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## TABLE OF CONTENTS

	Page
<u>OPENING SESSION</u>	
Importance of the Land Grant Universities in Peanut Research and Extension----- G. A. Buchanan	11
<u>TECHNICAL SESSIONS</u>	
<u>Plant Pathology - Nematology</u>	
Population Dynamics of <u>Meloidogyne arenaria</u> in a Peanut Field----- R. Rodriguez-Kabana, A. K. Culbreath, and D. G. Robertson	14
Combinations of 1,3-D and Aldicarb for Control of <u>Meloidogyne arenaria</u> in Peanut----- C. F. Weaver, R. Rodriguez-Kabana, and P. S. King	14
Corn and Sorghum as Rotational Crops for Control of <u>Meloidogyne arenaria</u> in Peanuts----- P. S. King, R. Rodriguez-Kabana, and J. T. Touchton	15
Occurrence of Peanut Pod Rot in Oklahoma and Phytopathogenic Fungi and Nematodes Isolated from Diseased Plants----- A. B. Filonow and M. W. Andrews	15
Evaluation of Chlorpyrifos and the break down product 3,5,6-trichloro-2- pyridinol for <u>Sclerotium rolfsii</u> control----- A. S. Csinos	16
White Mold Suppression on Peanuts with Lorsban 15G----- A. K. Hagan and J. R. Weeks.	16
Practical Implications of Resistance to Dicarboximide Fungicides in <u>Sclerotinia minor</u> from Peanuts----- T. B. Brenneman, P. M. Phipps, and R. J. Stipes	17
Comparisons of Hollow Cone and Flat Fan Spray Nozzles for Peanut Leafspot Control----- T. Kucharek and R. Cullen	17
An Assessment Method for Evaluating Foliar Fungicides for Control of Leaf Spot of Peanut----- K. E. Jackson and H. A. Melouk	18
Parasitic Fitness Parameters of Benomyl-Resistant and Sensitive Isolates of <u>Cercospora arachidicola</u> on peanut cv. 'Tamnut 74'----- H. A. Melouk and D. H. Smith.	18
Resistance to Early Leafspot in Peanuts----- P. Subrahmanyam, S. N. Nigam, P. Ngwira, and A. J. Chiyembekeza	19
Factors Influencing Yield Responses of Peanuts Following Seed Treatment with <u>Bacillus subtilis</u> ----- J. T. Turner and P. A. Backman	19
<u>Production Technology - Pest Management</u>	
Peanut Production at Various Management Levels----- D. T. Gooden, C. E. Drye, and J. W. Chapin	20
Determination of Growth Period Required for a Full-Season Runner to Exceed a Short-Season Spanish Peanut in Yield, Value and Seed Quality----- A. C. Mixon and W. D. Branch	20

Peanut Pest Management in South Texas-----	21
P. F. Lummus and C. T. Gasch	
Application of Current Technology to Achieve Maximum Profits in Peanut Production-----	21
A. H. Allison, P. M. Phipps, O. E. Rud, J. C. Smith, and G. G. Gallimore	
Irrigation and Tillage Effects on Peanut Yields in Virginia-----	22
F. S. Wright, D. M. Porter, N. L. Powell, and B. B. Ross	
Response of Three Peanut Cultivars to Different Rates of Gypsum-----	22
G. A. Sullivan and W. Ismail	
Response of Florunner Peanuts to Gypsum (Landplaster)-----	23
J. I. Davidson, Jr., R. J. Henning, P. D. Blankenship, T. H. Sanders, R. J. Cole, R. A. Hill, and W. R. Guerke	
Evaluation of Fenitrothion as a Protectant for Stored Farmers Stock Peanuts---	23
L. M. Redlinger and R. A. Simonaitis	
Evaluating Pest Management Programs Using Telephone Survey-----	24
J. C. French and J. R. Weeks	
Results of 1984 IPM Peanut Survey in Alabama-----	24
J. R. Weeks and J. C. French	
Yield Evaluation of Herbicide Tolerant Peanut Genotypes-----	24
M. S. Riffle, D. H. Teem, B. J. Brecke, and D. W. Gorbet	
Twin Rows as a Supplement to Yield and Weed Control in Peanuts-----	25
G. Wehtje, R. H. Walker, M. G. Patterson, and J. A. McGuire	
Effects of Row Patterns and Weed Control Systems on Peanut Yield, Weed Control, and Net Returns-----	25
D. L. Colvin, R. H. Walker, M. G. Patterson, and J. A. McGuire	
<u>Physiology, Seed Technology, Processing and Utilization</u>	
Effect of Kylar on Fatty Acid Composition of Seed of Five Peanut Cultivars----	26
R. W. Mazingo and J. L. Steele	
Changes in the Polypeptide Composition of the Peanut ( <i>Arachis hypogaea</i> L.) Seed During Roasting-----	26
S. M. Basha and C. T. Young	
Trypsin Inhibitors in Peanut Seed Protein-----	27
E. M. Ahmed, K. Bieshiada, and M. B. Shaik	
Response of Two Commercial Cultivars of Peanuts to Hot Water Treatment and Accelerated Storage-----	27
A. L. Branch, R. E. Worthington, M. S. Chhinnan, and T. O. M. Nakayama	
A Determination of the Relative Storage Life of Raw Peanuts-----	28
N. V. Lovegren, F. W. Parrish, and R. O. Hammons	
Rapid Colormetric Test for Ethanol-Related Off-Flavors in Peanuts-----	28
H. E. Pattee	
Reproductive Response of Peanut Cultivars to Photoperiod-----	29
F. P. Gardner	
Effect of Soil Temperature on Yield Factors of Florunner Peanuts-----	29
T. H. Sanders and P. D. Blankenship	
Membrane Thermostability of Peanut Genotypes-----	30
D. L. Ketrang	



