until 78 DAP, when FLS assessments were stopped. Fungicides had no affect on FLS intensity. FLS was more frequent in strip-till plots, compared to conventional till plots, for UF-99325 for all assessment dates, and Georgia Green for one date. Yield was significantly lower for UF-99325 from strip-till plots than conventional-till plots, but tillage did not affect yields for

Georgia Green. Evidence will be discussed concerning possible causes for FLS.

Arachis pintoi Seed Production in Florida. M.A. CARVALHO* and K.H. QUESENBERRY. Agronomy Department, University of Florida, Gainesville, FL 32611.

Arachis pintoi is a tropical legume originated in South America, more precisely in Brazil. It has multiple uses and today is planted as a forage, a cover crop, or to control erosion. During the 80's, basically under the CIAT coordination, a few accessions were distributed around the world. As a result of this work, some cultivars were released in Australia, Brazil, Colombia, Costa Rica, and Honduras based on one genotype (CIAT 17434). In Florida, cultivars Florigraze and Arbrook of *Arachis glabrata* were released in the 1980s with success. Although, the rhizoma peanut cultivars are very well adapted to Florida, they do not produce seeds, a fact that, associated with slow initial plant development, creates problems in the establishment of pastures. The objective of this research was to evaluate the agronomic potential of 25 different genotypes of *A. pintoi* under the soil and climatic conditions in Florida. In September 2001, plots with four rooted cuttings (2 x 2 m) were established in a randomized complete block design with two replications at the Agronomy Forage Research Unit of the University of Florida, near Gainesville. Cultivars Florigraze and Arbrook were used as control. The winter survival of the plants was observed during the years 2002 and 2003. In February 2003, soil core samples were taken from each plot with 12.5cm of diameter x 24cm depth. The samples were passed over a sieve (0.6 x 0.6 cm mesh) to separate the seeds from the soil. The seeds were then dried at room temperature for 6 weeks and weighed. Only 15 accessions produced seeds. Among those, the average seed production was 512 $kg.ha^{-1}$. Accession UF 2 was the most productive with 1996 $kg.ha^{-1}$. Accessions UF 1, 3, 8, 11, 27, and 31 produced less than 100 $kg.ha^{-1}$; accessions UF 15, 23, 24 produced between 200 and 500 $kg.ha^{-1}$; accessions UF 5,6,10, and 12 produced between 500 and 1000 $kg.ha^{-1}$, and finally accessions UF 2 and 7 produced above 1000 $kg.ha^{-1}$. The genotypes evaluated presented great variability in seed production with some of them reaching very high values. Assuming a rate of 12 $kg.ha^{-1}$ of seeds to establish a field, and using the average seed production in this trial of 512 $kg.ha^{-1}$, the rates of multiplication will be around 1ha to 42ha.

Influence of Application Timing and Fungicides on Sicklepod (*Senna obtusifolia*) Control and Pod Development Following Application of 2,4-DB. S. HANS*, J. SPEARS, D.L. JORDAN, A. YORK, J.W. WILCUT, and D. MONKS, Department of Crop Science, North Carolina State University, Raleigh, NC 27695-7620.

Sicklepod is a troublesome weed in North Carolina that has the ability to emerge throughout the growing season and also exhibits prolific seed production. Seed production may be reduced when 2,4-DB is applied late in the season. However, the specific timing of application of 2,4-DB relative to pod development has not been clearly established. Fungicides and 24-DB are often applied in mixtures. Determining if 2,4-DB and fungicides are compatible based on application timing should lead to more efficient weed management. The experiment was conducted in 2002 to evaluate the influence of application timing of 2,4-DB at 0.25 lb ai/acre applied alone or with chlorothalonil, tebuconazole, or pyraclostribin at the sicklepod developmental stages of pre-flower, early flower, full flower, pod set, and pod fill. Visual estimates of percent sicklepod control were recorded three weeks after each application. Sicklepod dry weight and pods per plant were determined in early October. Sicklepod seeds were grouped according to maturity based on pod color with green corresponding to immature pods and black corresponding to mature pods. Percent seed germination was also determined. Fungicides did not have a major impact on sicklepod control by 2,4-DB. However, sicklepod control was higher when 2,4-DB was applied pre-bloom rather than at more advanced stages of flower and pod development. Sicklepod control was also greater at initial bloom than when applied later in the season. The percentage of mature pods was higher when 2,4-DB was applied at full flowering or later compared to applications at pre-bloom or initial bloom, regardless of fungicide treatment.

Reduced Rate Herbicide Application of Strongarm, Valor, and Cadre in Peanut Production. S.D.WILLINGHAM*[1], B.J.BRECKE[2], J.T.DUCAR[3], G.E. MacDONALD[1], [1]Department of Agronomy, University of Florida, Gainesville, FL 32611, [2]West Florida Research and Education Center, Jay, FL 32565, and [3]Department of Animal and Horticultural Sciences, Berry College, Mt. Berry, GA 30149.

Field studies were conducted in 2002 at Jay and Citra, Florida to evaluate weed control, peanut tolerance and peanut yield using reduced rates of Strongarm, Valor and Cadre and to determine if herbicides at reduced rates could be used in combination to achieve broad spectrum weed control. Herbicide was applied with a CO2 backpack sprayer operated at 32 psi and calibrated to deliver 15 GPA. Treatments evaluated were Strongarm at 0.006 (1/4x) and 0.024 (1x) lb. ai/A, Valor at 0.024 (1/4x) and 0.094 (1x) lb. ai/A PRE; Strongarm at 0.006 (1/4x) plus Valor at 0.024 (1/4x) PRE tank mix; Strongarm (1/4x) plus Valor (1/4x) PRE fb Cadre POST at three rates 0.032 (1/2x), 0.042 (2/3x), and 0.064 (1x); Strongarm 0.024 (1x) and Valor 0.094 (1x) lb. ai/A PRE fb Cadre 0.064 (1x) lb. ai/A. A standard of Gramoxone Max 0.125 lb a.i/A plus Basagran 16 oz/A at cracking fb and Cadre 1.44 oz/A POST and an untreated check were also included.

Strongarm or Valor alone PRE at 1/4x rate gave control equal to the 1x rate for Florida beggarweed (Desmodium tortuosum) and amaranth (Amaranthus sp.) (85 and 95%). Strongarm or Valor PRE at the 1x rate controlled sicklepod (Senna obtusifolia) and yellow nutsedge (Cyperus esculentus) better than 1/4x rate of either herbicide. Strongarm plus Valor tank mix at 1/4x rate gave greater control (>75%) of yellow nutsedge than Strongarm or Valor alone at 1x rate (70 and 15%, respectively). Strongarm plus Valor at 1/2x and 1/4x rate gave 85% and 78% control of Florida beggarweed respectively and >95% control of amaranth. Strongarm plus Valor at all rate combinations controlled sicklepod and nutsedge between 65 and 75%. Strongarm plus Valor at 1/4x rate fb Cadre at 1/2x rate controlled amaranth and yellow nutsedge 88 and 95% and sicklepod and Florida beggarweed 75 and 76% respectively. When Cadre was applied POST at 2/3x with the same PRE combination, control of weeds increased to 99% for amaranth, 98% for yellow nutsedge, 83% for sicklepod, and 96% for Florida beggarweed. Strongarm plus Valor at 1/4x rate PRE fb Cadre at 2/3x rate POST gave control equal to that observed with the standard treatment. All herbicide management systems evaluated produced similar yields.

The highest net returns for the reduce rate treatments were for Strongarm +

Valor 1/4X, Strongarm + Valor 1/4X PRE fb Cadre 2/3X, Strongarm 1/4, Strongarm + Valor 1/4X PRE fb Cadre 1/2X at $346, 303, 257, 237 per acre.

This research indicates that growers can use PRE herbicides in combinations at reduce rates followed by POST at reduce rates and achieve weed control and peanut yields comparable to the standard.

Influence of Row Pattern and Seeding Rate on Incidence of TSWV in 'Georgia Green' Peanuts. L.E. SCONYERS*, T.B. BRENNEMAN, and K.L. STEVENSON, Department of Plant Pathology, University of Georgia, Tifton GA 31793 and Athens GA 30602.

Two field tests were conducted in 2001 and 2002 to determine the effects of row pattern and seeding rate on the incidence of tomato spotted wilt virus (TSWV) infection in 'Georgia Green' peanut using DAS-ELISA. Visible disease (% row feet showing symptoms) was also assessed at the same time as ELISA tests (30, 90 DAP and harvest), so that results from both methods could be compared. For one of the trials in each year, neither row pattern nor seeding rate had a significant ($p<0.05$) effect on ELISA TSWV incidence. In 2002, visible disease at harvest was significantly greater in single rows (6.7%) than twin rows (2.3%). For the second test in 2001, there was a significant row pattern x seeding rate interaction at 90 DAP; ELISA TSWV incidence was greatest (17%) in single rows at the low seeding rate. There was also a significant row pattern x seeding rate interaction for visible disease at harvest; disease incidence was greatest (8%) in single rows at the low seeding rate. For the second test in 2002, there was a significant row pattern effect for both visible and ELISA disease incidence at 90 DAP, with single rows having greater disease than twin rows. Visible disease incidence was greater in single rows than twin rows, regardless of the incidence of ELISA-positive plants. The incidence of ELISA-positive plants was generally higher than the incidence symptomatic plants. Symptom expression of TSWV in peanuts was greater in single than in twin rows but the reasons for this are not clear.

Aflatoxin Production in an Array of Peanut Lines Selected to Represent a Range of Linoleic Acid Contents. H.Q. XUE*, T.G. ISLEIB, G.A. PAYNE, W.F. NOVITZKY, and G. O'BRIAN, Dept. of Crop Science, Dept of Plant Pathology, and USDA-ARS, North Carolina State Univ.

Resistant cultivars should be a component of an integrated program of aflatoxin management, but to date no successful *Aspergillus*-resistant peanut (*Arachis hypogaea* L.) cultivar has been released. High-oleate (low-linoleate) backcross-derived variants of virginia-type cultivars were previously found to develop significantly more aflatoxin than their recurrent parents. In order to determine if linoleate level could be used to predict aflatoxin production level, 16 lines were sampled from the NCSU peanut breeding project's collection of germplasm to represent a broad range of linoleate content. Data from a prior evaluation of fatty acid content defined a range of 36 to 461 g kg^{-1} of linoleate among 611 lines in the collection. The 16 lines were selected to represent roughly equal increments of linoleate within that range. Fifty to 100 seeds of each line were sampled for fatty acid analysis, and the seeds closest to the mean for the line were used for the experiment. The distribution of oleate levels among lines in the seeds actually used was not uniform. One line had an oleate level of 43 g kg^{-1}, the other

15 ranged from 215 to 385 g kg^{-1}. Approximately 5 g of seeds of each entry were manually blanched, quartered and inoculated with spores of *A. flavus* Link ex Fries strain NRRL 3357, placed on moistened filter paper in 10 cm petri dishes, and incubated for 8 d at 28ºC. Linoleate levels of the seeds used in each experimental unit were recorded. The 16 petri dishes in each rep were arranged in 4 rows and 4 columns on a tray enclosed in a large plastic bag, using a 4x4 balanced lattice design with columns as blocks within reps. Stacked trays were separated by short sections of PVC pipe to eliminate pressure on petri dishes in lower trays. After incubation, samples were dried, ground, and tested for aflatoxin content by HPLC. Multiple regression was used to build a linear model to account for the variation among lines using the mean fatty acid contents as independent variables. Linoleate content accounted for 39% of the variation among lines for aflatoxin B1 (26% of variation when log-transformed), and total aflatoxin (27% of variation when log-transformed), and 44% for aflatoxin B2 (27% when log-transformed). Oleate content accounted for substantial additional variation among lines (27% for B1, 21% for log-transformed B1, 29% for B2, 23% for log-transformed B2, 27% for total aflatoxin, and 20% for transformed total). Other fatty acids accounted for statistically but small fractions of among-line variation. There was significant residual variation among lines for all aflatoxin traits. Because most of the variation in aflatoxin production among lines was due to the contrast between the single high-oleic line and the other 15 lines from the normal range, the data were reanalyzed with the high-oleic line removed. Oleate and linoleate level accounted for 20 to 25% of the variation among lines with eicosenoate (20:1) and stearate (18:0) accounting for additional small, statistically significant increments. Although fatty acids accounted for significant portions of the genetic variation, it does not appear to be practical to use fatty acid level as a predictor of aflatoxin, especially for lines in the normal range for oleate and linoleate.

BREEDING, BIOTECHNOLOGY, AND GENETICS I

<u>Breeding for Early-maturing Peanut.</u> M.D. BUROW*, Y. LÓPEZ, M.R. BARING, J.L. AYERS, and C.E. SIMPSON. Texas Agricultural Experiment Station, Texas A&M University, Lubbock, TX 79403; Department of Soil and 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.

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. $F_{2:5}$ runner and Spanish selections were evaluated as replicated row trials at the Western Peanut Growers Peanut Research Farm (WTPGF, Denver City) and Sudan, Texas for maturity, yield, seed size and %TSMK, growth habit, vigor, and overall appearance. Several runner lines combining high yield and early maturity (>80% black or brown pods as determined by the hull scrape method) were obtained; however, there was a strong negative correlation between maturity and seed weight. One line (TX017746) had high yield, acceptable seed size, and an intermediate maturity (76% and 43% at the WPGRF and Sudan, respectively; Florunner =25 and 7%).

Two additional lines with acceptable seed size and intermediate maturity were also reselected from the 2001 trial and increased. Among the Spanish lines, none were significantly better than the parents. Selections from three $F_{2:4}$ populations segregating for runner, Spanish, and bunch type were evaluated as single plants. Data from plants pooled on the basis of F_2 parent at the WPGRF have identified two subpopulations of $F_{2:4}$ runner lines with maturity of 64% (relative to 43% for Florunner). In addition, three subpopulations of Spanish $F_{2:4}$ lines had maturities in excess of 80% and wet pod weights similar to runners. $F_{2:4}$ plants will be analyzed for O/L ratio - one parent of each cross had a high-O/L ratio. Two additional populations of $F_{2:4}$ plants increased from F_2 parents were also evaluated. These results suggest the possibility of developing varieties with enhanced edible seed quality.

Resistance to *Scleritinia minor* Infection in Transgenic Peanut--a Three Year Study. K.D. CHENAULT*, and H.A. MELOUK. USDA-ARS, Plant Science and Water Conservation Research Laboratory, Stillwater, OK 74075.

Fungal diseases of peanut, such as Sclerotinia blight caused by *Sclerotinia minor*, are responsible for increased production costs and yield losses of up to 50% for peanut producers in the Southwest, North Carolina and Virginia. Traditional breeding programs have been successful in releasing a few peanut cultivars with moderate Sclerotinia blight resistance. Introduction of anti-fungal genes through genetic engineering offers an alternative method of producing peanut lines with resistance to Sclerotinia blight and other fungal diseases. Transgenic peanut plant lines containing anti-fungal genes were produced from somatic embryos of the susceptible cultivar Okrun and have been tested for *S. minor* resistance under greenhouse and field conditions. This report summarizes the results of a three year field trial in which thirty-two of these transgenic peanut lines were subjected to high disease pressure without application of fungicides for Sclerotinia management. Transgenic peanut lines averaged a 32% reduction in *S. minor* infection when compared the susceptible control Okrun. Two transgenic lines consistently averaged Sclerotinia blight incidence indistinguishable from that of the resistant control Southwest Runner. Shelling percentage and seed weight for all transgenic lines were similar to that of the non-transgenic Okrun control. This research has successfully identified three transgenic peanut lines with desirable agronomic traits. Field performance of these transgenic peanut lines indicated a great potential for the use of genetic engineering to manage Sclerotinia blight without the use of pesticides.

Development of High Oleic Peanut Varieties Adapted to Australian Production Systems and Markets. A.W. CRUICKSHANK and G.C. WRIGHT*. Queensland Department of Primary Industries (QDPI), Farming Systems Institute, Kingaroy, Qld, Australia, 4610.

The Australian peanut industry is characterised by diverse production environments and fluctuating production levels. Peanuts are grown in Australia from 15° 30' to 30° S, as both a rainfed and irrigated crop. The diverse production environments and systems require varieties of different maturity, growth habit etc. In addition to varieties for the Australian industry require quality characteristics - low aflatoxin risk, high oleic kernel, blanchability and size and appearance of pods and kernels. Since 1994 QDPI has been breeding for adapted varieties with high oleic kernel and the best possible combinations of other quality traits. A key tool has been screening F_2 part-seed for high oleic individuals. High oleic F_2 individuals can then be used in back-crossing, 3 way crosses and as a starting point for pedigree selection.

The first 2 varieties from this work have been released in 2003. 'Wheeler' is from a backcross to the high-yielding Nut-In-Shell variety, Conder. 'Middleton' is a pedigree selection from a 3-way cross with the drought tolerant Streeton as the 50% parent. Compared to Streeton and lines produced by back-crosses to Streeton, Middleton has better blanchability and greater percentage of high-value Jumbo and Virginia Grade 1 kernel, as well as the high oleic trait.

Applying the same strategies with elite ultra-early maturity material from India and Canada has facilitated development of early maturing, high oleic lines now being tested across Eastern Australia. A number of Virginia and Runner lines from the USA have also been evaluated.

<u>Field Evaluation of Peanut Breeding Lines for Disease Resistance and Yield.</u> K.E. DASHIELL*[1], and H.A. MELOUK[2], [1]Dept. of Plant and Soil Sciences, Oklahoma State University, Stillwater, OK 74078; [2]USDA/ARS, Stillwater, OK 74078.

The two major disease of peanut in Oklahoma are Sclerotinia blight and early leaf spot caused by *Sclerotinia minor* and *Cercospora arachidicola* respectively. Three field trials were initiated in Oklahoma during 2002 to evaluate 68 breeding lines and cultivars when subjected to four different disease environments; 1) low Sclerotinia blight and early leaf spot pressure, 2) high Sclerotinia blight and low early leaf spot pressure, 3) low Sclerotinia blight and high early leaf spot pressure and 4) high Sclerotinia blight and early leaf spot pressure. These four different disease environments were created by applying 1) inoculum of *S. minor* to high Sclerotinia blight plots, 2) a block program of Bravo and Folicur to low leaf spot plots and 3) Omega to low Sclerotinia blight plots. The ratings for defoliation caused by early leaf spot and severity of Sclerotinia blight confirmed that the methods that were used to create the four different disease environments gave the expected results. There were highly significant differences between the genotypes for disease ratings for early leaf spot, Sclerotinia blight and yield. This method of testing can evaluate breeding lines and cultivars for resistance to the two major diseases and yield in one season and should help the peanut breeding program in Oklahoma to quickly identify the best breeding lines.

<u>Botanical Variety-specific Markers in Cultivated Peanut.</u> G. HE[1]*, R. MENG[1], G. GAO[2], M. NEWMAN[3], R.N. PITTMAN[3], and C.S. PRAKASH[1]. [1]Tuskegee University, Tuskegee, AL 36088; [2]Guangxi Academy of Agricultural Sciences, Nanning, China; [3]USDA-ARS, Plant Genetic Resources Conservation Unit, Griffin, GA 30223.

Fifty-six unique microsatellites were identified from the cultivated peanut genome using an enrichment procedure. Genetic variation among 24 genotypes was detected from 19 microsatellite loci. The average number of alleles was 4.5 at these 19 loci and 14 alleles were found at one locus. Interestingly, five microsatellite markers and one AFLP codominant marker were identified as botanical variety-specific markers in the cultivated peanut. Of these six markers, one marker was specific to the variety *hypogaea*, one to the variety *peruviana*, and three to both varieties *fastigiata* and *vulgaris*. Moreover, one marker could differentiate genotypes, but only in the variety *fastigiata*. These markers are valuable in cultivar identification, genetic mapping, and molecular breeding. Although the function of microsatellites is unknown, they appear to be useful in discerning the differences in genomes among botanical varieties and might also be involved in shaping the evolution of peanut.

<u>Selection of a Core of the Core Collection for Peanut.</u> C.C. HOLBROOK*, and W.B. DONG, USDA-ARS, Coastal Plain Exp. Stn. Tifton, GA 31793.

A core collection (831 accessions) has been developed to represent the U.S. *Arachis hypogaea* germplasm collection and can be used to improve the efficiency of identifying genes of interest. An even smaller subset of germplasm would be useful for traits which are very difficult and/or expensive to measure. The objective of this research was to select a core of the core collection. Data for eight above ground and eight below ground morphological characteristics were measured for each accession in the core collection. Cluster analysis was used on this data set to partition the core accessions into groups which, theoretically, are genetically similar. Random sampling was then used to select a ten percent sample was selected from each group. The result was a core of the core collection consisting of 111 accessions. Examination of morphological data indicated that the genetic variation expressed in the core collection has been preserved in this core of the core collection. Data on disease resistances for accessions in the core collection were used to retrospectively determine how effective the use of this core of the core would have been in identifying sources of resistance in the core collection. The results indicated that this core of the core is a representative sample of the core collection, and can be used to improve the efficiency of identifying valuable genes in the core collection.

<u>Use of Pod Brightness and Seed Oil Content as Readily Measured Indicators of Maturity</u>. T.G. ISLEIB* and R.W. MOZINGO, II, Department of Crop Science, North Carolina State University, Raleigh, NC 27695-7629.

Efforts to breed early maturing peanut cultivars require simple measures of maturity that can be applied to large numbers of individual plants at reasonable cost. The standard method of measuring peanut maturity, the laborious and time-consuming hull scrape method, is not suited to the task. The breeding project at N.C. State University measures pod brightness colorimetrically and oil content using nuclear magnetic resonance on pod and seed samples from every plot of every replicated test. With the instrumentation in place, large numbers of samples can be assayed at minimal cost. Data from the project database of yield trial results were used to determine the relationship between pod brightness, oil content, and meat content, a crude measure of maturity. The relationship of all three of these traits to yield was also examined. Data on cultivars and breeding lines still being tested in 2001 and for which there were results from at least ten tests were analyzed. Linear and quadratic regression on pod brightness (Hunter L score) and linear regression on oil content together accounted for 31% of residual variation (including environmental) in meat content after removing the average effects of genotypes. In regressions calculated for individual genotypes, pod brightness was significantly correlated with meat content for 22 out of 44 lines. The relationship tended to be stronger in later-maturing lines, with pod brightness accounting for up to 75% of environmental variation in some leafspot-resistant lines. Oil content accounted for significant additional variation in only one line. In the analysis of yield, the linear effect of pod brightness and the linear and quadratic effects of meat content accounted for 29% of the residual variation in yield (including genotypic effects) after removing environmental effects. These results suggest that pod brightness can be used as an aid to identify mature lines, especially when digging the lines prior to the average date of maturity for a population. Joint selection on pod brightness, oil and meat content may result in genetic gain for yield.

GRADUATE STUDENT COMPETITION II

Management of Sclerotinia Blight in Peanut with the Biocontrol Agent *Coniothyrium minitans*, Moderate Resistance, and Fungicide Programs. D.E. PARTRIDGE*, T.B. SUTTON, D.L. JORDAN, and V.L. CURTIS. Departments of Crop Science and Plant Pathology, 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 sclerotia of *Sclerotinia* spp., is currently available commercially as ContansWG and is labeled for sclerotinia blight control. A long-term field experiment was initiated in 1999 to test repeated soil applications of *C. minitans* at 2 and 4 kg/ha for control of sclerotinia blight. *C. minitans* was applied in the fall of 1999 and 2000 in a field that had been planted to cotton and harvested prior to the applications and in the fall of 2001 following peanut harvest. Peanuts (cultivars NC-V 11 and Perry) were planted in the spring of 2001 and 2002. Additional treatments included fluazinam (Omega 500) at 0.6 kg ai/ha applied according to current weather advisories for sclerotinia blight management for peanut. Disease incidence and pod yield were recorded. Interactions among *C. minitans* application, peanut cultivar, and fluazinam were not significant. However, several main effects and 2-way interactions were significant. Less disease developed when fluazinam was applied and the cultivar Perry was planted. Sclerotinia blight incidence was reduced with the application of *C. minitans*. Soil applications of *C. minitans* at both 2 and 4 kg/ha reduced disease development during the growing season and the total amount of disease in 2002, but no difference was found between rates. Applications of *C. minitans* for either 1, 2, or 3 years reduced disease compared to non-treated peanut. Three consecutive years of application of *C. minitans* resulted in the lowest amount of disease. A management program integrating the moderately resistant cultivar Perry with consecutive applications of *C. minitans* and fluazinam applied according to the sclerotinia advisory warning system may provide the best control of sclerotinia blight in peanut in North Carolina.

The Influence of Herbicides on the Incidence of Tomato Spotted Wilt Virus in Peanut. N.P. SHAIKH*[1], G.E. MacDONALD[1], and B.J. BRECKE[2], [1]Department of Agronomy, University of Florida, Gainesville, FL, 32611; [2]West Florida Research and Education Center, Milton, FL 32583.

Field studies were conducted to investigate the effect of several pre and post emergence herbicides on the incidence of tomato spotted wilt virus (TSWV) in peanut. Studies were conducted at Gainesville and Marianna FL, in 2001 and

2002. All studies were planted within the first two weeks of May and utilized the variety “Georgia Green”. Plots were maintained weed-free throughout the study period. The insecticide phorate was applied in-furrow at the time planting at 1.0 lbs ai/A. Pre-emergence herbicides included flumioxazin, metolachlor, diclosulam, imazethapyr, norflurazon, prometryn, and oxyfluorfen applied at 0.094, 0.9, 0.023, 0.063, 1.2, 1.25, 0.2 lb ai/A, respectively. An untreated control was also included. Post-emergence herbicide treatments consisted of paraquat + (bentazon + acifluorfen), paraquat + bentazon, paraquat + bentazon + metolachlor applied at cracking at 0.125 + (0.5+0.25), 0.125 + 0.5, 0.125 + 0.5+0.9 lb ai/A, respectively. Imazapic, (bentazon + acifluorfen) + 2,4-DB, pyridate + 2,4-DB and imazapic + 2,4-DB were applied post-emergence at 0.063, (0.5+0.25) + 0.2, 0.9 + 0.2, 0.063 + 0.2 lb ai/A, respectively. An untreated control was also included. An additional post-emergence herbicide experiment consisted of chlorimuron applied at 4 rates of 0.0, 0.004, 0.008 and 0.012 lbs/A and at 4 timings 5, 7, 9 and 11 weeks after cracking (WAC). Visual observations of tomato spotted wilt virus incidence were taken at mid-season and prior to harvest. Peanut yield (lb/A) was determined for all studies. In the pre-emergence herbicide experiment in Gainesville in 2001 and 2002 there was no significant difference in the incidence of TSWV and peanut yield for all treatments in both years. In the pre-emergence herbicide experiment in Marianna in 2001, there was higher TSWV incidence in norflurazon and metolachlor treated peanut compared to control. The yield of diclosulam was at par to control whereas the yields of all other treatments were significantly lower compared to control. In Marianna in 2002 there was a greater overall incidence of TSWV, but all the treatments were at par for TSWV and yield. In post emergence herbicide experiments the TSWV incidence was higher in paraquat + (bentazon + aciflorfen) and (bentazon + aciflorfen) + 2,4-DB compared to control at Gainesville in 2002. However the yield was at par for all treatments. In Marianna, the incidence of TSWV was significantly higher for (bentazon + aciflorfen) + 2,4-DB compared to pyridate +2,4-DB and all other treatments were at par to control. The yields for all the treatments in this experiment were at par. These studies indicate that the different pre and post emergence herbicides tested did not influence the incidence of TSWV and yield. There was no impact on canopy width or TSWV incidence by chlorimuron applied at any rate or timing in Gainesville in 2001 and 2002 and Marianna in 2001. There was a concomitant increase in TSWV incidence as chlorimuron rate increased when applied at 5, 9 and 11 WAC. This study indicates that under heavy TSWV pressure, chlorimuron may further enhance the incidence of TSWV.

<u>Suppression of Peanut Leaf Spot with Tillage Practices, Resistant Genotypes, and Reduced Fungicide Regimes.</u> A.K. CULBREATH[1], S.K. GREMILLION*[1], J.W. TODD[1], and R.N. PITTMAN[2], [1]The University of Georgia, Coastal Plain Expt. Stn., Tifton, GA 31793; [2]USDA-ARS, Georgia Expt. Stn., Griffin, GA.

A field experiment was conducted in 2002 to determine the effects of tillage practices, new breeding lines and fungicide regimes on early leaf spot *Cercospora arachidicola* and late leaf spot *Cercosporidium personatum* of peanut *Arachis hypogaea*. Fungicide regimes were as follows: 1) nontreated control; 2) tebuconazole, 0.126 kg ai/ha, (TEB) at first appearance of leaf spot; 3) TEB at first appearance of leaf spot + 2 wk later; 4) TEB at first appearance of leaf spot + 2 wk later + 4 wk later; and 5) TEB applied at 2 wk intervals full season beginning 40 days after planting. Cultivars MDR-98, C-99R, Ga. Green, and Bayo Grande, and breeding lines RP-01, RP-08, RP-14, and RP- 20, developed from crosses of MDR-98 and Bayo Grande, were planted in strip and conventional tilled soils. Ga. Green had more severe leaf spot than the other genotypes. Leaf spot was less severe in strip-tilled plots. All fungicide spray regimes reduced incidence of leaf spot compared to non-sprayed plots. Best control was in plots sprayed on the 14-day schedule for genotypes.

Economic Efficiencies of Pest Management Schemes in Peanuts. M. CASELLAS*[1], T. HEWITT[2], R. SPRENKEL[3], and J.R. WEEKS[4], [1]Food and Resource Economics, The University of Florida, Gainesville, FL 32611; [2]Food and Resource Economics, University of Florida, North Florida Research and Education Center, Marianna, FL 32446; [3]Department of Entomology, University of Florida, North Florida Research and Education Center, Quincy, FL 32351; [4]Department of Entomology and Plant Pathology, Auburn University, Wiregrass Substation, Headland, AL 36345.

Production efficiency has been important to peanut farmers as they attempt to reduce costs and improve net farm income. Changes in the peanut program dictate that costs must be closely monitored and ways to reduce costs should be considered. A study has been conducted at two locations; Wiregrass Experiment Station, Headland, AL and the North Florida Research and Education Center, Marianna, FL to look at a way to improve production efficiency. The study was established to evaluate three levels of insect and disease management for pest efficiency, peanut yield, peanut grade, and economic return. Three management systems were compared; low input, IPM, and high input. The low input system is defined as applying the minimum rates of recommended pesticides. The IPM system is defined as a management system where treatments are applied based on the AUPnut production model. The high input system utilized maximum recommended rates of pesticides. All other inputs were used at standard recommended practices for typical farms. Yield data were calculated and grades were obtained for four varieties: Virugard, AT 1-1, Georgia Green, and C-99R. The most economical treatment was high input for the Georgia Green variety. However, the results indicate that the most expensive treatment program was not always the most economical and in some cases did not have the highest yields. The use of the high input system over the IPM program was only statistically significant for two varieties. The IPM system seemed to be the best overall for net income for all four varieties. Greatest cost effectiveness can be achieved utilizing a medium level of input for disease and insect management system in years similar to the previous two years with a high drought pressure.

Identification of Factors that Influence the Epidemiology of Sclerotinia Blight of Peanut (*Arachis hypogaea*). D.L. SMITH* and B.B. SHEW. Department of Plant Pathology, NC State University, Raleigh, NC 27695.

The relationships between Sclerotinia blight incidence, severity, environmental factors, and yield loss were examined in the field during the 2002 growing season. The environmental conditions that optimize the growth and spread of *Sclerotinia minor* were also determined in the laboratory. A highly susceptible (NC 12C) and a moderately resistant peanut cultivar (Perry) were planted in field plots in Perquimans Co, NC and treated with fungicide (fluazinam) at three rates to establish different disease severities among plots. Fungicide and cultivar

effects on yield were additive. Modeled weather data were obtained from Skybit Inc and related to weekly changes in incidence of Sclerotinia blight. In a separate test at the NCSU Phytotron, growth chamber studies were conducted to examine the effects of soil temperature and moisture on sclerotial germination, mycelial growth, and colonization. Soil was adjusted to water potentials of -7.2, -10, and -100 kPa and placed in glass jars. Sclerotia or mycelial plugs were placed on soil in glass jars and incubated at 18, 22, 26, and 30 C. Leaflets of three peanut lines were inoculated with mycelial plugs and incubated in jars under the same conditions. Sclerotial germination was greatest at 26-30 C and -7.2 kPa (saturated), whereas mycelial growth was greatest at 18-22 C at all water potentials. A combination of soil temperature between 18-22 C and soil moisture near -10 kPa (field capacity) was optimal for infection of leaves of all lines.

Weed Management in Peanut Under Twin Row Patterns and Conservation Tillage. D.C. YODER*[1], G.E. MacDONALD[1], D.L. WRIGHT[2], and B.J. BRECKE[3], [1]Department of Agronomy, University of Florida, Gainesville, FL 32611; [2]North Florida Research and Education Center, Quincy, FL 32351; [3]West Florida Research and Education Center, Jay, FL 32565.

Southeastern peanut producers face dynamic challenges in achieving profitability and sustainability. Continuous pressure to reduce input costs has played a role in re-evaluating standard production practices to determine the most cost effective herbicide programs for weed management. Recently, there has been tremendous interest in alternative row patterns, such as twin rows, for peanut production. Twin row spacing also leads to quicker canopy of row middles, but the impact on weed control efforts has not been determined. In addition, there is limited weed management research under conservation tillage regimes, especially in conjunction with twin row spacing.

To determine the impact of reduced tillage practices and twin row planting patterns on weed management in peanuts, experiments were conducted at Citra and Quincy, Florida in 2001 and 2002. A standard variety was utilized, Georgia Green, planted at 110 lbs/A for both single and twin row spacing. The single row spacing was standard 36 inches, with the twin row planting being on 36-inch centers and the two twin rows 8 inches apart. Tillage regimes included a typical conventional tillage system and a minimum tillage system. Within each pattern of row spacing and tillage method, five standard herbicide weed management packages were evaluated. Visual ratings of weed control and tomato spotted wilt virus (TSWV) were conducted throughout the season. Yield was taken at the end of each season at both locations in both years. Grades were determined for both locations in 2002. Data was subjected to analysis of variance ($P < 0.1$) to test for treatment effects and interactions.

There was a significant interaction between year and location, therefore results are presented accordingly. Significant yield differences were seen at both locations in both years. At Quincy in 2001, yields under conservation tillage were higher than conventional tillage and twin rows had greater yields compared to single rows. At Citra in 2001, significantly lower yields were observed with single row spacing under conservation tillage compared to single rows under conventional planting, or compared to twin rows under either tillage regime. This effect was also observed at the Quincy location in 2002. At Citra in 2002, no yield differences were seen. There were no differences noted for peanut grades at either location. Significantly lower TSWV was seen with the twin row pattern in Quincy in 2002. Twin rows had significantly greater weed control than single rows, 94% and 87%, respectively, on Florida beggarweed (*Desmodium tortuosum*). The predominant weed species found in Citra, dayflower (*Commelina spp*), was controlled 82% in twin rows and 74% in single rows. When metolachlor herbicide was included in a weed control system, dayflower was controlled >90%. The weed control system of flumioxazin applied preemergence followed by imazapic early postemergence provided >94% of all weed species.

BREEDING, BIOTECHNOLOGY, AND GENETICS II

<u>Genetic Transformation of Peanut for Resistance to *Sclerotinia minor*.</u> D.M. LIVINGSTONE*, J.L. HAMPTON, A.R. STILES, P.M. PHIPPS, E.A. GRABAU. Department of Plant Pathology, Physiology and Weed Science, Virginia Tech, Blacksburg, VA 24061 and Tidewater Agricultural Research and Extension Center, Suffolk, VA 23437.

Genetic transformation provides additional strategies for development of peanut varieties with enhanced resistance to plant pathogens. Of particular interest has been the improvement of commercial cultivars for resistance to *Sclerotinia minor*, a devastating disease of peanut in Virginia and elsewhere. We have previously isolated and cloned a barley oxalate oxidase gene as a potential resistance gene for introduction into peanut, developed a quantitative assay for the detection of oxalate oxidase enzyme activity, and established optimal conditions for the production of regenerable embryogenic cultures from the Virginia cultivars Wilson, Perry, NC7, 98R, 92R, Gregory, V11 and NC12C. Our objectives were to introduce the oxalate oxidase gene into peanut embryogenic callus by microprojectile bombardment, select for transformed callus, and regenerate transformed plants. Analysis of transformants included enzyme assays of transgene activity, molecular confirmation of transgene integration, and pathogen challenge to determine the extent of resistance to *Sclerotinia*. We have successfully recovered 180 independently transformed plants (from cvs. Wilson, Perry and NC7) that are now growing in soil in the greenhouse. Transformed plants generally express higher levels of oxalate oxidase activity than untransformed controls. 79% of Perry, 78% of Wilson and 35% of NC7 showed significantly elevated expression, and selected lines from each cultivar showed 3 to 4 times as much activity as untransformed controls. *In vitro* bioassays are being conducted on isolated leaves to determine whether the transformed plants have increased resistance to *Sclerotinia minor*. Bioassay and Southern DNA analysis results will be presented. Callus from the remaining cultivars Gregory, 98R, 92R, V11 and NC12C have been bombarded and are currently proceeding through the regeneration process.

<u>Determination of Maturity of Standard Varieties in West Texas.</u> Y. LÓPEZ*, M.D. BUROW, M.R. BARING, J.L. AYERS, J. CASON, and C.E. SIMPSON. Texas Agricultural Experiment Station, Texas A&M University, Lubbock, TX 79403; Department of Soil and Crop Sciences, College of Agriculture and Life Sciences, Texas A&M University, College Station, TX 77843.