In Vitro Culture of Peanuts and Preliminary Field Evaluation of Cloned Material-----	30
R. N. Pittman, D. J. Banks, and B. B. Johnson	
Effects of Duration, Timing and Intensity of Single and Multiple Droughts on Peanuts-----	31
R. C. Nageswara Rao and J. H. Williams	
Growth and Partitioning Responses of Four Peanut Genotypes to <u>Cercospora</u> Leafspot-----	31
K. V. Pixley, K. J. Boote, F. M. Shokes, and D. W. Gorbet	
Response of Florunner Peanuts to Application of Kylar-----	32
M. E. Walker, T. P. Gaines, A. S. Csinos, and B. G. Mullinix, Jr.	
Use of the CASAS (Computerized Automated Seed Analysis System) Dynamic Electrical Conductivity Analysis as an Indicator of Potential Freeze Damage in Peanut Seed-----	32
R. D. Keys, G. A. Reusche, and R. Margapuram	
Effect of Ethrel Seed Treatment on Growth, Yield, and Grade of Two Virginia-type Peanuts-----	33
T. A. Coffelt and R. K. Howell	
Water Relations and Yield of Peanut Genotypes Grown Under Irrigated and Rainfed Conditions-----	33
P. I. Erickson, D. L. Ketring, and Ming-Teh Huang	
Influence of Cultivar, Spacing and Sowing Date on the Performance of Peanut ( <u>Arachis hypogaea</u> L.)-----	34
E. O. Auma and F. P. Gardner	

#### Entomology

Comparisons of Soil Insect Damage to Conventional and Conservation Tillage Peanuts-----	35
J. M. Cheshire, Jr., W. L. Hargrove, C. S. Rothrock, and M. E. Walker	
Relation of Lesser Cornstalk Borer Damage to Peanut Pods and the Incidence of <u>Aspergillus flavus</u> -----	35
R. E. Lynch and D. M. Wilson	
Control of Lesser Cornstalk Borer with Granular Chlorphrifos-----	35
J. W. Chapin	
Summary of Peanut Insect Control with Chemicals Applied Through Irrigation Systems-----	36
L. W. Morgan and M. H. Bass	
Evaluation of Collections of International Peanut Germplasm for Insect Resistance-----	36
W. V. Campbell, J. C. Wynne, M. Keerati-Kasikorn, E. P. Cadapan, and S. Sirisingh	

#### Breeding and Genetics

Agronomic Response of Two Resistant Lines to Leafspot Management-----	37
D. W. Gorbet, A. J. Norden, F. M. Shokes, and D. A. Knauft	
Genetics of Solid Purple and Purple Striped Peanut Testa Colors-----	37
W. D. Branch	
A Wild <u>Arachis</u> Winter Nursery in South Texas-----	38
D. J. Banks, R. N. Pittman, and C. M. Heald	

Development of Foliar Diseases Resistant Groundnut Lines at ICRISAT-----	38
L. J. Reddy, S. N. Nigam, P. Subrahmanyam, S. L. Dwivedi, R. W. Gibbons, and D. McDonald	
Application of IBPGR/ICRISAT Minimum Descriptors to <i>Arachis hypogaea</i> L. Germplasm-----	39
C. E. Simpson, E. R. Howard, and D. L. Higgins	
An Investigation of Oil Quality in Ontario-grown Peanuts-----	39
E. E. Sykes and T. E. Michaels	

#### Extension Technology, Harvesting and Storing

Evaluation of Soil Extracting Reagents for Determining Available Calcium to Peanut Fruit-----	40
T. P. Gaines, A. S. Csinos, and M. E. Walker	
A Microcomputer Program to Aid County Agents in CBR Disease Management Decision Making-----	40
J. E. Bailey	
Cation Exchange Constants for a Gapon Model from Peanut Production Soil-----	41
F. J. Adamsen	
Peanut Nodule Mineral Content-----	41
R. K. Howell and L. P. Rose, Jr.	
Electronic Moisture Measurement of Peanuts-----	42
J. H. Young	
Effects of Microwave -- Vacuum Drying on Quality of Florunner Peanuts-----	42
J. L. Pearson, W. L. Shupe, T. H. Sanders, J. L. Butler, J. L. McMeans, and S. R. Delwiche	
Cooling a Peanut Warehouse with Aeration and/or Mechanical Ventilation-----	43
J. S. Smith, Jr., and J. I. Davidson, Jr.	
Separation and Removal of Aflatoxin Contaminated Peanuts at Peanut Cleaning and Shelling Plants-----	43
P. D. Blankenship, J. I. Davidson, Jr., T. H. Sanders, and C. T. Bennett	
Variability in Grade Determinations for Farmers' Stock Peanuts-----	44
J. W. Dickens, T. B. Whitaker, and J. I. Davidson, Jr.	
Factors Affecting Flavor and Headspace Volatiles of Cooked Peanuts-----	44
C. T. Young and R. W. Mozingo	

#### Mycotoxins

Relation of Preharvest Aflatoxin Contamination to Duration of Environmental Stress-----	45
R. J. Cole, P. D. Blankenship, T. H. Sanders, and R. A. Hill	
Colonization of Organic Matter Substrates in Soil by <i>Aspergillus flavus</i> -----	45
J. P. Stack and R. E. Pettit	
Development of Statistical Models to Simulate the Testing of Farmers' Stock Peanuts for Aflatoxin Using Visual, TLC, and Minicolumn Methods-----	46
T. B. Whitaker, J. W. Dickens, J. I. Davidson, and V. Chew	
Comparison of Methods for the Analysis of Cyclopiazonic Acid in Peanuts-----	46
J. A. Lansden	
Flavonoids and <i>A. flavus</i> Resistant Peanuts-----	47
D. J. Daigle, A. M. Nixon, A. J. DeLucca, II, and T. A. Coffelt	

Effect of Lesser Cornstalk Borer Peanut Pod Damage on Colonization by a Mutant of <u>Aspergillus parasiticus</u> -----	47
D. M. Wilson and R. E. Lynch	

## SYMPOSIA

### Irrigation Systems for Peanut Production

Irrigation Equipment, Scheduling, and Limitations of Each System-----	48
E. D. Threadgill	
The Technology for Successful Chemigation-----	49
C. C. Dowler	
Irrigation Schedules for Peanut Production-----	50
E. W. Rochester	

### Chemical, Genetic, and Engineering Aspects of Foliar Disease Management

Management of Peanut Cultivars with Genetic Resistance-----	51
F. M. Shokes, D. W. Gorbet, and R. H. Littrell	
Performance of Tilt 3.6EC in Peanut Leafspot Control-----	52
H. G. Hancock and J. D. Weete	
Management Strategies for Optimal Use of Chlorothalonil on Florunner Peanuts in the Southeast-----	52
P. A. Backman	
Effect of Fungicide Application Technique on Deposition, Disease Control and Pod Yield-----	53
R. H. Littrell and F. H. Shokes	

### Management of Nematodes in Peanuts

Population Dynamics and the Management of <u>Meloidogyne arenaria</u> in Peanuts-----	54
R. Rodriguez-Kabana	
Management of <u>Meloidogyne arenaria</u> in Peanut During the Past Ten Years-----	54
D. W. Dickson	
Nematicides for Nematode Control on Peanut-----	55
N. A. Minton	