Late maturity and lower oleic to linoleic ratios (O/L) are two important factors affecting peanut quality in West Texas. It has been suggested that later maturing accompany incorporation of high O/L trait in Spanish varieties. All varieties have F435 as a donor for the high O/L trait. There has been a concern whether F435 is a late maturing line. A study was set to compare maturity, and important associated traits, in both Spanish and runner market-type breeding lines and varieties. Ten Spanish and 10 runner entries, with 3 repetitions and three digging dates were planted during two consecutives years: at WPGRF (Denver City), West Texas in 2001, and in Denver City, Sudan, Stephenville, and Frio County during 2002. For the first year, there were significant differences for both digging dates and among lines/varieties for most of the traits in the Spanish test. Spanish lines indicated that lines had either just reached or were not quite mature by the final harvest. F435 took longer to approach maturity that all other accessions on basis of percentage black pods and %TSMK. Tamspan 90 and Spanco have higher %TSMK at earlier digging dates than does F435. An interesting result from this test is showed by the data of OLin (Tx962120), the breeding line that was released in 2001 as the first high O/L Spanish variety. OLin has %TSMK values for digging dates 1 and 2 that are 53.3% and 69.4%, almost equal to Tamspan 90, and much greater that F435, which had 40.9% and 62% TSMK at the first two digging dates, respectively. However, the maturity, as measured by percentage black pods, was average for OLin. It is suggested that OLin is a line that combines good genes for yield and grades with genes that confer some degree of earliness. Information and analyses for the second year are still being processed. Data have been analyzed only for the runner test at Sudan, TX. Results show significant differences for digging dates and among lines for yield, maturity, 100-seed weight, %TSMK, %ELK, and %Med. The cultivar Langley, included as an early maturity check, proved to be early, as compared to most of the other entries. In general, it appears that lines mature earlier in year 2002 as compared to 2001. However, there were differences in methodology that could have affected the results. This test-data will help breeders select traits that will combine good genes for yield and grade with those for earliness. Complete analyses will be discussed.

Application of EST Technology in Functional Genomics of *Arachis hypogaea* L.

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The genome size of peanut (*Arachis hypogaea* L.) is about 2800 Mb in comparison with the genome size 128 Mb and 425 Mb of *Arabidopsis thaliana* and rice (*Oryza sativa*), respectively, which have been completely sequenced. EST (expressed sequence tag) technology is the most cost-effect route for studying *A. hypogaea* genome and studying the complicated problem of host resistance and preharvest aflatoxin contamination. We constructed two cDNA libraries for EST analysis of gene expression profiles in two tissues of leaves and immature-pods from the field. We sequenced 769 ESTs from leaf cDNA library and 1056 ESTs from immature-pod cDNA library, and there are 536 and 769 unique sequences respectively. The BLASTx research resultes 52.8% and 78.6% ESTs with known functions from these two libraries, respectively. There are about 27.3% and 22.1% ESTs matching homologous sequences in dbEST of

GenBank based on BLASTn algorithm with un-known functions. We are interested in identifying the adversity tolerance genes especially in drought tolerance and disease resistance and marker development. The disease resistance related genes are relative abundant such as glycosyl hydrolase family, PR-1, PR10, GST 8, GST 9, beta-glucosidase, defensin protein precursor. Stress induced genes are also found such as dehydration stress-induced protein, osmotin-like protein, hydroxyproline-rich glycoprotein, heat-shock protein, low temperature and salt responsive protein, ultraviolet-ß-repressible protein, aluminium-induced protein. Several genes reported with adversity tolerance were also found such as nonspecific lipid-transfer protein, 10 kDa protein precursor, caffeic acid O-methyltransferase, drought inducible protein, 22kD protein, metallothionein, catalase, proteinase inhibitor, F-box protein, defensin protein, drought induced protein. We also found some redundant ESTs without known function, and some do not have homologous sequences in the GenBank. SSR (simple sequence repeat) markers could be developed from ESTs.

New B Genome Donor of *Arachis hypogaea* L. N. MALLIKARJUNA*, S.K. TANDRA, D. JADHAV and J.H. CROUCH. International Crops Research Institute for Semi Arid Tropics, Patancheru 502 324, Andhra Pradesh, India.
Arachis hypogaea L, the cultivated peanut, is a believed to be an allotetraploid and the evolution of the crop dates back to the tertiary era (Gregory and Gregory, 1979). Cultivated peanut is comprised of two genomes A and B (Simpson and Stalker, 1995). Gregory and Gregory (1976) were the first to suggest that *A. duranensis* is one of the putative genome donor of *A. hypogaea*. Cytogenetical and molecular data support *A. duranensis* as the female parent and the A genome donor of *A. hypogaea* (Simpson and Stalker, 1995), and there is no ambiguity about it. The problem has long been the B genome donor. Different species from the B genome pool have been proposed. According to Singh and Smartt (1998) *A. batizocoi* is the donor. Kochert et al., (1991) based on RFLP studies, suggested *A. ipaensis* as the donor. According to Paik-Ro et al (1992), *A. batizocoi* is not closely related to *A. hypogaea* and hence cannot be the B genome donor. Karyotype studies of Fernandez and Krapovickas (1994) support *A. duranensis* and *A. ipaensis* as the A and B genome donors of *A. hypogaea*. Inter-relationships of twenty-five species of *Arachis*, of which thirteen were from section *Arachis*, were studied by Randomly Amplified Polymorphic DNA (RAPD)-cluster analysis. It was interesting to note that most of the species from different sections grouped together as per the classification of *Arachis*. The B genome species formed two groups placed away from each other. One group comprised of *A. batizocoi*, *A. ipaensis* and *A. magna*. The other group comprised of *A. hoehnei*, *A. benensis* and *A. valida*. The *A. hoehnei* group showed closer relationship to cultivated species *A. hypogaea*, whereas the *A. batizicoi* group showed a distant relationship. Crossability between *A. hoehnei* and *A. hypogaea* produced bold seeds without the application of growth regulators, indicating lack of barriers. A few mature seeds were obtained. Majority of the seeds were bold but immature and were germinated in vitro to obtain plants. Fertility in the hybrids was promising and ranged from 14-21 %. Cytological analysis showed 86% of the PMCs with more than 10 bivalents and a mean of 4 univalents per PMC. Trivalents ranged from 1-3 with a mean of 3 per PMC. Based on crossability studies, cytogenetics and the molecular data, we propose *A. hoehnei* as the B genome donor.

<u>Genomic Characterization of Section *Arachis* Species.</u> S.P. TALLURY*[1], S.R. MILLA[1], H.T. STALKER[1], and K.W. HILU[2], [1]Department of Crop Science, NCSU, Raleigh, NC 27695; [2]Department of Biology, Virginia Tech, Blacksburg, VA 24061.

Knowledge of the genomic affinities of diploid species of section *Arachis* that are cross-compatible with *A. hypogaea* will be useful to devise efficient interspecific hybridization programs. Although genomic designations of the newly named *Arachis* species is available, no attempts were made to hybridize these species to understand their genetic affinities with the A and B genomes of section *Arachis* as well as with *A. hypogaea*. The overall goal of this research is to decipher the genomic identities of selected diploid *Arachis* species of section *Arachis*. We have selected *A. duranensis* (K 7988), and *A. batizocoi* (K 9484) as the representative A and B genome tester species. They were used as female parents to make crosses with *A. benensis* (KGSPSc 35005), *A. cruziana* (KSSc 36024), *A. herzogii* (KSSc 36029), *A. hoehnei* (KG 30006), *A. ipaensis* (KGBSPSc 30076), *A. kempff-mercadoi* (KGSSc 30088), *A. kuhlmannii* (VKSSv 8888), *A. palustris* (VPmSv 13023), *A. praecox* (VSGr 6416) and *A. williamsii* (WiCla 1118) as male parents. Karyotypes of *Arachis* species, crossability, pollen fertility and meiotic analysis in F1 hybrids indicated that *A. benensis*, *A. herzogii*, *A. kempff-mercadoi*, and *A. kuhlmannii* belong to A genome species whereas *A. cruziana*, *A. hoehnei*, *A. ipaensis* and *A. williamsii* contained the B genome. No hybrids were obtained from *A. palustris* and *A. praecox* crosses. Although these two species were presumed to be A genome species, additional work needs to be carried out to clarify their genomic affinities. Further, clustering of *Arachis* species based on AFLP analysis led to *A. herzogii*, *A. kempff-mercadoi*, *A. kuhlmannii* to group along with other A genome species, *A. cruziana* grouped with *A. batizocoi* accessions (B genome), whereas the remaining species fell into ambiguous clusters. Additionally, we propose to use trnT-F plastid regions to resolve some of the ambiguity of genetic relationships between section *Arachis* species.

<u>Physiological Interpretation and Manipulation of Inheritance for Yield.</u> B.R. NTARE[1] and J.H. WILLIAMS*[2]. [1]ICRISAT, BP 320, Bamako. Mali and [2]Peanut CRSP, University of Georgia, Griffin GA 30224.

Yield is commonly a characteristic with low heritability and many breeding practices are related to the problems that breeders have in identifying progeny with high yield potential from within segregating populations. In terms of the general phenotype model (Y = G + E +G.E) this means that E and G.E are much greater than G, and because of difficulties in separating the components of the model breeders only select for yield in later stages of the crop improvement process. If E can be quantified then the breeders' ability to determine G is increased, and his ability to select for yield is improved. Simple resource capture models allow estimates of Crop Growth Rate (C), and partitioning to be made from phenological observations and final biomass in shoots and fruit. Since variation in C is largely determined by environment resource capture, using C as a proxy for environment has the effect of increasing heritability of yield. Across a series of trials (conducted in Africa) where inheritance of yield was estimated, and also estimated using C as a covariate, the estimates of inheritance was increased by the use of C. This method applies equally to single plants, rows and plots, and allows breeders to consider changing their selection process.

WEED SCIENCE

Reduced Rates of Cadre and Pursuit for Weed Control in Peanut. T.A. BAUGHMAN*, W.J. GRICHAR, P.A. DOTRAY, and J.C. REED. Texas Cooperative Extension, Texas Agricultural Experiment Station, and Texas Tech University; Vernon, Yoakum, and Lubbock, TX.

Research was conducted during the 2002 growing season to evaluate weed control in peanut (*Arachis* hypogaea L.) with reduced rates of Cadre and Pursuit in Northwest and South Texas. Herbicides combinations and rates included Cadre and Pursuit applied postemergence at (0.72 or 1.44 oz pr/A) alone or in combination with postemergence applications of Strongarm (0.225 oz pr/A or 0.45 oz pr/A), Dual Magnum (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).

Yellow nutsedge control was at least 85% with Cadre and Pursuit alone at the 1X rate or applied at the 1/2X rate in combination with Strongarm or Dual Magnum at the 1/2X and 1X rates, in Northwest Texas at one location, Yellow nutsedge control was at least 70% with all Cadre combinations except Cadre 1/2X + Strongarm 1/2X, at a second location. Yellow nutsedge was less than 60% with all Pursuit combinations. Palmer amaranth control was greater than 75% when Cadre or 2,4-DB was applied alone at the 1X rate or with Cadre 1X + Storm. Palmer amaranth control (third experiment) was less than 15% Cadre was applied in combination with Ultra Blazer. Palmer amaranth and ivyleaf morningglory (fourth experiment) was at least 80% with all combinations of Cadre, Pursuit, Strongarm, and 2,4-DB except when Pursuit was applied at the 1/2X rate alone.

Cadre applied alone at the 1/2X rate or used in combination with Strongarm at the 1/2X or 1X rate controlled Palmer amaranth, smellmelon, and yellow nutsedge at least 80% in South Texas. Pursuit applied alone or in combination with Dual Magnum or Strongarm controlled yellow nutsedge control less than 60%. The only treatment that controlled Palmer amaranth and yellow nutsedge at least 80% was Cadre 1/2X + 2,4-DB (second experiment). Smellmelon control was at least 80% when Ultra Blazer was used in combination with Pursuit or Cadre at both the 1/2X and 1X rates.

This research while preliminary does suggest there is an opportunity to reduce rates of Cadre and Pursuit. However, this will be dependent on weed species, environmental condition, and potential tank-mix partner. In addition, antagonism can occur with some tank-mixes and weed species.

Interaction of Clethodim (Select) with Fungicides. W.J. GRICHAR*, B.A. BESLER, and A.J. JAKS, Texas Agricultural Experiment Station, Beeville, TX 78102.

Field studies were conducted during the 2002 growing season at several locations in the south Texas peanut (*Arachis hypogaea* L.) growing area to evaluate the interaction of clethodim (Select) with the fingicides azoxystrobin (Abound 2.08F), chlorothalonil (Bravo Weatherstik), tebuconazole (Folicur 3.6

F), and BAS 500 (Headline) when used in combination with the surfactants Agridex, Kinetic, or AG-98 for annual grass control and foliar disease [*Cercospora arachidicola* S. Hori and *Cercosporidium personatum* (Berk. & M.A. Curtis) Deighton] development. When rated 5 weeks after treatment, Texas panicum (*Panicum texanum*) control with clethodim alone or in combination with fungicides was at least 90% when Agridex was used. When Kinetic or AG-98 were used as surfactants, Texas panicum control was less than 60%. Under weed-free conditions, no difference in disease development was noted when clethodim was used in combination with fungicides. However, clethodim alone did result in more leafspot than when used in combination with fungicides. Reduced peanut yield were noted when clethodim was used alone compared to clethodim in combination with fungicides.

<u>Preliminary Results of Non-Chemical Weed Control Research in Peanut Production Using Cultural Controls and Propane Flaming.</u> W.C. JOHNSON, III* and A.K. CULBREATH. USDA-ARS, Coastal Plain Experiment Station, Tifton, GA 31793.

Trials were initiated in 2003 to evaluate systems of weed management in peanut without using herbicides. Two trials were conducted at the Coastal Plain Experiment Station in Tifton, GA; conventional tillage and strip-tillage. The conventional tillage trial evaluated two levels of stale seedbed management, two row patterns, and five levels of weed control using propane flaming. The strip-tillage trial was conducted at a site with a senescent rye cover crop. This trial evaluated all combinations of three levels of cover crop management and nine levels of weed control using propane flaming. Both trials were conducted at sites managed for weed science research with heavy natural populations of southern crabgrass, pitted morningglory, and yellow nutsedge. In the conventional tillage trial, shallow tillage of stale seedbeds twice before planting provided superior weed control compared to stale seedbeds flamed three times before planting. Early season ratings showed weed control was not improved by narrow row patterns over wide row patterns. Over-the-top propane flaming sequentially at peanut emergence and one week after emergence provided early season weed control nearly comparable to the standard herbicide check, when used in conjunction with shallow tillage of stale seedbeds. Single flaming operations did not adequately control weeds. Peanut exhibited acceptable tolerance to over-the-top propane flaming early season. Despite the promising efficacy of multiple propane flamings for weed control, the lack of residual weed control may be evident later in the season. In conservation tillage trials, weeds were not adequately controlled by any form of propane flaming. Burning, mowing, or planting directly into standing rye resulted in numerous weed escapes that could not be controlled by propane flaming after planting. Based on these preliminary results, propane flaming is not a stand-alone practice for non-chemical weed control in peanut, but offers potential when integrated with mechanical and cultural weed control practices.

<u>Managing Tropic Croton with Cadre/Ultra Blazer Tank-Mixes in Peanut.</u> E.P. PROSTKO*[1] and J.M. KICHLER[2]. [1]Department of Crop & Soil Sciences, University of Georgia, Tifton, GA 31793-1209; and [2]Webster County Cooperative Extension Service, Preston, GA 31824-0089.

Tropic croton (*Croton glandulosus* var. *septentrionalis*) is the third most troublesome weed of peanut in Georgia. Cadre (imazapic) is the most popular herbicide used in Georgia but provides inadequate control of tropic croton. Ultra Blazer (acifluorfen) can be used to control tropic croton in peanut but growers are reluctant to use this herbicide because of its perceived potential to cause crop injury and higher cost/A. The objective of this research was to determine if tropic croton control with Cadre could be improved with tank-mixes of Ultra Blazer at reduced rates.

Two on-farm field trials were conducted in Webster County, GA in 2002. 'Georgia Green' peanut was planted on April 30. Treatments included postemergence applications of Cadre 70DG at 1.44 oz/A, Ultra Blazer 2L at 24 oz/A and Cadre (1.44 oz product/A) + Ultra Blazer at 2, 4, 8, 12, or 16 oz/A. All treatments included a non-ionic surfactant (80/20) at 0.25% v/v. In Test 1, all treatments were applied when the tropic croton was 1 inch tall. In Test 2, all treatments were applied when the tropic croton was 5-6 inches tall. The treatments were arranged in a randomized complete block design with four replications. Crop injury and weed control data were visually evaluated and subjected to ANOVA (P=0.10). Tropic croton populations in the test areas averaged 6.5 plants/ft2.

In both tests, the additions of Ultra Blazer to Cadre did not significantly increase peanut injury when compared to either herbicide applied alone. When treatments were applied at the 1 inch stage, tropic croton control with Cadre was improved with tank-mixes of Ultra Blazer at rates at or above 4 oz product/A. At least 8 oz/A of Ultra Blazer, mixed with Cadre, was required to provide control similar to the 24 oz/A rate of Ultra Blazer applied alone. When treatments were applied at the 5-6 inch stage, tropic croton control with Cadre was improved with Ultra Blazer combinations at rates at or above 4 oz/A. However, all Cadre + Ultra Blazer tank-mixes were less effective than the 24 oz/A rate of Ultra Blazer applied alone.

Physiological Behavior of Root-Absorbed Flumioxazin in Peanut, Ivyleaf Morningglory, and Sicklepod. J.W. WILCUT*[1], A.J. PRICE[1], and S.B. CLEWIS[1], and J.R. CRANMER[2], [1]Crop Science Department, North Carolina State University, Raleigh, NC 27695-7620; [2]Valent USA Corp., Cary, NC 27511.

Previous research indicated that flumioxazin has the potential to cause peanut injury. In response to this concern, greenhouse and laboratory experiments were conducted to investigate: 1) the influence of temperature on flumioxazin-treated peanut seed germination, 2) the influence of six different simulated rainfall intervals after soil-applied flumioxazin preemegence (PRE) application on peanut emergence and injury, and 3) 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 umol/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, iyvleaf 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).

Peanut Tolerance to Flumioxazin, Diclosulam, and Dimethenamid. P.A. DOTRAY*[1], T.A. BAUGHMAN[2], J.W. KEELING[3], and T.A. MURPHREE[4], [1]Texas Cooperative Extension, Lubbock, TX 79401-9757; [2]Texas Cooperative Extension, Vernon, 76385; [3]Texas Agricultural Experiment Station, Lubbock, TX 79401-9746; [4]Department of Plant and Soil Science, Texas Tech University, Lubbock, TX 79409-2122.

Field experiments were conducted in 2002 near Lamesa (AG-CARES and grower fields), Denver City (WPGRF), Flomot, and Rayland, TX to evaluate peanut tolerance to flumioxazin, diclosulam, and dimethenamid applied at different rates and application timings. Soil types were an Amarillo fine sandy loam with 0.4% organic matter and pH 7.8 at AG-CARES, a Brownfield loamy fine sand at WPGRF, and a Miles loamy fine sand and Delwin fine sand at Rayland and Flomot, respectively. At WPGRF, Flumioxazin 51 WP at 0.094 and 0.188 lb ai/A was applied PPI or PRE and Flavor Runner 458 was planted. At Flomot and WPGRF, flumioxazin was applied PRE at 0.063 and 0.094 lb ai/A after planting Tamrun 96, Tamrun OL/01, Flavor Runner 458, and Georgia O/L (Sunoleic 97R was also included at WPGRF). At Boardman's, flumioxazin formulations (51 WG, 51 WP, 4 L, 51 WDG) were applied PRE at 0.094 and 0.188 lb ai/A after planting Sunoleic 97R. At AG-CARES, flumioxazin was applied PRE at 0.063, 0.094, 0.125, and 0.188 lb ai/A after planting Flavor Runner 458. At AG-CARES and Rayland, diclosulam was applied POST at 0.008, 0.016, 0.023, 0.031, and 0.046 lb ai/A to Olin (Flavor Runner 458 was also included at AG-CARES). At Pendagraph's, AT VC2 was planted and diclosulam at 0.024 lb ai/A was applied PRE, AC, or POST alone or as part of a weed management program. At AG-CARES, dimethenamid at 0.05, 0.75, and 0.84 lb ai/A was applied PPI, PRE, AC, and POST in Flavor Runner 458. All herbicides were broadcast applied using either a tractor-mounted compressed air sprayer calibrated to deliver 10 GPA or a CO2-pressurized backpack sprayer calibrated to deliver 15 GPA. Herbicides applied preplant were incorporated with a springtooth harrow prior to listing. Tolerance studies were maintained weed-free and visual peanut injury was recorded throughout the growing season. Peanut yields were determined at several locations. No flumioxazin treatment caused visual peanut injury or yield loss at any location. Yield in weed-free studies ranged from 4803 to 5335 lb/A at WPGRF (PPI/PRE study), 2940 to 3235 lb/A at AG-CARES (rate study), 2690 to 2706 lb/A at Flomot (averaged across varieties), and 5719 to 5735 lb/A at WPGRF (averaged across varieties). At the end of the growing season, diclosulam applied PRE injured AT VC2 peanuts 17 to 20%, while diclosulam applied AC injured peanut 6 to 8%. No visual injury was observed following diclosulam POST. At AG-CARES, diclosulam POST did not injure Flavor Runner 458 or Olin. Yield from Flavor Runner 458 plots ranged from 3100 to 3427 lb/A, while yield from Olin plots ranged from 2953 to 3273 lb/A. At Rayland, diclosulam did not cause visual peanut injury or reduce yield. Dimethenamid applied PPI, AC, or POST did not injure peanut, but injury was observed following PRE applications at 0.75 and 0.84 lb ai/A. Early-season injury ranged from 19 to 29% and mid-season injury ranged from 3 to 4%, but no injury was observed at harvest. Yields ranged from 2478 to 2860 lb/A, and less yield was observed in plots treated with dimethenamid at 0.75 and 0.84 lb ai/A. These studies suggest that peanuts have excellent tolerance to flumioxazin PRE, diclosulam POST, and dimethenamid PPI, AC, and POST on the Texas High and Rolling Plains.

PROCESSING AND UTILIZATION

Sensory Quality Traits of the Runner-Type Peanut Cultivar Georgia Green and Its Value as a Parent Compared with Florunner. H.E. PATTEE*[1], T.G. ISLEIB[2], D.W. GORBET[3], K.M. MOORE[4], Y. LOPEZ[5], M.R. BARING[5], and C.E. SIMPSON[5]. [1]USDA-ARS and [2]Crop Science Dept., N.C. State Univ., Raleigh, NC 27695-7625; [3]North Florida Research and Education Center, Marianna, FL 32446, formerly of [4]AgraTech Seeds Inc, Ashburn, GA 31714; [5]Soil and Crop Sci. Dept., Texas A&M Univ., College Station, TX 77843-2474.

Georgia Green has become the dominant runner market-type peanut in the United States because of its superior disease resistance. However, the roasted peanut flavor quality of Georgia Green has never been formally reported, and questions regarding its flavor quality have been expressed by the peanut industry. The objective of this study was to compare the roasted peanut flavor qualities of Georgia Green to the long-time roasted peanut flavor quality standard Florunner. This study also provided opportunities to further expand investigations into the parent selection effects on progeny roasted peanut flavor quality. A total of 192 samples of Florunner, Georgia Green, and Georgia Green's parents, Southern Runner and Sunbelt Runner, were collected from 1986 to 2000 from the Southeast, Southwest, and Virginia-Carolina peanut production regions. A descriptive sensory panel evaluated flavor attributes of a roasted sound mature kernel (SMK) sample from each plot. The sensory attributes of the four lines were compared directly, and the data were included in a Best Linear Unbiased Prediction of breeding value of 112 peanut cultivars and breeding lines. Georgia Green was not significantly different from the industry standard cultivar Florunner in the sensory attributes roasted peanut (4.5 vs. 4.1 flavor intensity units [fiu], ns), bitter (3.2 vs. 3.3 fiu, ns), and astringent (3.3 vs. 3.4 fiu, ns). It was significantly sweeter than Florunner (3.3 vs 3.0 fiu, $P<0.05$). The BLUPs of breeding value for roasted peanut and sweet attributes of Georgia Green were among the highest of any peanut lines included in the analysis. Based on this finding, widespread use of Georgia Green, as a parent should contribute to flavor improvement in runner market-type breeding programs.

Improving Shelf Life of Roasted and Salted Inshell Peanuts Using High Oleic Acid Chemistry. R.W. MOZINGO*[1], S.F. O'KEEFE[2], and T.H. SANDERS[3] and K.W. HENDRIX[3], [1]Tidewater Agricultural Research and Extension Center, Virginia Tech, Suffolk, VA 23437, [2]Department of Food Science and Technology, Virginia Tech, Blacksburg, Virginia 24061 [3]USDA, ARS, North Carolina State University, Raleigh, North Carolina 27695.

The high oleic variety AgraTech V-C 2 and the normal oleic acid variety VA 98R, large-seeded, Virginia-type peanuts from the 2000 and 2001 crop were used for shelf life evaluations after roasting inshell and salting-roasting inshell. The 2000 crop peanuts were obtained from a commercial sheller. Peanuts from the 2001 crop were grown at the Tidewater Agricultural Research and Extension Center in Suffolk, Virginia. All peanuts were sized into fancy inshell grade and prepared for processing. After sizing the 2000 crop peanuts were put in cold storage (4.5 °C and 65-70% RH) on April 9, 2001. The peanuts in cold storage were taken out two days ahead of processing in order to equalize kernel temperature before roasting. Peanuts from the 2001 crop used for roasting inshell were not put in cold storage since they were used immediately after sizing. Peanuts from both the 2000 and 2001 crop year were roasted inshell at a commercial roasting facility on February 12, 2002, packaged in 2-mil cellophane bags, sealed, and stored at ambient temperature. The same two varieties of normal and high oleic acid peanuts used for the salting-roasting inshell process were grown, sized and stored as described above for roasted inshell samples except that the samples from the 2001 crop were put in cold storage on March 22, 2002 and stored until August 23, 2002. A saturated salt solution obtained from a commercial processor was used for small lot (approximately 5.4 kg) salting inshell on August 28, 2002. The peanuts were allowed to drain after removal from the salt solution, dried in a forced air drier for four days to reduce the moisture to approximately 9%, and put in wire mesh bags for identity preserved roasting at a commercial roasting facility on September 4, 2002. After roasting they were packaged in 3-mil cellophane bags, sealed, and stored at ambient temperature. For both the roasted inshell and salted-roasted inshell experiment, three replicate samples were taken the day of roasting and then every two weeks for 12 weeks. After 12 weeks samples were taken at four-week intervals through 36 weeks for the roasted inshell and 40 weeks for the salted-roasted inshell. After sampling, all samples were stored in a freezer at -15 C until peroxide values (PV) could be run to determine shelf life based on rancidity. Peroxide values were determined using the American Oil Chemists' Society Official method Cd 8-53. Research data from sensory panels show that a PV around 10meq/kg indicates that the product has noticeable oxidation and by 20meq/kg has reached unacceptable levels of rancidity. Peroxide value (PV) results for the roasted inshell peanuts indicated that normal oleic acid (50% range) peanuts reached a PV of 20 by the end of four weeks of storage. This was true with both the 2000 and 2001 crop years. On the other hand the high oleic acid (80% range) peanuts did not reach a value of 20 until week 28 for the 2000 crop and week 36 for the 2001 crop. This difference in the time between the two years is believed to be due to the 2000 crop being in cold storage for ten months, which led to some oxidation. The normal oleic acid peanuts rapidly pass a PV of 20 before the second week when salted-roasted inshell; whereas, the high oleic acid peanuts still had not reached a PV of 20 after 40 weeks of storage. These data are also interesting in that the salted-roasted inshell normal oleic acid peanuts become rancid much more rapidly than the roasted inshell while the high oleic acid peanuts seem to oxidize at about the same rate whether roasted inshell or salted-roasted inshell. These results show a significant advantage of high oleic acid peanuts for extending shelf life of large-seeded, Virginia-type peanuts for roasting inshell and salting-roasting inshell processing.

The Effect of Degree of Roast on Shelf-life Quality of In-shell Peanuts. T.H. SANDERS[1], K.W. HENDRIX*[1], and D. HELMS[2], [1]USDA, ARS, Box 7624, Raleigh, NC 27695-7624, [2]Northampton Peanut Company, Severn, NC 27877.

External peanut pod appearance is a critical factor when consumers make purchase decisions. Pod color is affected by degree of roasting. In a study designed to evaluate the quality characteristics of roasted in-shell peanuts, three degrees of roasting were imposed on peanuts to produce measurable differences in pod color. Peanuts were roasted at 347, 354, and 358 C in a Proctor & Schwartz, Inc. commercial roaster for ca. 25 min to produce pods with significantly different mean Hunter L values of 43.5, 42.1, and 40.2, respectively. Roasted pods were placed into 21 or 30 C temperature controlled storage 3 d after roasting and samples were taken weekly for 2 wk and then biweekly through 16 wk. Moisture content was higher in the lighter roasted peanuts and moisture increased approximately 1.5% in all pods during storage. Oxidative stability index (OSI) indicated the relative stability of oil from the peanuts to increase from dark to light roast. Significant differences in OSI were noted after one wk and all treatments were significantly different over the storage period. Peroxide values indicated the same relationship among roast treatments. Descriptive sensory analysis revealed significantly higher intensity of roasted peanutty from dark to light roast and the differences persisted over the storage period. Dark roast flavor intensity was found to be almost two intensity units higher in the darker roasted samples while raw beany flavor was higher in the lighter roasted samples. Painty descriptor, commonly associated with lipid degradation, began to increase after 2 wk at 30 C and after 8 wk at 21 C. At both storage temperatures, the lighter roast samples had significantly higher painty intensity. The study demonstrated that light roasting of in-shell peanuts to preserve a lighter color results in decreased shelf life quality.

Reducing the Allergenic Properties of Peanut Proteins by Peroxidase. S.Y. CHUNG*, S.J. MALEKI and E.T. CHAMPAGNE. USDA-ARS, SRRC, New Orleans, LA 70124.

Peroxidase (POD) is an enzyme known to catalyze the cross-linking of proteins in the presence of hydrogen peroxide. Because of this catalytic property, POD has been shown to be capable of reducing the immunogenic properties of milk and soy proteins. The objectives of this study were to determine if POD can reduce the allergenic properties of peanuts and if it can be applied to products such as peanut butter to achieve the same purpose. To perform POD treatment, extracts from raw and roasted defatted peanut meals were incubated with and without POD/ hydrogen peroxide in 0.02 M phosphate buffer, pH 7 at 37 oC for 60 min. In addition, POD or no POD/hydrogen peroxide was added to peanut butter slurries and incubated in the same way as described. The treated and untreated samples were then subjected to SDS-PAGE and a competitive ELISA assay, respectively. In the ELISA, a pooled serum containing IgE antibodies from several peanut allergic individuals was used to determine IgE binding (i.e., allergenicity). Results showed that POD treatment led to a significant decrease in the levels of two major peanut allergens (Ara h 1 and Ara h 2) and a reduction in IgE binding. This decrease of allergens occurred in roasted but not in raw peanuts after treatment. Slurries from peanut butter treated with peroxidase also exhibited a similar decrease in the two allergens, but the decrease was less significant when the slurries were concentrated and with matrix particles. It was

concluded that POD is capable of reducing the allergenic properties of peanuts and the butter slurries under the conditions that peanuts are roasted and the butter slurries have little matrix effects.

Peanut Production in Topographic Fields with Surface Drip Irrigation. H. ZHU, M.C. LAMB, C.L. BUTTS*, AND P.D. BLANKENSHIP. USDA, ARS, National Peanut Research Laboratory, Dawson, GA 31742.

A surface drip irrigation system was developed to irrigate peanuts in two experimental fields, one with very little topographic variation and Greenville fine sandy loam soil, and one with undulating terrain containing 2.4% slope and 282% coefficient of topographic variation and Faceville fine sandy loam soil. Peanut pod yield, kernel size distribution, and total sound mature kernels (TSMK) were evaluated with two peanut varieties, two planting patterns and two drip tape lateral spacings. Test results were compared with the adjacent non-irrigated area planted with the same varieties of peanuts. No significant difference ($p<0.05$) was observed in yields between 0.91-m and 1.82-m drip tape lateral spacings with surface drip irrigation. Peanut yields with surface drip irrigation were 1.43 times the non-irrigated yield. The net yield gain from surface drip irrigation was 10 kg/ha-mm during the two growing seasons. Yields tended to slightly decrease as the land elevation decreased for both irrigated and non-irrigated zones. However, the land elevation variation did not significantly influence the TSMK for both irrigated and non-irrigated areas. And there was no significant difference in yields either between two peanut varieties (Georgia Green and Virugard) or between two planting patterns (Single-row and Twin-row) in surface drip irrigation areas. Compared to the non-irrigated areas, the surface drip irrigation area produced more large kernels than small kernels. The average TSMK in the undulating topographic area was 64.9% and 73.7% for non-irrigated and drip irrigated treatments, respectively. An average gross revenue of 1253 US dollars per ha was realized with no irrigation and 2093 US dollars per ha with surface drip irrigation.

Development of Value-added Snacks From Defatted Peanut Flour. M. AHMEDNA*, K. MATHEWS, and I. GOKTEPE, Department of Human Environment and Family Sciences, North Carolina A&T State University, Greensboro, NC 27411.

The demand for snacks and convenience foods is steadily increasing along with that for lean foods. An example of these is Latin foods continue to gain popularity as the Hispanic population grows to become the largest minority population in the US. Defatted peanut flour (DPF) is a protein-rich but underutilized by-product of the peanut industry that can be used to develop various value-added products such as meat substitutes and high protein snacks. Many of these products would appeal to vegetarians and other health-conscious consumers as well as the growing ethnic communities.

The study objectives were to 1) modify DPF by heat treatment and fungal fermentation, 2) evaluate the functional properties of modified and unmodified flours, 3) develop meat analogs from modified DPF and evaluate their potential as ground beef/pork substitutes in three Latin snacks and 4) explore the use peanut flour in the formulation of consumer-acceptable fish nuggets.

DPF was subjected to heat treatment and/or fungal fermentation. Flours were evaluated for functional properties. Fermented flour was processed into meat analogs and used as meat substitutes in three popular Latin snacks, tamales, taquitos and chili. A five-member focus group evaluated the use of DPF as extender of tilapia and catfish minces at proportion ranging from 5 to 30% (w/w) under different extrusion conditions. Extrusion conditions that produced the best end-products were 160 rpm and 120°C. Most acceptable peanut-based fish nuggets were formulated with 10 and 15% of minced catfish and tilapia, respectively. Panels of 75-100 consumers (including Hispanic as needed) evaluated peanut-based products' color, flavor, texture and overall liking by using a 9-point hedonic scale (1=dislike-extremely, 9=like-extremely). In the case of fish nuggets, off-flavor and purchase intent were judged using a yes/no scale while spiciness/saltiness was rated using a just-right scale.

Modification of peanut flour enhanced its functional properties. After fermentation and heat treatment, peanut lost its peanuty aroma and developed meat-like flavor. Acceptability of products containing peanut-based meat analog was comparable to the beef controls, with most mean ratings exceeding 6. Hispanics consistently rated products containing meat analog higher than their respective controls. This level of acceptability indicates that peanut-based meat substitutes may serve as alternative to ground meat in food products. The process of extrusion increased fish nuggets' acceptability by enhancing their flavor and texture while roasted DPF effectively masked the muddy flavor in catfish compared to control. This study demonstrated that peanut flour can be used to develop novel meat substitutes and consumer acceptable peanut-based fish nuggets. These applications have the potential to add value to the peanut and fish industries.

Characterization of Peanut-based Products from Ghana. M.J. HINDS*[1], W.O. ELLIS[2] and K. FRIMPONG[2], A. SALAM[3] and S. GEDELA[3], [1]Nutritional Sciences Department, Oklahoma State University, Stillwater, OK 74078[2]Kwame Nkrumah University of Science and Technology, Kumasie, Ghana, West Africa. [3]Nutritional Sciences Department, Oklahoma State University, Stillwater, OK 74078.

Peanut production in Ghana is at the subsistence level. Traditionally, most of the peanuts were ground with water into paste, and used in soups or spreads. In recent years, small-scale processors are developing new products but they have not been characterized. This study focused on evaluating some biochemical and physical properties of four popular new products: kurikuri (KK), chocolate pebbles (CP), starch-coated chocolate pebbles (SP), and nkatie burger (NB). The pebbles and nkatie burger are semi-spherical products consisting of a central peanut covered by a coating, whereas the kurikuri are cylindrical in shape and prepared from flavored, ground partially defatted peanuts. Texture of the products was evaluated with a TAXT2*i* Texture Analyzer fitted with a 2mm blunt probe; moisture by a Denver IR analyzer; water activity by a Rotronic meter; color by a Minolta Chroma Meter Reflectance System; and ash, fat, sucrose and free fatty acids by standard AOAC methods. Extracted fat was methylated to fatty acid methyl esters (FAMEs) using the boron-trifluoride esterification method #Ce 1c-89 of AOCS. FAMEs were analyzed using an Agilent 6890 GC fitted with a flame ionization detector (FID), and Supelco 2380 fused silica capillary column. Among the semi-spherical products, SP had the hardest coating (446.9 g shear force), but its internal peanuts were the softest (887 g) compared with the others, which ranged from 1304 to 1629 g shear force. Mean moisture (%), sucrose (%), ash (%), and free fatty acid (%) were respectively 4.6, 5.3, 4.42, 0.29 for KK; 2.5, 15.7, 2.59, 1.15 for CP; 3.55, 24.7, 1.91, 1.09 for SP; and 2.2, 6.2, 1.92, 0.38 for NB. Mean total fat (%), monounsaturated fat (%), saturated fat (%), and polyunsaturated fat (%) were respectively 21.1, 47.9, 25.1, 27.0 for KK; 33.6, 45.0, 29.5, 25.5 for CP; 25.3, 35.8, 52.2, 12.1 for SP; and 34.7, 36.9, 50.8, 12.3 for NB. KK had significantly ($p<0.05$) less total fat but significantly more monounsaturated fat than the other products. Its lipid profile suggests the potential for development of a similar product that could serve as a new flavored and crunchy peanut-based snack from US peanut presscake.

EXTENSION TECHNIQUES and TECHNOLOGY/EDUCATION FOR EXCELLENCE

Control of Tropical Spiderwort (*Commelina benghalensis*) in Peanut with Selected Herbicides. J.T. FLANDERS*[1], E.P. PROSTKO[2], [1]County Extension Coordinator, University of Georgia Cooperative Extension Service, Cairo, GA; and [2]Extension Weed Specialist, University of Georgia, Tifton, GA.

Tropical spiderwort (*Commelina benghalensis*) is a noxious and invasive plant that has become a serious weed problem in several counties in southern Georgia. In 2002, an on-farm field trial was conducted in Grady County to evaluate Cadre (imazapic) at 1.44 oz product/A, Dual Magnum (S-metolachlor) at 1.33 pt/A, Outlook (dimethenamid-P) at 14 oz/A, and Strongarm (diclosulam) at 0.45 oz/A for the control of tropical spiderwort in peanut. All herbicides were applied preemergence (PRE) or postemergence (POST) at 7, 13 and 17 days after planting (DAP). Gramoxone Max (paraquat) at 5.5 oz/A was included with all POST treatments except Cadre. A non-ionic surfactant at 0.25% v/v was included with all POST treatments. Timing by herbicide interactions were significant. Peanut stunting was observed from all treatments applied 13 and 17 DAP. When applied at 13 and 17 DAP in combination with Gramoxone Max, Dual Magnum, Outlook, and Strongarm were more injurious than Cadre. Gramoxone Max + Dual Magnum applied 13 and 17 DAP caused the most peanut injury. Dual Magnum and Outlook were more effective when applied 7, 13, and 17 DAP than when applied PRE. Tropical spiderwort control was ∃ 89% with all POST applications of Gramoxone Max + Dual Magnum. Gramoxone Max + Strongarm applied at 13 and 17 DAP provided 84% and 90% control, respectively. All POST applications of Cadre provided good (80-86%) control of tropical spiderwort.

Calibration of Soil Test Calcium with Modern Cultivar Yield, Grade and Germination. J.D. JONES, Jr.*[1], D.L. HARTZOG[2], G. GASCHO[3], [1]Alabama Cooperative Extension System, Abbeville, AL 36310; [2]Dept. of Agronomy and Soils, Auburn University, AL 36849; [3]University of Georgia, P.O. Box 748, Tifton, GA 31793.

Calcium nutrition of the peanut is of major importance for top yields, grades, and seed germination. Historically, it has been researched well and both its importance and best management practices established. However, most of the research has been conducted using the Florunner peanut variety. Little research has been conducted on the calcium requirements of the new cultivars from Florida and Georgia. These cultivars often vary in seed size, a factor implicated in the calcium needs. It is evident from grower contact that in some cases farmers are losing yield, grade, seed quality, and profit due to insufficient calcium applications. In other cases, farmers are incurring wasteful input costs by application of gypsum, where it offers no benefit. During crop year 2002, the varieties Georgia Green, Nordan, AT201, and C-99R were planted in a randomized complete block design a the Wiregrass Research and Extension Center, Headland, AL. Treatments were 600 lbs./ac gypsum at early bloom and check plots. Yields and grades were measured. There was no yield or grade response to supplemental calcium at soil test calcium levels ranging from 540 lbs/ac to 930 lbs/ac.

Fungicide Treatment Effects on the Incidence of Rhizoctonia Limb Rot in Peanut.
P.D. WIGLEY[1]*, R.C KEMERAIT, Jr.[2], and S.J. KOMAR[1], [1]The University of Georgia, Cooperative Extension Service, Morgan, GA 31766; [2]Department of Plant Pathology, The University of Georgia, Tifton, GA 31793.
Field experiments were conducted to evaluate four fungicides for control of *Rhizoctonia solani* in peanut. Azoxystrobin (Abound 2.08 F), tebuconazole (Folicur 3.6 F), flutolanil (Moncut 50 WP), and flutolanil plus propiconazole (Montero) were applied according to manufacture's recommendations and compared to chorothalonil alone (Bravo Ultrex) during the 2001 growing season in Calhoun County, Georgia. Among treatments, azoxystrobin (Abound) provided significantly better control of Rhizoctonia limb rot resulting in 80 percent less disease per 100 foot of row than the control (chlorothalonil alone) plots. Yields were increased significantly in the azoxistrobin (Abound) and the tebuconozole (Folicur) plots. All other treatments did not provide any yield advantage over the control plots. Azoxystrobin (Abound) provided greater disease control under certain field conditions and disease pressures resulting in increased yields.

Peanut Variety Response to Mechanical and Thrips-mediated Inoculations with *Tomato Spotted Wilt Virus*.
M.C. BLACK*, A.M. SANCHEZ, N.T. TROXCLAIR, and M.R. BARING, Texas A&M University, Texas Cooperative Extension, Uvalde, TX 78802-1849 and Texas Agricultural Experiment Station, College Station, TX 77843-2474.
Resistance in peanut (*Arachis hypogaea* L.) to *Tomato spotted wilt virus* (TSWV) was documented in growth chamber tests. Seedlings were transplanted 3-4 d after imbibition and any intact testae restricting cotyledons were cut with a scalpel. Mechanical inoculation at 7 d after seed imbibition was according to Mandal *et al.* (2001. Plant Dis. 85:1259-1263). Infected tobacco thrips (*Frankliniella fusca* (Hinds)) previously fed on symptomatic TSWV-infected detached peanut leaflets as first stage larvae were released above plants (ca. five adults per plant) 8-9 d after seed imbibition. Both inoculation techniques usually identified the most field-susceptible entry (Tamrun 88) and the most field-resistant entry (C11-2-39), but usually did not rank intermediate varieties (Tamrun 96, Georgia Green, Florunner) consistent with previous field rankings. Thrips feeding preference and reproduction studies and thrips no-choice feeding and reproduction studies on detached leaflets were inconsistent among trials. In

a greenhouse study, rank of the ratio of main stem length to mean length of the first two secondary stems (MS:SS1,2) among selected varieties was similar to rank of variety spotted wilt reaction in previous field plot experiments. This characteristic is apparently common in several varieties and breeding lines that rank low for spotted wilt in field experiments. Variety spotted wilt rank in the field may be influenced by thrips response to plant canopy characteristics. Selecting breeding lines for low MS:SS1,2 may have potential in early generations. The benefits of twin rows vs. single rows during spotted wilt epidemics may be due in part to relatively short and wide canopy characteristics. Peanut variety reactions in the field may be due to both variety x virus and canopy x thrips interactions.

<u>Profit Potential of Various Inputs Under the New Peanut Program.</u> W.D. THOMAS*, Columbia County, Cooperative Extension Service, University of Florida, Institute of Food and Agricultural Sciences, Lake City, Florida 32025.

Current cultural and crop protectant practices developed and adopted under the previous peanut quota program need to be reevaluated and perhaps revised due to the economic changes and profit potential resulting from the new Farm Bill of 2002. The change in support price from $610 per ton to $355 per ton loan price requires both growers and Extension to analyze all aspects of production to assess profitable practices and recommendations.

Trials conducted in commercial fields in 2000, 2001 and 2002 evaluating nematicide rates and products in peanuts provide an example of how much yield increase is required to justify various levels of inputs under each of the peanut programs.

As the price of the commodity decreases, larger yield enhancements are required to cover the cost of inputs. Economic analysis of cost and returns of current recommended production practices and pest management practices in peanut production require reassessment by researchers to ensure potential profitability under the given situations.

Most current production practices/recommendations were developed and economically evaluated under a significantly higher peanut price structure than we have today. Therefore, we have an obligation to review and in some cases revise practices that no longer generate profitable returns over their cost.

<u>Impact of Azocxystrobin (Abound 2.08F) Used In-Furrow To Manage Disease in Peanuts.</u> R.B. BARENTINE*[1], and R.C. KEMERAIT, Jr.[2], [1]Pulaski County Extension Service, Hawkinsville, GA 31036 [2]Department of Plant Pathology, University of Georgia, Tifton, GA 31793.

Field trials were established on the Hardy Farm, Pulaski County, to assess impact of an in-furrow application of azoxystrobin (Abound 2.08F, 7 fl oz/A). Peanut, cv. ‘Gregory’, was planted on 26 April 2001 and cv. ‘NCV-11' was planted on 27 May 2002. Alternating strips of treated and untreated plots were replicated four times. Diplodia collar rot (Lasiodiplodia theobromae) was the predominant seedling disease. A very slight, but not significant, increase in stand occurred where Abound 2.08F was applied; however in 2002 there was significant reduction in dead seedlings in plots treated with Abound verus untreated (8.0 and 32.5 plants/100 feet, respectively.) In 2001 and 2002, there was a reduction (not statistically significant) in southern stem rot at harvest where Abound had been applied in-furrow. Yields in plots treated with Abound were significantly greater (5110.3 lb/A) than in untreated plots (4934 lb/A in 2001. Plots treated with Abound yielded (4433 lbs/A) and untreated plots yielded (4120 lbs/A) in 2002. Yields were combined across plots, therefore, statistical analysis was not possible.

Results from Farmer Surveys Concerning Tomato Spotted Wilt in North Carolina Peanut (*Arachis hypogaea*). A. COCHRAN*, C. ELLISON, J. PEARCE, M. RAYBURN, R. RHODES, M. SHAW, B. SIMONDS, L. SMITH, P. SMITH, C. TYSON, S. UZZELL, A. WHITEHEAD, JR., M. WILLIAMS, F. WINSLOW, C.A. HURT, R.L. BRANDENBURG, B.B. SHEW, D. JOHNSON, and D.L. JORDAN, North Carolina Cooperative Extension Service, North Carolina State University, Raleigh, NC 27695-7620.

Tomato spotted wilt has become a significant pest in the Virginia-Carolina region. A variety of cultural and pest management practices can be used to minimize incidence of tomato spotted wilt and are included in several versions of risk indices or advisories in states where peanut is produced. Seeding rate, planting pattern, planting date, tillage system, insecticide choice, and variety selection can contribute to incidence of tomato spotted wilt. Peanut fields were scouted in North Carolina during 2002 to determine if levels of incidence and severity were associated with production and pest management strategies that have been shown to affect tomato spotted wilt in research trials. In many cases, levels of virus would have been predicted based on advisories and previous research findings. A survey was also conducted at county production meetings in February 2003 to approximate the percentage of acres in North Carolina infested with tomato spotted wilt virus. Percentages of incidence of spotted wilt ranged from 0 to 100 (approximately 45% of peanut acreage was represented). When averaged across counties, producers indicated that 47% of peanut acreage was infested by spotted wilt. This percentage was for incidence of virus only, and did not reflect the severity of virus. Additionally, the percentage of infested acreage relies on farmer recognition of the virus, and may be an over estimate incidence.

ECONOMICS I

Crop Enterprise Selection in the Southeast Under the 2002 Farm Bill. T. DAVIS[1], C. CURTIS[1], T. HEWITT*[2], G. SHUMAKER[3], and N.B. SMITH[4], [1]Department of Agricultural and Applied Economics, Clemson University, Clemson, SC 29634; [2]Food and Resource Economics, University of Florida, North Florida Research and Education Center, Marianna, FL 32446; [3]Department of Agricultural and Applied Economics, University of Georgia, Statesboro, GA 30460 and [4]Tifton, GA 31793.

A continuing problem for farm decision-making is determining the optimal crop enterprise mix due to price and yield variability as well as producer attitude toward risk. The Southeast region has a greater potential for enterprise diversification than most areas of the county due to the large number of crops that will grow in the region and the established markets. The optimal enterprise mix is also influenced by farm policy. The 2002 Farm Bill changed the marketing loan system. Also, a major change in farm policy occurred in peanuts where the marketing quota program was eliminated. Linear programming models are often used to help producers determine the optimal crop mix on a given farm under certain limitations. To incorporate risk in the decision a target MOTAD model can be used to determine optimal crop mix. A target MOTAD model using the data from a stochastic simulation model was used to determine the risk efficient crop mix in the Southeast. Peanuts were modeled under both a contract and non-contract scenario. The summary statistics indicated that peanuts had the smallest coefficient of variation, which means the lowest relative yield risk. Peanuts produced under contract had the largest return for both yield and price scenarios. A peanut-cotton rotation is preferred by the model. The results suggest great potential for increased peanut production in the Southeast region, especially in areas previously limited from producing peanuts. The labor and machinery resources required would need to be considered by potential producers along with the possibility of no premiums being offered in the future if peanut supplies build.

Research at the NPRL Shellman Irrigation Research Farm. M.C. LAMB*, D.L. ROWLAND, R.B. SORENSEN, H. ZHU, P.D. BLANKENSHIP and C.L. BUTTS, USDA, ARS, National Peanut Research Laboratory, Dawson, GA. 39842.

Next to land, adequate water for irrigation is arguably the most important natural resource in production agriculture. However, repeated drought years, urban sprawl, and interstate litigation are individually and collectively threatening the current and future availability of water for crop irrigation. Potential reductions in future irrigation water availability exist. The impact of such reductions will directly impact farm income and risks. To address the impact of potential water reductions and develop more water conserving irrigation technologies, a large-scale irrigation research facility was established in CY 2001 comparing three irrigation methods (sprinkler, sub-surface drip, surface drip), three irrigation rates (100%, 66%, 33%), and a non-irrigated control in six replicated rotation sequences including peanuts, cotton, corn, and grain sorghum. One of the objectives of this research is to compare irrigation methods, amounts, and amount within method on peanut (and other crop) yield, quality, and net economic returns. Comparing the 100% irrigation rates in the sprinkler, sub-surface drip, surface drip and non-irrigated treatments, peanut yields averaged 5130, 5089, 5164, and 3291 kg/ha, respectively. No significant differences resulted in peanut yield in the irrigation methods, amounts, or amounts within methods while all were significantly higher than non-irrigated yields. Previous research indicates that from a capital investment standpoint, drip irrigation is more cost effective on small fields (50 acres or less) and/or irregularly shaped fields while centerpivot is more cost effective on larger fields. Though preliminary, the results of this research will allow producers to evaluate the economies of scale for irrigation methods specific to individual fields with constant yield expectations.

Tomato Spotted Wilt Virus: Economic Impact of Management Options Using a Field Resistant and a Susceptible Cultivar Under Conventional and Strip Tillage. A. LUKE-MORGAN*[1], S.M. FLETCHER[2], and J.W. TODD[3], [1]Agricultural and Applied Economics Department, National Center for Peanut Competitiveness, The University of Georgia, Tifton, GA 31793-0748; [2]Agricultural and Applied Economics Department, National Center for Peanut Competitiveness, The University of Georgia, Griffin, GA 30223-1797; [3]Entomology Department, The University of Georgia, Tifton, GA 31793-0748.

In 1995, tomato spotted wilt virus (TSWV) became the most damaging disease problem in peanuts in Georgia and Florida. The University of Georgia developed a tool to aid in the management of this financially devastating disease, the Tomato Spotted Wilt Virus (TSWV) Risk Index for peanuts. The Index considers the key components that have been found to have a relationship with the incidence and severity of the disease. Producers can use the Index to try to lower their risk of TSWV incidence. There are several key components of the Index including planting date and cultivar. The question arose as to what would be the impact if a producer minimized his risk of TSWV by using all the suggested guidelines of the Index except for one component, i.e, what would be the impact of pushing one of the components of the Index to the extreme if all other components were chosen to minimize the risk? Studies to characterize the combined effects of susceptible and resistant cultivars in twin rows, with and without in-furrow systemic insecticides, in conventional and strip-tillage at two planting dates, on TSWV severity and the resulting yield, and grade were conducted in 2001 and 2002 in Tifton and Midville, Georgia. These data were analyzed to determine the net returns for the various treatments in the study and to determine the overall profitability of using the Index approach to managing TSWV. Preliminary analysis shows that net returns follow previously observed trends and verified the TSWV Risk Index values for these components. Net returns were higher for the resistant C99R cultivar than those for the more susceptible Sunoleic 97R cultivar; net returns were lower for the treatments with the early April planting date than those planted in the May “window”. Further economic analysis is being conducted on the data to determine the financial impact of producing peanuts under “extreme” conditions in relation to Tomato Spotted Wilt Virus.

Improving Peanut Production Efficiencies. T. HEWITT. University of Florida, North Florida Research and Education Center, Marianna, FL 32446.

Changes in the Farm Program for peanuts have resulted in decreased income for peanut producers throughout the peanut belt. For a producer who averages 3000 pounds per acre typical income has been reduced from $900 per acre to $650 per acre. To lessen the impact of the reduced income, producers must consider practices that increase yields and/or reduce costs. Improving production efficiency becomes more important. To determine actual producer costs two farms have been monitored for two years. Actual production inputs were measured along with labor and tractor hours. Certain costs were higher than those listed on a typical extension budgets while other costs were lower. Costs that were higher than typically listed on enterprise budget, were equipment, labor, and chemicals. Seed costs were also relatively high. Both operations averaged over 20 trips across the field under conventional tillage. Areas that could possibly be addressed for reducing costs are tillage methods,

seeding rates, chemical use, and labor. Costs averaged $435 per acre for the two operations and could possibly be reduced by 10 to 15 percent. Though yields averaged 3700 pounds on the two farms, changing certain production practices would reduce costs without sacrificing yields. By improving production efficiency, costs can be decreased and help to offset the likely reduction in per acre income that will result from changes in the peanut program.

PLANT PATHOLOGY AND NEMATOLOGY I

Peanut Cultivar Response to Rust (*Puccinia arachidis*), Southern Blight (*Sclerotium rolfsii*), and Tomato Spotted Wilt when Planted in a Conventional and Twin-Row Configuration. B.A. BESLER*, W.J. GRICHAR, AND A.J. JAKS. Texas Agricultural Experiment Station, Beeville, TX 78102.

A field study was intiated in 2001 in south Texas (Frio County) to evaluate four peanut cultivars (AT 1-1, Flavor Runner 458, Georgia Green and Tamrun 96) when planted in a conventional and twin-row configuration and exposed to rust, southern blight and Tomato Spotted Wilt Virus (TSWV). The test was a split-plot design with subplots consisting of 6 ft by 25 ft long with 3 replications. The conventional row spacing was 2 rows spaced 36 in apart with 6 seed/ft. The twin-row configuration consisted of two rows spaced 7 in apart on a 36 in bed with 3 seed/ft. Cultivars were planted on May 30 using a Monosem vacuum planter. Fungicide treatments consisted of 4 applications of Folicur 3.6F at 7.2 fl oz/A applied 62, 76, 90 and 105 days after planting (DAP) and 2 applications of Abound 2.08SC at 18.5 fl oz/A applied 62 and 90 DAP. The test also consisted of untreated check of each cultivar. Rust was evaluated using the ICRISAT scale where 1= no disease and 9= plants severely affected, 50-100% leaves withering. Southern blight disease incidence was determined by counting disease hits per 50ft of row immediately after inversion on Oct 19 (a hit was defined as a diseased area on pods and stems which was equal to 1 ft or less of affected row). TSWV was assessed based on percent row feet infected. Averaged across all treatments, rust and southern blight disease incidence was significantly reduced when both Folicur and Abound was applied compared to the untreated check. No significant differences were seen among the row spacings for both rust and southern blight. Averaged across all cultivars, a 19% reduction in TSWV occurred with the twin-row spacing compared to the conventional row spacing. Significant yield increases resulted with AT 1-1 and Georgia Green when planted in a twin-row configuration (807 and 727 lb increase respectively) compared to the conventional row spacing. Averaged across all cultivars, the twin-row configuration resulted in a 527 lb/A yield increase over the conventional row spacing. Averaged across all cultivars, Abound and Folicur provided significant yield increases for both the conventional and twin-row configuration. All cultivars except Flavor Runner 458 planted in twin-row configuration resulted in a significant increase in value/acre compared to the conventional row spacing.

Role of Non-dispersal Components of *Cercospora arachidicola* Life Cycle in Early Leaf Spot Reductions in Peanut-Maize Intercrops. M.A. BOUDREAU*[1], B.B. SHEW[2], and L.E. DUFFIE[2], [1]Biology Department, Warren Wilson College, Asheville, NC 28815, [2]Department of Plant Pathology, North Carolina State University, Raleigh, NC 27695.

Reductions in early leaf spot incidence observed under intercropping with maize may be due to effects on dispersal or other, non-dispersal, phases in the life cycle of *C. arachidicola*. Microclimatic alterations have been implicated in the latter. Non-dispersal components were evaluated near Asheville, NC in three experiments in 2000 and two in 2001. Plots (11 x 11 m) were arranged in a randomized complete block design with three blocks and five treatments: peanut monocrop, strip intercrop (4 peanut rows: 4 maize rows), and planting patterns of 1:1, 2:1, and 3:1 (peanut rows and maize rows, respectively). The moderately resistant cv. NC-6 was used, but for each experiment, five randomly-placed susceptible VA-98R plants in each plot were inoculated with *C. arachidicola* conidia and evaluated for disease severity after approximately 21 days. Temperature and leaf wetness were continuously monitored in the center of each plot throughout the experiments. Severity was not affected by intercropping in any of the 2001 trials nor in the third inoculation of 2000. Where an effect was seen in 2000 ($p < 0.01$), severity was highest in strip intercrops and lowest in the 1:1 intercrop, with monocrops intermediate. The results are related to microclimatic observations, which suggest that alterations in the microclimate and the non-dispersal phase of the pathogen's life cycle generally do not drive the overall disease reductions seen elsewhere.

Effect of Seed Treatment and Fungicides Applied In-Furrow on Peanut Diseases and Yield. T.B. BRENNEMAN*, Department of Plant Pathology, University of Georgia, CPES, Tifton, GA 31794.

A split plot experiment was conducted in 2001 and 2002 to evaluate the effects of in-furrow fungicides applied to peanut seed (cv. Georgia Green) either treated with Vitavax PC (4 oz/100 lb seed) or nontreated. Whole plots were seed treatments and subplots were in-furrow sprays applied in a volume of 5 gal/A. In-furrow sprays included labeled and half rates of Terraclor 2E (96 and 48 fl oz) and Abound 2.08F (6 and 3 fl oz), along with experimentals including Moncut 70WDG (7.1 oz), Botran 75W (12 oz), Moncut (3.6 oz) + Botran (6 oz), Topsin M 70W (0.5 lb), and AMS21619 480SC (5.7 fl oz). In-furrow treatments had little effect on plant stands from treated seed, but nearly all in-furrow sprays increased stands from nontreated seed. Terraclor and Abound treatments produced equivalent stands at full and half rates, and also had similar levels of spotted wilt (21-30% and 13-16% on nontreated and treated seed, respectively, in 2002). Plots with no seed treatment or in-furrow spray had 67% spotted wilt incidence in 2002, and only 8% in 2001. Stem rot was present at low to moderate levels both years, and in-furrow sprays did not reduce disease incidence. Vitavax PC increased pod yield by 545 and 1550 lb/A in 2001 and 2002, respectively. In-furrow sprays did not increase yield with treated seed in either year. With nontreated seed, full rates of Abound and Terraclor increased yields both years, and 3 fl oz of Abound increased yield in 2002. AMS21619 also increased yield, but only in 2002. Overall, in-furrow sprays had little effect when good quality, treated seed were planted. When seed were not treated, both Terraclor and Abound effectively increased stands and pod yields. Reduced rates of each were also effective for stand establishment, but did not consistently increase yield.

Ten Years of Stable Field Resistance to Tomato Spotted Wilt Virus in Georgia Green Cultivar. A.K. CULBREATH*[1], J.W. TODD[2], W.D. BRANCH[3], and D.W. GORBET[4], [1]Dept. of Plant Pathology, [2]Dept. of Entomology, [3]Crop and Soil Science Dept., The Univ. of Georgia, Tifton, GA 31793-0748; [4]Agronomy Dept., The Univ. of Florida, Marianna, FL 32446.

Since 1993, small plot field tests conducted at Attapulgus or Tifton, GA and Marianna FL for evaluation of peanut (*Arachis hypogaea* L.) cultivars and new breeding lines for field resistance to tomato spotted wilt virus (TSWV) have included the cultivar Georgia Green. A total of 48 tests were conducted from 1993 to 2002 in which Georgia Green was compared to one of Florunner, Georgia Runner, GK-7, or SunOleic 97R cultivars. All tests were of randomized complete block design with 6 replications. All tests utilized conventional tillage, early (before May 1) planting dates, sparse (≤ 12 seed/m of row) seeding rates, no insecticide for thrips control, and planting border plots of susceptible cultivars Tamrun 88, SunOleic 95R, or SunOleic 97R, to maximize disease pressure from spotted wilt. Disease pressure during that time ranged from relatively light in 1993 and 1994 to extremely heavy in 1997 and 2002. Across all tests in those ten years, average final incidence of spotted wilt was 45.0% in Georgia Green compared to 68.6% in the respective susceptible check cultivar. Yields for Georgia Green averaged 3130 kg/ha across all tests, compared to 2294 kg/ha for the susceptible check. Disease potential for spotted wilt was greater in 2002 than in any previous year. Across six tests in 2002, final incidence of Georgia Green was 76.0% compared to 87.4% for SunOleic 97R. In 2002, yields were 1460 kg/ha for Georgia Green and 1046 kg/ha for SunOleic 97R. Results in years and locations with high potential for spotted wilt epidemics indicate that the moderate level of field resistance in Georgia Green can be overwhelmed, especially when other spotted wilt management practices are not used. However, based on relative performance compared to other cultivars, the utility of the moderate field resistance of Georgia Green in these tests in Georgia and Florida has been much more stable than reported for resistance to TSWV in most other crops.

Reaction of the Peanut Core Collection to Sclerotinia Blight and Pepper Spot. J.P. DAMICONE*[1] and K.E. JACKSON[1], K.E. DASHIELL[2], H.A. MELOUK[3], and C.C. HOLBROOK[4], [1]Dept. of Entomology and Plant Pathology, [2]Dept. of Plant and Soil Sciences, Oklahoma State University, Stillwater, OK 74078; [3]USDA/ARS, Stillwater, OK 74078; [4]USDA/ARS, Tifton, GA 31793.

In 2001, entries from the peanut core collection, a subset of the USDA peanut germplasm collection, were planted in non-replicated plots in a field with a history of Sclerotinia blight. Variability existed among entries for reaction to Sclerotinia blight. Incidence of Sclerotinia blight approached 100% in several entries. Of the 745 entries evaluated, 10.9% were highly resistant (no disease) and 18.4% were resistant (1 to <10% disease incidence). Most of the highly resistant and resistant entries had an upright growth habit and were in maturity groups 2 and 3 (1=earliest, 6=latest). Sufficient seed was available for 74 of the 81 entries selected in 2001 for evaluation in replicated plots in 2002. Susceptible (Okrun), moderately resistant (Tamrun 96), and resistant (Tamspan 90) cultivars were included for comparison. Disease development was delayed in 2002 because row closure did not occur until late in the season. However, cool and rainy weather prevailed in October, which promoted late-season development of Sclerotinia blight that reached 44% in the susceptible cultivar ‘Okrun’. Of the 74 entries, 20 were highly resistant and 30 were resistant. All of the highly resistant entries had an erect growth habit and were susceptible to pepper spot (*Leptosphaerulina crassiasca*), which developed to moderate and severe levels in 2001 and 2002, respectively. Of the entries that were resistant to Sclerotinia blight, entries (PI no.) 153339, 259639, 442724, 314817, 461451, 268891, 268903, 504614, 468195, and 290961 were also resistant to pepper spot. Only entries 268891 and 468195 were resistant to Sclerotinia blight and had a prostrate (runner-type) growth habit. Several of the entries that were highly resistant (502004, 268659, 313134, 313131) and resistant (259639, 442724, 313140, 461451) to Sclerotinia blight had yields that were similar to Tamspan 90. Selected entries that were highly resistant and resistant to Sclerotinia blight will be further evaluated in 2003, and germplasm from the USDA collection that is related to the selected entries will also be evaluated.

<u>Yield Response and Reaction of Runner Peanut Lines to Diseases in an Irrigated Production System.</u> A.K. HAGAN*[1] and J.R. WEEKS[1], B. GAMBLE[2], and J. BOSTICK[3], [1]Department of Entomology and Plant Pathology, Auburn University, AL 36849; [2]Wiregrass Research and Extension Center, Headland, AL 36345; [3]Alabama Crop Improvement Association, Headland, AL 36345.

From 1999 through 2002, runner peanut lines, including many newly released selections, were evaluated at the Wiregrass Research and Extension Center in Headland, AL for their reaction to leaf spot diseases, southern stem rot (SSR), and tomato spotted wilt virus (TSWV), as well as yield response. The study site, which was maintained in a cotton-cotton-peanut rotation, was prepared using conventional tillage practices. Seeding rate was approximately six seed/ft of row. Gypsum was applied at a rate of 600 lb/treated acre on a 14 inch band over the row middle. Fertility and weed control recommendations of the Alabama Cooperative Extension System were followed. Four mid-season applications of Folicur 3.6F at 0.45 pt/A and a final application of Bravo Ultrex at 1.4 lb/A followed two initial applications of Bravo Ultrex at 1.4 lb/A. Plots were irrigated as needed. The hull scrape method was used to determine the digging date. Counts of TSWV loci were made approximately 1 week before the expected digging date. Shortly before plot inversion, severity of early and late leaf spot was assessed using the Florida leaf spot scoring system. Loci counts for SSR were made immediately after the plots were inverted and the plots were harvested 3 to 5 days later. Over the four-year reporting period, Virugard, AT201, Carver, Georgia Green, Florida C-99R, and Southern Runner had lower TSWV ratings than Florunner. In two of four years, virus ratings for Virugard and Florida C-99R were lower than for those of Georgia Green. Of the newly released lines, GA 02C and DP-1 suffered from less TSWV than did Georgia Green. Late leaf spot was the dominant leaf spot disease observed. GA 02C and DP1, which were evaluated in only two years, demonstrated a higher level of leaf spot resistance than many of the other peanut lines. Overall, the reaction of the remaining peanut lines to leaf spot diseases often was similar. In three of four years, Florunner had higher SSR damage ratings than most of the other peanut lines screened, including Georgia Green. Relatively few differences in SSR incidence were noted between Georgia Green and most of the other peanut lines. However, Virugard suffered less SSR damage than Georgia Green in three of four years. In two of four years, SSR incidence was higher on AT201 compared to Georgia Green. Except for 2002, the newer peanut lines almost always produced higher yields than Florunner. Yield for Virugard was higher in two of four years than those recorded for Georgia Green, while those for DP-1 were lower. In limited testing, Andru II, Georgia Hi Oil, GA 02C and GA 01R demonstrated excellent yield potential.

PRODUCTION I

Interdisciplinary Approach to Evaluating Peanut Cultivars Planted in Twin and Single Rows by Conventional and Reduced Tillage Methods. D.L. HARTZOG*[1], J. ADAMS[1], K. BALKCOM[1], J.A. BALDWIN[2], D.L. WRIGHT[3], E.J. WILLIAMS[2], N.B. SMITH[2], T. HEWITT[4], T.B. BRENNMAN[2], B. KERMERAIT[2], R.N. GALLAGHER[5] and G.E. MacDONALD[5]. [1]Auburn University, [2]University of Georgia, and [3]University of Florida, Quincy, FL, [4]University of Florida, Marianna, FL and [5]University of Florida, Gainesville, FL.

Peanut production must continue to improve cultural practices to maintain maximum profitability. An experiment was initiated in 2002 to determine the optimum tillage, variety and row spacing for the best management practice. The test was a split-split design with tillage as the whole plots, variety as sub plots and single verus twin rows as subplots. Tillage plots were conventional (moldboard plow) and strip tillage. The varieties were DP 1, AT 201, Carver and GG with sub-sub plots as single or twin rows. Yields, TSMK and incidence of tomato spotted wilt virus were collected. Yields were effected by tillage, variety and row spacing. Higher yields were obtained with conventional tillage and Carver was the highest yielding variety. In addition twin rows were significantly higher in yield. Significant interactions were found for tillage and varietyd variety. TSMKs were effected to a lesser degree than yield. Tillage had an effect on TSMK with the moldboard having the higher grade. Variety and row spacing also showed responses as well as the interaction of tillage and row spacing. Tomato spotted wilt virus was effected by treatments but to a lesser degree.

Response of Peanut to Planting in a Triple Row Pattern. J.P. BEASLEY, JR.*[1], J.A. BALDWIN[1], E.J. WILLIAMS[1], S.L. BROWN[1], J.W. TODD[1], R.C. KEMERAIT, Jr.[1], A.K. CULBREATH[1], N.B. SMITH[1], D.L. HARTZOG[2], J.R. WEEKS[2], and E.B. WHITTY[3], [1]University of Georgia, Tifton, GA 31793; [2]Auburn University, Headland, AL 36349; [3]University of Florida, Gainesville, FL 32611.

Previous research has clearly shown the advantage of peanut planted in the twin-row pattern compared to the single-row pattern. Peanut planted in twin rows will, on average, out-yield single rows by 400 lbs/A, grade one to two percent higher in total sound mature kernels, and have less spotted wilt disease. Research was initiated to determine if peanut planted in a triple-row pattern would provide similar advantages over the twin-row pattern. Tests were conducted in crop years 2001 and 2002 at multiple locations in Georgia, Alabama, and Florida. Cultivars ‘Georgia Green’, ‘AgraTech 201’, and ‘C-99R’ were planted in single, twin, and triple-row patterns. The triple-row pattern consisted of three rows spaced six inches apart on each side of a 72-inch wide planted bed. Plant population in all three patterns remained constant at 87,120 seed on a per acre basis (six seed per foot in single rows, three seed per foot in

each twin row, and two seed per foot in each triple row). Experimental design at each location in both years was a randomized complete block design with four replications. Data collected included yield (lbs/A), grade (% TSMK), and spotted wilt disease severity. The data from 2001 indicate no significant differences among the row patterns for yield, grade, and spotted wilt severity when averaged over locations and cultivars. In 2002, triple and twin-row patterns had significantly ($p<0.01$) higher yield and grade than the single-row pattern and significantly less percent spotted wilt disease. Triple-row had significantly less spotted wilt disease than the twin-row pattern at the five percent level of probability.

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

Dryland peanut (*Arachis hypogaea* L.) production accounts for approximately 50% in the southeast U. S. In addition to more drought tolerant cultivars, disease and insect resistant cultivars are also needed to reduce the input cost of peanut production for a greater dollar return. Thus, the objective of this research study was to evaluate several advanced Georgia breeding lines when grown with minimum inputs under dryland conditions. Minimum-Input preliminary yield trials were conducted for the past three years (2000-02) at the University of Georgia, Coastal Plain Experiment Station without irrigation. No systemic insecticides at planting were used, and only about half the total number of recommended fungicide sprays were used throughout the growing season. Adequate rainfall and distribution is critically important without irrigation. During this study, total annual rainfall was >508 mm from April through October with June and July receiving the highest monthly distributions. Thrips injury was the most noticeable insect damage early each year, but plants seemingly recovered by mid-season. Spotted wilt caused by tomato spotted wilt virus (TSWV) was the most noticeable disease damage each year, but other foliar and soilborne pathogens and insects also caused some damage particularly toward the end of each growing season. Results from these replicated field tests showed significant differences among the peanut genotypes evaluated. Two recently released advanced Georgia breeding lines, GA 942511 'Georgia-01R' and GA 982508 'Georgia-02C', consistently had the lowest disease incidence and the greatest dollar value return of all breeding lines and cultivars.

Annual Ryegrass Cover Crop Adaptability in Southern Cropping Systems: Year 1. J.B. EITZEN*, K.M. MOORE, AgResearch Consultants Inc., P.O. Box 2301, Tifton, GA 31793.

The purpose of this research is to compare annual ryegrass (*Lolium multifolium* L.) to wheat and rye as cover crops for peanut and cotton production systems. In the fall of 2001 two tests were planted with four replications of each cover crop treatment in a randomized complete block design. Growth analysis of above ground biomass, root biomass, and total biomass for each cover crop prior to planting peanut and cotton mains crops showed ryegrass to have significantly greater root and total biomass than wheat or rye. Disease incidence and ratings were low throughout the test field and no differences were observed between treatments. Soil analysis showed normal variation over the plots with no significant organic matter increase in year one from pre-test levels. Peanut and cotton stand establishment was problematic in all cover crops resulting in skippy stands especially in the ryegrass plots. Peanut yields were 3669, 3533, 2744, 2884 lbs. per acre for the no cover control, ryegrass, wheat, and rye, respectively. Grades were in the mid 70's. Cotton yields were considerably lower than state averages due to heavy weed infestation and reduced stands. This test will be repeated in 2003.

Summary of Row Pattern Trials in Peanut (*Arachis hypogaea*) Grown in North Carolina. D.L. JORDAN*, J. LANIER, J. SPEARS, R. WELLS, C.A. HURT, and R.L. BRANDENBURG, Departments of Crop Science and Entomology, North Carolina State University, Raleigh, NC 27695-7620.

Research was conducted from 1998 through 2002 to compare peanut response under various row patterns including standard twin row patterns (rows spaced 7 inches apart on 36-inch centers) and narrow rows (three twin row planting pattern arrangements on 19-inch centers). Severity of tomato spotted wilt virus (TSWV) was lower in twin and narrow patterns than in single rows patterns. Although less TSWV was noted in the narrow planting pattern than in twin row planting patterns, yield did not differ among these planting patterns. In weed management trials, sicklepod (*Senna obtusifolia*) control was approximately 10% higher in twin rows compared with single rows, regardless of herbicide programs. Yield was higher in most trials when peanut was seeded in twin row patterns. However, the magnitude of difference often varied by cultivar, location, and presence of disease.

Disease Management in Peanut (*Arachis hypogaea*) with Overhead Sprinkler and Subsurface Drip Irrigation. J. LANIER, D.L. JORDAN*, S. BARNES, G. GRABOW, B. GRIFFIN, J. BAILEY, J. SPEARS, and R. WELLS, Department of Crop Science, North Carolina State University, Raleigh, NC 27695-7620.

Experiments were conducted during 2001 and 2002 in North Carolina to compare development of early leaf spot (*Cercospora arachidicola* Hori), peanut pod yield, and market grade characteristics under overhead sprinkler irrigation (OSI) and subsurface drip irrigation (SDI) when fungicides were not applied or when fungicide applications were based on weather advisories or when applied bi-weekly. Incidence of early leaf spot was lower when peanut was grown under SDI compared with OSI when fungicides were not applied. Although fungicides were needed to optimize early leaf spot control, fewer fungicides were needed when applications were based on weather advisories rather than bi-weekly applications. There was no difference in early leaf spot control or peanut foliage defoliation caused by this disease when fungicides were applied, regardless of irrigation system. Pod yield was higher in 2001 under SDI compared with OSI when fungicides were not applied; yield was similar in 2002. Disease severity was much higher in 2001 than in 2002, and this most likely explains differences in yield between years. No difference in yield was noted when fungicides were applied, regardless of irrigation system or year. The percentage of extra large kernels was lower in one of two years under SDI compared with OSI. The percentage of total sound mature kernels was higher when fungicides were applied compared with non-treated peanut. There were no differences in percentages of fancy pods and other kernels among irrigation systems or fungicide programs. In a separate experiment where fungicides were applied bi-weekly, pod yield was similar under SDI and OSI but greater than non-irrigated peanut. Percentages of total sound mature kernels, extra large kernels, and fancy pods were higher under both OSI and SDI than non-irrigated peanut. No difference in these market grade characteristics was noted among OSI and SDI systems.