## DISCUSSION GROUPS

### Peanut Stripe Virus

Peanut Stripe Virus Infecting U.S. Peanuts: An Overview-----	56
J. W. Demski	
Use of Cytological and Immunodiffusion Techniques to Aid Virus Identification-----	57
D. E. Purcifull, R. G. Christie, E. Hiebert, Z. Xiong, and S. R. Christie	
Plant Introductions and the Distribution of Peanut Seed-----	58
G. R. Lovell	
Peanut Stripe Virus, Infection of Peanuts, and Breeding Programs-----	59
J. C. Wynne	
Regulation of Seed Distribution as Influenced by New Diseases or Insect Pests-----	60
B. G. Lee and A. Elder	

### Extension and Industry

Peanut Disease Loss Estimates for Major Peanut Producing States in the United States for 1983-----	62
R. V. Sturgeon, Jr.	
No EDB! Now What? for Root Knot Nematode Control on Peanuts-----	65
T. A. Lee, Jr.	
New Developments from Helena Chemical Company-----	65
A. Underwood	
QUANTUM <sup>®</sup> 4000 - A New Type of Seed Treatment for Peanuts-----	66
W. G. Hairston	
Product Characteristics of Lorsban 15G in Peanut-----	66
D. B. Hale	
Actellic; An Update-----	66
C. Weed	
Harvest Plus: A High Analysis, Complete Foliar Nutritional-----	67
R. E. Woodward	
New Products for the Control of Sclerotinia Blight of Peanut-----	67
P. M. Phipps	
Standardized Systems for Nematicide Evaluation - Variable Data: Why and How?-----	68
C. H. Baldwin, J. Bailey, D. Dickson, and R. Kabana	

### SOCIETY BUSINESS

Minutes of APRES Board of Directors Meeting 17 July 1984-----	69
Minutes of the Regular Business Meeting of the American Peanut Research and Education Society-----	71
Financial Statement-----	72
President's Report-----	75
Executive Officer's Report-----	77
Program Committee Report-----	78
Finance Committee Report-----	88
Publication and Editorial Committee Report-----	90
Peanut Quality Committee Report-----	91
Site Selection Committee Report-----	92
Public Relations Committee Report-----	93
Golden Peanut Award Advisory Committee Report-----	93
Bailey Award Committee Report-----	94
Nominating Committee Report-----	95
Fellows Committee Report-----	95
Liaison Representative Between APRES and the American Society of Agronomy Report-----	97
By-Laws-----	98
Membership Roster-----	104
Author Index-----	125

## OPENING SESSION

### Importance of the Land Grant Universities in Peanut Research and Extension. Gale A. Buchanan, Alabama Agricultural Experiment Station.

Few would argue over the importance of the land grant university's research and extension programs in peanuts. In fact, most of you would probably agree that the peanut industry, as we know it today, has been made possible to a great extent by research and extension programs.

In no way do I wish to detract from the contributions of American industry, hardworking and innovative producers, and in no small measure, good soil and a favorable climate that occur throughout most of the peanut producing regions of the United States.

Many of us remember well how we produced peanuts in 1950. In fact, the average peanut producer used about the same tools in 1950 that were available at the turn of the century. This does not mean that major contributions had not been made in improved cultivars, greater knowledge of fertility and better management practices, but the real changes in peanut production have occurred since 1950.

Recall, if you will, where we were in peanut production in 1950. The great strides had been dreamed about, but not made, in pest control, particularly weeds and diseases. Harvesting was almost always dictated by the level of disease infestation late in the season. Remember, also, the cost both in dollars and human drudgery in controlling grasses and other weeds in peanuts. And harvesting - digging with the moldboard plow minus the wing, and the stationary combines.

These few examples clearly document where we were just a few years ago. Peanut yields in Alabama were below 1,000 pounds per acre in 1950 as compared to 2,450 pounds per acre in 1983. However, this was down from 2,950 pounds in 1982. Although credit for this phenomenal increase in productivity must be shared with industry, innovative producers, and others, the bottom line makes it clear that research and education programs are largely responsible for the strides we have made.

It would be nice if we could end the story on this positive note, because it is a good one with a lot of excitement and glory to share with all concerned--but there is another side to the story that must be faced. Probably never in the history of the peanut industry has the need for effective research and extension programs been greater than is true today. It is a challenge that each of us faces if we are to see peanuts remain a viable commodity in the United States. Please allow me to share with you some of my thoughts on this subject and how I visualize the role of research and extension programs of the land grant universities continuing to develop during the coming years.

There are a few relevant facts that should be recognized at the outset. First, peanuts are a high quality and highly desirable commodity. The fact that peanuts are not necessarily accepted should be thought of as potential for growth. Second, there are substitutes for many of the uses of peanuts today. Thirdly, the United States represents only about 10% of world production.