ECONOMICS II

<u>Southeastern Representative Peanut Farms Established Through the National Center for Peanut Competitiveness.</u> A. McCORVEY*[1], A. LUKE-MORGAN[1], S.M. FLETCHER[2], and J. RICHARDSON[3], [1]Agricultural and Applied Economics Department, National Center for Peanut Competitiveness, The University of Georgia, Tifton, GA 31793-0748; [2]Agricultural and Applied Economics Department, National Center for Peanut Competitiveness, The University of Georgia, Griffin, GA 30223-1797; [3]Department of Agricultural Economics, Agricultural and Food Policy Center, Texas A&M University, College Station, TX 77843-2124.

The mission of the National Center for Peanut Competitiveness (NCPC) is to enhance the competitiveness of U.S. peanut producers through product development, economics and production research. A current project, organized through the Center to help carryout this mission, that is being funded by the National Peanut Board through the Southeastern Peanut Research Initiative is the establishment of Southeastern representative peanut farms. The project is being coordinated with the support of the Cooperative Extension Service and local county agents. The NCPC is working with the Agricultural and Food Policy Center (AFPC) at Texas A&M University on this project since the AFPC has a twenty year history of designing such representative panel farms used in analyzing the impacts of agricultural policy and environmental issues. Until now there has been no need for this information for peanut farms. However, the peanut industry is currently in a transition stage. In the past, the U.S. government regulated through a price-support system how peanuts were sold. But that's changing, and producers need to know how these changes will affect their bottom lines. Under this project eleven representative Southeastern peanut farms representing Georgia, Alabama, Florida and South Carolina were developed. The information gathered from these representative farms will be used to analyze the impacts of potential adoption of alternative production technologies, environmental regulations, water usage and other potential changes in peanut production. Basically, any time an issue comes up from a regulatory- or policy-type avenue these model farms can be used to see how they'll be impacted. This type of information will allow peanut farmers to know ahead of time how a particular issue might affect their operations, and, therefore, respond in a proactive way.

Financial Impacts of the 2002 Farm Bill on Peanut Farms. J.W. PEASE*[1], M.T. ROBERTS[2], S.G. BULLEN[3], F.M. SHOKES[4], [1]Agricultural And Applied Economics, Virginia Polytechnic Institute, Blacksburg, VA 24061, [2]Virginia Cooperative Extension, Prince George County Extension, Prince George, VA 23875-2527, [3]Agricultural And Resource Economics, North Carolina State University, Raleigh, NC 27695, [4]Tidewater Research And Extension Center, Suffolk, VA 23434.

This study analyzed financial performance of peanut farm models representing high-quality management in the leading peanut county of Virginia, North Carolina, Georgia, Alabama, Florida, and Texas. Representative farm models were developed through on-site interviews with producers and other experts in the studied counties. All production and overhead costs were estimated, as well as all government payments, family living expenses, off-farm income, and taxes. Profitability, liquidity, and other financial indicators were estimated using the University of Minnesota deterministic budgeting programs collectively called FINPACK. Financial performance was estimated with and without the provisions of the 2002 Farm Bill (FSRI) for both the farm business as well as the farm family.

Operating under 1996 Farm Bill (FAIR) provisions, net farm income ranges from -$7 thousand (Alabama) to $96 thousand (Texas). Although farm profits are positive for 5 of 6 farms, no peanut farm business generates enough net cash to pay all scheduled principal and interest payments, family living expenses, and taxes. Overall, these top-management peanut farm families are persevering, but not thriving under FAIR. Operating under 2002 FSRI conditions, all representative peanut farms are unambiguously better off financially, even while facing the loan rate ($355/ton) as the lowest effective peanut price. Peanut commodity program payments add more farm and family income than has been lost by reduced peanut prices. Net farm income of the representative farms ranges from $57 thousand (Alabama) to $238 thousand (Texas), 43-59 percent more than FAIR results. Although family net cash position improves for all farms, the Virginia and Alabama farm families net $25 thousand and $17 thousand, respectively, less than family cash requirements, and the North Carolina and Florida farm families approximately break even. The Georgia farm family nets $19 thousand more than family cash requirements, and the Texas farm family earns $46 thousand more net cash than required.

Sensitivity analysis reveals the financial impacts of higher yields or higher prices, of eliminating peanut production, and of including peanut quota buyout in family net cash income. At $459 per ton peanuts market price (29 percent greater than the loan rate), offsetting reductions in commodity payments cause net family cash income to remain negative for the Virginia and Alabama farms, to improve marginally beyond break-even for the North Carolina and Florida farms, to increase by 40 percent for the Georgia farm, and to increase hardly at all for the Texas farm. With respect to eliminating peanut production, only the Florida and Texas farm families are financially better off by raising peanuts rather than by increasing cotton production. Peanut farm families become increasingly dependent on government programs under FSRI provisions, with farm commodity payments equal to 93-165 percent of net cash farm income across the six farms. Keys to financial survival for peanut farm families under the new policy environment include low debt, least-cost machinery complements, reduced input and rent costs, high yields, and control of peanut program acreage and all associated commodity payments.

Marketing Alternatives Under the New Peanut Program. N.B. SMITH, Department of Agriculture and Applied Economics, The University of Georgia.

The new peanut program established by the 2002 Farm Security and Rural Investment Act moves the peanut market toward a market-oriented system. The price of peanuts theoretically will greater reflect the supply and demand of peanuts. The marketing loan program for peanuts provides a new tool for producers to market their peanuts. The new system provides a floor price of $355 per ton for all peanuts produced. Producers must become more active in marketing their peanuts in order to receive more than $355. Alternatives for marketing peanuts include market contracts, cash sales, loan storage, and marketing cooperatives. Each marketing alternative has been examined as to the pros and cons of method. The market loan program is involved in each alternative, so it is imperative that producers understand the rules and eligibility requirements such as beneficial interest. The right choice by the producer depends upon their managerial ability and commitment to marketing.

Economic Assessment of Using Different Schedules of Chlorothalonil and Tebuconazole Sprays Under the New Market Loan Rate on Dry-Land No-Till Production System. V. SUBRAMANIAM*, S.C. PHATAK, N.B. SMITH, S.M. FLETCHER, A.K. CULBREATH, W.D. BRANCH, J.R. BATEMAN. The University of Georgia.

Non-irrigated conservation tillage peanut production is considered a low cost production technology and can be an alternative production strategy for many farms with limited resources. In recent years, fungicide response work in non-irrigated fields has not been characterized as well as that in irrigated fields. To address this issue, trials were conducted at the Coastal Plain Experiment Station in Tifton, Georgia in 1999, 2000 and 2001. Twelve different fungicide spray regimes consisting of 14 and 21-day schedules totaling from three to seven sprays of either chlorothalonil (Bravo Weatherstik applied at 1.5 pt per acre) or tebuconazole (Folicur 3.6F applied at 0.45 pt per acre) on a dry-land conservation (no-till) tillage

production system. Georgia Green was planted in a single row pattern. Averaging all three years, the yields of 4, 5 and 7 applications with tebuconazole produced significantly higher yields than the non-treated. However, the economic analysis shows that the greatest net returns were produced in the non-treated plots. These results imply that the present peanut price ($355 per ton) and the cost of fungicide applications reduce the importance of fungicide application in this type production system, especially when rotated with grain crops. Using the $355 per ton market loan rate compared to the $610 per ton quota price, the required break-even yield for a spray of tebuconazole is increased from 56 lb per acre to 99 lb per acre. The respective increase for a spray of chlorothalonil is from 28 to 49 lb per acre. This indicates that growers need to use more leaf spot resistant varieties and efficient rotations to produce profitable peanuts. Otherwise, a reduction in cost of fungicides will be necessary to use moderate amount of fungicides.

The Impact of the 2002 Farm Security and Rural Investment Act on the Economic Viability of Peanut Buying Points in Georgia. L. WEBB*, S.M. FLETCHER, N.B. SMITH, A. LUKE-MORGAN, Department of Agriculture and Applied Economics, National Center for Peanut Competitiveness, The University of Georgia.

The 2002 Farm Security and Rural Investment Act will have a significant impact on the marketing system for farmer stock peanuts. The major change will occur within the peanut buying point segment of the marketing channel. To address the change, a representative peanut buying point for the State of Georgia was built using survey data collected from Georgia peanut buying points regarding their handling capacity, storage capacity and costs associated with the handling and storage of farmer stock peanuts. The survey was also used to determine the revenue received for their services rend in processing commercial and loan farmer stock peanuts from the producer to the sheller. The average returns per ton for the representative peanut buying point were determined under six different scenarios. The scenarios included an increase in handling capacity efficiency to determine the capability of peanut buying points to lower their average costs by spreading the costs of their fixed assets over a larger number of tons handled. This study also alludes to the incorporation of new technology and the ability of the new technology to lower average costs associated with handling, cleaning, and drying.

PLANT PATHOLOGY AND NEMATOLOGY II/MYCOTOXINS

Peanut Soilborne Disease Control Using Replicated Treatments of Vapam and Fungicides to Evaluate the Control of Cylindrocladium Black Rot (CBR), Rhizoctonia Solani (Pot Rot), Scleratium Rolfsii (White Mold), and Aspergillus Viger (Crown Rot). E.L. JORDAN*[1], and T.B. BRENNEMAN[2], [1]University of Georgia Cooperative Extension Service, Newton, GA 39870; [2]Department of Plant Pathology, University of Georgia, Tifton, GA 31793.

The incidence of peanut soilborne disease increased in Baker County Georgia during the 1990's. This is an attempt to suppress the occurance of the major soilborne diseases with the preplant application of Vapam and the application of two different foliar applied fungicides.

The trial was analyzed as a split-plot design with Vapam treatments as whole plots and the fungicide treatments as sub-plots. There were no interactions between the two factors so results presented are the men values across treatments. This same 12 row replicated plot design was followed in 2001 and 2002. Plot size varied as the rows ran from the start to the end of the field in an irrigated pivot. Vapam was applied at 10 gallons per acre in alternate 12 row blocks two weeks before planting in May. Georgia Green peanut variety was planted. Foliar fungicides were applied with a 12 row sprayer centered on either side of the alternate 12 row plots treated with Vapam. The sub-plots treated within the Vapam split-plot design were two treatments comparing Folicur 7.2 ounces per acre applied 3rd through the 6th application and with Moncut 1.5 pounds per acre plus chlorothalonil the 3rd and 6th spray. The Vapam treated plots in 2001 had a lower % CBR with the treated plots having 13.9% CBR and the non-treated plots having 22.6% CBR. The Vapam sub-plots treated with

Folicur and Monicut plus Chlorothalonil showed no significant differences between the two fungicide programs in disease levels or yield, although the Folicur program had a numerically higher yield in 2001. The only LSD (P<0.05) in the test occurred with Vapam controlling CBR, with a difference of 4.3 while Vapam reduced CBR incidence by 38.5% and increased pod yield by 328 pounds per acre.

The Vapam treated plots in 2002 also had a lower % CBR with the treated plots 3.7% CBR and the non-treated plots at 7.1% CBR. The Vapam sub-plots treated with Folicur and Monicut plus Chlorothalonil showed a lower incidence of white mold with Monicut plus Chlorothalonil at 4.8% compared with Folicur at 8.0%. The Monicut plus Chlorothalonil had an LSD (P<0.05) value in controlling white mold at 2.6 while Monicut plus Chlorothalonil reduced white mold incidence by 40% the yield was not significantly different. In 2002 we evaluated crown rot with no significant difference in control between Folicur and Monicut plus Chlorothalonil. In 2002 Vapam significantly reduced CBR incidence with an LSD (P<0.05) value at 1.2 and increased yield of 235 pounds per acre.

The results of this 2 year replicated treatment was that Vapam did significantly reduce the incidence of CBR both years. At the current prices this yield increase did not cover the entire cost of the fumigant. Future CBR treatments are planned using new peanut cultivars to evaluate their resistance to CBR.

Field and Soil Characteristics That Affect Aflatoxin Contamination in the Southeastern U.S. K.L. BOWEN *[1], J.N. SHAW[2], and J.P. BEASLEY, Jr.[3], [1]Dept. Entomology and Plant Pathology, [2]Dept. Agronomy and Soils, Auburn University, AL 36849, [3]Dept. Crop and Soil Sciences, University of Georgia, Tifton, GA 31793.

Hot dry conditions are known to favor aflatoxin development and accumulation in peanuts. Drought periods during the last 3-4 weeks before harvest are especially conducive to the accumulation of aflatoxins. Other field conditions are also 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. A number of factors were characterized in 32 peanut production fields in Alabama and Georgia. Soil calcium, potassium, and 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. Positive relationships existed between soil calcium and nematode numbers. The positive correlation between total nematode numbers and aflatoxin contamination was significant ($P < 0.10$). Multiple samples were also collected in a grid pattern from each of two fields for evaluation of landscape-level pedological factors that might affect aflatoxin contamination.

Long-term Effects of Application of Nontoxigenic Strains of *Aspergillus flavus* and *A. parasiticus* to Peanut Soil for Biological Control of Aflatoxin Contamination. J.W. DORNER*, USDA, ARS, National Peanut Research Laboratory, Dawson, GA 39842.

Several studies have demonstrated the potential for biological control of aflatoxin contamination of peanuts by competitive exclusion using nontoxigenic strains of

Aspergillus flavus and *A. parasiticus*. An eight-year (1995-2002) field study was conducted in southwestern Georgia to measure the long-term effects of application of nontoxigenic strains of *A. flavus* and *A. parasiticus* to peanut soil. Six distinct 0.25 acre plots (24 rows 150 ft. long) were treated with various nontoxigenic strains using different formulations and application rates during those years. Six equivalent plots in a different part of the field served as untreated controls. For the first five years (1995-1999) plots were planted to peanut, and "treated" plots were inoculated with nontoxigenic strains each year. Plots were not inoculated in 2000-2001 during which time a cover crop of rye was present. Plots were again planted to peanut in 2002 and treated plots were again inoculated. Monitoring of soil for *A. flavus* and *A. parasiticus* population densities in the spring and fall of each year beginning in 1996 showed that application of nontoxigenic strains significantly reduced the incidence of toxigenic *A. flavus* and *A. parasiticus* in soil. The incidence of toxigenic strains averaged > 95% in control plots compared with < 5% in treated plots. Total *A. flavus* and *A. parasiticus* populations were variable, sometimes being greater in control plots and sometimes greater in treated plots. Peanuts were exposed to late-season drought in 1997, 1999, and 2002, and were contaminated with aflatoxin each of those years. However, mean aflatoxin concentrations in peanuts from treated plots were reduced by 91.6, 89.5, and 98.3%, respectively, in each of those years.

Impact of Phytoalexins and Lesser Cornstalk Borer Damage on Resistance to Aflatoxin Contamination. B.Z. GUO*[1], V. SOBOLEV[2], C.C. HOLBROOK[3], AND R.E. LYNCH[1]. [1]USDA-ARS, Crop Protection and Management Research Unit, Tifton, GA 31793; [2]USDA-ARS National Peanut Research Laboratory, Dawson, GA 39842; [3]USDA-ARS, Crop Genetics and Breeding Research Unit, Tifton, GA 31793.

In peanut, the mechanism of resistance to *Aspergillus flavus* has been reported as the capacity to synthesize phytoalexins, the antibiotic secondary metabolites. The lesser cornstalk borer (LCB) is one of the most destructive insects in peanut production area. Penetration of peanut pods by insects enhances infection of pods by *A. flavus/parasiticus* and aflatoxin contamination in peanut. Water activity is a measurement of the energy status of the water in a system, indicating how tightly water is bound. We use water activity in a pod to explain the drought stress placed on the plants and drought tolerance. Field experiments were carried out in the rainout shelters to study the influence of phytoalexins on resistance to aflatoxin formation in peanut lines and determine if damage to the peanut by lesser cornstalk borer compromises the resistance. We compared two peanut cultivars, Georgia Green (popular commercial cultivar) with a small root system and Tifton 8 (drought tolerance) with a large root system. Rainout shelter was moved over 90 days after planting. We measured water activity, phytoalexins, and aflatoxin concentrations in all samples. The preliminary analyses of 2001 samples indicate that peanut cultivar Tifton 8 has higher water activity under drought stressed condition than Georgia green. Three phytoalexins have been measured, trans-resveratrol, trans-arachidin-3, and trans-3-isopentadienyl-4,3',5'-trihydroxystilbene. Damaged pods of Tifton 8 had higher concentrations of all three phytoalexins than Georgia Green. The total aflatoxins levels were lower in Tifton 8 than in Georgia Green. LCB damage significantly increased aflatoxin concentrations in all samples, but Tifton 8 had lower total aflatoxin contamination, which might be correlated with the concentrations of phytoalexins in the damaged pods.

Human Exposure to Aflatoxin and Probable Consequences. J.H. WILLIAMS, Peanut CRSP, University of Georgia, GA 30223.

Aflatoxin (AF) is recognized as a problem for both producers and consumers of peanut, and FDA regulations limit allowable levels to 10 ppb for humans and to 300 ppb for farm animals. The major human toxicity concern for the USA has been the risk of liver cancer, but animals exposed to AF at higher levels also experience reduced growth, immune system suppression, and micro nutrient deficiencies. However, AF is not confined to peanut and occurs in the worlds major food commodities (corn, rice, cassava, spices and nuts). A literature review of papers and trade reports of food contamination by AF, incidences of acute poisoning, and reports of both chronic human and animal exposure to AF was combined with FAO population databases to arrive at an estimate of people exposed on a world scale. Temperature conditions necessary for the production of the toxin establish boundaries for contamination at approximately 40º N and S. Data from human serum in Africa and China, incidences of poisoning, knowledge of the food system and market food samples suggest that between 90 and 100% of people living in this zone (excluding the USA, Japan, Europe and Australia); that is, about 4.6 billion people are chronically exposed.

Reducing Aflatoxin in the Australian Peanut Crop Using an Integrated Harvesting Management System. G.C. WRIGHT*[1], N.R. RACHAPUTI[1], S. KROSCH[1] and A. BROOME[2]. [1]Queensland Department of Primary Industries (QDPI), Farming Systems Institute, Kingaroy, Qld, Australia, 4610 and [2]Peanut Company of Australia (PCA), Kingaroy, Qld, Australia, 4610.

Aflatoxin contamination is a major issue for rainfed peanut growers throughout Queensland, Australia. Penalties imposed by shellers of up to $450 AUD/tonne for aflatoxin positive product provide strong pricing signals back to growers to minimise contamination ‘on-farm’. An active research, development and extension program funded by growers, shellers and QDPI, has developed an integrated package of harvesting management practices that have significantly reduced aflatoxin contamination in the Australian crop. Practices including timely pulling, forming inverted windrows, short cutting-threshing intervals, thorough pre-cleaning and timely and efficient post-harvest drying have been rapidly adopted by farmers. An aflatoxin prediction module has been developed in the Agricultural Production Simulator (APSIM) peanut model to allow prediction of aflatoxin risk, using inputs such as in-season climate and soil temperature data. This tool has played a significant role in assisting growers in making informed decisions about pre- and post-planting aflatoxin management practices. Other research has assessed the potential of using remotely sensed aerial images of peanut crops showing spatial variations in infra-red reflectance, and hence regions of the crop which are more highly stressed, and at higher risk of aflatoxin contamination. Farmers are using these images to segregate high aflatoxin risk regions of their crops during the harvesting operation. An aflatoxin monitoring and management system using the above-mentioned practices was implemented under a “pilot” farm framework involving QDPI researchers, selected producers and PCA. Industry aflatoxin statistics from the severely drought affected 2001/2 crop clearly showed that the number of aflatoxin positive loads delivered from ‘pilot farm’ co-operators crops was more than 25% lower than the industry average. The overall impact of this was to ensure that many regional peanut producers remained viable and delivered largely acceptable product, in what would have been a potentially disastrous year given the aflatoxin contamination statistics of previous years involving similar weather patterns.

Effect of Ozonation and Mild Heat Treatment on Degradation of Aflatoxins in Peanuts. A. PROCTOR*[1], J. KUMAR[1], M. AHMEDNA[2], I. GOKTEPE[2], [1]Chemistry Department, and [2]Department of Human Environment and Family Sciences, North Carolina A&T State University, Greensboro, NC 27411.

Aflatoxins are toxic compounds produced by some strains of *Aspergillus flavus* and *A. parasiticus*. Under favorable conditions of temperature and humidity, these fungi grow in foods such as peanuts and produce aflatoxins. Once ingested, aflatoxins are known to be potent carcinogens. Products contaminated with aflatoxins levels higher than 20 ppb are unfit for human consumption and are often discarded causing economic losses. Therefore, new ways to detoxify contaminated peanut products are needed to limit the economic loss and add value to the peanut industry.

The objectives of this study were to 1) develop methods for aflatoxin detoxification through ozonation and mild heat treatment, and 2) quantify the level of aflatoxin destruction in comparison to untreated samples.

Peanut samples were inoculated with known concentrations of aflatoxins. Contaminated and control samples were subjected to gaseous ozonation and mild heat treatments. Following each treatment, peanut samples were extracted using acetonitrile/water, derivatized in trifluoroacetic acid solution at 65°C and quantified using a HPLC.

The highest degradation (98%) was observed at 10 minutes and 75°C among all four toxins for aflatozin B1. This is significant because aflatoxin B1 is the primary source of toxicity. Similar trends to aflatoxin B2 can be observed in the ozonation of aflatoxin B2 where the maximum degradation is 95%, which occurred at 75°C after 10 minutes of ozone exposure. Aflatoxin G1 exhibited a degradation profile similar to that of aflatoxin B1 but was more resistant to ozonation and heat treatment. The best treatment (75°C, 10 minutes) achieved about 67% G1 degradation. Ozone exposure at 10 minutes and 75°C caused the maximum amount of aflatoxin G2 degradation. Since the breakdown of aflatoxins is expected to yield by-products that should be proven safe for human consumption, studies will be conducted to separate/identify the by-products of aflatoxin breakdown and evaluate their relative toxicity using animal and cell toxicity assays.

This study showed that ozone gas with mild heat could be used as simple means to degrade aflatoxins. This could be an inexpensive way to detoxify contaminated peanut batches, limit economic loss and add value to the peanut industry.

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

Dynasty™ PD: A New Peanut Seed Treatment From Syngenta Crop Protection.
G.L. CLOUD*, D. LONG, and C. PEARSON, Syngenta Crop Protection, Greensboro, NC 27904.

Peanut seed treatments have long been an essential component of an overall pest management system in peanut production. An effective seed treatment protects the seed during seed germination and seedling growth from seed-borne and soil-borne fungi that effect stand establishment and uniformity. In today`s economic environment only the best production practices are successful and it is a "must" to maximize yield and quality. To meet this challenge, SYNGENTA CROP PROTECTION has designed and developed an odorless broad spectrum fungicide that contains three reduced risk compounds, Fludioxonil (MAXIM®), Mefenoxam (APRON XL®) and Azoxystrobin (PROTÉGÉ®), into a registered product called Dynasty™ PD. In 2002, Dynasty™ PD was evaluated in traditional small-plot research trials in Texas, Alabama, Georgia, North Carolina and Virginia on Runners, Virginia types, and Spanish type peanuts. Results show excellent control of *Rhizoctonia solani* and *Aspergillus niger* with the use of Dynasty™ PD. Stand counts were generally higher at 7 to 10 days after planting in the Dynasty™ PD plots when compared to the Vitavax PC and the untreated check plots. In the majority of the trials, peanuts treated with Dynasty™ PD had higher yields than peanuts treated with Vitavax PC and peanuts in the untreated check. In regions where Tomato Spotted Wilt Virus (TSWV) occurs, the use of Dynasty™ PD has been shown to significantly reduce the incidence of the virus at the end of the growing season due to increased stand counts. Sparse peanut stands are associated with higher incidences of TSWV than normal stands, i.e. 3-5 plants per foot of row. In all trials conducted, no phytotoxicity symptoms were observed with the use of Dynasty™ PD. In conclusion, Dynasty™ PD has provided rapid peanut stand establishment, excellent disease control with no deleterious effects to the peanut crop. More research will be conducted to evaluate the effect Dynasty™ PD has on the incidence of *Sclerotium rolfsii* infections early in the growing season.

Heat Tolerance in Groundnut.
P.Q. CRAUFURD[1], P.V.V. PRASAD*[2], V.G. KAKANI[3], T.R. WHEELER[4], and S.N. NIGAM[5], [1]Department of Agriculture, The University of Reading, RG2 9AD, UK; [2]Agronomy Department, The University of Florida, FL32611; [3]Department of Plant and Soil Science, Mississippi State University, MS 39762; [4]Department of Agriculture, The University of Reading, RG2 9AD, UK; [5]International Crops Research Institute for the Semi-Arid Tropics, AP502324, India.

Tolerance to high soil and air temperature during the reproductive phase is an important component of adaptation to arid and semi-arid cropping environments in groundnut. 10 to 22 genotypes were screened in controlled environments for tolerance to high soil temperature during pod growth and/or short episodes of high air temperature shortly before and at flowering. High soil temperature (38°C) reduced crop growth rates and pod growth rates, but not pod harvest index. High air temperature (37 to 40°C) at flowering caused a larger reduction in fruit-set than high air temperature 3 to 6 days before flowering. Six genotypes (796, 55-437, ICG 1236, ICGV 86021, ICGV 87281 and ICGV 92121) were identified as heat tolerant based on their performance in all tests. Groundnut genotypes can be easily screened for reproductive tolerance to high air and soil temperature and several sources of heat tolerance are available in groundnut germplasm.

Nondestructive Moisture Determination in Small Samples of Peanut Pods by RF Impedance Method. C.V.K. KANDALA* and C.L. BUTTS. National Peanut Research Laboratory, Dawson, GA 39842.

A method was developed earlier to estimate the moisture content in small samples (6 to 8 kernels) of peanuts using RF Impedance measurements, made on a parallel-plate capacitor with the peanut kernels held between the plates, in an empirical equation. Using this method but with parallel-plates with a larger surface area, a similar attempt was made to estimate the moisture content in small samples (about 6 to 8) of peanut pods. Capacitance, phase angle and dissipation factor were measured with an impedance analyzer at 1 and 5 MHz on a parallel-plate capacitor holding 6 to 8 peanut pods between the plates. These values were plugged into a slightly modified empirical equation and the moisture contents were predicted successfully within 1% of their air-oven values for over 85% of the peanut pod samples with moisture contents ranging between 6 and 20%.

Tracing the Uptake and Duration of Water Use in Peanuts Using Deuterium Labeled Water Applied From an Overhead Irrigation System. D.L. ROWLAND*[1], R.B. SORENSEN[1], J.W. DORNER[1], M.C. LAMB[1], and A.J. LEFFLER[2], [1]USDA-ARS, National Peanut Research Laboratory, 1011 Forrester Dr. SE, Dawson, GA 39842; [2]Utah State University, Ecology Center, 5205 Old Main Hill, Logan, UT 84322-5205.

The ability to determine how long a crop utilizes a given amount of water either from an applied irrigation or a precipitation event would have great potential in improving irrigation decision systems. This would be true particularly for peanut growers since over 50% of all U.S. peanut production is irrigated and has the potential to increase yields by 19% over dryland production. We attempted to quantify water movement through soil and peanut plants in two soil types in southwest Georgia: Tifton sandy loam and Greenville clay loam. During the active growth phase (~ 80 days after planting), deuterium labeled water was applied to peanuts growing in both soils simulating a typical irrigation or rainfall event experienced by peanut plants. Soil at four depths and stem tissue was collected after the deuterium was applied. The first experiment in Greenville soil was conducted over a 24 hour period in order to determine how much of a rainfall or irrigation event was utilized in a fully charged soil profile. The second experiment in Tifton soil was conducted over a four-day period starting with a relatively dry soil profile in order to determine how long a peanut plant could utilize an irrigation or rainfall event over a time period that would be typical between irrigation applications in this region.

Mechanical Curing versus Field Curing: Effect on Peanut Quality and Economics.
J.C. TUGGLE* and M.D. TIMMONS. Crop Docs Research and Consulting, Ltd. Brownfield, TX 79316.
Mechanical Curing is considered a standard harvest procedure throughout most of the peanut industry. The new production regions in West Texas have developed without adequate infrastructure and the necessity of mechanical curing has been challenged by growers and industry in the area. The purpose of this research was to determine the impact of field curing in relation to peanut quality and economic loss. Incoming moisture (IM) effect on percent split and percent loose shell kernels (LSK) was analyzed on 3,250 loads from 1999 and 2000 crop seasons at DeLeon Peanut Company buying stations. Moisture treatments included from five to 19.9 percent. A year by treatment interaction occurred between years on percent splits. Incoming moisture means for % splits were 4.6% for 10% in 1999 and 4.9% for 10% in 2000 while IM means for % splits were 4.03% for 17% in 1999 and 3.59% for 16% in 2000. Ranges occurred from 3.5% to 17.5% across years. Differences in treatments occurred in LSK percentages with 10% IM at 7.9% LSK and 18% IM at 5.0%. Economic loss due to field curing with IM at 10% on a runner quota basis was $60.76 per ton in 1999 while 2000 losses were $60.52 ton.

Improving Accuracy of Electronic Moisture Meters. P.D. BLANKENSHIP* and C.L. BUTTS, USDA, ARS, National Peanut Research Laboratory, Dawson, GA 39842.
Peanut kernel moisture content (MC) is measured periodically during curing and post harvest processing with electronic moisture meters for marketing and quality control. MC is predicted for 250 g samples of kernels with a mathematical function from measurements of capacitance, conductance, and temperature. To examine the accuracy of the function used in the Dickey John GAC-2100 for measuring MC of runner-type peanuts, capacitance and conductance of 613 samples were measured with the meter and compared to corresponding, oven determined MC data. Oven MC was determined using the ASAE Oven Moisture Standard. A prediction equation was determined comparing meter MC versus oven MC. Similarly, a prediction equation was determined for MC from the capacitance, conductance and oven MC data. Accuracy of both equations varied proportionally with MC. A comparison of correlation coefficients of the two equations indicated that the accuracy of the mathematical function used in the commercial meter could be improved.

Testing Use of Fungicide, Early Sowing, and Improved Cultivars to Increase Peanut Yield in Ghana. J.B. NAAB[1], F.K. TSIGBEY[1], P.V. V. PRASAD[2], K.J. BOOTE*[2], J. BAILEY[3], and R.L. BRANDENBURG[3], [1]Savanna Agricultural Research Institute, Nyankpala, Ghana, [2]Agronomy Department, University of Florida, Gainesville, FL 32611-0500, [3]Crop Science Department, North Carolina State University, Raleigh, NC 27695-7613.
This research was part of a peanut collaborative research support project focused to improve crop resource management to increase peanut production in Ghana. Prior research had been conducted on sowing dates and cultivars. Field measurements and systems analyses showed that water was not a major limitation in this rainfall zone, and further suggested that peanut yield could be increased considerably if foliage loss could be prevented. Growth analyses showed that peanut lost most of its leaves by harvest time. Thus, an experiment

was conducted on two cultivars, sown at three dates, with split-plot folicure fungicide treatment applied bi-weekly. The study was carried out at Nyankpala for 3 years and at Wa for 2 years. Folicure fungicide treatment reduced defoliation and disease score, and resulted in a 75% increase in yield, averaged over all studies. The 120-day cultivar F-mix yielded 41% more than the 90-day Chinese cultivar. Early sowing increased yield 22% and 60% over the second and third later sowing dates, in part because disease score and defoliation were less. As a result of these studies, we recommended on-farm trials to see if similar yield response could be obtained with fungicide treatment in grower fields. We recommended economic feasibility studies be conducted to see if fungicide treatment is economically feasible. For the early sowing date, pod yield with improved technology (F-mix cultivar with fungicide) averaged 3857 kg ha^{-1}, compared to 1742 kg ha^{-1} for the standard practice (Chinese cultivar with no fungicide).

<u>Automated Over Space Ventilation Controls for Farmer Stock Warehouses in the Southeast.</u> C.L. BUTTS[1]*, S.L. BROWN[2], F.H. ARTHUR[3], and J.E. THRONE[3]. [1]USDA, ARS, National Peanut Research Laboratory, Dawson, GA 39842, [2]Department of Entomology, University of Georgia, Tifton, GA 31793, and [3]USDA, ARS, Grain Marketing and Production Research Center, Manhattan, KS 66502.

Four commercial farmer stock peanut warehouses were instrumented during the 2001 and 2002 crop years to determine the effect of automated over space fan controls on shrinkage, insect population, and storage conditions. Two similar warehouses at two different locations were selected each year. A programmable microprocessor was used to control the over space ventilation fans in one warehouse while the fans in the other warehouse were manually controlled according to the owner's conventional practice. The two warehouses at the first location had over space ventilation and in-floor aeration systems while warehouses at the second location were equipped with only over space ventilation. The automated controller measured air temperature (T_{os}) and relative humidity (RH_{os}) in the over space, and the roof temperature (T_r). Fans were automatically turned on when any one of the following three conditions were true: (1) T_{os} ?21C, (2) RH_{os} 80%, (3) RH_{os} ∃ 60% and T_{os} -T_{roof} ∃7.2C. A cable with temperature sensors spaced at 3.3 m intervals from the floor to the top of the peanut pile were placed in the center of each warehouse to monitor peanut temperature throughout the storage period. Six samples were obtained at the time of loading at each 3.3 m interval. Three were placed on the cable and three were returned to the laboratory to determine peanut quality at the time of loading. The peanut samples remaining in the warehouse were retrieved as the warehouse was unloaded and evaluated. Quality parameters included loose shelled kernels, foreign material, kernel size distribution, moisture content, and aflatoxin. Populations of indianmeal moth, *Plodia interpunctella* (Hübner), were monitored by counting adult male moths caught in six pheromone traps equally along the length of each warehouse. Traps were checked weekly and the pheromone replaced every two weeks.

During the two-year study, no apparent reduction shrink was observed due to automated over space fan controls. Shrink tended to increase as the storage period duration increased. Double roofed warehouses in the study tended to have less value loss during storage than conventionally roofed warehouses. Temperature and insect population data will be presented.

PRODUCTION II

Preliminary Assessment of the Annual Peanut as a Forage Crop for Grazing by Growing Beef Cattle. R.O. MYER*, D.W. GORBET, and A.R. BLOUNT, University of Florida, NFREC, Marianna, FL 32446.

A preliminary study was conducted to evaluate annual peanuts (*Arachis hypogaea* L.) as a pasture forage crop for young, growing beef cattle. A 4.4 ha field that was originally planted in 1997 to 'Florida MDR 98' was utilized. Since '97 the peanuts have "reseeded" themselves each year and a new crop emerged the following spring. The forage production since 1998 was harvested for hay and the nuts (pods/seed) were left in the soil. During 2002, an initial grazing trial was conducted on this field. Twenty-five early-weaned beef steers and heifers with an average initial body weight, of 200 kg (range 115 to 259) were utilized. The peanut field was rotationally grazed (four equal size sub pastures) starting mid July. After 41 days, the heaviest 11 cattle were removed and the remaining were allowed to graze an additional 48 days. Initial composition of the peanut forage averaged (DM basis; n = 2) 19.6% crude protein, 30% ADF, 36% NDF, and 9.0% lignin. Forage dry matter yield averaged (n = 4), 3857, 1348, and 716 kg/ha for 1 through 3 rotations, respectively. Cattle avg. daily gain for the first 41 days averaged 0.89 kg (n = 25) and for the last 48 days, -0.20 kg (n = 14). The peanuts initially were an excellent forage for grazing, but the lack of adequate regrowth resulted in poor animal performance late in the grazing period.

Development of a Peanut Precision Agriculture/General Research Farm and Its Use in Addressing Real-World Production Problems. A.M. SCHUBERT, D.O. PORTER, T.A. WHEELER, C.L. TROSTLE, K.E. BRONSON, and P.A. DOTRAY. Texas A&M University Agricultural Research & Extension Center. Lubbock, TX 79403-9803.

Initial peanut precision agriculture (PA) research began 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, Western Peanut Growers Association leased 320 acres of land in northern Gaines County, TX to serve as a peanut-based field research farm. Starting with a clean slate at the Western Peanut Growers Research Farm (WPGRF), we placed a major emphasis from the beginning on the use of PA tools to develop the farm as a major PA research site and to provide exhaustive background information that could be used by all research projects at the location. The most intensive activities located on the east 120-acre circle. The area was grid soil sampled at ½-acre increments. At each GPS-referenced site, we took two soil cores as deep as possible to four feet. Each core was encased in plastic sleeves, which allowed us to measure depths to soil color changes and caliche. Cores were cut into 0-6, 6-12, 12-24, and 24-36 inch increments, weighed to obtain an estimate of bulk density, analyzed for soil chemical properties and soil texture was determined for each site-depth combination. Remote images have been obtained from public websites, FSA compliance aerial images, and aerial infrared photography throughout the project to help identify field zones and surface and crop conditions. USDA-NRCS cooperators supplied a detailed GPS-referenced elevation map. Whenever possible, notes and measurements have been GPS-referenced so that site-specific inferences can be drawn. GPA-referenced yield mapping has been used extensively. We are beginning our fourth crop year at WPGRF. During that time we have conducted research on numerous irrigation issues, soil moisture-disease interactions, soil fertility, inoculation, sensors-activated herbicide application, large-scale variety performance, and yield patterns in large unaltered field areas, while being able to analyze results in relationship to site-specific soil chemical and physical and topographical data. PA approaches have allowed us to obtain more reliable results and to understand more complex interactions than from small plots and to test imaging tools to diagnose production problems.

Peanut (*Arachis hypogaea*) Response to Cyclanilide and Prohexadione Calcium

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Ten experiments were conducted from 2000 to 2002 in North Carolina to compare peanut response to cyclanilide (Finish©) at 0.044 lb ai/acre and prohexadione calcium (Apogee©) at 0.125 lb ai/acre applied at 50% row closure followed by a repeat application 2 wk later. Cyclanilide and prohexadione calcium increased row visibility in all experiments. Main stem height was shorter at the end of the season when cyclanilide or prohexadione calcium was applied compared with non-treated peanut in all but one experiment. Prohexadione calcium was more effective than cyclanilide in improving row visibility in 3 experiments; row visibility was similar with both plant growth regulators in the other experiments. Main stem height was similar following application of cyclanilide and prohexadione calcium in 8 of the 10 experiments. While the experiment by plant growth regulator treatment interaction was significant for row visibility and main stem height, this interaction was not significant for pod yield. When pooled over experiments, pod yield of non-treated peanut, peanut following application of cyclanilide, and peanut following application of prohexadione calcium was 4370, 4210, and 4480 kg/ha, respectively. Yield did not differ between non-treated peanut and peanut treated with either plant growth regulator. However, yield following application of prohexadione calcium exceeded that by peanut treated with cyclanilide.

Five Years of Subsurface Drip Irrigation on Peanut: What Have We Learned?

R.B. SORENSEN*, C.L. BUTTS, and D.L. ROWLAND, USDA-ARS-National Peanut Research Laboratory, Dawson, GA 39842.