We should also recognize that someone, somewhere, is going to produce peanuts. We would like to find the key that will ensure that U.S. farmers are the ones who will be producing peanuts in the future. The peanut producing regions of this country certainly have the soils, climate, and expertise to produce peanuts effectively and efficiently enough to be competitive on the world market.

For the remainder of my presentation, I would like to discuss a few of the areas where I feel research and extension programs in land grant universities can make a difference and assure that we, in the United States, will be successful in peanut production in the future.

It is important to note that there are opportunities for important contributions from all of the traditional areas of peanut research. Consequently, I would like to simply recognize the importance of such areas as fertility and

general cultural practices, and emphasize that research in each area should be expected to produce continued technology necessary for successful peanut production in the future.

### Tillage

Much research has been conducted through the years regarding the effects of cultivation of peanuts. However, only in recent years has any research been done concerning reduced tillage as a primary production practice in peanuts, and this has been on a limited basis. Sufficient data, however, have been accumulated to indicate the potential of utilizing reduced tillage production practices for satisfactory peanut production, particularly in some areas of the southeast. The advantages of reduced tillage practices need further clarification, as do the means to achieve these advantages (i.e., slit till, row till, no till, etc.).

### Pest Management

The control of pests remains one of the major areas of additional research emphasis in peanuts. While tremendous strides have been made in recent years in effectively mitigating the effects of a number of peanut pests, the problem remains a long way from effective solution. The loss in recent years of some extremely important and effective nematocides clearly indicates that this is an area where considerable fundamental research remains to be done. The loss to other pesticides is there, too! The continued refinement of herbicides, resulting in highly effective control of certain weed species, simply points toward the need for more definitive information regarding the effects of weeds on crops. The dynamics of all pest populations--diseases, nematodes, and weeds - in relation to yield and economics of production should be evaluated for both presently used cultivars and those under development.

In order to effectively utilize available pest control technology, we must have a clear understanding of the losses caused by these pests before the implementation of control measures. Because of the losses of some practical pesticides in recent years and the continuing high cost of other pest control technology, it is imperative that we continue to look for broader based biological control measures for insects, nematodes, weeds, and diseases. Coupled with this is the need for utilization of various cultural practices which mitigate or lessen the effects of various pests without causing substantial or significant losses in yields. The possibility of developing artificial populations of natural enemies by rotation, interplanting other crops, or culture and release of predators, is another area that deserves careful consideration.

### Microcomputers

The utilization of microcomputers will continue to increase dramatically during the next decade. It is important that we begin now to develop appropriate computer programs for peanuts that will enable producers to effectively utilize all technology involved in the production of peanuts. In order for the peanut producer to effectively utilize the technology available, he must have an understanding and appreciation for computers and how they can be used in his production and marketing systems. The use of computers will be crucial in optimizing the decision-making process in the years ahead.

### Postharvest Technology

The area of postharvest technology will require considerable research emphasis during the next decade.

### Irrigation

It's ironic that the Southeastern United States, which has 50 to 60 inches of rainfall per year, still has droughts which can be devastating for all of our crops, including peanuts. In order to minimize the risks involved in producing a high value crop such as peanuts, we need further refinement in irrigation technology. New developments in various irrigation systems, coupled with basic economics, is an important area that needs further research attention.

### Economics

One of the most important considerations for peanuts, as well as for other commodities, is a clear understanding of the economic considerations of all aspects of production. If peanuts are to remain a viable crop, we need further input-output analyses of all production aspects of this crop.

### Genetics and Breeding

We must have renewed effort in the traditional area of genetics and breeding of peanuts. In addition, we must not overlook the potential for contributions from the growing field of molecular genetics.

### Summary

In order for the U.S. peanut farmer to make a reasonable profit, he must grow a minimum of 1.5 tons per acre--three times the minimum requirement in the developing world. As these developing countries (many of whom are represented here) continue their technological advances, however, they will provide more peanuts to the world market and force the U.S. farmer to further improve his efficiency through increased yield or reduced costs.

Only through unparalleled efficiency can the U.S. producer compete as the developing world closes the present gap. Such improved efficiencies will come only as the products of careful research covering the spectrum of peanut science. It is our challenge to provide that research.

## PLANT PATHOLOGY - NEMATOLOGY

Population Dynamics of *Meloidogyne arenaria* in a Peanut Field. R. Rodriguez-Kabana, A. K. Culbreath, and D. G. Robertson, Department of Botany, Plant Pathology, and Microbiology, Agricultural Experiment Station, Auburn University, AL 36849.

The development of larval populations of *Meloidogyne arenaria* (Neal) Chitwood in soil was studied for 2 years in a peanut (*Arachis hypogaea* L) field near Headland, Alabama. The field had been with peanut for the preceeding 5 years and was planted every fall with hairy vetch (*Vicia villosa* Roth) to serve as cover crop and maintain populations of the nematode. Soil samples for nematode analysis were collected every 15-20 days during the entire peanut season every year. At each sampling a total of 24 plots were sampled. The plots were 2-row (each 0.9 M wide) x 10 M, and were planted with Florunner peanuts. Samples from each plot consisted of 16-20, 2.5-cm-diam soil cores taken from the root zone along the center of each plot. The cores were composited and a 100 cm<sup>3</sup> subsample was used to determine the number of larvae using the "salad bowl" incubation method. Analysis of the data indicated that larval populations of *M. arenaria* in soil developed according to the logistic equation model. Larval populations at planting time were <10 larvae/100 cm<sup>3</sup> soil each year; the populations developed quickly attaining 50% of the theoretical maximal population for the field within 100 days after planting when the rate of population development stopped increasing.

Combinations of 1,3-D and Aldicarb for Control of *Meloidogyne arenaria* in Peanut. C. F. Weaver, R. Rodriguez-Kabana, and P. S. King, Department of Botany, Plant Pathology, and Microbiology, Alabama Agricultural Experiment Station, Auburn University, AL 36849.

The efficacy of planting time applications of the fumigant 1,3-dichloropropenes (1,3-D) and the systemic nematicide aldicarb (Temik® 15G) for control of *Meloidogyne arenaria* (Neal) Chitwood in Florunner peanut (*Arachis hypogaea* L) was studied in a field near Headland, Alabama. Aldicarb was applied at 1.1 and 2.2 Kg a.i./ha in a 20 cm band with the seed furrow in the middle; 1,3-D was injected as Telone® II to a depth of 25 cm at rates of 18.7, 37.4, and 56 L/ha using 2 injectors/row set 25 cm apart with the seed furrow in the middle between the injectors. All possible combination treatments with the 2 nematicides at the rates described were also studied. All treatments reduced soil larval populations of the nematode determined 4 weeks prior to harvest. All treatments but one (1,3-D at 18.7 L/ha) resulted in increased yields. Factorial analysis of the yield data revealed no significant interaction between the effects of 1,3-D and the effects of aldicarb on the variable. The effects of aldicarb on yield when considered independently of the effects of 1,3-D were significant; maximal yield response to aldicarb was obtained by the use of the 1.1 Kg a.i./ha rate and no significant additional response was obtained with the 2.2 Kg a.i./ha rate. Maximal yield response to applications of 1,3-D was obtained with either of the 2 highest dosages; there were no significant differences between the 37.4 and the 56 L/ha rate. Results suggest that the effects of 1,3-D and aldicarb treatments on yield were additive.



Corn and Sorghum as Rotational Crops for Control of Meloidogyne arenaria in Peanuts. P. S. King, R. Rodriguez-Kabana, and J. T. Touchton, Departments of Botany, Plant Pathology, and Microbiology, and Agronomy, Agricultural Experiment Station, Auburn University, AL 36849.

The value of corn (Zea mays L.) and sorghum (Sorghum bicolor (L) Moench) as rotational crops for control of Meloidogyne arenaria (Neal) Chitwood in peanut (Arachis hypogaea L.) was studied in two 3-year experiments conducted in a field near Headland, AL. The experiments compared several rotational schemes with the performance of continuous peanuts; plant applications of ethylene dibromide (EDB) were included in some of the schemes to determine the value of nematicide use in the rotations. Corn and sorghum reduced larval populations in soil; however, the populations recovered quickly when peanuts followed either of the 2 other crops. The use of EDB to control M. arenaria in a continuous peanut situation was not reliable; yield differences between fumigated and unfumigated plots under continuous peanut culture while significant during the first year were not so after 3 years. Highest peanut yields were obtained from plots which had been with corn or sorghum in the preceeding 2 years and which had been fumigated every year. Results showed that reliance on corn or sorghum as the sole means for controlling M. arenaria in peanut fields cannot be economically justified.

Occurrence of Peanut Pod Rot In Oklahoma And Phytopathogenic Fungi And Nematodes Isolated From Diseased Plants. A. B. Filonow\* and M. W. Andrews, Department of Plant Pathology, Oklahoma State University, Stillwater, OK 74078.