A subsurface drip irrigation system was installed in 1998 on a Tifton loamy sand (Fine-loamy, siliceous, thermic Plinthic Paleudult) with five crop rotations, two drip tube lateral spacings, and three irrigation levels. Crop rotations ranged from continuous peanut (*Arachis hypogeae* L) to four years between peanut rotated with cotton (*Gossypium hirusutum* L) and maize (*Zea mays* L). Laterals were spaced underneath each crop row (narrow) and alternate row middles (wide). Crops were irrigated daily at 100, 75 and 50% of recommended water use values. Continuous peanut yields averaged 3100 kg/ha while peanut in rotation averaged 4860 kg/ha. Peanut planted in an alternate year rotation with either cotton or maize averaged 4236 kg/ha across all irrigation levels while at the 75% irrigation level pod yield averaged 4600 kg/ha. Longer peanut rotations of three and four years averaged 5073 kg/ha. Yield of peanut, in rotation and with narrow spaced drip tube laterals, averaged 5034 kg/ha and wide spaced laterals averaged 4690 kg/ha. Peanut in rotation and irrigated at 75% had essentially the

same pod yield (4964 kg/ha) as the 100% irrigated (4916 kg/ha) implying a 25% water savings for the same yield. The 50% irrigated area had 4% lower yields compared with the 100 and 75% irrigated area. Overall, with best management practices of good crop rotation (at least two years between peanut crops), drip tube under every row, and irrigating at 75%, peanut yield averaged 5515 kg/ha. Worst case scenario of continuous peanut, irrigated at 50%, and drip tube laterals at wide spacing showed peanut yield of 2850 kg/ha or a 46% yield decrease.

Is Nitrogen Fertilization of West Texas Peanut Justified? C.L. TROSTLE* and S.K. LONG*, Texas Cooperative Extension, Texas A&M Lubbock, Route 3, Box 213AA, Lubbock, TX 79403.

Controversy and debate exists among research and extension personnel regarding the merits of fertilization of West Texas Peanuts with nitrogen. To many if not most producers, however, the matter of nitrogen fertilization of peanut is a non-issue. They fertilize, often with amounts up to 100 kg N/ha. Substantial Texas A&M research from 1990 to 1998 rarely noted significant response to fertilizer N. However, one key research site for earlier research was identified in 1999 as having up to 180 kg soil N/ha at 15-75 cm depth. Furthermore, no record of the degree of *Bradyrhizobium* nodulation at each field site in previous work was made. Field research in 2001 recorded significant runner peanut yield response of ~300 to 950 kg/ha for rates of applied N at 55 kg N/ha or higher applied in June. In 2002, a year in which *Bradyrhizobium* nodulation was high across the Texas South Plains, five of five on-farm test sites saw no response to 50 and 100 kg N/ha applied in June. All N applications were made using hand broadcast urea within 24 hours of pivot irrigation. Research objectives have now turned toward identifying other factors besides N fertilization rate, which might predict peanut response to N fertilizer.

EXTENSION TECHNIQUES AND TECHNOLOGY

Using Pocket HERB for Weed Management Decisions in Peanut. M. SHAW*, M. WILLIAMS, A. COCHRAN, C. ELLISON, A. WHITEHEAD, JR., M. RAYBURN, G. WILKERSON, B. ROBINSON, A.J. PRICE, and D.L. JORDAN, North Carolina Cooperative Extension Service, Raleigh, NC 27695-7620.

Pocket HERB and HADSS (Herbicide Application Decision Support System) have been developed to assist growers and their advisors with selection of herbicides for postemergence applications in peanut (*Arachis hypogaea*). A project was initiated in 2002 to enhance Cooperative Extension field faculty understanding of threshold-based weed management using Pocket HERB. Field faculty from six counties in North Carolina surveyed fields, collected weed population data, and made herbicide recommendations to producers. Fields were also monitored later in the season to determine effectiveness of herbicides. A series of questions were asked growers and County field faculty on the usability of Pocket HERB and possible ways to improve this approach to weed management in peanut. Most comments from growers were positive, although they were not directly involved in scouting, entering data, and determining the Pocket HERB recommendation. County agents were also positive relative to this approach to weed management. Greater promotion of this approach to weed management accompanied by more instruction on weed identification was suggested by county agents.

Effect of Cover Crops and Reduced Tillage Methods on Yield and Grade of Georgia Green Planted Pattern. J.A. BALDWIN*[1], E.J. WILLIAMS[2], [1]Crop and Soil Sciences Department, [2]Biological and Ag Engineering, University of Georgia, Tifton, GA.

"Georgia Green" peanut *Arachis hypogeae* L. was planted in 23 cm twin row patterns following a rye *Secale cereale* L., Wheat, *Triticum aestivum* L. or Oat *Avena sativa* L, cover crop by paratill, strip-tillage, strip tillage + wing, or Lift'n Til reduced tillage systems during 2002. Plots were in a split plot design with cover crop being main plots and tillage system as split with four replications. Peanut yield and % TSWV were affected by tillage and plant stand was affected by cover crop. Paratill and strip- tillage yields were greater ($p \leq .10$) than Lift'n Til and Paratill and strip-tillage plus wing had significantly ($p \leq .10$) less % TSWV than the other two tillages. Field plant stand was significantly higher ($p \leq .05$) for wheat compared to oats or rye. There were no cover crop by tillage interactions for any treatment. Also there was no effect by any treatment on grade factors.

PLANT PATHOLOGY AND NEMATOLOGY III

Evaluation of Reduced Fungicide Programs on Peanut in Oklahoma. K.E. JACKSON* and J.P. DAMICONE. Department of Entomology and Plant Pathology, Oklahoma State University, Stillwater, OK. 74078.

Reduced fungicide programs that consisted of fewer than six applications, which are normally conducted on a 14-d interval, were evaluated for control of early leaf spot (*Cercospora arachidicola*) and southern stem rot (*Sclerotium rolfsii*). The runner cultivars 'Okrun', 'Tamrun 96', 'AT 120', 'AT 1-1', and the Spanish cultivar 'Tamspan 90' were evaluated in nine tests at six different locations across Oklahoma in 2002. The program that consisted of only two applications of azoxystrobin at 0.3 lb/A at 60 and 90 days after planting significantly increased peanut yields in six of nine tests. Yield increases ranged from 320 to 1543 lb/A with an average of 817 lb/A. At the current market value for farmer stock peanuts, the cost of two applications of azoxystrobin is equivalent to the value of 390 lb/A yield. Azoxystrobin applied two times had a similar percent incidence of early leaf spot as the non-treated check in six of the nine tests. A 50% reduction in the incidence of southern stem rot resulted from the reduced azoxystrobin program where southern stem rot was the prevalent peanut disease. Tebuconazole applied either two or three times at 0.2 lb/A resulted in a significant yield increase in five of nine tests. Increased yield responses ranged from –136 lb to 1633 lb/A with an average yield increase of 583 lb/A. Yield increases of 140 to 265 lb/A were necessary to offset the cost of the tebuconazole programs. The reduced tebuconazole program resulted in similar incidences of early leaf spot as the non-treated check in four of the nine tests. Where southern stem rot was prevalent, the reduced tebuconazole programs did not control this disease. Pyraclostrobin applied twice at 0.15 lb/A with and without additional applications of chlorothalonil resulted in a significant yield increase in seven of nine tests. Yield increases ranged from 191 to 1479 lb/A with an average yield increase of 898 lb/A. The costs of the pyraclostrobin programs were equivalent to a 200 to 365 lb/A yield increase. The reduced pyraclostrobin programs did not control southern stem rot, but effectively controlled early leaf spot. In conclusion, yield responses to the reduced pyraclostrobin programs was greatest where early leaf spot was predominant and when the cultivars were susceptible to early leaf spot. Conversely, yield responses to the reduced azoxystrobin programs occurred where southern stem rot was the prevalent disease and for cultivars less susceptible to early leaf spot. Yield responses to reduced tebuconazole programs occurred in fields without soilborne diseases and a low level of early leaf spot pressure.

Peanut Disease Control Potential of Two Local Soaps in Northern Ghana Over Four Years. F.K. TSIGBEY*[1], R.L. BRANDENBURG[2], and V.A. CLOTTEY[3], [1]Department of Plant Pathology, The University of Florida, FL 32351-5677, [2]Department of Entomology, NCSU, Raleigh; [3]Savanna Agric. Research Institute, Nyankpala, Tamale, Ghana.

Groundnut field surveys in northern regions of Ghana (Northern, Upper East and West Regions) covering Latitudes N [8 50.333 to 11 04. 146] and Longitudes E [0 02.540] to W [2 42.272] revealed high disease incidence and severities of late leaf spot (*Cercospora personatum*), rust (*Puccinia arachidis*) and southern stem rot (*Sclerotium rolfsii*). Severe leaf defoliation (>80%) was recorded at most locations during harvest over the years, with associated poor pod formation. Pod loss due to Cercospora leaf spots was as high as 78% on-farm and varied considerably depending on the rainfall pattern and plot history. Two local soaps (Alata Samina and Local Black Soap) were evaluated at different levels alongside fungicides in disease management from 1999-2002. The soap levels were 1%, 2.5% and 3% wt/vol. Efficient disease control was achieved through the use of fungicide (tebuconazole [Folicur 3.6F @ 0.22 kg ai/ha]). Soap treated peanut plots had reduced disease severity and gave higher pod yields above the no spray plots throughout the four years of study. Alata Samina sprays gave 2.7-53.2% higher pod yield above the no sprayed plots whereas the black soap sprays gave 6.4-32.3% increase in yield across years. Alata Samina at higher concentration (3%) induced severe scorching on leaves while the black soap at the same level did not but rather induced dark green foliage on peanut plants. Alternative sprays of soaps and fungicides gave comparable yield with the sole fungicide spray plots and holds promise for future. Fungicide sprayed plots gave the highest pod yields as well as low disease severities compared to all other forms of spray regimes. In the absence of sprays, disease severities were high while pod and haulm yields were similarly low. Strategies and significance of alternative sprays of soaps and fungicides were discussed.

The Occurrence and Control of Peanut Rust in Central Florida from 1998 through 2002. T.A. KUCHAREK* and C.R. SEMER. Plant Pathology Dept., University of Florida, Gainesville, FL 32611.

Peanut rust, caused by *Puccinia arachidis* Speg., was first detected at the test sites in central Florida on 8/13/98, 8/16/99, 8/17/00, 8/14/01, and 7/16/02. In each of the five years a replicated fungicide evaluation test with four replications was established near Gainesville for leaf spot. Therefore, efficacy for these treatments was evaluated for rust. All treatments were applied in 468 L ha^{-1} of water at 207 kPa with a single SS 8008 nozzle over the center of the row. The

cultivar Florunner was used in 1998 and Georgia Green was used in 1999, 2001, and 2002. Both cultivars were compared in 2000. In six comparisons, six sprays of Bravo Ultrex 82.5 WDG (BU) @ 1.4 lb/A reduced leaflets with rust (LWR) in the center of the canopy from 56 to 91% when compared to the unsprayed treatment (P=0.05). Where five sprays of BU were used, LWR was reduced by 86 and 32% in 2001 and 2002, respectively. Where BU was used in the first and sixth sprays and Abound 2.08 F @ 9.2 fl oz and Folicur 3.6 F @ 7.2 fl oz were alternated midseason, reductions of LWR were from 57 to 100% in five comparisons. Where BU was used in the first and sixth sprays and the four midseason sprays had a tank mix of Abound @ 6.1 fl oz and Folicur @ 4.8 fl oz, LWR was reduced by 99 or 100% in four comparisons. A treatment of BU in the first and sixth sprays with four midseason sprays of Folicur @ 7.2 fl oz reduced LWR from 61 to 99% in six comparisons. Where 1 lb of Manzate 75 DF was tank mixed with 4.8 fl oz of Folicur in the mid season sprays, LWR was reduced from 21 to 95% in four comparisons. Where Headline 2.08 FL @ 6.3 fl oz was alternated with BU in two comparisons, LWR was reduced by 44 and 93%. AMS 21619 480 SC @ 5.0 fl oz reduced LWR from 83 and 99% in two comparisons. In 2001 or 2002, treatments that did not reduce (P=0.05) LWR were six sprays of Kocide 2000 53.8 DF @ 2 lb, Manzate 75 DF @ 2 lb, or a tank mix of Kocide with Seranade 10 WP. Treatments that increased LWR (P=0.05) were Seranade @ 4 lb, Kasil No. 6 @ 1000 ppm, and Messenger 3 WDG @ 4.5 oz. In 2000, LWR was greatest in the unsprayed Florunner compared to all other treatments including unsprayed Georgia Green (P=0.05).

First Report of Sclerotinia Blight on Peanut in Nebraska. H.A. MELOUK*[1], K.E. JACKSON[2], and J.P. DAMICONE[2], [1]*USDA-ARS, [2]Department of Entomology and Plant Pathology, Oklahoma State University, Stillwater, OK 74078-3033.

An isolate of *Sclerotinia sclerotiorum* was recovered from symptomatic peanut (*Arachis hypogaea* L.) cv. Valencia C grown in a field near Clearwater, Nebraska, in 2002. Affected peanut plants had all the classical symptoms and signs of Sclerotinia blight, including the presence of sclerotia in the pith cavity. *S. sclerotiorum* was grown on potato dextrose agar containing 100 mg of streptomycin/L (SPDA) at 22$\pm$ 2 C, where it produces mature sclerotia after 15 days of growth. The weight for ten sclerotia of *S. sclerotiorum* ranged from 0.05-0.08 g compared with 0.0065-0.0125 g for sclerotia from *S. minor*, the principal pathogen that causes Sclerotinia blight on peanut. In greenhouse experiments, pathogenicity of *S. sclerotiorum* was compared with that of *S. minor* on several peanut genotypes. Results showed that *S. sclerotiorum* was less virulent than *S. minor* where the length of lesions on inoculated detached shoots produced by *S. sclerotiorum* was about one fifth of that for *S. minor*. Mycelial growth of *S. minor* and *S. sclerotiorum* was incompatible on SPDA in paired culture.

Improving the Efficiency of Foliar Fungicide Sprays in Peanut Production Through Integration of Cultivar Susceptibility and Reproductive Stage into Weather-based Advisory Programs. P.M. PHIPPS* and R.W. MOZINGO, Tidewater Agricultural Research & Extension Center, Virginia Polytechnic Institute & State University, Suffolk, VA 23437.

Peanut growers in Virginia have used weather-based advisories over the last 20 years to reduce input costs without sacrificing yield or quality. Early in the growing season, advisories alert growers at the first occurrence of favorable conditions for infection and the need to apply fungicide. Subsequent advisories report the “last effective spray date” for leaf spot control based on weather conditions and a 10-day protection period by the previous fungicide application. Over the period from 1990 to 1995, an average of four fungicide applications were required. Results of five trials in 1998, 1999, and 2000 demonstrated that starting spray programs at flowering (R1), beginning pod (R3) or as late as beginning seed (R5) and applying subsequent sprays according to weather-based advisories required an average of 4.8, 3.6 and 2.8 applications per season, respectively. Reproductive stages after planting occurred as follows: R1 between June 16 and 22, R3 between July 10 and 22, and R5 between July 28 and August 4. Leaf spot incidence at harvest with the R1-advisory and the R3-advisory programs were not significantly different, and defoliation never exceeded 40% even with the R5-advisory program. Trials in 2001 and 2002 with four cultivars (VA 98R, NC-V 11, Wilson, Perry) were conducted in fields with center-pivot irrigation and a 2-year rotation of peanut and cotton. Main plots were four, 25-ft rows per fungicide program and subplots were two rows per cultivar in four randomized complete blocks. All plots were planted on May 1 and dug on 4 October in 2001 and 2002. The first spray of Bravo Weather Stik at 1.5 pt/A was applied at the designated reproductive stage (R1, R3, R5) and subsequent sprays were applied according to weather-based advisories until beginning maturity. The number of fungicide sprays averaged five for the R1-advisory, four for the R3 advisory, and three for the R5-advisory programs. Leaf spot incidence in unsprayed plots on 29 August 2001 was significantly lower in Perry (11%) in comparison to VA 98R (33%) and NC-V 11(30%). Leaf spot incidence in Wilson (22%) was not significantly different from levels in other cultivars. A similar trend in leaf spot incidence was observed across cultivars in unsprayed plots in 2002, but differences were significant. Web blotch reached high levels of incidence at harvest in untreated plots of VA 98R and NC-V11 in 2001 and 2002. Wilson showed a lower level of susceptibility and Perry exhibited partial resistance. Wilson produced significantly higher yields than other cultivars in 2001. Yields combined across treatments in 2002 were similar for Wilson, NC-V11 and Perry, and significantly lower for VA 98R. In both years, Perry had the lowest yield response to fungicide programs. Overall, it appeared that the most efficient approach for control of leaf spot and web blotch was the R3-advisory program for all cultivars, except Perry, which had low levels of disease with the R5 program.

Evaluation of Two Nematicides and Timing of Application to Manage Peanut Root-knot Nematode in Georgia. R.C. KEMERAIT, JR.*[1], R.F. DAVIS[2], and C.L. BREWER[3], [1]Department of Plant Pathology, The University of Georgia, Tifton, GA 31794; [2]USDA-ARS, Coastal Plain Experiment Station, Tifton, GA 31793; Department of Plant Pathology, The University of Georgia, Athens, GA 30602.

Field trials (randomized complete block design, six replications) were conducted at the Southeast Georgia Research and Education Center in Attapulgus, GA in 2001 and 2002 to evaluate the effectiveness of aldicarb (Temik 15G) and ethoprop (Mocap 15G) on management of the peanut root-knot nematode. In 2001, pressure from the peanut root-knot nematode, *Meloidogyne arenaria*, was light to moderate. In 2002, nematode pressure in the same field was severe (populations reached 1674 root-knot nematodes/100 cc soil in the control plots) and was complicated by Cylindrocladium black rot. In 2001, two trials were conducted side-by-side in the plot area. Efficacies of Temik 15G applied at planting (10 lb/A), at pegging (10 lb/A), or at planting and pegging (10lb/A + 10lb/A) were evaluated. In the second trial, efficacies of at-pegging applications of Temik 15G (10 lb/A) and Mocap 15G (10 lb/A) after both received at-plant applications of Temik 15G (10 lb/A) were compared. The control in the first trial received 5 lb/A Thimet 20G at planting; the control in the second trial received Temik 15G at planting. In 2002, the treatments from the first year were combined into a single trial; the control was treated with 5 lb/A Thimet 20G at planting. In 2001 and 2002, pod galling and yields from plots that received applications of Temik 15G at planting without an application at pegging were not statistically different from the control. In two of three trials, pod galling was significantly lower when Temik 15G was applied at pegging, with or without an at-plant treatment, than when plots were treated with Temik only at planting. At-pegging applications of Mocap 15G after at-plant applications of Temik did not significantly reduce galling or increase yield over at-plant applications of Temik 15G alone. There were trends for increased yields in plots treated with Temik 15G at pegging and at plant + at pegging in all three trials over at-plant applications of Temik alone; however the increases were only statistically significant in one trial in 2001 and in the trial conducted during 2002.

POSTER SESSION

Impacts of Cotton and Peanut Rotations on a Sandy Soil: Organic Matter, Aggregate Stability, Microbial Biomass, Microbial Community Composition, and Enzyme Activities. V. ACOSTA-MARTINEZ*[1], [1]USDA-ARS, Lubbock, TX 79415, D.R. UPCHURCH[2], [2]USDA-ARS, Lubbock, TX 79415, and D.O. PORTER[3] [3]Texas A&M Agricultural Research and Extension Service, Lubbock, TX 77843.

The impacts of different cotton (*Gossypium hirsutum* L.) (=Ct) and peanut (*Arachis hypogaea* L.) (=Pt) cropping systems on a Brownfield fine sand soil (Loamy, mixed, superactive, thermic Arenic Aridic Paleustalfs) from West Texas, USA were investigated. Soil surface samples (0-12.5 cm) were taken in March and June 2002 from PtPt at 75% (evapotranspiration) ET irrigation, and from CtCt and PtCt at 50, 75 and 100% ET irrigation. The samples were taken again in September 2002 when the rotations became PtPtPt, CtCtPt, and PtCtCt. The soil contains 91% sand, 7% clay, and 2% silt. The soil properties investigated were not affected by irrigation. The soil total N and aggregate stability were not affected by crop rotations. The soil pH was generally >8.0, however continuous peanut showed lowest soil pH values in comparison to the rotations. In all samplings, soil organic C, the activities of ?-glucosidase, ?-glucosaminidase, acid phosphatase, alkaline phosphatase and phosphodiesterase, and the intracellular and total arylsulfatase activities were higher in continuous peanut than in the peanut-cotton rotations. The soil enzyme activities in the peanut-cotton rotations were generally similar during March, June and September but there was a decrease in the soil enzyme activities from March to June in soils under PtPt. Therefore, it appears that this change was not due to seasonal effects but to differences in enzyme stabilization in soil under different cropping systems. The soil microbial biomass C (C_{mic}) was significantly higher under PtPt than under CtCt in March and under PtPt than under PtCt in June. In September, there were no significant differences in soil C_{mic} among the systems, but it was increased in comparison to June sampling due to the rhizosphere effect on the soil microorganisms. Fatty acids methyl ester (FAME) analyses, which provide a characterization of the soil microbial community structure, revealed higher concentrations of the fungi indicator fatty acids 18:2ω6c and 18:1ω9c in the continuous peanut than in the peanut and cotton rotations. For this sandy soil, in contrast to soils with higher contents of clay and organic matter, the continuous peanut tended to promote soil microbiological properties compared to crop rotations. However, it is known that this is not a long-term sustainable system.

Perceptions, Attitudes, and Preferences of Elderly Consumers Concerning Peanuts and Peanut Products. C.M. BEDNAR*, M.B. DAUGHERTY, R. KANDALAFT, Department of Nutrition and Food Sciences, Texas Woman's University, Denton, TX 76204-5888.

The purpose of this project was to determine through qualitative focus group discussions the perceptions, attitudes, and preferences of elderly consumers concerning peanuts and peanut products. Independent-living adults, 65 years and older, were recruited by flyers distributed at the university, a city senior center, a retirement complex, and a community center. Participants were screened so that only individuals who consumed peanuts were included in the study. Questions and a script developed by the researchers for previous focus groups on a similar topic were modified slightly. Questions focused on what type of peanut products were typically consumed, perceptions of quality for peanuts, peanut butter, and peanut butter cookies, opinions on whether peanuts are healthy, and ideas for new peanut products. At each focus group, peanuts and peanut food items such as peanut butter cookies, peanut butter sandwiches, and peanut candy were served at the beginning of the session, followed by a 25-30 minute discussion period. All focus group sessions were conducted by a trained researcher, audiotaped using a tape recorder, transcribed verbatim, and then analyzed to determine frequency of key words and phrases.

Four focus groups with a total of 41 participants were conducted. Approximately ½ of the individuals were in the 65-74 age category, ½ in the 75-84 age category, and three people were 85 or older. Peanut butter was a frequently consumed product with ½ of the participants preferring crunchy and ½ preferring smooth. Dry roasted peanuts (salted and unsalted, peanut butter cookies, and peanut brittle were other peanut products regularly consumed. Quality in snack peanuts was felt to be related to brand, freshness, flavor, and variety of peanut. Brand was most frequently mentioned as influencing quality of peanut butter; other factors were natural ingredients, oiliness, sweetness, texture, and additives. Quality in peanut cookies was associated with homemade peanut butter cookies and brand and flavor in purchased cookies. A majority of these elderly consumers felt that peanuts were healthy. Fat and protein content were frequently mentioned. A small number stated reasons that peanuts were unhealthy such as allergies, chewing problems, and unpleasant physical reactions. Participants suggested a number of ideas for new peanut products, and also packaging and texture modifications.

Elderly consumers generally had favorable opinions about consumption of peanuts and peanut products. Brand was an important indicator of quality for snack peanuts, peanut butter, and purchased peanut cookies.

Peanut Production Development in Bulgaria. N.A. BENCHEVA[1], S.G. DELIKOSTADINOV[2], C.M. JOLLY[3] and N. PUPPALA*[4]. [1]Department of Management and Marketing, Agricultural University of Bulgaria, Plovdiv; [2]Institute for Plant Genetic Resources, Sadovo, Bulgaria 4122; [3]Agricultural University in Auburn – Alabama, [4]New Mexico State University, Agricultural Science Center at Clovis, Star Route Box 77, Clovis - NM 88101.

In the beginning of the 90-ies, a long process of transition from a centrally planned to a market economy has started in Bulgaria. As a result of the implemented agrarian reform the agricultural sector began a process of transformation which affected the peanut industry. The purpose of this article is to present the main effects of the implemented agrarian reform on peanut production and development and to discuss the opportunities for increasing peanut profitability. Peanuts are one of the few crops where production during the period of transition remained stable. Peanut production in Bulgaria has a long history and good transitions. The presence of fertile soils, the possibilities for irrigation and comparative good climatic factors create suitable conditions for cultivation of this southern crop. The recent development of high yielding, early maturing varieties, and industrial technologies for mechanized cultivation and harvesting confirm peanut as a preferred, profitable crop. In economic terms peanut is in second place, after sunflower, among oil-producing and industrial crops. During the years of transition, peanut production gradually transferred into private farms, and in 2000 these farms were responsible for 99% of the country production. These events have triggered an inquiry into production and distribution of the crop, and data have been collected directly from peanut producers.

Comparison of the AU-Pnut Disease Advisory and Standard Calendar Fungicide Programs on Selected Cultivars. H.L. CAMPBELL*, A.K. HAGAN and K.L. BOWEN. Dept. of Entomology and Plant Pathology, Auburn University, AL 36849.

AU-Pnut leaf spot advisory was developed to improve the timing of fungicide sprays for control of early and late leaf spots on peanut. When compared to a calendar program, use of this advisory can save from one to three sprays per year. In 2002, tests were conducted to compare the level of disease control obtained with 7-spray calendar programs to that with fungicide applications according to the standard AU-Pnut advisory rules. All studies were conducted at the Wiregrass Research and Extension Center in Headland, AL. For Test 1, recommended rates of Bravo Ultrex only, Bravo Ultrex/Abound 2SC, Bravo Ultrex/Folicur 3.6F, and Bravo Ultrex/Headline 2.09EC were applied on a 14-day calendar schedule and according to the standard AU-Pnut advisory rules on the 'Georgia Green' peanut. For Test 2, the same fungicide regimes as those listed above were evaluated on 'Virugard', 'Georgia Green', and 'Florida C99-R' peanuts. Test 1 was irrigated but Test 2 was not. Leaf spot ratings were made using the Florida 1-10 leaf spot rating scale from 7 July to 19 Sep at two-week intervals. Area under disease progress curves (AUDPCs) for each fungicide program were calculated. Southern stem rot (SSR) hits counts were made at plot inversion. In the first study, the Bravo Ultrex/Headline calendar program gave better leaf spot control than all other regimes except for the calendar Bravo Ultrex/Abound 2SC program. When applied according to the AU-Pnut advisory,

Bravo Ultrex/Folicur 3.6F and Bravo Ultrex programs allowed the greatest leaf spot severity. No significant differences in SSR control were noted between any of the fungicide treatment regimes. Yields of peanuts treated according to calendar Bravo Ultrex/Abound 2SC and Bravo/Folcur programs were significantly higher than those recorded for the Bravo Ultrex AU-Pnut regime and both the calendar and AU-Pnut programs with Headline. In the second study, 'Florida C99-R' had less leaf spot severity across all treatment programs than either 'Virugard' or 'Georgia Green'. When AU-Pnuts was compared with the calendar program, leaf spot control was similar with all fungicide regimes except for Bravo/Folcur in which the AU-Pnut program had higher leaf spot severity. SSR was lower in 'Virugard' than the other two cultivars. When the two programs were compared, SSR was similar in all treatment regimes. Yields across all cultivars was similar and similar across all treatment regimes. Reducing the number of fungicide applications with the use of AU-Pnuts had little impact on disease severity and yield of peanut.

Comparison of Inoculation Methods to More Rapidly Identify Peanut Genotypes with Resistance to *Meloidogyne arenaria*. W.B. DONG*[1], C.C. HOLBROOK[2], P. TIMPER[2], and J.P. NOE[3], [1]Department of Crop & Soil Science, University of Georgia, Tifton, GA 31793; [2]USDA-ARS, Coastal Plain Exp. Stn. Tifton, GA 31793; [3]Department of Plant Pathology, University of Georgia, Athens, GA.

Developing and utilizing resistant peanut cultivars is a desirable approach to manage peanut root-knot nematode disease, caused by *Meloidogyne arenaria*. Greenhouse screening techniques to identify peanuts with resistance to *M. arenaria* are available, however, the standard protocol can take up to 10 weeks before results are available. The objective of this study was to evaluate more rapid techniques for assessing resistance to *M. arenaria* in peanut. During 2002-2003, two pot trails were conducted in Tifton, Georgia to determine the appropriate screening protocol for identifying resistant genotypes under greenhouse conditions. Two levels of egg suspension inoculum and two levels of second-stage juveniles (J_2) inoculum were used to inoculate four peanut genotypes with different resistance to *M. arenaria*. Galling index values and gall numbers were evaluated 2 and 4 weeks after inoculation (WAI); while galling index values, gall numbers, egg mass index and egg number per gram fresh were evaluated 6 and 10 WAI to determine the most suitable inoculum and harvest date for identifying resistance. The results indicated that all of the tested inoculum levels, 2000 J_2, 4000 J_2, 8000 eggs, and 16000 eggs would be suitable to inoculate the peanut plants. It took 3-5 days to collect enough J_2 for inoculating a trial, however, using J_2 as inoculum did not show any advantages, compared to using eggs. The peanut genotypes with different resistance to the nematode can be identified correctly two weeks (around 150 degree days) after inoculation based on the 0-5 scale galling index values. Dependable resistance can be identified 6 WAI (about 520 degree days) as well as 10 WAI, based on egg mass index or egg number per gram fresh root. Pearson's correlation coefficients were calculated to compare galling index, gall number, egg mass index, and egg number per gram fresh root for every harvest. Significantly positive correlations ($P<0.01$) were observed among galling index, gall number, egg mass index, and egg number per gram root. We propose a two-stage greenhouse screening protocol to identify peanut genotypes with resistance to the root-knot nematode. A preliminary screen would first be used to eliminate susceptible genotypes

based on the 0-5 galling index values assessed 14 days (150 degree days) after inoculation with 8000 eggs. The selected genotypes should then be assessed for egg mass index or egg number per gram fresh root at 6 weeks (520 degree days) after inoculation with 8000 eggs to verify the resistance.

Compatibility of Clethodim and Sethoxydim with Selected Fungicides. S. HANS*, D.L. JORDAN, A. YORK, J.W. WILCUT, J. SPEARS, and D. MONKS, Department of Crop Science, North Carolina State University, Raleigh, NC 27695-7620.

Peanut producers apply a wide range of agrichemicals throughout the growing season to control pests and to optimize crop growth and development. Previous research suggests that several commercially available fungicides reduce efficacy of clethodim. Additionally, research evaluating compatibility of sethoxydim with fungicides is much less extensive than research with clethodim. The influence of more recently registered fungicides for peanut on herbicide efficacy needs to be defined, especially with respect to sethoxydim. Field experiments were conducted to evaluate the efficacy of clethodim and sethoxydim applied alone or with the fungicides azoxystrobin, boscalid (BAS 510), chorothalonil, fluazinam, propiconazole plus trifloxystrobin, pyraclostrobin (BAS 500), and tebuconazole. Herbicides and fungicides were applied as tank mixtures when large crabgrass [*Digitaria sanguanilis* (L.) Scop.] was 6 to 10 cm in height. A crop oil concentrate was included with all treatments. Visual estimates of percent large crabgrass control were recorded approximately 3 weeks after application on a scale of 0 (no control) to 100% (complete control). The experimental design was a randomized complete block with 3 or 4 replications, and experiments were repeated. Pyraclostrobin reduced large crabgrass control by clethodim and sethoxydim more frequently and generally to a greater degree than the other fungicides. Azoxystrobin and chlorothalonil reduced herbicide efficacy while boscalid, fluazinam, propiconazole plus trifloxystrobin, and tebuconazole did not affect efficacy of these graminicides.

Nutritional and Physical Properties of Peanut-based Beverage. D. ISERLIYSKA[1], M.S. CHINNAN*[2], A.V.A. RESURRECCION[2], G.D. FARRELL[2], and P. PARASKOVA[3], [1]Institute of Horticulture and Canned Foods, Plovdiv, Bulgaria; [2]Department of Food Science and Technology, University of Georgia, Griffin, GA 30223-1797; [3]Institute of Horticulture and Canned Foods, Plovdiv, Bulgaria.

Consumption of dairy beverages is rapidly growing. A variety of formulations is available in the market today. Filled milk, imitation milk, and toned milk are being used in different parts of the world for various reasons. According to the US Filled Milk Act, filled milk is a product resembling milk, made by combining skim milk solids with fats other than butterfat. Toned and double-toned milk, currently marketed in India, are formulations of reconstituted milk solids from buffalo or cow's milk, which contain 3.0% fat and 8.5% nonfat solids. The purpose of this study was to develop a peanut-based beverage, peanut punch, rich in nutritional value inherent in the natural ingredients used in the formulation: skim milk and peanut butter. The peanut punch was formulated in the pilot plant by combining liquid skim milk, fine sugar, stabilizer, liquid caramel and peanut butter. It was homogenized at 82°C and 1800 psi and then heated to the same temperature. Bottled samples were stored at 5^0 C for 5 days. Preliminary tests were conducted

to assess the effect of different blends of stabilizers on the skim milk-peanut butter system and to select one blend for the final formulation. Samples were evaluated based on selected physical and nutritional properties. Suspension stability index (top-bottom solids) and viscosity of peanut punch beverage did not significantly differ from that of cow's milk (0.5±0.03, where 1.0=maximum stability) and exhibited viscosity comparable to commercial chocolate milk (15.0±0.89cps). The peanut beverage contained (g/100 g beverage) protein (5.6), fat (3.12) and carbohydrates (13.3).

Pod Yield and Market Grades with Mixed Plantings of Peanut Cultivars. D.L. JORDAN* and D. JOHNSON, North Carolina Cooperative Extension Service, Raleigh, NC 27695-7620.

Four experiments were conducted from 2000 through 2002 to compare pod yield and market grade characteristics when two cultivars were applied in adjacent rows and harvested together. Cultivar combinations included: VA 98R/NC 12C, VA 98R/NC-V 11, VA 98R/Perry, NC 12C/NC-V 11, NC 12C/Perry, and NC-V 11/Perry. These cultivars were also planted individually. Pod yield and market grade characteristics did not differ between individual cultivars panted alone and the combination of cultivars harvested together. These data suggest that mixed plantings of cultivars offer little to no benefit over cultivars planted individually.

Detection of Genetic Diversity in Valencia Peanuts Using Microsatellite Markers. G.K. KRISHNA*[1], J. ZHANG[1], L. YINGZHI[1], G. HE[2], R.N. PITTMAN[3], M.D. BUROW[4], S.G. DELIKOSTADINOV[5] and N. PUPPALA[1]. [1]New Mexico State University; [2]Tuskegee University; [3]Plant Genetic Resources Conservation Unit and USDA, ARS; [4]Texas A&M University; and [5]Institute for Plant Genetic Resources, Sadovo, Bulgaria.

Peanut is widely grown as oilseed crop around the world and in United States used as a direct source of human food. Several species of peanut have been cultivated for their edible seeds but only *Arachis hypogaea* L. has been widely domesticated and distributed. Different types of peanuts are grown ranging from Runners, Virginias, Spanish and Valencia types. Despite the existence of considerable genetic diversity among the cultivated peanut genotypes for various morphological, physiological, agronomical and quality traits, very less molecular variations had been reported. The lack of molecular divergence in this crop has made it lag behind in studies of genetic mapping, marker development and marker assisted selection, gene cloning and evolutionary studies as compared to other crops. Microsatellites a class of molecular markers also known as Simple Sequence Repeats (SSR) are repeat sequences spread through out the genome. These DNA markers are highly abundant, polymorphic, co-dominant and easily detectable than other marker systems. Here in the present study twenty five SSR primers were used to initially identify the polymorphism in the Valencia peanut across diverse origin around the globe using unlabeled primers and agrose: metaphor gels and later eighteen polymorphic primers were fluorescently labeled and analyzed using ABI 377 for diversity among the forty nine Valencia types. We scored a total of 120 data points over all the genotypes. The f-SSR data which were analyzed using cluster algorithms and Principal Component Analysis (PCA) indicate that a.) Considerable genetic variations exist among the analyzed Valencia genotypes b.) The bold seeded Bulgarian genotypes distinctly separated out from American and the rest of Valencia type's c.) The f-SSR in general was sufficient to obtain estimates of genetic diversity for the material in the study.

Resistance to *Aspergillus Flavus* in Peanut Seeds is Associated with Constitutive Trypsin Inhibitor and Inducible Chitinase and ß-1-3 glucanase.

X.Q. LIANG ([1,2]), B.Z. GUO ([2]), C.C. HOLBROOK ([3]), and R.E. LYNCH([2]); ([1])University of Georgia, Coastal Plain Experiment Station, Tifton, GA 31793; ([2])USDA-ARS, Crop protection and Management Research Unit and ([3])Crops Genetics and Breeding Research Unit, Tifton, GA 31793.

Peanut is one of the susceptible crops to *Aspergillus flavus* invasion and aflatoxin production. The objectives of this research were to study the constitutive expressed protein trypsin inhibitor (TI) and inducible antifungal hydrolase chitinase and ß-1-3-glucanase by *Aspergillus* infection, which may associate with the resistance in peanut seeds. The purified TI in peanut seeds, including to subunits with molecular weight of 10.3-kD and 17-kD, respectively, can inhibit *A.flavus* spore germination and growth in vitro in the concentration of 10 µg.ml-1. The concentration and activity of TI in resistant genotypes were significantly higher than that in susceptible genotypes. From in-gel (native PAGE) assay, one band and two band of endo-chitinase isoform pattern of ß-1-3-glucanase also showed more bands in resistant genotypes than in susceptible genotypes. Chitinase from PI 337494 inoculated with *A.flavus* was purified with molecular weight 31-kD. The purified chitinase from peanut significantly inhibits spores germination and hypha growth in vitro.

Arachis Genome Relationships Revealed by AFLP Markers.

S.R. MILLA, S.P. TALLURY, H.T. STALKER, and T.G. ISLEIB, Crop Science Department, North Carolina State University, Raleigh, NC 27695-7629.

Cultivated peanut, *Arachis hypogaea*, is a tetraploid (2n = 40) species considered to be of allopolyploid origin. Its closest diploid relatives are the annual and perennial species included with it in section *Arachis*. The identity of the two genome donors to *A. hypogaea* remains a subject of discussion. Cytological, morphological, biochemical, cross-compatibility and marker studies have been conducted in an attempt to identify these donors. However, no study to date has included all species in section *Arachis*. In the present study, 108 accessions representing all 26 species in section *Arachis* were analyzed with Amplified Fragment Length Polymorphism (AFLP) markers. A total of 1328 polymorphic fragments were generated with 8 primer combinations. From those, only 239 unambiguous bands ranging in size from 65 to 760 bp were scored as present or absent. Genetic distances between each accession and *A. hypogaea* ranged from 0.15 to 0.68. The accessions that possessed the shortest distances were 30029 (*A. helodes*), 36009 (*A. simpsonii*), and 30067 (*A. duranensis*) among A genome species, and 30076 (*A. ipaensis*) and 1118 (*A. williamsii*) among B genome species. Based on the cluster analysis, accessions 30076, 30029, and 36009 were the ones most closely associated with *A. hypogaea*. Results will be discussed in terms of their relevance to peanut evolution.

Yield and Pest Resistance in a Bolivian Landrace Peanut Variety, 'Bayo Grande', and Five Similar Bolivian Plant Introductions of *Arachis hypogaea* from the USDA *Arachis* Germplasm Collection. R.N. PITTMAN[1], J.W. TODD[2], A.K. CULBREATH[3], and D.W. GORBET[4], [1]USDA, Griffin, Ga. 30223; [2]Dept. of Entomology, [3]Dept. of Plant Pathology, [2,3]University of Georgia, Coastal Plain Experiment Station, Tifton, Ga., 31793; [4]Agronomy Department, University of Florida, North Florida Research and Education Center, Marianna, Fl., 32446.

One of the projects of the joint Florida/Georgia/Bolivia USAID Peanut CRSP Project Team was to evaluate the entire Bolivian peanut germplasm collection of the USDA in Griffin, Ga., based on Germplasm Resources Information Network data. Five hundred and forty-seven accessions were evaluated for phenotype, disease and insect susceptibility, and yield in 1997 at Attapulgus, Ga. Twelve accessions were selected for further evaluation based upon favorable ratings for early leafspot, Cercospora arachidicola; TSWV, tomato spotted wilt virus; foliage feeding corn earworm, Helicoverpa zea; leafhopper, Empoasca fabae; and plant vigor. In 1998, the U.S. team visit to Bolivia was provided an opportunity to purchase seven peanut samples of Bolivian land race varieties from local farmer markets in Santa Cruz and Warnes, Bolivia. The 12 accessions selected from the Bolivian collection for further evaluation in 1997 were grown and compared to the land races procured on the trip in field tests in the summer of 1998. The similarities of five of the twelve accessions from the 1997 selections to one of the land races purchased in the Bolivian markets, 'Bayo Grande' were very obvious, and immediately led us to consider the extent of those similarities. The growth habit, foliage color, pubescence, testa color, yield and damage ratings for several pests were similar for all the accessions when compared to 'Bayo Grande'. Subsequent testing in 1999, 2000, 2001, and 2002, confirmed the similarities among the following plant introductions, and further work is planned to determine the genetic similarities, if any, between these accessions. Plant Introduction numbers 339967, 475971, 475972, 497412, and 540866 from the Bolivian Arachis collection apparently have similar multi-pest resistance, as well as exceptional yield and other desirable agronomic and growth characteristics. Similarities of these with the land race cultivar 'Bayo Grande' are yet to be determined.

Using an Advisory Index for Managing Tomato Spotted Wilt Virus in North Carolina Peanuts. B.M. ROYALS*[1], R.L. BRANDENBURG[1], D.A. HERBERT, Jr.[2], D.L. JORDAN[3], C.A. HURT[1], [1]Department of Entomology, North Carolina State University, Box 7613, Raleigh, NC 27695-7613, [2]Tidewater AG RES & EXT Center, 6321 Holland Road, Suffolk VA 23437. [3]Department of Crop Science, North Carolina State University, Box 7620, Raleigh, NC 27695-7620.

North Carolina peanut growers have seen an increase in the amount of tomato spotted wilt virus (TSWV) over the past few years. The increase in TSWV has forced researchers and growers to look for alternative ways to help combat this virus. TSWV is transmitted by thrips, which feed on the peanut plants. Both in furrow and foliar insecticides do a good job of controlling thrips, but have only a limited impact on the rate of virus transmission because the virus is transmitted to the peanut plants before the thrips are killed with systemic insecticides. There are no known controls measures for TSWV, but there are several steps growers can take to help reduce the incidence of the virus. Research in NC and VA has developed an advisory index for managing TSWV. The advisory can help growers reduce their risk by variety selection, planting date, plant population, insecticide selection, and tillage practices. Some varieties (Perry, NC 9, NC 7, NC 12C) pose a higher risk for virus, whereas Gregory, NC-V11, Georgia Green C99R have a lower risk. Peanuts planted prior to May 10 tend to have a higher risk to thrips injury than peanuts planted after that date. The index recommends planting 4 to 5 plants per linear foot of row, which will greatly reduce the risk of TSWV. However, fields planted with 2 or fewer plants per linear foot face a greater risk since the thrips are more likely to move into these fields. Establishing optimum plant stands is critical in managing this pest. While no single insecticide treatment is available to control TSWV there are some advantages to using them. Thimet 20G or phorate 20G may reduce the incidence of TSWV in a particular field. The influence of an insecticide on TSWV should not be the overriding consideration for product selection. A disadvantage to conventional tillage is higher thrips populations, which often leads to more TSWV. Growers using a strip tillage program tend to have less thrips injury and lower virus counts, however their yields tend to be lower as compared to a conventional tillage system. All of these production practices play a vital role in minimizing the amount TSWV in peanuts.

Polyphenolic Content and Sensory Properties of Normal, Mid, and High Oleic Acid Peanuts. S.T. TALCOTT[1], D.W. GORBET[2], C.E. DUNCAN[1], S.P. PASSERETTI[1], [1]University of Florida, Department of Food Science and Human Nutrition. PO Box 110370 Gainesville, FL 32611-0370, [2]University of Florida, Department of Agronomy, North Florida Research and Education Center. 3925 Hwy 71 Marianna, FL 32446-7906.

Peanuts are an important food crop with many potential health benefits of their consumption already realized by consumers worldwide. Little information is available on non-nutrient phytochemical composition of peanuts and their relative antioxidant values, data that may serve to increase overall marketability of the crop. Peanuts of various cultivars and oil chemistries were evaluated for phytochemical, antioxidant, and sensory properties and a subsequent study compared phytochemical storage stability characteristics in normal NO), mid (MO), and high (HO) oleic acid peanut varieties. Each cultivar was roasted under identical conditions and evaluated both raw and roasted for color, total soluble phenolics, polyphenolic profiles by HPLC, and antioxidant capacity by ORAC. A trained sensory panel subsequently evaluated peanuts for roasted peanut attributes, sweetness, and bitterness. Shelf life evaluations additionally measured peroxide values (PV) after 0, 30, 60, 90, and 120 days of storage at both 20 and 30°C as in indication of oxidative stability during storage and to determine if coupled oxidative reactions impacted concentrations of individual polyphenolics.

Numerous individual polyphenolics were separated and characterized based on spectral similarities to *p*-hydroxybenzoic acid (257.3 nm), tryptophan (280.3 nm), and *p*-coumaric acid (309.3 nm) in both free and bound forms; however free *p*-hydroxybenzoic acid was not detected these samples. The predominant phenolic acid with antioxidant potential was *p*-coumaric acid and raw peanut cultivars contained 85-668 mg/kg, while after roasting the same peanuts contained appreciably higher levels at 199-1,125 mg/kg. Total reducing agents were measured in gallic acid equivalents via a metal-ion reduction assay (Folin-Ciocalteu) and concentrations ranged from 584-800 mg/kg. Antioxidant capacity was relatively high in both raw (17.38-34.35 µM Trolox equivalents/g) and roasted (23.68-41.21) peanuts compared to other commonly consumed fruits and vegetables and may be a primary reason for their purported health benefits. On average, HO peanuts had higher burnt peanut aroma/flavor but no differences were found for roasted peanut aroma/flavor, sweetness, or bitterness compared to NO varieties.

Storage stability of roasted peanuts followed predicted increasing trends in PV as influenced by storage temperature and time with values for NO peanuts twice that of MO, which was even higher than for HO peanuts. Total soluble phenolics and antioxidant capacity decreased with storage time but were independent of storage temperature or oleic acid content. However, no differences were found for individual polyphenolics as influenced by storage time or temperature indicating that these compounds were relatively stable even in the presence of hydroperoxides in vivo and that compounds other than polyphenolics were responsible for decreased in antioxidant capacity in roasted peanuts. Overall, roasted peanuts were found to be a good source of antioxidant polyphenolics that varied between peanut cultivars and these compounds were found to be relatively stable under diverse conditions of storage.

Influence of Soil Temperature on Seedling Emergence of Peanut Cultivars.

P.V.V. PRASAD*[1], K.J. BOOTE[1], J.M.G. THOMAS[1], and L.H. ALLEN, Jr.[2], [1]Agronomy Department, University of Florida, Gainesville, FL 32611-0500; [2]USDA-ARS, Gainesville, FL 32611-0965.

Peanut crops planted in early spring often have poor seed germination and seedling development. We studied the influence of soil temperature on seedling emergence and growth of six peanut cultivars (MDR98, Southern Runner, Georgia Green, Sun Oleic 97R, Florunner and C99R) in natural field soil profiles in temperature-gradient greenhouses during 2001 and 2002 at Gainesville, Florida. A range of soil temperatures were achieved by four sowing dates between December and May. On each sowing date two temperature treatments (ambient and ambient + 4.5°C) were provided by sowing cultivars on either end of each greenhouse applying differential heating. Each treatment was replicated four times in different greenhouses. Data on emergence (%), seedling growth (formation of first two fully expanded tetrafoliolate leaves) and early vegetative growth were measured. Mean soil temperature from sowing to full emergence in different treatments ranged from 15 to 32°C. There were significant effects of soil temperature and cultivars on seedling emergence and growth. For all cultivars lowest germination was observed in the coolest soil temperatures (earliest sowing). Among cultivars, MDR98 was most sensitive to cool temperature with lowest germination percentage and smallest seedling size followed by Southern Runner. Georgia Green was the most cold-tolerant with highest germination percentage followed by Sun Oleic 97R. However, at warmer temperatures there were no cultivar differences and MDR98 and Southern Runner performed on par with Georgia Green and other cultivars. These results show potential for cultivar choice and/or genetic improvement in regions with cooler soil temperatures and where early planting is desirable.

Cloning of Peanut Genes Expressed During Tissue Culture. K. CHENGALRAYAN*, and M. GALLO-MEAGHER, Agronomy Department, University of Florida, Gainesville, FL 32611-0300.

Somatic embryogenesis and organogenesis of peanut were obtained from the same explant source, mature zygotic embryo-derived leaflets (MZELs). Histological studies revealed that both somatic embryos and organogenic buds developed directly from the subepidermal layers of MZELs and were of multi-cellular origin. Initially, MZELs underwent anitclinal division when cultured on MS medium containing 20 mg/l 2,4-D (embryogenic medium) giving rise to somatic embryos. Interestingly, MZELs underwent periclinal division when cultured on MS medium containing 4 mg/l NAA and 5 mg/l BAP (organogenic medium) which resulted in organogenesis. To understand early initiation of these two morphogenetic pathways, we have used differential display of mRNA to identify gene products that are induced by the media composition. Since cell division of MZELs in embryogenic medium started as early as the 3rd day and in oragnogenic medium on the 6th day, mRNA was isolated from 2d-old MZELs from embryogenic medium, and 2d- and 6d-old leaflets from organogenic medium. MZELs grown on MS for 2d were used as a control. cDNA was synthesized using oligo dT primers. PCR was performed with factorial combinations of three anchored primers and sixty-four random primers for a total of 192 reactions. Fifty-one differentially expressed genes were cloned and sequenced. Putative identification of these cDNAs by comparison to known sequence data has allowed us to infer some of the biochemical and molecular processes that are altered in MZELs response to tissue culture media.

Salt-and Herbicide-Iinduced Increase in Glyoxalase I Activity in Cell Lines of *Arachis hypogaea* L. M. JAIN*[1,3], D. CHOUDHARY[2], R.K. KALE[3], M. GALLO-MEAGHER[1] and N. BHALLA-SARIN[3], [1]Agronomy Department, University of Florida, Gainesville, Florida; [2]University of Connecticut Health Center, Connecticut, Farmington; [3]School of Life Sciences, Jawaharlal Nehru University, New Delhi, India.

Glyoxalase I (EC 4.4.1.5) activity has long been associated with rapid cell division, but experimental evidence is forthcoming linking its role to stress tolerance as well. Rapidly proliferating callus cultures of *Arachis hypogaea* L. cv. JL24 showed a 3.3-fold increase in glyoxalase I activity during the logarithmic growth phase. Inhibition of cell division decreased glyoxalase I activity and vice versa, thus further corroborating its role as a cell division marker enzyme. *Arachis hypogaea* cell lines selected in the presence of high salt (NaCl) or herbicide (glyphosate) amendments, yielded elevated enzyme activity (4.2- to 4.5-fold and 3.9- to 4.6-fold, respectively). The increase in the glyoxalase I activity was reflective of the level of stress tolerance, and was accompanied by an increase in the non-protein thiol content. Inhibitor studies indicate adaptive significance of elevated glyoxalase I activity towards maintenance of cellular glutathione pool. Glutathione homeostasis appears to be the prime link integrating cellular processes and a choice for rapid cell division (or differentiation) in response to the prevalent growth conditions.

Cloning of a Novel Arah3 Gene. I-H. KANG*, and M. GALLO-MEAGHER, Agronomy Department, University of Florida, Gainesville, FL 32611-0300.

Arah3, an 11S seed storage protein, is a major peanut allergen. It has been reported that the Arah3 gene has high sequence homology with Arah4, and other legume seed storage proteins from soybean and pea. We isolated a novel Arah3 cDNA clone of approximately 1.5kb that shows 85% nucleotide sequence homology with other Arah3 genes previously cloned. The new gene contains three of the IgE-binding regions previously identified, but is missing a fourth IgE-binding region. How this may affect its allergenicity is still unclear. Expression studies revealed that Arah3 is expressed in developing seed with the highest transcript levels present at the mature stage. No transcripts were detected in flowers, leaves or roots, indicating that Arah3 is expressed in a seed-specific manner.

Marker-assisted Selection in Screening Peanut for Resistance to Root-knot Nematode. J.C. SEIB*[1], L. WUNDER[1], M. GALLO-MEAGHER[1], V. CARPENTIERI-PIPOLO[2], D.W. GORBET[3], and D.W. DICKSON[4], [1]Agronomy Department, University of Florida, Gainesville, FL 32611-0300; [2]Universidade Estadual de Londrina, Londrina PR Brazil; [3]Agronomy Department, University of Florida, Marianna, FL; [4]Entomology and Nematology Department, University of Florida, Gainesville, FL.

A restriction fragment length polymorphism (RFLP) marker linked to a locus for resistance to *Meloidogyne arenaria* (Neal) Chitwood race 1, along with visual evaluation following root staining were used to screen four breeding populations and three lines of peanut (*Arachis hypogaea* L) in a root-knot nematode infested field. COAN and Florunner peanut cultivars were used as resistant and susceptible controls, respectively. Genomic DNA was isolated from young leaves of these plants during the growing season, and Southern blot analysis was conducted using RFLP probe R2430E. Only the line T301-1-8 was homozygous for the resistance marker. At harvest, the root systems were stained with Phloxine B, egg masses were counted and resistance phenotype scored. Field tests confirmed the RFLP marker results. Except for the T301-1-8, all other genotypes displayed high levels of nematode reproduction. The RFLP probe R2430E loci linked to nematode resistance provided a useful selection method for identifying resistance to the peanut root-knot nematode. However, we have been seeking a simpler method to use for screening. Consequently, DNA from F2 seed of crosses made with COAN and materials from the Florida peanut breeding program was extracted and used for PCR. The primers used for PCR screening were SCZ3-FO1 5'-CAGCACCGCAGCATAAAAAC-3', and SCZ3-RO2 5'-CAGCACCGCACACATTCTGG-3'. A positive PCR reaction yielded a fragment of approximately 280 bp. Florunner was used as the negative control and NemaTAM was used as the positive control. PCR-positive seeds, considered putatively nematode resistant, were planted in May 2003 in Florida. DNA extracted from leaves of these plants will be screened for both the RFLP and PCR marker and evaluated for nematode resistance. Those plants having nematode resistance will be used to further develop Florida cultivars that contain nematode resistance plus other favorable agronomic traits.

Use of a 2X Rate of APOGEE Growth Regulator on Peanut in South Texas. A.J. JAKS*, B.A. BESLER, W.J. GRICHAR. Texas Agricultural Experiment Station, Beeville, TX 78102.

The growth regulator APOGEE (BASF Corp.), common name prohexadione calcium, was applied at a 2X rate on Tamrun 96 peanut in a Atascosa County growers field. The peanut variety is characterized by profuse vegetative growth under optimum growing conditions. Tests in 2001 at this location with a 1X rate did not significantly reduce plant growth. APOGEE was used alone and tank mixed with fungicide (Bravo WS or Folicur) in three, four and five applications. APOGEE treatments applied three times were initiated at 44 days after planting (DAP) and continued at three week intervals. Four and five spray treatments started 30 DAP and continued on a respective 21 and 14 day schedule. Untreated plots as well as fungicide treated plots only were checks. Plots were sprayed with a hand-held boom. APOGEE (0.34 lb/A) was mixed with 32% UAN (1.0qt/A) and Agri-dex (1.0 qt/A) in the alone treatments. APOGEE and 32% UAN were mixed with fungicide at recommended rates except that Agri-dex was omitted. All APOGEE treatments, whether applied alone or mixed with fungicide, had reduced growth statistically different from the fungicide only and untreated plots. APOGEE treatments applied alone had significantly less growth than respective treatments mixed with fungicide. There was no statistical difference in canopy growth from the three and four APOGEE treatments applied alone. APOGEE applied five times alone had significantly less canopy growth than the respective three and four spray treatments. Plant height was shorter with all APOGEE treatments applied alone or mixed with fungicide over the check treatments. APOGEE alone treatments were shorter that APOGEE plus fungicide treatments. No difference in plant height was noted from respective four and five APOGEE sprays applied alone and mixed with fungicide. Leafspot control was significantly better in plots in which fungicide and APOGEE were applied separately and the five application treatment mixed with fungicides. Three and four APOGEE treatments mixed with fungicide provided control equal to the fungicide only treatment. Rust control was similar for all APOGEE/APOGEE and fungicide and the fungicide only treatment. Yields were higher with APOGEE mixed with fungicide but these treatments were not significant from fungicide only treatment. Grade was similar for all treatments in the test. Dollar per acre values were higher for APOGEE plus fungicide over APOGEE alone treatments but these values were not different from the fungicide alone treatment. Wet field conditions delayed digging with some loss of yield.

Evaluation of Valencia Peanut Varieties Investigated in Bulgaria. S.G. DELIKOSTADINOV[1] and, N. PUPPALA*[2]. [1]Department of Peanut and Sesame Breeding. Institute for Plant Genetic Resources, Sadovo, Bulgaria 4122; [2]New Mexico State University, Agricultural Science Center at Clovis, Star Route Box 77, Clovis – NM 88101.

In an effort to identify suitable genotypes of Bulgarian climatic conditions, 10 New Mexico (NM) Valencia varieties of peanuts were investigated over two growing seasons at Institute for Plant Genetic Resources (IPGR), Sadovo, Bulgaria. The agronomic traits such as crop duration, production, productivity, resistance to pest and diseases and seed flavor were recorded. The results indicated that the NM varieties had slightly longer growing period compared to the Bulgarian check (Kalina) but all the NM varieties recorded lower yield compared to Kalina. In terms of agronomic traits, the NM varieties have more vegetative growth and are taller when compared to the Bulgarian type. All the varieties were tolerant to *fusarium* and leaf spot diseases caused by *Phyllostica arachidis*, *Sclerotinia arachidis*, *Cercosporella spp*, *Cercosporidum spp*, *Lepthosphaerulina crassica*, *Oidium spp*. Few of the NM varieties were tolerant to Alternaria spp as compared to the Bulgarian varieties.

Minutes of the APRES Board of Directors Meeting
35th Annual Meeting, Hilton Clearwater Beach Resort
Clearwater Beach, FL
July 8, 2003

President Tom Isleib called the meeting to order at 7:10 pm. President Isleib welcomed the group and made some general comments.

President Isleib called on Executive Officer, Ron Sholar to read the minutes of the last Board of Director's meeting held in Research Triange Park, NC. The minutes were approved as published in the 2002 Proceedings.

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

Editor's Note: Some of the committee oral reports given during the Board of Directors 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.

General Business

Howard Valentine will replace Jeannette Anderson as the American Peanut Council representative on the Board of Directors.

After significant discussion, the board voted that all presentations starting with annual meeting in 2004 in San Antonio, TX will be made with LCD projectors.

American Society of Agronomy Liaison Report

Tom Stalker reported that the annual meetings of the joint American Society of Agronomy, Crop Science Society of America, and Soil Science Society of America were held in Indianapolis IN from November 10-14, 2002. More than 3,000 scientific presentations were made of which about 15 were devoted to peanut research. The next annual meeting will be held in Denver, CO from November 2-6, 2003.

Council for Agricultural Science and Technology Report

See official report in committee reports section of Proceedings.

Finance Committee Report

The APRES financial committee met Tuesday, July 8, 2003 with the following members present: Vernon Langston, David Hunt, Hassan Melouk, John Beasely, Marshall Lamb, and Ron Sholar as ex-officio. The finance committee recommended that the language specific to dues structure be removed from the by-laws of the society to increase the flexibility in changing dues expeditiously to meet the needs of the society. Second, the committee unanimously recommended that registration be increased from $100.00 to $200.00. Registration for non members will be raised to $300. Further it was recommended that individual membership dues be raised to $80.00 per year.

The committee voted to submit a budget of $104,800 in receipts and $119,650 in expenditures for the 2003-2004 year which includes compensation for the Executive Officer, the Editor of Peanut Science and a half time assistant for each office. The society currently has $134,000 in liquid assets in CDs and checking account. While the financial position of the society remains in an excellent position, we must closely monitor future income and expense to ensure the long-term financial stability of the society.

Peanut Quality Committee Report

See official report in committee reports section of Proceedings.

Public Relations Committee Report

See official report in committee reports section of Proceedings.

Nominating Committee Report

John Damicone reported that the nominating committee consisted of Albert Culbreath (University of Georgia), Harold Pattee (USDA/ARS – North Carolina State University), Mike Schubert (Texas A&M University) and John Damicone (Chair and Past President, Oklahoma State University).

The committee was charged with nominating two individuals
President-Elect
Board of Directors member representing Production area

The Nominating Committee submitted the following for consideration by the board:

President-Elect..James Grichar
Board of Directors, Production ....Michael Franke

This slate will be submitted for a vote by the membership at the Friday morning business meeting. Nominations will also be sought from the floor.

Publications and Editorial Committee Report

Ken Dashiell presented the report of the Publications and Editorial Committee. Tom Stalker presented the Peanut Science Editor's Report for 2003. After significant discussion, the Board of Directors authorized the following:
Peanut Science will be electronically published starting with Volume 31. Tom Stalker indicated that setup costs will be $15,000 to $25,000 and the cost of two issues per year will be between $9,000 and $13,000. The current cost for two issues is between $20,000 and $22,000.

The Board authorized Tom Stalker to develop an electronic publication for Peanut Science. If initial startup costs exceed $25,000 or if annual fees (for publication) exceed $15,000, then board approval will be required. A professional publishing company is contacted to manage the publishing of

Peanut Science.

The board also approved the electronic publication of the Proceedings of the annual meeting starting with the Proceedings of the 2003 annual meeting. Cost of electronic publication will not exceed $5,000 per year.

Tom Stalker requested and the board approved that no more reprints of articles in Peanut Science be printed.

The committee recommended and the board approved that there would be a vote of members at the next business meeting to determine if Peanut Research should be continued. The committee also recommended that APRES request the American Peanut Council and the Peanut Foundation advertise the availability of “Advances in Peanut Science”.

The committee recommended that Michael Franke and Nathan Smith be appointed to serve three-year terms as Associate Editors of Peanut Science. The board approved the appointment of Ken Dashiell as Peanut Research editor and authorized that the newsletter be published electronically.

Bailey Award Committee Report

Todd Baughman reported that the Bailey Award Committee did not formally meet. He reported that was a nomination for consideration for the 2004 Bailey Award for each of the 15 eligible sections from the 2003 meeting. He also reported that year's recipient was paper #113 from 2002 meeting Processing and Utilization Section titled "Effect of Microwave Energy on Blanchability, Shelf-Life and Roast Quality of Peanuts. T. H. Sanders, K. W. Hendrix, T. D. Rausch, T. A. Katz, and J. M. Drozd.

Fellows Committee Report

Chip Lee reported that it was the unanimous opinion of the committee that Dr. Rick Brandenburg and Dr. James Todd be selected as recipients of the 2003 APRES FELLOWS award. These nominees had been submitted for a vote by the Board of Directors and both were elected to fellowship in the society. The announcement will be made at the business meeting.
It was also decided to announce that 2004 nominations for the Fellows award would be taken starting immediately.

Site Selection Committee Report

Maria Gallo-Meagher reported that the Site Selection Committee had met and discussed future meetings. The 2004 meeting will be held in San Antonio, Texas at the Hyatt Regency San Antonio, on the Riverwalk at Paseo del Alamo. The room rates are $110 and the dates are July 12-17, 2004. The contract has been signed.

The Site Selection Committee proposed that the 2005 meeting be held in Portsmouth, Virginia at the Renaissance Portsmouth Hotel. The room rates are $119 and the dates are July 9-17, 2005. The Board authorized Executive Officer Ron Sholar to complete the contract with the hotel.

Coyt T. Wilson Distinguished Service Award Committee Report

Richard Rudolph reported that the Coyt T. Wilson Distinguished Service Award committee discussed methods to stimulate the membership to nominate candidates for consideration. The committee confirmed the selection of Dr. Hassan Melouk as the 2003 award recipient.

The committee encouraged APRES members to make timely submissions of candidates for consideration by the committee. Nominations can be made at any time during the year prior to the published deadline.

Joe Sugg Graduate Student Award Committee Report

The APRES Joe Sugg Graduate Student Contest Committee met on Tuesday 8 July at Clearwater Beach, FL. Procedures for judging 2003 graduate student papers were reviewed. Five judges have been lined up. There will be 12 students competing in the 2003 contest, representing three universities in the peanut belt. Students sign up for the contest when they submit their abstract. The committee chair contacts the students by mid April. A follow up letter is sent to the students by mid May. Students are mailed their score sheets by late July.

The committee recommended that all presentations be by LCD.

The protocol established in 2001calls for all graduate students who participate in the Joe Sugg Contest to receive their score sheets and related comments from the judges by late-July.

Dow AgroSciences Award Committee Report

No oral report given. See official report.

Program Committee Report

Ben Whitty recognized the committees for the 34th annual APRES meeting at the Hilton Clearwater Beach Resort in Clearwater Beach, Florida. Maria Gallo-Meagher, Greg MacDonald, and Mary Ann Whitty chaired the Technical, Local Arrangements, and Spouses' committees, respectively. He reported that there were 108 oral presentations and 21 posters scheduled, but one oral paper was converted to a poster and one additional poster was exhibited. Two poster and three oral presentations were canceled. Twelve of the oral presentations were in the graduate student competition. One technical session used Powerpoint presentations, but all others used 2x2-inch slides.

Registration included 240 members and 235 spouses and children.

Additional Business

The board discussed providing compensation for the Editor of Peanut Science to match that being provided to the Executive Officer. On Friday, July 11, the Board of Directors voted unanimously to provide the same compensation for the Executive Officer and Peanut Science Editor positions and directed the chair of the finance committee to adjust the proposed budget to accommodate this change.

OPENING REMARKS BY THE PRESIDENT
AT THE 2003 APRES AWARDS AND BUSINESS MEETING
July 11, 2003

Ladies and gentlemen, if I could have your attention, it is time for the dreaded annual President's report.

For the past several years, with the impending and then the actual change in the peanut price support program, it has been customary for the Society's President to review what he perceives to be needs in the arena of research to be done to keep US peanuts competitive in the world market. What do we need to do? The short version is that we need to (1) reduce the grower's cost of production and (2) maintain or improve quality. There are numerous avenues for reducing production costs, avenues that have been traditional ones for research. They fall into two general categories corresponding to what might be called "defensive" and "offensive" strategies.

From a defensive perspective, the US peanut grower needs more cost-effective weed, disease, and pest management programs. This is of course the raison d'être of the agrichemical industry and the basis for a tremendous amount of applied research at agricultural schools. When the peanut price support program changed, I heard predictions that the chemical companies would greatly reduce their efforts to label new compounds for peanuts, but there have been some new chemicals brought to market nevertheless. Being a plant breeder, it would be impossible for me to omit the potential contribution of breeding to weed control, particularly since the advent of herbicide-tolerant crops. Although there currently are no commercially available GMO peanuts, there is no technical reason why herbicide-tolerant peanuts could not be developed. The genes are available at a price, and the technology for peanut transformation exists in several laboratories around the country. The hurdles are regulatory, economic and sociological. Even without going to the extreme of plant transformation, every peanut improvement program in the United States, indeed in the world, invests a good deal of its effort into breeding for resistance to the economically important diseases. In order to most effectively combine chemical applications and host-plant resistance, the relatively new field of computer-assisted decision-making has developed. These programs allow every computer-literate grower to have ready access to the best advice of the best production specialists, right in the cab of his pick-up.

From an offensive perspective, the grower needs to maximize his return per dollar invested by increasing yield. Again, this is not a new idea. Researchers and extension specialists have developed and promulgated high-yield management practices that took advantage of every new technological advance. These advances have come in the form of new cultivars, better irrigation practices, or new and improved machinery. The new packages of "precision ag" techniques promise to return us to an era in which the grower manages small parcels of land with applications tailored to each parcel, the difference being that in the old days, one or a few such parcels were all an individual grower managed, whereas with yield monitoring, GPS, and computer assistance, one grower can manage hundreds or even thousands of small contiguous parcels. As in defensive strategy, timing is critical in offensive operations, so once again, computer-assisted decision making helps the grower to apply new technologies in the most cost-effective way.

Maintenance or improvement of quality is at times a hard sell. A grower facing imminent frost or the approach of a hurricane is likely to be satisfied to simply get his peanut crop harvested, let alone concerning himself with maximum quality. However, growers must become more aware of the demands of the marketplace, and they must do what they can when they can to ensure that the peanuts they deliver to market are of the highest possible quality. It may or may not be reflected in the price received, but neglect of quality will inevitably lead to declining market share. Growers can protect quality through their choices of varieties. Breeders can include aspects of quality among the criteria they use to select new varieties. However, change of variety is an option only at planting time. After that, the grower can apply several techniques to maximize quality. Key in this are harvest and post-harvest technique. The crop should be allowed to reach optimum maturity, weather permitting. The drying/curing process is also critical: too rapid drying and too high temperatures must be avoided or quality will suffer. Once the peanuts reach storage, either in-shell or shelled, the storage conditions must be monitored, temperature and humidity controlled to avoid deterioration of flavor and the accumulation of aflatoxin from fungal growth. Aflatoxin must be monitored carefully as the peanuts move through commercial channels.

By attending to these few simple matters, we as a group will preserve the US peanut industry. What about the Society itself? As incoming President, I thought it would be wise to be sure I understood the express purpose of the Society. Quoting from Article II of the by-laws, it is:

"...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 presentations 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."

This description lays out just how important these meetings and the Society's publications are in the fulfillment of the Society's main objectives. I was further moved to ascertain what exactly were the responsibilities of the President as laid out in Article VII 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 the Society."

This description is fairly general. Ron Sholar was very helpful in identifying more specific duties, such as the joyful task of identifying and appointing members and chairs of the various Society committees. As the year passed, I came to recognize that every President wants to leave behind a legacy for the Society. Past President Walt Mozingo commissioned the carving of the beautiful APRES wooden peanut that you see before you at the speakers' podium, a legacy that every following President suddenly realizes that he is required to transport to the next year's meeting. I, too, wanted to leave behind a legacy, and an idea occurred to me as I read through the Society by-laws: They are too complex. Members need a simpler code to live by. In thinking about a simple code that people could easily remember, it seemed to me that the Ten Commandments are a good example – they are clear, concise, and not so many in number that they are daunting.

With no disrespect intended, I have drafted a set of commandments for APRES membership. Not being omnipotent or omniscient, I have been unable to keep the number down to ten. There are fourteen. Here we go:

I. I am thy president, if only for another 90 minutes. Thou shalt have only 34 presidents before me.
II. As a member in good standing, thou shalt strive to make the Society better.
III. Thou shalt renew thy membership promptly each year.
IV. Thou shalt encourage thy colleagues and thy students to become members, extolling the virtues of the Society to all who will hear it.
V. Thou shalt serve on Society committees actively and without grumbling. Yea, even on the Quality Committee.
VI. Thou shalt nominate thy deserving colleagues for Society awards. This shalt thou do before the deadline.
VII. Thou shalt attend the annual meeting.
VIII. In a technical session, thou shalt confine thy presentation to the 15 minutes provided, including time for questions.
IX. In thy presentation, thou shalt not use red text on a blue background.
X. In closing thy presentation, thou shalt not conclude that more research is needed.
XI. Thou shalt not engage in raucous conversation in the foyer outside a technical session, nor shalt thou bogart the cold drinks during breaks.
XII. Thou shalt consider the Society's journal, Peanut Science, a worthy vehicle for publication of thy research.
XIII. When thou servest as a reviewer of a Peanut Science manuscript, thou shalt read it thoroughly, criticize it constructively, and return thy review to the Associate Editor in a timely manner.
XIV. Associate Editors seated in the rear, thou shalt not snicker at thy president. And members, thou shalt DO as thy president SAYS, NOT as he DOES with regard to manuscript review.

Thank you for the honor of serving as president in 2002-2003. I look forward to executing the duties of Past President in the coming year. I would like to offer my thanks to Ron Sholar and Irene Nickels of the Society office in Stillwater, to Tom Stalker and Peggy Brantley of the editorial office in Raleigh, to Ben Whitty, Maria Gallo-Meagher, Greg MacDonald and the Florida members who organized the 2003 meeting, and to all the members who have served the Society in the past year.

BUSINESS MEETING AND AWARDS CEREMONY
AMERICAN PEANUT RESEARCH AND EDUCATION SOCIETY
Hilton Clearwater Beach Resort
Clearwater Beach, Florida
July 11, 2003

The meeting was called to order by President Thomas Isleib. The following items of business were conducted.

1. President's Report – Thomas Isleib

2. Reports were given and awards were made by the following people. Detailed reports are presented in the PROCEEDINGS.

    a. Coyt T. Wilson Distinguished Service Award – Richard Rudolph
    b. Fellows Award – Chip Lee
    c. Bailey Award – Todd Baughman
    d. Joe Sugg Graduate Student Competition – Carroll Johnson
    e. Dow AgroSciences Awards for Research and Education – John Baldwin
    f. Past President's Award – Thomas Isleib
    g. Peanut Science Associate Editors – Tom Stalker

3. The following reports were made, accepted, and approved by the membership. Detailed reports are presented in the PROCEEDINGS.

    a. Executive Officer Report and Reading of Minutes of 2002 meeting – Ron Sholar
    b. Finance Committee Report – Marshall Lamb
    c. Public Relations Committee Report – Tim Williams
    d. Peanut Science Editor's Committee Report – Tom Stalker
    e. Nominating Committee Report – John Damicone
    f. Fellows Committee Report – Chip Lee
    g. Bailey Award Committee Report – Todd Baughman
    h. Joe Sugg Graduate Student Award Report – Carroll Johnson
    i. Coyt T. Wilson Distinguished Service Award Report – Richard Rudolph
    j. Dow AgroSciences Awards Committee Report – John Baldwin
    k. Peanut Quality Committee Report – Mark Burow
    l. Site Selection Committee Report – Maria Gallo-Meagher
    m. Publications and Editorial Committee Report – Ken Dashiell
    n. Program Committee Report – Ben Whitty
    o. CAST Report – Stanley M. Fletcher

4. Thomas Isleib turned the meeting over to the new President, Ben Whitty of Florida, who then adjourned the meeting.

FINANCE COMMITTEE REPORT

The APRES financial committee met Tuesday, July 8, 2003 with the following members present: Vernon Langston, David Hunt, Hassan Melouk, John Beasley, Marshall Lamb, and Ron Sholar as ex-officio. The finance committee recommended that the language specific to dues structure be removed from the by-laws of the society to increase the flexibility in changing dues expeditiously to meet the needs of the society. Second, the committee unanimously recommended that registration be increased from $100.00 to $200.00, registration for non members will be raised to $300.00. Further it was recommended that membership dues be raised to $80.00 per year.

The committee voted to submit a budget of $104,800 in receipts and $119,650 in expenditures for the 2003-2004 year which includes compensation for the Executive Officer, the Editor of Peanut Science and a half time assistant for each office. The society currently has $134,000 in liquid assets in CDs and checking account. While the financial position of the society remains in an excellent position, we must closely monitor future income and expense to ensure the long-term financial stability of the society.