A pod rot survey of 37 peanut fields was done from early September to mid October, 1983. Thirty plants per acre and 2-8 acres per field were sampled. Sixteen fields (43%) had pod rot as diagnosed by symptoms and isolation of pathogens from diseased pods. Pod rot was found on cv. 'Comet', Starr', 'Pronto', 'Spanco' and 'Florunner'. Pythium myriotylum, Rhizoctonia solani AG4, Fusarium solani and Sclerotium rolfsii were isolated from diseased pods in 43%, 19%, 30% and 54% of the 37 fields. Soil populations were 1,000-27,000 propagules(p)/g soil for F. solani; none detected (ND)-5,500 p/g for P. myriotylum; ND-34.0/100 g soil for S. rolfsii and ND-16.9 p/100 g for R. solani AG4. Two or more of these fungi were isolated from diseased pods in 78% of the fields. All isolates of P. myriotylum and R. solani AG4 and 9 of 11 isolates of F. solani were pathogenic to seedlings of cv. 'Tammur 74'. Twenty-two of the fields had southern blight, and all fields with pod rot also had southern blight. Pratylenchus spp., Meloidogyne spp. and Criconebella spp. were found in 42%, 42% and 16% of the fields, respectively. Root populations of species of Pratylenchus and Meloidogyne were ND-62/g root and ND-207/g, respectively. Seventy-eight percent of the fields with nematodes also had rotted pods with one or more fungal pathogens.

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Evaluation of chlorpyrifos and the break down product 3,5,6-trichloro-2-pyridinol for *Sclerotium rolfsii* control. A. S. Csinos, Plant Pathology Department, Coastal Plain Station, Tifton, GA 31793.

Chlorpyrifos technical, 4EC and 15G and the break down product 3,5,6-trichloro-2-pyridinol (Pyridinol) were evaluated in vitro for activity in reducing radial growth sclerotial inhibition of *Sclerotium rolfsii*. Ten cm diameter petri plates containing water agar amended with 0.5, 1, 2, 5, 10, 25 and 100 µg/ml of chlorpyrifos technical, 4EC, 15G and pyridinol were inoculated with either a single infested rye seed or with 10 sclerotia and incubated for 72 hrs at 27 C in an unlighted incubator. Pyridinol, chlorpyrifos 4EC, chlorpyrifos 15G and chlorpyrifos technical reduced radial growth in descending order of activity. Pyridinol was as active as PCNB (the standard) at  $\geq 10$  µg/ml. Sclerotial germination and formation was inhibited by chlorpyrifos (technical) and chlorpyrifos 15G at  $\geq 25$  µg/ml, chlorpyrifos 4EC at  $\geq 10$  µg/ml, and pyridinol at  $\geq 1$  µg/ml. Chlorpyrifos may suppress growth of *S. rolfsii* and reduce germination of sclerotia when applied as an insecticide on peanuts in vivo.

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White Mold Suppression On Peanuts With Lorsban 15G. A. K. Hagan and J. R. Weeks. Alabama Cooperative Extension Service, Auburn University, AL 36849.

Efficacy of Lorsban 15G, Terraclor 10G, and combination of Lorsban 15G + Terraclor 10G for white mold suppression was evaluated at 11 locations in a 6 county area over a 2 year period. Two row plots, 27.4 m long, were arranged in a randomized complete block design with a minimum of 4 replications. Terraclor 10G (112 kg/ha), Lorsban 15G (14.6 kg/ha), and Lorsban 15G (14.6 kg/ha) + Terraclor 10G (112 kg/ha) were applied on an 45.7 cm band at mid to late pegging. Lorsban 15G and Terraclor 10G were applied individually to plots treated with both materials. Disease ratings were made after the peanuts were inverted. Plots were harvested with a field combine and yields were calculated at 10% moisture. Across all locations in 1982 and 1983, significantly fewer white mold hits were recorded in the treated plots than the controls. Lorsban 15G was as effective as Terraclor 10G in suppressing white mold on peanuts. No significant differences in disease development or yield response were observed between these treatments in either year. The Lorsban 15G + Terraclor 10G combination provided better disease suppression than either Lorsban 15G or Terraclor 10G alone in 1983 but not 1982. Yield response to the combination treatment was superior to Lorsban 15G or Terraclor 10G both years. White mold activity was not uniform across all locations. Little or no yield response to any treatments was noted at locations where disease activity was low.