Respectfully submitted,
Marshall C. Lamb, Chair

AMERICAN PEANUT RESEARCH AND EDUCATION SOCIETY
BUDGET 2003-04

RECEIPTS	
Registration	$48,000
Membership Dues	18,000
Special Contributions	12,000
Other Income (Spouses program)	0
Differential Postage	1,200
Peanut Science & Technology	100
Quality Methods	0
Proceedings	0
Peanut Science & Page Charges	21,500
Peanut Research	0
Interest	3,000
Advances in Peanut Science	1,000
Total Receipts	**$104,800**

EXPENDITURES	
Annual Meeting	$16,100
Spouse Program	0
Awards (Coyt Wilson, Dow AgroScience, Joe Sugg)	4,500
CAST Membership	550
CAST BioTechnology Initiative	1,000
CAST Travel	0
Office Supplies	1,500
Professional Services – Executive Officer	16,000
Professional Services – Peanut Science Editor	16,000
Secretarial Services	17,000
Postage	4,000
Travel – Officers	1,500
Bayer – Expense reimbursement to Extension Agents	0
Legal Fees (tax preparation)	600
Proceedings	5,000
Peanut Science	33,000
Peanut Science & Technology	0
Peanut Research	0
Quality Methods	0
Bank Charges	0
FICA/Medicare	2,600
Advances in Peanut Science	0
Corporation Registration	300
Total Expenditures	**$119,650**

AMERICAN PEANUT RESEARCH AND EDUCATION SOCIETY
BALANCE SHEET FOR FY 2002-03

ASSETS	June 30, 2002	June 30, 2003
Petty Cash Fund	$ 493.23	$ 683.28
Checking Account	21,822.91	34,080.73
Certificate of Deposit #1	30,318.18	31,016.73
Certificate of Deposit #2	19,090.17	0.00
Certificate of Deposit #3	10,415.45	10,613.62
Certificate of Deposit #4	13,609.11	13,867.92
Certificate of Deposit #5	18,138.79	0.00
Certificate of Deposit #6	14,713.21	15,080.77
Certificate of Deposit #7	12,471.44	12,908.57
Certificate of Deposit #8	5,581.94	5,755.16
Money Market Account	1,850.12	1,856.51
Savings Account (Wallace Bailey)	757.12	596.81
Bayer Account	8,635.35	12,425.65
Computer and Printer	677.72	107.91
Peanut Science Account (Wachovia Bank)	2,939.08	3,817.05
Inventory of PEANUT SCIENCE & TECHNOLOGY Books	3,530.00	2,980.00
Inventory of ADVANCES IN PEANUT SCIENCE Books	17,774.08	7,830.00
TOTAL ASSETS	**$182,817.90**	**$153,620.71**
Liabilities		
No Liabilities	0.00	0.00
Fund Balance	$182,817.90	$153,620.71
TOTAL LIABILITIES & FUND BALANCE	**$182,817.90**	**$153,620.71**

AMERICAN PEANUT RESEARCH AND EDUCATION SOCIETY

STATEMENT OF ACTIVITIY FOR YEAR ENDING

RECEIPTS	June 30, 2002	June 30, 2003
Advances Book	$ 1,125.00	$ 702.50
Ann Mtg Reg	20,795.00	22,550.00
Award Income	216.39	0.00
Contributions	14,050.00	16,200.00
Differential Postage	1,265.00	1,362.50
Dues	17,618.00	18,231.00
Interest	7,113.05	3,260.66
Peanut Science	136.00	1,315.50
Peanut Research	0.00	0.00
Peanut Science Page Charges	11,683.50	22,512.30
Peanut Science & Technology	95.00	325.00
Proceedings	43.00	13.00
Quality Methods	0.00	32.50
Spouse Reg	656.25	615.00
Transfer	0.00	0.00
TOTAL RECEIPTS	**$74,796.19**	**$87,119.96**

EXPENDITURES		
Advances in Peanut Science	$ 0.00	$0.00
Annual Meeting	15,147.61	14,321.85
Bank Charges	83.50	83.25
CAST Membership	1,546.00	556.00
Corporation Registration	230.00	15.00
Exec Off	0.00	12,675.96
Federal Withholding	984.00	2,364.00
FICA	1,785.60	3,851.47
Legal Fees	565.00	2,376.00
Medicare	417.60	900.76
Miscellaneous	423.45	0.00
Office Expenses	1,367.84	2,176.94
Oklahoma Withholding	231.00	594.00
Peanut Research	0.00	0.00
Peanut Science	28,174.41	40,379.34
Peanut Science & Technology	0.00	0.00
Postage	2,351.69	3,922.69
Proceedings	4,336.78	5,072.31
Refund	0.00	5.00
Sales Tax	48.79	1.30
Secretarial Services	12,062.40	12,743.88
Spouse Program Expenses	1,476.68	565.50
Travel, Exec Off, Sec	1,852.04	504.76
Travel, Bayer	3,492.49	2,691.22
Transfer	0.00	0.00
TOTAL EXPENDITURES	**$76,576.88**	**$105,801.23**

2002 EXCESS EXPENDITURES OVER RECEIPTS $ -1,780.69
2003 EXCESS EXPENDITURES OVER RECEIPTS $-18,681.27

PEANUT SCIENCE BUDGET
2003-2004

INCOME

Page and reprint charges	$21,000.00
Journal orders	500.00
Foreign mailings	1,500.00
APRES member subscriptions	8,000.00
Library subscriptions	2,000.00
TOTAL INCOME	**$33,000.00**

EXPENDITURES

Printing and reprint costs	$13,876.00
Editorial assistance	16,224.00
Office supplies	400.00
Postage	2,500.00
TOTAL EXPENDITURES	**$33,000.00**

ADVANCES IN PEANUT SCIENCE SALES REPORT AND INVENTORY ADJUSTMENT
2002-03

Beginning Inventory (Adjusted – after physical count)		818
1st Quarter	31	787
2nd Quarter	1	786
3rd Quarter	1	785
4th Quarter	2	783
TOTAL	**35**	

783 REMAINING BOOKS X $10.00 (BOOK VALUE) = $7,830.00 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

PEANUT SCIENCE AND TECHNOLOGY SALES REPORT AND INVENTORY ADJUSTMENT
2002-03

Beginning Inventory (Adjusted – after physical count)		324
1st Quarter	23	301
2nd Quarter	0	301
3rd Quarter	1	300
4th Quarter	2	298
TOTAL	**26**	

298 remaining books x $10.00 (book value) = $2,980.00 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

PUBLIC RELATIONS COMMITTEE REPORT

Held on 8 July 2003, At Hilton Clearwater Beach Resort, Clearwater Florida. Members present: J H. “Tim” Williams, Dan Gorbet, Kenny Robison.

Necrology.

Firstly, APRES needs to recognize and pay our respects to former members of the association who were deceased since the last meeting. The committee has been provided with the names of members who have passed on since the last APRES meeting.

Coyt T. Wilson – was a founder of APRES and dedicated to the promotion of Peanut Research and Education to the extent that we annually honor his name in the Coyt T. Wilson Awards for papers presented at APRES. The Association expresses its sympathy to those of his family; and will continue to further the interests that he held so dear during his life.

Revitalizing APRES Public Relations Efforts.

The committee recognized the need to engage with various Peanut Industry Associations and increase their awareness of the Association, its goals and the opportunities that the association offered. It seems important that the association seeks to attract members from outside of the USA. The world is becoming more globalized and the peanut research and extension community, and our Association needs to follow that trend. Recognizing that for many potential members residing outside the USA who are not able to attend meeting and who operate in different economies the committee recommended to the Association that a class of membership that caters for the special needs of potential members in other countries be considered, and that opportunities existed to capture other groups relevant to the Associations memberships. The following classes were suggested for consideration by the membership committee:

1. Life time member
2. Emeritus
3. International

The development of electronic mediums and communication make it more feasible for APRES to increase its outreach and responsiveness. It was decided to work with other participants in the Peanut Sector to have the APRES web site linked to their sites.

Publicity Committee needs to increase outreach through the web, and actively push the web site.

Collection of reports for publicity needed to be streamlined. To do this the committee needed to recruit members charged to report on the following areas of responsibility:

1. States
2. Sectors
3. Meetings

Awards and Achievement Notifications.

APRES needs to establish a better means of collecting and publicizing information on awards and achievements.

Members serving in IRAQ should be acknowledged for their service to the country.

Respectfully submitted by,
J.H. “Tim” Williams, Acting Chair

Also included in this report is the necrology report on Milton Eldridge Walker.

MILTON ELDRIDGE WALKER

Milton Eldridge Walker, 79, of Tifton, GA died 22 February 2003. Born 28 January 1924 in Fitzgerald, GA, Milton was retired agronomist and Associate Professor with the University of Georgia at the Coastal Plain Experiment Station in Tifton. He was a member of the American Society of Agronomy, Soil Science Society of America, and American Peanut Research and Education Society. Milton was a veteran of World War II, serving with the U. S. Army Field Artillery in the Pacific Theater. After military service, he attended Abraham Baldwin Agricultural College in Tifton, GA and later received his B.S., M. S., and PhD. Degrees in Agronomy from the University of Georgia. Milton was a member of Phi Kappa Phi and Sigma Xi. Milton began his career as a faculty member with University of Georgia in 1955 and retired in 1987. Milton worked his entire career at the Coastal Plain Experiment Station in Tifton serving Georgia farmers.

Milton’s career was devoted to serving Georgia farmers as a researcher in soil fertility and plant nutrition. In an era of specialization, Milton’s research career in soil fertility touched on many cropping systems of significant importance to Georgia agriculture. During his career, Milton conducted applied soil fertility research on cotton, peanut, soybean, perennial forage grasses, small grains, and millet. Within these cropping systems, Milton studied fertilizer sources of macro- and micro-nutrients, rates, and methods of application with constant attention to yield, quality, and net returns to the grower. Milton provided leadership, technical guidance, and promotion of the early publicly-funded soil testing laboratory in Georgia. Milton was part of a team operating a soil testing laboratory serving south Georgia farmers, initially as a mobile laboratory traveling by truck throughout south Georgia in the late-1950's and later at the Coastal Plain Experiment Station. Milton published his research in refereed journals including Agronomy Journal, Soil Science Society of America Journal, and Peanut Science; popular press publications including Progressive Farmer, Crop and Soils, Farm Chemicals, Georgia Farmer, and in many local newspapers; and numerous University of Georgia College of Agriculture research bulletins. Much of Milton’s research findings are the basis on which soil fertility recommendations are based throughout the southeastern U. S., particularly for calcium nutrition and zinc toxicity of peanut.

Milton was a deacon and dedicated member of the First Baptist Church of Tifton. Milton particularly enjoyed working with the youth of First Baptist Church and often chaperoned their camping trips and other activities. Milton was a solid citizen and his church, family, and community activities were punctuated with his sincerity, a broad smile, and south Georgia drawl. Milton is survived by this wife of 57 years, Mary Lewis Walker, one son and daughter-in-law, three daughters and sons-in-law, eight grandchildren, and two great-grandchildren. Milton was a handsome southern gentleman and will be missed by all those who had the privilege and honor of working with him, whether as an agronomist or in church activities.

PUBLICATIONS AND EDITORIAL COMMITTEE REPORT

The Committee met from 2:00 – 3:00 pm on July 8, 2003. Members present were Jay Chapin, Michael Franke, Eric Prostko and Kenton Dashiell (Chair). Tom Stalker also participated.

Tom Stalker presented the Peanut Science Editor's Report for 2003 (this report is given below). The committee discussed the report and also expressed their appreciation to Tom Stalker and the Editorial Board for their dedication and service to the Peanut Science Journal.

After brief discussions the committee recommends the following to the Board.

Peanut Science is only electronically published starting with Volume 31.

A professional publishing company is contacted to manage the publishing of Peanut Science.

There should be a vote of members at the next business meeting to determine if Peanut Research should be continued.

We need to request the American Peanut Council and the Peanut Foundation to advertise that we have copies of "Advances in Peanut Research" for sale.

Proceedings of our Annual Meeting should be received within three months of the end of the meeting.

We propose that Michael Franke and Nathan Smith be appointed to serve three-year terms as Associate Editors of Peanut Science.

Respectively submitted by,
Kenton Dashiell, Chair

PEANUT SCIENCE EDITOR'S REPORT

Volume 29 of Peanut Science had 26 manuscripts totaling 156 pages. Volume 30, issue no. 1 has eight manuscripts accepted for publication and these have been sent to the printer. At least three additional manuscripts are needed before publication.

Twenty one manuscripts were submitted to the journal from July 1, 2002 to June 30, 2003. This number is approximately half the number of papers submitted during the previous two years and is approaching the average of 24 manuscripts of 3-5 years ago. Six manuscripts were released to authors during the past year. The journal needs to publish at least 24 manuscripts annually to remain viable, and additional submissions are needed.

Last year's budget has been itemized and a proposed budget for the coming year has been completed. Both budgets can be found in these Proceedings. The journal experienced a financial loss of $5,934.37, which is an increase from the $2,459 deficit of the previous year. To be financially solvent, the journal must have a larger distribution to membership and libraries.

During the past year the publisher has been more responsive to our needs. Manuscripts have been processed in a timely way and, in general, professionally. The printing problems of the previous year were corrected by sending new copies of the journal to the membership who requested them. About 15 corrected copies were mailed from the surplus in stock at the editor's office.

Drs. Margaret Hinds and Marshall Lamb have completed six-year terms as Associate Editors and Dr. Greg MacDonald completed a three-year term as Associate Editor of the journal. Sincere thanks is expressed to each of these Associate Editors for service to the journal and to APRES.

Respectfully submitted,
H. Thomas Stalker
Editor, Peanut Science

NOMINATING COMMITTEE REPORT

The nominating committee for the 34th Annual Meeting of the American Peanut Research and Education Society consisted of Albert Culbreath (University of Georgia), Harold Pattee (USDA/ARS – North Carolina State University), Mike Schubert (Texas A&M University) and John Damicone (Chair and Past President, Oklahoma State University).

The committee was charged with nominating two individuals, one to serve as President-Elect and another to serve on the Board of Directors representing Production.

The Nominating Committee met at 3:00 PM on 8 July 2003 at Hilton Clearwater Beach Resort in Clearwater, FL. Albert Culbreath, Mike Schubert, and John Damicone were in attendance.

The committee nominated the following individuals:

President-Elect .... James Grichar
Board of Directors, Production .... Michael Franke

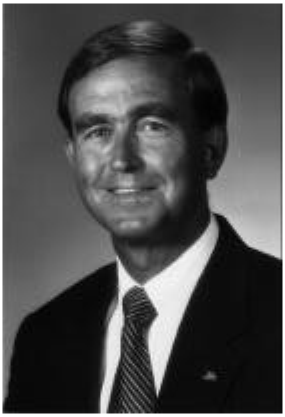
Respectfully submitted by,
John Damicone, Chair

FELLOWS COMMITTEE REPORT

On July 8, 2003, the APRES Fellows selection committee met at the Hilton Clearwater Beach Resort in Clearwater, Florida. It was the unanimous opinion of the committee that Dr. Rick Brandenburg and Dr. James Todd be selected as recipients of the 2003 APRES FELLOWS award. It was also decided to announce that 2004 nominations for the award would be taken starting immediately.

Respectfully submitted by:
Chip Lee, Acting Chair

BIOGRAPHICAL SUMMARIES OF FELLOWS



Dr. Rick Brandenburg earned a B.S. in Entomology (1977) from Purdue University and a Ph.D. in Entomology (1981) from North Carolina State University. After four years as an Assistant Professor at the University of Missouri – Columbia, in 1985 he accepted a position as Extension Specialist at North Carolina State, where he is a Professor in the Department of Entomology. His current responsibilities focus on peanut and turfgrass research and extension.

Dr. Brandenburg's program is a model in its integration of mission oriented research and extension of research results. As a result of his work, North Carolina is a leader in the integration of pest management information on peanut.

In his extension program, Dr. Brandenburg emphasizes scouting, the use of thresholds, and integrated pest management. He collaborated with Dr. Ames Herbert at Virginia Tech to create the Southern Corn Rootworm Advisory, which helps growers make informed decisions about rootworm control. He developed a program to implement the advisory in both states and to provide validation of its effectiveness. The advisory has measurably reduced the amount of soil insecticide applied to peanut in North Carolina.

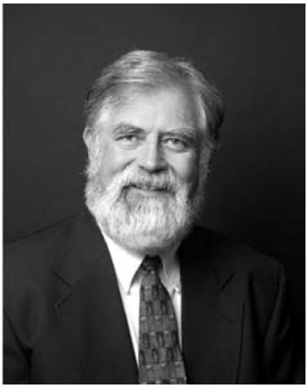
Recently, Dr. Brandenburg's research and extension efforts have proactively addressed the growing threat of Tomato Spotted Wilt Virus (TSWV) in North Carolina and Virginia. In collaborative work with colleagues at North Carolina State and Virginia Tech, the Georgia TSWV advisory was evaluated, modified, and disseminated to growers in a timely manner. His research on the ecology and management of thrips will serve as a foundation for future improvements in the management of TSWV.

Dr. Brandenburg currently is the lead PI on a USAID Peanut CRSP grant to enhance peanut production in West Africa through the development of IPM strategies. He previously led a similar program in the Philippines and Thailand.

Dr. Brandenburg is internationally recognized for his strong research programs and contributions to graduate education. He has served as Chair or Co-Chair on eight M.S. and four Ph.D. committees. He received the John V. Osmun Alumni Professional Achievement Award in Entomology from Purdue University in 2002, the Outstanding Extension Service Award at North Carolina State in 2003, and the 2003 Alumni Outstanding Outreach and Extension Award at North Carolina State University. In addition to authoring numerous research and extension publications, Dr. Brandenburg has written more than 300 trade journal articles, and shares responsibility for updating a website that receives over one million hits per year.

Dr. Brandenburg has served the American Peanut Research and Education Society through participation on many committees and the Publication and Editorial Board. He was the North Carolina Contributing Author for Peanut Research Newsletter from 1992 – 1998. Dr. Brandenburg also has served the Entomological Society of America in several capacities.

Dr. Brandenburg has a fundamental appreciation of the needs of the peanut industry and realizes the importance of cooperation among disciplines in a holistic approach to pest management and peanut production. Dr. Brandenburg's achievements and contributions to the peanut industry have led to significant improvements in the way insects are managed and are a reflection of his outstanding dedication, openness, high sense of values, and professional skills.



Dr. James W. Todd is Professor of Entomology at the University of Georgia, Coastal Plain Experiment Station in Tifton, Georgia. He is a native of Dothan, Alabama. Dr. Todd received the B.S. Degree (1966) and M.S. (1968) degrees from Auburn University and the Ph.D. (1973) from Clemson University.

Dr. Todd has had a truly outstanding and significant peanut research career. Dr. Todd's scholarly publication record is clearly indicative of the quality, significance and relevance of his research program. The number of presentations that Dr. Todd has given to professional meetings also indicates an excellent research program. The number of international papers at a variety of countries is very impressive. This indicates that professionals in other countries are keenly interested in his research program. The level of grant funding by Dr. Todd is also outstanding. All of these factors clearly indicate the respect that other peers have of his research program and output from his research. Not only does it indicate respect, these factors also indicate the significance and originality of Dr. Todd's basic and applied research contributions.

While Dr. Todd's academic career has been research, he has not limited himself to only research activities. Dr. Todd has also performed extension related activities as well as provided service to the peanut industry. These are briefly documented in the above appropriate sections. When tomato spot wilt virus (TSWV) first came on the scene in Georgia, Dr. Todd was invited to address the Georgia House of Representatives, Agriculture Committee, and the Governor's Office of Planning and Budget review Committee on the status of TSWV and the potential impact on the Georgia peanut industry. Dr. Todd gave an excellent presentation. However, Dr. Todd did not stop there in providing service related activities. His extension colleagues have repeatedly requested his assistance in providing in-depth technical training for county agents, provide presentations on Field Day and Tours to peanut producers and professionals as well as participate in county peanut meetings. This clearly indicates the respect that peanut extension specialist have for Dr. Todd's research and communication skills.

In regards to the international arena, Dr. Todd is well respected by peanut professionals and scientist. He has been asked to review the peanut production capabilities in Argentina and Australia. Dr. Todd was invited to be part of the Peanut CRSP team on a Bolivia project. While Dr. Todd is listed as a co-principal investigator on the project, in reality, Dr. Todd is providing the key leadership to the group. From this project, the team has discovered some Bolivia peanut cultivars that have excellent disease resistance. In fact, it has some of the best, if not the best, disease resistance when compared to current and potential U.S. peanut cultivars. Dr. Todd has been working hard with his other project members in a breeding program utilizing this Bolivia germplasm. Currently, there are a couple of lines that show excellent promise. If these lines are introduced, peanut farmers' cost of production could be significantly reduced which would enhance their competitiveness under the new 2002 Peanut Program.

Dr. Todd's research has been critical to the survival of the Southeast peanut farmers. Dr. Todd's basic research on insect vectored viruses and thrips along with his ability to look at the big picture enabled him to provide invaluable service to the peanut industry. When TSWV was a problem for South Texas peanut producers, no research or extension related activities was able to "shed" any light on how to minimize the impact of the disease. No integrated pest management scheme was implemented. In the late 1980s, TSWV started to show up in some Georgia fields but was very minor. Dr. Todd recognized the potential impact this disease could have on the Southeast peanut industry with ramifications on the local economies heavily dependent on the peanut sector. Dr. Todd provided the leadership and helped coordinate a team of peanut scientists from Alabama, Florida and Georgia. This has become the "model" multidisciplinary team in the peanut industry. This team has received several state and national peanut awards for their research and extension activities. By 1997, approximately 12% of the Georgia peanut crop value was lost due to TSWV. This accounted for over $40 million loss. This team was able to develop through the leadership of Dr.Todd a TSWV risk index. The Extension Service disseminated the TSWV risk index. Research indicated that a one percentage point increase in the risk index could lead to a 25 pound per acre yield decline. In terms of economics, research indicated that the same one percentage point decline in the index could lead to approximately $11 per acre increase in net returns. This TSWV risk index was truly an "integrated" pest management success story. After the rapid adoption of the index, peanut losses due to TSWV dropped below 6%. Without this multidisciplinary team, the risk index could not have been developed. This would lead one to wonder as to what would be the status of the peanut industry in the Southeast. In all likelihood, it would not be what it is today. As a further confirmation of the vision of Dr. Todd in building this TSWV team, other scientists are following this “model” in developing management models for other pest, aflatoxin and diseases. In fact, other peanut regions are using this model to develop their own TSWV risk index.

In summary, Dr. Todd has the tremendous respect of his fellow scientists both domestically and internationally. He has an outstanding research and service program. Without a question, Dr. Todd deserves the honor of being a Fellow of the American Peanut Research and Education Society.

Guidelines for

AMERICAN PEANUT RESEARCH AND EDUCATION SOCIETY FELLOW ELECTIONS

Fellows

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

Eligibility of Nominators

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

Eligibility of Nominees

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

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

Nomination Procedures

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

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

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

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

Basis of Evaluation

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

The Bailey Award Committee did not formally meet. However, there was a nomination for consideration for the 2004 Bailey Award for each of the 15 eligible sections from the 2003 meeting. In addition this year's recipient was paper #113 from 2002 meeting Processing and Utilization Section titled "Effect of Microwave Energy on Blanchability, Shelf-Life and Roast Quality of Peanuts. T. H. Sanders, K. W. Hendrix, T. D. Rausch, T. A. Katz, and J. M. Drozd.

Respectfully submitted by:
Todd A. Baughman, Chair

Guidelines for

AMERICAN PEANUT RESEARCH AND EDUCATION SOCIETY BAILEY AWARD

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

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

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

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

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

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

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

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

1. Appropriateness of the introduction, materials and methods, results and discussion, interpretation and conclusions, illustrations and tables.

2. Originality of concept and methodology.

3. Clarity of text, tables and figures; economy of style; building on known literature.

4. Contribution to peanut scientific knowledge.

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

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

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

JOE SUGG GRADUATE STUDENT AWARD COMMITTEE REPORT

The APRES Joe Sugg Graduate Student Contest Committee met on Tuesday 8 July at Clearwater Beach, FL. Committee members in attendance were Carroll Johnson, Brent Besler, Pete Dotray, and Bob Kemerait.

Procedures for judging 2003 graduate student papers were reviewed. Due to conflicts, two committee members were excused from judging and two replacement judges were secured.

There were 12 students competing in the 2003 contest, representing three universities in the peanut belt. The top two presentations were:

First Place ($500 award):
"Weed Management in Peanut Under Twin Row Patterns and Conservation Tillage". D.C. Yoder, G.E. MacDonald, D.L. Wright, and B.J. Brecke. University of Florida, Gainesville, FL.

Second Place ($250 award):
"Influence of Row Pattern and Seeding Rate on Incidence of TSWV in 'Georgia Green Peanuts". L.E. Sconyers, T.B. Brenneman, and K.L. Stevenson. University of Georgia, Tifton, GA.

As per protocol established in 2001, all graduate students who participated in the Joe Sugg Contest received their score sheets and related comments from the judges by late-July.

Respectively Submitted;
W. C. Johnson, III, Chair

THE COYT T. WILSON DISTINGUISHED SERVICE AWARD COMMITTEE REPORT

The Coyt T. Wilson Distinguished Service committee met at 1:00 pm July 8 in Clearwater Beach, FL. The committee discussed how to stimulate the membership to nominate candidates for consideration and confirmed the selection of Dr. Hassan Melouk as the 2003 award recipient.

The membership of APRES is encouraged to make timely submissions of candidates for consideration by the committee. Nominations can be made at any time during the year prior to the published deadline.

Respectfully submitted by:
Richard Rudolph, Chair
Corley Holbrook
Pat Phipps
Charles Simpson
Eric Prostko
James Hadden

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

Dr. Hassan Melouk earned a BS degree in Plant Protection from Alexandria University in Egypt in 1962, and was an instructor there from 1962 to 1964. Subsequently, he earned MS and PhD degrees in Plant Pathology from Oregon State University in 1967 and 1969 respectively. After earning his PhD degree, Hassan remained at Oregon State as a Research Associate in Plant Pathology until 1976. Since that time, he has been employed by the USDA-ARS as a Research Plant Pathologist and Professor at Oklahoma State University.

For 26 years, Hassan has been a Graduate Student Advisor for research that has positively impacted the peanut industry. His work as a plant pathologist and scholar is recognized world-wide. He is an authority on Sclerotina blight control in peanut, and has developed unique techniques for evaluating the reaction of peanut lines to this devastating disease. The research programs of Dr. Melouk have resulted in the release of six Sclerotina resistant peanut cultivates. In addition, Hassan is an expert on other peanut diseases, including southern blight, early leaf spot, late leaf spot, Verticillum wilt, and pod rot. Hassan also served the peanut industry by serving as editor of Peanut Health Management, published in 1985 which has sold more than 1200 copies through the American Phytopathological Society.

Dr. Melouk has been an active and serving member of the American Peanut Research and Education Society for 27 years, attending 26 annual meetings. He has served the Society by serving two terms on the Editorial Board of Peanut Science, three years on the Board of Directors, three terms on the Site Selection Committee, two terms on both the Finance and Joe Sugg Graduate Student Award Committees, and one term on the Public Relations, Nominating, Program, Fellow, and Bailey Award Committees. Dr. Melouk's committee service includes being chair of the Finance, Nominating, Program, Fellow, Joe Sugg Graduate Student Award, and Bailey Award committees. He served the Society also for three years as Chair of the Ad Hoc Committee which established the Joe Sugg Graduate Student Award Committee. Later, his work on this Committee led to significant improvements in this segment of the annual meeting. He has overseen an improvement in both the number and quality of student presentations resulting in better training and a positive experience for graduate students. In addition to extensive committee service to the Society, Hassan has served the membership as President Elect, President, and Past President.

The Society has already recognized the service of Dr. Melouk and honored him by his election as President in 1988, choosing him as a Fellow of the Society in 1992, and awarding him the DowElanco Award for Excellence in Research in 1993.

Dr. Hassan Melouk has been a positive force for both the peanut industry and APRES. His extensive service to the Society makes him richly deserving to be recognized by the Society for his distinguished service.

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 committee would encourage entries from all segments of the industry. Some suggestions for improvement would include;

Make all nomination forms and information available in pdf form on the web,
all nomination packets should be electronic in a common format,
automatically rollover all qualified nominees to the next year with the option to update.

Since many members work in both research and education allow the committee to place them in either area for consideration based upon the material received.

Respectfully submitted by,
John Baldwin, Chair

BIOGRAPHICAL SUMMARY OF DOW AGROSCIENCES AWARD FOR EXCELLENCE IN RESEARCH RECIPIENT

John W. Wilcut, is a Professor of Crop and Weed Science at North Carolina State University. He received his B.S. (1978) and M.S. in Botany (1982) from Eastern Illinois University, Charleston, IL. He received his Ph.D. in Weed Science/Plant Pathology (1986) from Auburn University, Auburn, AL.

Dr. Wilcut has dedicated a tremendous amount of his time and energies into weed science research in peanut. He is considered not only one of the preeminent weed scientist working in peanut, but also in the entire country. He has been bestowed with one of the highest honors this past year in becoming a Fellow of the Weed Science Society of America. He has also served as co-author on two papers that received the prestigious APRES Bailey Award. Dr. Wilcut has authored five book chapters and authored or co-authored 122 referred journal articles. Two of these book chapters and approximately one-half of the journal articles deal specifically with peanut. This research deals with the most applied to the most basic of concepts. He has served as chair or co-chair of 21 graduate students. The expertise that these students received while being advised by Dr. Wilcut will be a definite benefit to the industry as a whole for many years to come.

Dr. Wilcut's program is recognized for providing national leadership in the areas of weed management, weed/peanut ecology and biological relationships, and in the physiological behavior of herbicides in peanuts and weed species important to the peanut industry. He has shown excellence in research, extension, and teaching at North Carolina State University, the University of Georgia, and VPI&SU. His research program has influenced weed management systems in every peanut-producing state in the country. His expertise in peanuts has been recognized by regulatory agencies at the state and federal level, by peanut commodity groups in a number of states as evidenced by funding and requests for presentations, field days, and commodity meetings, and by state, regional, and national professional societies.

The total impact of Dr. John Wilcut as a researcher, educator and mentor, a prolific publisher of novel research, and a leader of innovative research initiatives propels him into the upper echelon of peanut scientists. In summary, his research and collaborative research efforts have had a significant impact to the peanut industry. Very few scientists have shown this level of dedication, productivity, and excellence in peanuts.

BIOGRAPHICAL SUMMARY OF DOW AGROSCIENCES AWARD FOR EXCELLENCE IN EDUCATION RECIPIENT

Dr. Harold Pattee is a Research Chemist with USDA/ARS, North Carolina State University, Raleigh, North Carolina. He received a B.S. (1958) in Agronomy from Brigham Young University and a M.S. in Agronomy from Utah State University. He received his Ph.D in Agronomy from Purdue University and Post-doc in Plant Biochemistry from UCLA. He was named editor of Peanut Science in 1976 when it was on the verge of being disbanded because of insufficient manuscripts and financial drain on the Association. Across an 18-year span Dr. Pattee has developed Peanut Science into a high respected scientific and internationally known journal. He is also senior editor of the two technical book publications of the Society. Both have received worldwide acclaim. He is also co-editor of the technical bulletin Peanut Quality: Its assurance and maintenance from the farm to end-product, of which over 7,000 copies have been distributed. These publications have contributed to the education of countless peanut researchers, growers, extension personnel, and industry workers. In providing educational opportunities to students, he has directed five candidates for advanced degrees, served as committee member for thirteen other advanced degree candidates, ten Ph.D's, three Master's, and numerous times as the Graduate School Representative.

Nominator Dr. Dan Gorbet is quoted as saying, " Dr. Pattee's service to APRES as co-editor of Peanut Science and Technology and Advances in Peanut Science was a major contribution to the entire peanut industry worldwide. There are no other publications in existence that provide the full range of scientifically based information that is available in these two books. They should be a foundation of information on peanuts for decades to come"

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

The Peanut Quality Committee met and discussed 5 issues:

1. UPPT quality data have a wealth of information that can be analyzed for stability of flavor components. An additional year of data is needed before beginning this analysis can be recommended.

2. Reports on 2002 crop quality mentioned that the most-significant problems were immaturity in West Texas, and aflatoxin contamination in the Southeast.

3. The EU will ban organophosphate residues in peanut, with a zero tolerance limit. This will affect Orthene and potentially Temik. Germany also wants testing for the heavy metals Cd, Pb, As, and Hg.

4. European buyers are expected to specify that they will buy only high O/L peanuts. The only definition of high-O/L currently is the University of Florida patent. What value is desired by industry has not been formalized as a single value because of differences in end-use products and location of planting.

5. The use of nontoxigenic Aspergillus lines by the EPA has not been granted yet. A lethal inflammatory response to spores in rats at high dosage will necessitate further studies before approval is given.

Respectfully submitted by,
Mark Burow, chair

PROGRAM COMMITTEE REPORT

The 35th annual APRES meeting was held July 8-11, 2003 at the Hilton Clearwater Beach Resort in Clearwater Beach, Florida. Maria Gallo-Meagher, Greg MacDonald, and Mary Ann Whitty chaired the Technical, Local Arrangements, and Spouses' committees, respectively. There were 108 oral presentations and 21 posters scheduled, but one oral paper was converted to a poster and one additional poster was exhibited. Two poster and three oral presentations were canceled. Twelve of the oral presentations were in the graduate student competition. One technical session used Powerpoint presentations, but all others used 2x2-inch slides.

Registration included 240 members and 235 spouses and children.

Respectively submitted by:
Ben Whitty

2003 PROGRAM

Contributors to 2003 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 Corporation, Agriculture Division
Dow AgroSciences
Syngenta

Products

Alabama Peanut Producers Association
Florida Peanut Producers Association
Georgia Peanut Commission
Golden Peanut Company
North Carolina Peanut Producers Association
Oklahoma Peanut Commission
South Carolina Peanut Producers Board
Southern Peanut Farmers Federation
Georgia Peanut Producers Association
Texas Peanut Producers Board
Virginia Peanut Growers Association
Western Peanut Producers Association

Regular Activities

Amvac
BASF
Birdsong Peanuts
Chem Nut
Gowan
Griffin L.L.C.
Gustafson
Helena
J Leek & Associates
Meherrin
Nitragin, Inc.
Oklahoma Peanut Commission
Sipcam Agro USA, Inc
Southeast Farm Press
Southern States
Triangle Chemical Company
UAP Carolina
Vicam

THIRTY-FIFTH ANNUAL MEETING
AMERICAN PEANUT RESEARCH AND EDUCATION SOCIETY
CLEARWATER BEACH, FLORIDA
JULY 8-11, 2003

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Tuesday, July 8

APRES Golf Tournament **8:30 am** **Countryside Country Club**

Committee, Board, and Other Meetings

8:00 - 12:00	Crops Germplasm Committee	Salon A
12:00-8:00	APRES Registration	Banquet Foyer D-G
1:00- 5:00	Spouses' Hospitality	Mandalay
1:00- 5:00	Poster Set-up	Salon G
1:00- 2:00	Associate Editors, Peanut Science	Salon A
1:00- 2:00	Site Selection Committee	Salon B
1:00- 2:00	Fellows Committee	Salon C
1:00- 2:00	Coyt T. Wilson Distinguished Service Award	Exec. Conf
2:00- 3:00	Publications and Editorials Committee	Salon A
2:00- 3:00	Public Relations Committee	Salon B
2:00- 3:00	Bailey Award Committee	Salon C
2:00- 3:00	Dow AgroSciences Awards Committee	Exec. Conf.
3:00- 4:00	Nominating Committee	Salon A
3:00- 4:00	Joe Sugg Graduate Student Award Committee	Salon B
3:00- 4:00	Peanut Quality Committee	Salon C
4:00- 5:00	Finance Committee	Exec. Conf.
7:00-11:00	Board of Directors	Mangrove
7:00- 9:00	Ice Cream Social	Sandpiper/Gazebo Decks

Wednesday, July 9

8:00- 4:00	APRES Registration	Banquet Foyer D-G
8:00- 5:00	Spouses' Hospitality	Mandalay
8:00- 9:45	General Session	Salons A-E
9:45-10:00	Break	Banquet Foyer D-G
9:45- 5:00	Poster Session	Salon G
10:00-11:45	Entomology	Salon D
10:00-11:30	Graduate Student Competition I	Salon E
1:15- 3:00	Breeding, Biotechnology, and Genetics I	Salon D
1:15- 2:45	Graduate Student Competition II	Salon E
3:00- 3:30	Break	Banquet Foyer D-G
3:30- 5:00	Breeding, Biotechnology, and Genetics II	Salon D
3:30- 4:45	Weed Science	Salon E
6:00- 9:00	Reception /Evening Meal	Sandpiper/Gazebo Decks Syngenta Crop Protection

Thursday, July 10

8:00-12:00	APRES Registration	Banquet Foyer D-G
8:00-12:00	Spouses' Hospitality	Mandalay
8:15-10:00	Processing and Utilization	Salon D

8:15-10:15	Extension Techniques and Technology/Education for Excellence	Salon E
8:15- 9:45	Economics I	Salon F
9:45- 5:00	Poster Session	Salon G
10:15-10:30	Break	Banquet Foyer D-G
10:30-11:45	Plant Pathology and Nematology I	Salon D
10:30-12:00	Production I	Salon E
10:30-12:00	Economics II	Salon F
1:15- 3:00	Plant Pathology and Nematology II/Mycotoxins	Salon D
1:15- 3:15	Physiology and Seed Technology/Harvesting, Curing, Shelling, and Handling	Salon E
1:15- 2:45	Production II	Salon F Banquet Foyer D-G
3:15- 4:15	Extension Techniques and Technology	Salon D
3:15- 4:45	Plant Pathology and Nematology III	Salon E
6:00- 9:00	Reception /Hawaiian Luau	Sandpiper/Gazebo Decks Bayer

Friday, July 11

7:00-8:00	Awards Breakfast	Salons D-F Dow AgroSciences
8:00-10:00	APRES Awards Ceremony and Business Meeting	Salon D-F
10:00-12:00	Peanut CRSP Project	Exec. Conf.
2:45- 3:15	Break	

Wednesday, July 9 - Morning
Salons D-F

8:00	Call to Order	Dr. E. Ben Whitty APRES President-Elect
8:05	Welcome to Florida	Dr. Richard L. Jones Dean for Research, University of Florida
8:15	Peanut Research and Extension Programs: History, Opportunities, and Challenges	Dr. Jerry M. Bennett Chair, Agronomy Department, University of Florida
8:45	Impact of the Food Security and Rural Investment Act of 2002: A Look Back and a Look Ahead	Dr. Marshall C. Lamb USDA-ARS, National Peanut Research Laboratory
9:15	Announcements	Dr. Maria Gallo-Meagher Chair, Technical Program Dr. Greg MacDonald Chair, Local Arrangements

Morning

ENTOMOLOGY

Salon D

Moderator: J.W. Todd, University of Georgia, Tifton, GA

10:00 (1) Association of a Burrower Bug, Pangaeus bilineatus (Say) (Heteroptera: Cydnidae) with Aflatoxin Contamination of Peanut Kernels. J.W. Chapin*, J.W. Dorner, and J.S. Thomas. Clemson University, Blackville, SC. USDA-ARS, Dawson, GA.

10:15 (2) Efficiency of a Mobile Soil Insect Sampler. N. Eroglu* and S.L. Brown. University of Georgia, Tifton, GA.

10:30 (3) The Effects of Three Acaricides on Tetranychus urticae (Koch) (Tetranychidae: Acari). D.A. Herbert, J. L. Ashley*, E.E. Lewis, and C. Brewster. Virginia Tech, Tidewater AREC, Suffolk, VA. Virginia Tech, Blacksburg, VA.

10:45 (4) Tracer* Naturalyte* Insect Control in Peanuts. V.B. Langston*, L.C. Walton, G.A. Finn, R.M. Huckaba, and L.L. Braxton. Dow AgroSciences, Indianapolis, IN.

11:00 (5) Lorsban 15G – The Backbone of Insect Control Solutions in Peanuts. L.C. Walton*, G.A.Finn, W.H. Hendrix, R.M. Huckaba, and V.B. Langston. Dow AgroSciences, Indianapolis, IN.

11:15 (6) Assessment of Cultural Controls to Reduce the Incidence of Tomato Spotted Wilt Virus in Peanut in North Carolina. C.A. Hurt*, R.L. Brandenburg, and D.L. Jordan. North Carolina State University, Raleigh, NC.

11:30 (7) Cultural Practices for Control of Spotted Wilt Disease in Peanut. J.W. Todd*, A.K. Culbreath, J.A. Baldwin, and D.W. Gorbet. University of Georgia, Tifton, GA. University of Florida, Marianna, FL.

GRADUATE STUDENT COMPETITION I

Salon E

Moderator: K.H. Quesenberry, University of Florida, Gainesville, FL

10:00 (8) Characterization and Control of an Undescribed Leaf Spot of Peanut. E.C. Cantonwine*, A.K. Culbreath, and R.C. Kemerait. University of Georgia, Tifton, GA

10:15 (9) Arachis pintoi Seed Production in Florida. M.A. Carvalho*, and K.H. Quesenberry. University of Florida, Gainesville, FL.

10:30 (10) Influence of Application Timing and Fungicides on Sicklepod

(Senna obtusifolia) Control and Pod Development Following Application of 2,4-DB. S. Hans*, J. Spears, D.L. Jordan, A. York, J.W. Wilcut, and D. Monks. North Carolina State University, Raleigh, NC.

10:45 (11) Reduced Rate of Herbicide Application of Strongarm, Valor, and Cadre in Peanut Production. S.D. Willingham*, B.J. Brecke, J.T. Ducar, G.E. MacDonald. University of Florida, Gainesville, FL. University of Florida, Jay, FL. Berry College, Mt. Berry, GA.

11:00 (12) Influence of Row Pattern and Seeding Rate on Incidence of TSWV in 'Georgia Green' Peanuts. L.E. Sconyers* T.B. Brenneman, and K.L. Stevenson. University of Georgia, Tifton, GA.

11:15 (13) Aflatoxin Production in an Array of Peanut Lines Selected to Represent a Range of Linoleic Acid Contents. H.Q. Xue*, T.G. Isleib, G.A. Payne, W.F. Novitzky, and G. O'Brian. North Carolina State University and USDA-ARS, Raleigh, NC.

Afternoon

BREEDING, BIOTECHNOLOGY, AND GENETICS I

Salon D

Moderator: Tom Isleib, North Carolina State University, Raleigh, NC

1:15 (14) Breeding for Early-maturing Peanut. M.D. Burow*, Y. Lopez, M.R. Baring, J.L Ayers, and C.E. Simpson. Texas A&M University, Lubbock, TX. Texas A&M University, College Station, TX. Texas A&M University, Stephenville, TX.

1:30 (15) Resistance to Sclerotinia minor Infection in Transgenic Peanut – A Three Year Study. K.D. Chenault*, and H.A. Melouk. USDA-ARS, Stillwater, OK.

1:45 (16) Development of High Oleic Peanut Varieties Adapted to Australian Production Systems and Markets. A.W. Cruickshank, and G.C. Wright*. QDPI, Farming Systems Institute, Kingaroy, Qld, Australia.

2:00 (17) Field Evaluation of Peanut Breeding Lines for Disease Resistance and Yield. K.E. Dashiell*, and H.A. Melouk. Oklahoma State University, Stillwater, OK. USDA-ARS, Stillwater, OK.

2:15 (18) Botanical Variety-specific Markers in Cultivated Peanut. G. He*, R. Meng, G. Gao, M. Newman, R.N. Pittman, and C.S. Prakash. Tuskegee University, Tuskegee, AL. Guangxi Academy of Agricultural Sciences, Nanning, China. USDA-ARS, Griffin, GA.

2:30 (19) Selection of a Core of the Core Collection for Peanut. C.C. Holbrook* and W.B. Dong. USDA-ARS, Tifton, GA.

2:45 (20) Use of Pod Brightness and Seed Oil Content as Readily Measured Indicators of Maturity. T.G. Isleib* and R.W. Mozingo II. North Carolina State University, Raleigh, NC.

GRADUATE STUDENT COMPETITION II

Salon E

Moderator: D.L. Wright, University of Florida, Quincy, FL

1:15 (21) Management of Sclerotinia Blight in Peanut with the Biocontrol Agent Coniothyrium minitans, Moderate Resistance, and Fungicide Programs. D.E. Partridge*, T.B. Sutton, D.L. Jordan, and V.L. Curtis. North Carolina State University, Raleigh, NC.

1:30 (22) The Influence of Herbicides on the Incidence of Tomato Spotted Wilt Virus in Peanut. N.P. Shaikh*, G.E. MacDonald, and B.J. Brecke. University of Florida, Gainesville, FL. University of Florida, Jay, FL.

1:45 (23) Suppression of Peanut Leaf Spot with Tillage Practices, Resistant Genotypes, and Reduced Fungicide Regimes. A.K. Culbreath, S.K. Gremillion*, J.W. Todd, and R.N. Pittman. University of Georgia, Tifton, GA. USDA-ARS, Griffin, GA.

2:00 (24) Economic Efficiencies of Pest Management Schemes in Peanuts. M. Casellas*, T. Hewitt, R. Sprenkel, and J.R. Weeks. University of Florida, Gainesville, FL. University of Florida, Marianna, FL. University of Florida, Quincy, FL. Auburn University, Headland, AL.

2:15 (25) Identification of Factors that Influence the Epidemiology of Sclerotinia Blight of Peanut (Arachis hypogaea). D.L. Smith*, and B.B. Shew. North Carolina State University, Raleigh, NC.

2:30 (26) Weed Management in Peanut Under Twin Row Patterns and Conservation Tillage. D.C. Yoder*, G.E. MacDonald, D.L. Wright, and B.J. Brecke. University of Florida, Gainesville, FL. University of Florida, Quincy, FL. University of Florida, Jay, FL.

3:00 Break

BREEDING, BIOTECHNOLOGY, AND GENETICS II

Salon D

Moderator: J.H. Williams, Peanut CRSP, Griffin, GA

3:30 (27) Genetic Transformation of Peanut for Resistance to Sclerotinia minor. D.M. Livingstone*, J.L. Hampton, A.R. Stiles, P.M. Phipps, and E.A. Grabau. Virginia Tech, Blacksburg, VA. Virginia Tech, Suffolk, VA.

3:30 (28) Determination of Maturity of Standard Varieties in West Texas. Y. Lopez*, M.D. Burow, M.R. Baring, J.L. Ayers, C.E. Simpson and J. Cason. Texas A&M University, Lubbock, TX. Texas A&M University, College Station, TX.

3:45 (29) Application of EST Technology in Functional Genomics of Arachis hypogaea L. M. Luo*, P. Dang, B.Z. Guo, C.C. Holbrook, and M. Bausher. University of Georgia, Tifton, GA. USDA-ARS, Tifton, GA. USDA-ARS, Ft. Pierce, FL.

4:00 (30) New B Genome Donor of Arachis hypogaea L. N. Mallikarjuna*, S.K. Tandra, D. Jadhav, and J.H. Crouch. ICRISAT, Pradesh, India.

4:15 (31) Genomic Characterization of Section Arachis Species. S.P. Tallury*, S.R. Milla, H.T. Stalker, and K.W. Hilu. North Carolina State University, Raleigh, NC. Virginia Tech, Blacksburg, VA.

4:30 (32) WITHDRAWN

4:45 (33) Physiological Interpretation and Manipulation of Inheritance for Yield. B.R. Ntare, and J.H. Williams*. ICRISAT, Pradesh, India. University of Georgia, Griffin, GA.

WEED SCIENCE

Salon E

Moderator: P.A. Dotray, Texas Tech University, Lubbock, TX

3:30 (34) Reduced Rate of Cadre and Pursuit for Weed Control in Peanut. T.A. Baughman*, W.J. Grichar, P.A. Dotray, and J.C. Reed. Texas, Cooperative Extension, Vernon, TX. TAES, Yoakum, TX. TAES, Lubbock, TX. Texas Tech University, Lubbock, TX.

3:30 (35) Interaction of Clethodim (Select) with Fungicides. W.J. Grichar*, B.A. Besler, and A.J. Jaks. TAES, Beeville, TX.

3:45 (36) Preliminary Results of Non-Chemical Weed Control Research in Peanut Production Using Cultural Controls and Propane Flaming. W.C. Johnson III*, and A.K. Culbreath. USDA-ARS, Tifton, GA. University of Georgia, Tifton, GA.

4:00 (37) Managing Tropic Croton with Cadre/Ultra Blazer Tank-Mixes in Peanut. E.P. Prostko*, and J.M. Kichler. University of Georgia, Tifton, GA. Webster County Cooperative Extension Service, Preston, GA.

4:15 (38) Physiological Behavior of Root-Absorbed Flumioxazin in Peanut, Ivyleaf Morningglory, and Sicklepod. J.W. Wilcut*, A.J. Price, S.B. Clewis, and J.R. Cranmer. North Carolina State University, Raleigh, NC. Valent USA Corp., Cary, NC.

4:30 (39) Peanut Tolerance to Flumioxazin, Diclosulam, and Dimethenamid. P.A. Dotray*, T.A. Baughman, J.W. Keeling, and T.A. Murphree. Texas Cooperative Extension, Lubbock, TX. Texas Cooperative Extension, Vernon, TX. TAES, Lubbock, TX. Texas Tech University, Lubbock, TX.

Morning

PROCESSING AND UTILIZATION

Salon D

Moderator: M.J. Hinds, Oklahoma State University, Stillwater, OK

8:15 (40) Sensory Quality Traits of the Runner-Type Peanut Cultivar Georgia Green and Its Value as a Parent Compared with Florunner. H.E. Pattee*, T.G. Isleib, D.W. Gorbet, K.M. Moore, Y. Lopez, M.R. Baring, and C.E. Simpson. USDA-ARS, Raleigh, NC. North Carolina State University, Raleigh, NC. University of Florida, Marianna, FL. AgraTech Seeds, Inc., Ashburn, GA. Texas A&M University, College Station, TX.

8:30 (41) Improving Shelf Life of Roasted and Salted Inshell Peanuts Using High Oleic Acid Chemistry. R.W. Mozingo*, S.F. O'Keefe, and T.H. Sanders. Virginia Tech, Suffolk, VA. Virginia Tech, Blacksburg, VA. North Carolina State University, Raleigh, NC.

8:45 (42) The Effect of Degree of Roast on Shelf-life Quality of In-shell Peanuts. T.H. Sanders*, K.W. Hendrix, and D. Helms. USDA-ARS, Raleigh, NC. Northhampton Peanut Company, Severn, NC.

9:00 (43) Reducing the Allergenic Properties of Peanut Proteins by Peroxidase. S.Y. Chung*, S.J. Maleki, and E.T. Champagne. USDA-ARS, New Orleans, LA.

9:15 44) Peanut Production in Topographic Fields with Surface Drip Irrigation. H. Zhu, M.C. Lamb, C.L. Butts*, and P.D. Blankenship. USDA-ARS, Dawson, GA.

9:30 (45) Development of Value-added Snacks from Defatted Peanut Flour. A. Ahmedna*, K. Mathews, and I. Goktepe. North Carolina A&T State University, Greensboro, NC.

9:45 (46) Characterization of Peanut-based Products from Ghana. M.J. Hinds*, W.O. Ellis, K. Frimpong, A. Salam, and S. Gedela. Oklahoma State University, Stillwater, OK. Kwame Nkrumah University of Sciences and Technology, Kumasie, Ghana.

EXTENSION TECHNIQUES AND TECHNOLOGY/EDUCATION FOR EXCELLENCE

Salon E

Moderator: R. Rudolph, Bayer

8:15 (47) Control of Tropical Spiderwort (Commelina benghalensis) in Peanut with Selected Herbicides. J.T. Flanders*, and E.P. Prostko. University of Georgia Cooperative Extension Service, Cairo, GA. University of Georgia, Tifton, GA.

8:30 (48) Calibration of Soil Test Calcium with Modern Cultivar Yield, Grade and Germination. J.D. Jones Jr.*, D. Hartzog, and G. Gascho. Alabama Cooperative Extension System, Abbeville, AL. Auburn University, AL. University of Georgia, Tifton, GA.

8:45 (49) Fungicide Treatment Effects on the Incidence of Soilborne Diseases in Peanut. P.D. Wigley*, S.J. Komar, R.C. Kemeriat. Calhoun County Extension Service, Morgan, GA. Randolph County Extension Service, Cuthbert, GA. University of Georgia, Tifton, GA.

9:00 (50) Peanut Variety Responses to Mechanical and Thrips-mediated Inoculations with Tomato Spotted Wilt Virus. M.C. Black*, A.M. Sanchez, N.T. Troxclair, and M.R. Baring. Texas Cooperative Extension, Uvalde, TX. TAES, College Station, TX.

9:15 (51) Profit Potential of Various Inputs Under the New Peanut Program. W.D. Thomas*. Columbia County Cooperative Extension Service, Lake City, FL.

9:30 (52) WITHDRAWN

9:45 (53) Impact of Azocxystrobin (Abound 2.08F) Used In-Furrow to Manage Disease in Peanuts. R.B. Barentine*, and R.C. Kemerait, Jr. Pulaski County Extension Service, Hawkinsville, GA. University of Georgia, Tifton, GA.

10:00 (54) Results from Farmer Surveys Concerning Tomato Spotted Wilt in North Carolina Peanut (Arachis hypogaea). A. Cochran*, C. Ellison, J. Pearce, M. Rayburn, R. Rhodes, M. Shaw, B. Simonds, L. Smith, P. Smith, C. Tyson, S. Uzzell, A. Whitehead, Jr., M. Williams, F. Winslow, C.A. Hurt, R.L. Brandenburg, B.B. Shew, D. Johnson, and D.L. Jordan. North Carolina Cooperative Extension Service, North Carolina State University, Raleigh, NC.

ECONOMICS I

Salon F

Moderator: T. Hewitt, University of Florida, Marianna, FL

8:15 (55) WITHDRAWN

8:30 (56) Crop Enterprise Selection in the Southeast Under the 2002 Farm Bill. T. Davis, C. Curtis, T. Hewitt, G. Shumaker, and N.B. Smith. Clemson University, Clemson, SC. University of Florida, Marianna, FL. University of Georgia, Statesboro, GA. University of Georgia, Tifton, GA.

8:45 (57) Research at the NPRL Shellman Irrigation Research Farm. M.C. Lamb*, D.L. Rowland, R.B. Sorensen, H. Zhu, P.D. Blankenship, and C.L. Butts. USDA-ARS, Dawson, GA.

9:00 (58) WITHDRAWN

9:15 (59) Tomato Spotted Wilt Virus: Economic Impact of Management Options Using a Field Resistant and a Susceptible Cultivar Under Conventional and Strip Tillage. A. Luke-Morgan*, S. Fletcher, and J.W. Todd. University of Georgia, Tifton, GA. University of Georgia, Griffin, GA.

9:30 (60) Improving Peanut Production Efficiencies. T. Hewitt. University of Florida, Marianna, FL.

10:15 Break

PLANT PATHOLOGY AND NEMATOLOGY I

Salon D

Moderator: A.K. Hagan, Auburn University, Headland, AL

10:30 (61) Peanut Cultivar Response to Rust. B.A. Besler*, W.J. Grichar, and A.J. Jaks. TAES, Beeville, TX.

10:45 (62) Role of Non-dispersal Components of Cercospora arachidicola Life Cycle in Early Leaf Spot Reductions in Peanut-Maize Intercrops. M.A. Boudreau*, B.B. Shew, and L.E. Duffie2. Warren Wilson College, Asheville, NC. North Carolina State University, Raleigh, NC.

11:00 (63) Effect of Seed Treatment and Fungicides Applied In-Furrow on Peanut Diseases and Yield. T.B. Brenneman*. University of Georgia, Tifton, GA.

11:15 (64) Ten Years of Stable Field Resistance to Tomato Spotted Wilt Virus in Georgia Green Cultivar. A.K. Culbreath*, J.W. Todd, W.D. Branch, and D.W. Gorbet. University of Georgia, Tifton, GA. University of Florida, Marianna, FL.

11:30 (65) Reaction of the Peanut Core Collection to Sclerotinia Blight and Pepper Spot. J.P. Damicone*, K.E. Jackson, K.E. Dashiell, H.A. Melouk, and C.C. Holbrook. Oklahoma State University, Stillwater, OK. USDA-ARS, Stillwater, OK. USDA-ARS, Tifton, GA.

11:45 (66) Yield Response and Reaction of Runner Peanut Lines to Diseases in an Irrigated Production System. A.K. Hagan*, J.R. Weeks, B. Gamble, and J. Bostick. Auburn University, Headland, AL. Wiregrass Research and Extension Center, Headland, AL. Alabama Crop Improvement Association, Headland, AL.

PRODUCTION I

Salon E

Moderator: D. Jordan, North Carolina State University, Raleigh, NC

10:30 (67) Interdisciplinary Approach to Evaluating Peanut Cultivars Planted in Twin and Single Rows by Conventional and Reduced Tillage Methods. D.L. Hartzog*, J. Adams, K. Balkcom, J.A. Baldwin, D.L. Wright, E.J. Williams, N.B. Smith, T. Hewitt, T.B. Brenneman, B. Kermerait, R.N. Gallagher, and G. MacDonald. Auburn University, Headland, AL. University of Georgia, Tifton, GA. University of Florida, Quincy, FL. University of Florida, Marianna, FL. University of Florida, Gainesville, FL.

10:45 (68) Response of Peanut to Planting in a Triple Row Pattern. J.P. Beasley, Jr.*, J.A. Baldwin, E.J. Williams, S. L. Brown, J.W. Todd, R.C. Kemerait, Jr., A.K. Culbreath, N.B. Smith, D.L. Hartzog, J.R. Weeks, and E.B. Whitty. University of Georgia, Tifton, GA. Auburn University, Headland, AL. University of Florida, Gainesville, FL.

11:00 (69) Minimum-input Nonirrigated Preliminary Peanut Yield Trials. W.D. Branch* and S.M. Fletcher. University of Georgia, Tifton, GA. Georgia Experiment Station, Griffin, GA.

11:15 (70) Annual Ryegrass Cover Crop Adaptability in Southern Cropping Systems: Year 1. J.B. Eitzen* and K.M. Moore. AgResearch Consultants Inc., Tifton, GA.

11:30 (71) Summary of Row Pattern Trials in Peanut (Arachis hypogaea) Grown in North Carolina. D.L. Jordan*, J. Lanier, J. Spears, R. Wells, C.A. Hurt, and R.L. Brandenburg. North Carolina State University, Raleigh, NC.

11:45 (72) Disease Management in Peanut (Arachis hypogaea) with Overhead Sprinkler and Subsurface Drip Irrigation. J. Lanier, D. Jordan*, S. Barnes, G. Grabow, B. Griffin, J. Bailey, J. Spears, and R. Wells. North Carolina State University, Raleigh, NC.

ECONOMICS II

Salon F

Moderator: S. Fletcher, University of Georgia, Griffin, GA

10:30 (73) Southeastern Representative Peanut Farms Established Through the National Center for Peanut Competitiveness. A. McCorvey*, A. Luke-Morgan, S.M. Fletcher, and J. Richardson. University of Georgia, Tifton, GA. University of Georgia, Griffin, GA. Texas A&M University, College Station, TX.

10:45 (74) Financial Impacts of the 2002 Farm Bill on Peanut Farms. J.W. Pease*, M.T. Roberts, S.G. Bullen, and F.M. Shokes. Virginia Tech, Blacksburg, VA. Virginia Cooperative Extension, Prince George, VA. North Carolina State University, Raleigh, NC. Tidewater Research and Extension Center, Suffolk, VA.

11:00 (75) WITHDRAWN

11:15 (76) Marketing Alternatives Under the New Peanut Program. N.B. Smith*. University of Georgia, Tifton, GA.

11:30 (77) Economic Assessment of Using Different Schedules of Chlorothalonil and Tebuconazole Sprays Under the New Market Loan Rate on Dry-Land No-Till Production System. V. Subramaniam*, S.C. Phatak, N.B. Smith, S.M. Fletcher, A.K. Culbreath, W.D. Branch, and J.R. Bateman. University of Georgia, Tifton, GA.

11:45 (78) The Impact of the 2002 Farm Security and Rural Investment Act on the Economic Viability of Peanut Buying Points in Georgia. L. Webb*, S.M. Fletcher, N.B. Smith, and A. Luke-Morgan. University of Georgia, Tifton, GA

Afternoon

PLANT PATHOLOGY AND NEMATOLOGY II/MYCOTOXINS

Salon D

Moderator: T. Kucharek, University of Florida, Gainesville, FL

1:15 (79) Management of Peanut Diseases in Georgia with Metam Sodium and Fungicides. E.L. Jordan* and T.B. Brenneman. University of Georgia, Cooperative Extension Service, Newton, GA. University of Georgia, Tifton, GA.

1:30 (80) Field and Soil Characteristics that Affect Aflatoxin Contamination in the Southeastern U.S. K.L. Bowen*, J.N. Shaw, and J.P. Beasley, Jr. Auburn University, Headland, AL. University of Georgia, Tifton, GA.

1:45 (81) Long-term Effects of Application of Nontoxigenic Strains of Aspergillus flavus and A. parasiticus to Peanut Soil for Biological Control of Aflatoxin Contamination. J.W. Dorner*. USDA-ARS, Dawson, GA.

2:00 (82) Impact of Phytoalexins and Lesser Cornstalk Borer Damage on Resistance to Aflatoxin Contamination. B.Z. Guo*, V. Sobolev, C.C. Holbrook, and R.E. Lynch. USDA-ARS, Tifton, GA. USDA-ARS, Dawson, GA.

2:15 (83) Human Exposure to Aflatoxin and Probable Consequences. J.H. Williams*. University of Georgia, Griffin, GA.

2:30 (84) Reducing Aflatoxin in the Australian Peanut Crop Using an Integrated Harvesting Management System. G.C. Wright*, N.R. Rachaputi, S. Krosch, and A. Broome. Queensland Department of Primary Industries, Kingaroy, Australia. Peanut Company of Australia, Kingaroy, Australia

2:45 (85) Effect of Ozonation and Mild Heat Treatment on Degradation of Aflatoxins in Peanuts. A. Proctor*, J. Kumar, M. Ahmedna, and I. Goktepe. North Carolina A&T University, Greensboro, NC.

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

Salon E

Moderator: K.J. Boote, University of Florida, Gainesville, FL

1:15 (86) DynastyTM PD: A New Peanut Seed Treatment from Syngenta Crop Protection. G.L. Cloud*, D. Long, and C. Pearson. Syngenta Crop Protection, Greensboro, NC.

1:30 (87) Heat Tolerance in Groundnut. P.Q. Craufurd*, P.V.V. Prasad, V.G. Kakani, T.R. Wheeler, and S.N. Nigam. University of Reading, UK. University of Florida, Gainesville, FL. Mississippi State University, MS. ICRISAT, India.

1:45 (88) Nondestructive Moisture Determination in Small Samples of Peanut Pods by RF Impedance Method. C.V.K. Kandala* and C.L. Butts. USDA-ARS, Dawson, GA.

2:00 (89) Tracing the Uptake and Duration of Water Use in Peanuts Using Deuterium Labeled Water Applied From and Overhead Irrigation System. D.L. Rowland*, R.B. Sorensen, J.W. Dorner, M.C. Lamb, and A.J. Leffler. USDA-ARS, Dawson, GA. Utah State University, Logan, UT.

2:15 (90) Mechanical Curing versus Field Curing: Effect on Peanut Quality and Economics. J.C. Tuggle* and M.D. Timmons. Crop Docs Research and Consulting, Ltd., Brownfield, TX.

2:30 (91) Improving Accuracy of Electronic Moisture Meters. P.D. Blankenship* and C.L. Butts. USDA-ARS, Dawson, GA.

2:45 (92) Testing Use of Fungicide, Early Sowing, and Improved Cultivars to Increase Peanut Yield in Ghana. J.B. Naab, F.K. Tsigbey, P.V.V. Prasad, K.J. Boote*, J. Bailey, and R.L. Brandenburg. Savanna Agricultural Research Institute, Nyankpala, Ghana. University of Florida, Gainesville, FL. North Carolina State University, Raleigh, NC.

3:00 (93) Automated Over Spacing Ventilation Controls for Farmer Stock Warehouses in the Southeast. C.L. Butts*, S.L. Brown, F.H. Arthur, and J.E. Throne. USDA-ARS, Dawson, GA. University of Georgia, Tifton, GA. USDA-ARS, Manhattan, KS.

PRODUCTION II

Salon F

Moderator: A.R. Blount, University of Florida, Marianna, FL

1:15 (94) Preliminary Assessment of the Annual Peanut as a Forage Crop for Grazing by Growing Beef Cattle. R.O. Myer*, D.W. Gorbet, and A.R. Blount. University of Florida, Marianna, FL.

1:30 (95) Development of a Peanut Precision Agriculture/General Research Farm and its Use in Addressing Real-World Production Problems. A.M. Schubert*, D.O. Porter, T.A. Wheeler, C.L. Trostle, K.E. Bronson, P.A. Dotray. Texas A&M University, Lubbock, TX.

1:45 (96) Peanut (Arachis hypogaea) Response to Cylanilide and Prohexadione Calcium. B. Simonds*, D.L. Jordan, J. Beam, J. Lanier, S. Hans, and D. Johnson. North Carolina Cooperative Extension Service, North Carolina State University, Raleigh, NC.

2:00 (97) Five Years of Subsurface Drip Irrigation on Peanut: What Have We Learned? R.B. Sorensen*, C L. Butts, and D.L. Rowland. USDA-ARS, Dawson, GA.

2:15 (98) Is Nitrogen Fertilization of West Texas Justified? C.L. Trostle* and S.K. Long. Texas Cooperative Extension, Texas A&M University, Lubbock, TX.

2:30 (99) Presented in the Poster Session

2:45 Break

EXTENSION TECHNIQUES AND TECHNOLOGY

Salon D

Moderator: J.A. Baldwin, University of Georgia, Tifton, GA

3:15 (100) WITHDRAWN

3:30 (101) Using Pocket HERB for Weed Management Decisions in Peanut. M. Shaw*, M. Williams, A. Cochran, C. Ellison, A. Whitehead, Jr., M. Rayburn, G. Wilkerson, B. Robinson, A.J. Price, and D.L. Jordan. North Carolina Cooperative Extension Service, North Carolina State University, Raleigh, NC.

4:00 (102) Effect of Cover Crops and Reduced Tillage Methods on Yield and Grade of Georgia Green Planted Pattern. J.A. Baldwin* and E.J. Williams. University of Georgia, Tifton, GA.

PLANT PATHOLOGY AND NEMATOLOGY III

Salon E

Moderator: R. C. Kemerait, Jr., University of Georgia, Tifton, GA

3:15 (103) Evaluation of Reduced Fungicide Programs on Peanut in Oklahoma. K.E. Jackson* and J.P. Damicone. Oklahoma State University, Stillwater, OK.

3:30 (104) Peanut Disease Control Potential of Two Local Soaps in Northern Ghana for Over Four Years. F.K. Tsigbey*, R.L. Brandenburg, and V.A. Clottey. University of Florida, Quincy, FL. North Carolina State University, Raleigh, NC. Savanna Agricultural Research Institute, Nyankpala, Ghana.

3:45 (105) The Occurrence and Control of Peanut Rust in Central Florida from 1998 through 2002. T.A. Kucharek* and C.R. Semer. University of Florida, Gainesville, FL.

4:00 (106) First Report of Sclerotinia Blight on Peanut in Nebraska. H.A. Melouk*, K.E. Jackson, and J.P. Damicone. USDA-ARS, Oklahoma State University, Stillwater, OK.

4:15 (107) Improving the Efficiency of Foliar Fungicide Sprays in Peanut Production through Integration of Cultivar Susceptibility and Reproductive Stage into Weather-based Advisory Programs. P.M. Phipps* and R.W. Mozingo. Tidewater Agricultural Research and Extension Center, Virginia Polytechnic Institute and State University, Suffolk, VA.

4:30 (108) Evaluation of Two Nematicides and Timing of Application to Manage Peanut Root-knot Nematode in Georgia. R.C. Kemerait, Jr.*, R.F. Davis, and C.L. Brewer. University of Georgia, Tifton, GA. USDA-ARS, Tifton, GA. University of Georgia, Athens, GA.

POSTER SESSION

Posters will be displayed from 9:45 am – 5:00pm on both Wednesday and Thursday. Authors will be present as follows:

Authors for papers 109-119 will be present with paper from 1:15 to 2:15 pm on Wednesday, July 9th.

Authors for papers 120-129 will be present with paper from 10:30 to 11:30 am on Thursday, July 10th.

(109) Impacts of Cotton and Peanut Rotations on a Sandy Soil: Organic Matter, Aggregate Stability, Microbial Biomass, Microbial Community Composition, and Enzyme Activities. V. Acosta-Martinez*, D.R. Upchurch, and D. Porter. USDA-ARS, Lubbock, TX. Texas A&M University, College Station, TX.

(110) Perceptions, Attitudes, and Preferences of Elderly Consumers Concerning Peanuts and Peanut Products. C.M. Bednar*, M.B. Daugherty, R. Kandalaft. Texas Woman's University, Denton, TX.

(111) Peanut Production Development in Bulgaria. N.A. Bencheva*, S.G. Delikostadinov, C.M. Jolly and N. Puppala. Agricultural University of Bulgaria, Plovdiv, Bulgaria and New Mexico State University, Clovis, NM.

(112) Comparison of the AU-Pnut Disease Advisory and Standard Calendar Fungicide Programs on Selected Cultivars. H.L. Campbell*, A.K. Hagan, and K.L. Bowen. Auburn University, AL.

(113) Comparison of Inoculation Methods to More Rapidly Identify Peanut Genotypes with Resistance to Meloidogyne arenaria. W.B. Dong*, C.C. Holbrook, P. Timper, and J.P. Noe. University of Georgia, Tifton, GA. USDA-ARS, Tifton, GA. University of Georgia, Athens, GA.

(114) WITHDRAWN

(115) Compatibility of Clethodim and Sethoxydim with Selected Fungicides. S. Hans*, D.L. Jordan, A. York, J.W. Wilcut, J. Spears, and D. Monks. North Carolina State University, Raleigh, NC.

(116) Nutritional and Physical Properties of Peanut-Based Beverage. D. Iserliyska, M.S. Chinnan*, A.V.A. Resurreccion, G.D. Farrell, and P. Paraskova. Institute of Horticulture and Canned Foods, Plovdiv, Bulgaria. University of Georgia, Griffin, GA.

(117) Pod Yield and Market Grades with Mixed Plantings of Peanut Cultivars. D.L. Jordan* and D. Johnson. North Carolina Cooperative Extension Service, Raleigh, NC.

(118) Detection of Genetic Diversity in Valencia Peanuts Using SSR Markers. G.K. Krishna*, N. Puppala, J. Zhang, L. Yingzhi, G. He, R.N. Pittman, M.D. Burow, and S.G. Delikostadinov. New Mexico State University, Clovis, NM. Tuskegee University, Tuskegee, AL. USDA-ARS, Griffin, GA. Texas A&M University, Lubbock, TX. Institute for Plant Genetic Resources, Sadovo, Bulgaria.

(119) Resistance to Aspergillus flavus in Peanut Seeds is Associated with Constitutive Trypsin Inhibitor and Inducible Chitinase and ? -1-3-Glucanase. X.Q. Liang*, B.Z. Guo, C.C. Holbrook, and R.E. Lynch. University of Georgia, Tifton, GA. USDA-ARS, Tifton, GA. USDA-ARS, Tifton, GA.

(120) Arachis Genome Relationships Revealed by AFLP Markers. S.R. Milla*, S.P. Tallury, H.T. Stalker, and T.G. Isleib. North Carolina State University, Raleigh, NC.

(121) Yield and Pest Resistance in a Bolivian Landrace Peanut Variety, 'Bayo Grande', and Five Similar Bolivian Plant Introductions of Arachis hypogaea from the USDA Arachis Germplasm Collection. R.N. Pittman*, J.W. Todd, A.K. Culbreath, and D.W. Gorbet. USDA-ARS, Griffin, GA. University of Georgia, Tifton, GA. University of Florida, Marianna, FL.

(122) Using an Advisory Index for Managing Tomato Spotted Wilt Virus in North Carolina Peanuts. B.M. Royals*, R.L. Brandenburg, D.A. Herbert, Jr., D.L. Jordan, and C.A. Hurt. North Carolina State University, Raleigh, NC. Virginia Tech, Suffolk, VA. North Carolina State University, Raleigh, NC.

(123) Polyphenolic Content and Sensory Properties of Normal, Mid, and High Oleic Acid Peanuts. S.T. Talcott*, D.W. Gorbet, C.E. Duncan, and S.P. Passeretti. University of Florida, Gainesville, FL. University of Florida, Marianna, FL.

(124) WITHDRAWN

(125) Influence of Soil Temperature on Seedling Emergence of Peanut Cultivars. P.V.V. Prasad*, K.J. Boote, J.M.G. Thomas, and L.H. Allen, Jr. University of Florida, Gainesville, FL. USDA-ARS, Gainesville, FL.

(126) Cloning of Peanut Genes Expressed During Tissue Culture. K. Chengalrayan* and M. Gallo-Meagher. University of Florida, Gainesville, FL.

(127) Salt- and Herbicide-Induced Increase in Glyoxalase I Activity in Cell Lines of Arachis hypogaea L. M. Jain*, D. Choudhary, R.K. Kale, M. Gallo-Meagher, and N. Bhalla-Sarin. University of Florida, Gainesville, FL. University of Connecticut Health Center, Farmington, CT. Jawaharlal Nehru University, New Delhi, India.

(128) Cloning of a Novel Arah 3 Gene. I-H. Kang* and M. Gallo-Meagher. University of Florida, Gainesville, FL.

(129) Marker-assisted Selection in Screening Peanut for Resistance to Root–knot Nematode. J.C. Seib*, L. Wunder, M. Gallo-Meagher1, V. Carpentieri–Pipolo, D.W. Gorbet, and D.W. Dickson. University of Florida, Gainesville, FL. Universidade Estadual de Londrina, Londrina PR, Brazil. University of Florida, Marianna, FL.

(130) Use of 2X Rate of APOGEE Growth Regulator on Panut in South Texas. A.J. Jaks*, B.A. Besler, and W.J. Grichar

(131) Evaluation of Valencia Peanut Varieties Investigated in Bulgaria. S.G. Delikostadinov and N. Puppala

SITE SELECTION COMMITTEE REPORT

The Site Selection Committee members met at 1:00 p.m. on July 8. Present were: Maria Gallo-Meagher, Ben Whitty, Pat Phipps, Bob Kemerait, Fred Shokes, Diane Rowland, Todd Baughman, Brent Besler and Ron Sholar.

The 2004 meeting will be held in San Antonio, Texas at the Hyatt Regency San Antonio, on the Riverwalk at Paseo del Alamo. The room rates are $110 and the dates are July 12-17, 2004. The contract has been signed.

The 2005 meeting proposal is for Portsmouth, Virginia at the Renaissance Portsmouth Hotel. The room rates are $119 and the dates are July 9-17, 2005.

Respectfully submitted by:
Maria Gallo-Meagher, Chair

AMERICAN SOCIETY OF AGRONOMY LIAISON REPRESENTATIVE REPORT

The annual meetings of the joint American Society of Agronomy, Crop Science Society of America, and Soil Science Society of America were held in Indianapolis IN from November 10-14, 2002. More than 3,000 scientific presentations were made of which about 15 were devoted to peanut research. The next annual meeting will be held in Denver, CO from November 2-6, 2003.

Respectfully submitted,
H. Thomas Stalker, Chair

CAST REPORT

The Council for Agricultural Science and Technology (CAST) Board met in Phoenix, Arizona fall 2002 and Washington, D.C. spring 2003. Your APRES representative, Stanley Fletcher, is a member of the National Concerns Standing Committee and a member of the Plant and Soil Science Workgroup. CAST has a core membership of 38 scientific societies that represent over 173,000 member scientist. Besides the Ames, Iowa office, CAST has a Washington, D.C. office that is the base for executive vice president Teresa Gruber and the Biotechnology Communications Coordinator, Cindy Lynn Richard.

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.
United Soybean Board and CAST coordinated the publication: Comparative Environmental Impacts of Biotechnology-derived and Traditional Soybean, Corn, and Cotton Crops. Additional details are on the CAST web site.
Entered into an agreement with the U.S. Trade and Development Agency to coordinate a U.S.-China food and agricultural biotechnology training program and dialogue.
Hosted more than 100 scientists, regulators, and non-profit organization representatives for a two-day workshop on *Biotechnology-derived, Perennial Turf and Forage Grasses: Criteria for Evaluation*.
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."
Submitted comments to the President's Advisory Council on Science and Technology regarding their draft letter to President Bush concerning Federal investment in science and technology.
Held a symposium, *Management of Pest Resistance: Strategies Using Crop Management, Biotechnology and Pesticedes*, involving diverse stakeholders working on insect, pathogen and weed pest resistance management issues.
Published an issue paper entitled, "Environmental Impacts of Livestock on U.S. grazing Lands."
Published an issue paper entitled, "Integrated Pest Management: Current and Future Strategies."
Published a Task Force Report entitled, "Mycotoxins: Risks in Plant, Animal, and Human Systems."
Published a special publication entitled, "Boundless Science for Bountiful Agriculture: Winning Student Essays 2003."
Publication in the work entitled, "Nutraceuticals for Health Promotion and Disease Prevention."
Publication in the work entitled, "Climate Change and Greenhouse Gas Mitigation: Challenges and Opportunities for Agriculture."

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. Minimum annual dues for the five classes of membership shall be:

a. Individual memberships:	$ 40.00
b. Institutional memberships:	40.00
c. Organizational memberships:	50.00
d. Sustaining memberships:	150.00
e. Student memberships:	10.00

(Dues were set at 1999 Annual Meeting, Savannah, Georgia)

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, 1999, Savannah, Georgia

APRES MEMBERSHIP 1975-2003

	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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