Practical Implications of Resistance to Dicarboximide Fungicides in Sclerotinia minor From Peanuts. T. B. Breneman\*, P. M. Phipps, and R. J. Stipes, Tidewater Research Center, VPI&SU, Suffolk, VA 23437.

In vitro studies with Sclerotinia minor on media amended with iprodione (I) and vinclozolin (V) demonstrated a 1.8% mutation rate for fungicide resistance. Resistant strains grew at fungicide concentrations up to 100 µg/ml, and were cross-resistant to both I and V as well as dicloran (D) and PCNB. On non-amended media, some fungicide-resistant strains grew slower than sensitive strains, but produced more sclerotia. Additional tests indicated that some resistant strains were more sensitive to osmotic stress. Both fungicide-sensitive and -resistant strains were pathogenic to Florigiant peanut and produced similar levels of disease in field microplots. Three applications of V (0.84 kg/ha) effectively controlled disease caused by either sensitive or resistant strains. Similar treatments with I (1.12 kg/ha) and D (2.8 kg/ha) provided only partial control. Disease severity at harvest was suppressed 13, 20 and 84% by D, I and V, respectively. Isolates of S. minor from microplots infested with fungicide-resistant strains still exhibited in vitro resistance at harvest, whereas sensitive strains remained sensitive. Additional microplots infested with equal numbers of sclerotia from sensitive and resistant strains showed resistant variants to be somewhat less competitive. These data indicate that in vitro dicarboximide resistance may not be correlated with in vivo resistance; the latter has not been detected in surveys wherein 622 isolates were evaluated from naturally-infested field plots treated with either D, I or V.

Comparisons of Hollow Cone and Flat Fan Spray Nozzles for Peanut Leafspot Control. Tom Kucharek and Richard Cullen, Plant Pathology Dept., University of Florida, Gainesville, FL 32611.

Field tests in 1982 and 1983 were conducted to determine if peanut leaf spot control would differ when the fungicide, chlorothalonil, was delivered through hollow cone (HC) or flat fan (FF) nozzles (N) on a horizontal spray boom. In 1982, D2-25 and D4-13 HCN were compared to 8002 and 8003 FPN. In 1983, D2-25 HCN were compared to 8003 FPN. In both tests the Florunner peanut cultivar was planted and spray was delivered at 2109 g/cm<sup>2</sup> in 374 l/ha of water via three nozzles/row, the outer two being on swivels to adjust for canopy growth. All nozzle treatments were tested at the highest and half of the highest labeled rate of chlorothalonil/hectare. No discernible or statistical differences occurred in leafspot numbers or associated defoliation between nozzle treatments where the fungicide was applied at the same rate. All assessments at any one time on leafspot numbers and defoliation counts were least at the high fungicide rate, but statistical differences between assessments did not always exist between equivalent or non-equivalent nozzle treatments at different fungicide rates. That adequate disease severity existed in both tests is indicated by the 93% and 95% defoliation assessments within the unsprayed treatments at 107 and 137 days after planting in the 1982 and 1983 tests, respectively. Peanut yields, measured in the 1983 test, did not differ statistically ( $P = .05$  or  $.01$ ) between nozzle treatments regardless of fungicide rate but all sprayed treatments were significantly different ( $P = .01$ ) from the unsprayed treatment.

An Assessment Method For Evaluating Foliar Fungicides For Control Of Leaf Spot Of Peanut. K. E. Jackson\* and H. A. Melouk. Department of Plant Pathology and USDA -ARS, Oklahoma State University, Stillwater, OK 74078.

Ten fungicides were evaluated for control of Cercospora arachidicola on cv. 'Pronto'. Peanuts were planted in late May, 1983 at Stillwater and Perkins, OK. Plots were 3.65 X 9.15 m with rows spaced at 0.91 m. Treatments were replicated four times in a completely randomized block design. Plots were kept continually moist by sprinkle irrigation. Fungicide application began July 6 and continued on a 14-day interval until September 29. One week following the last application, leaf spot was rated for amount of leaf necrosis, leaf defoliation and sporulation. A leaf spot reaction index (LSRI) was calculated by multiplying the leaf spot index by the sporulation index as described by Melouk et al. (Plant Disease: 1984, in press). Data were analyzed using nonparametric statistical methods. The magnitude of the LSRI reflected the efficacy of a fungicide treatment. For example, KWG 1608 (Mobay) and chlorothalonil both had a similar leaf spot index, but KWG 1608 had a lower LSRI than chlorothalonil because of a lower sporulation index. The LSRI is useful in two ways, separating the performance of different fungicides or various rates of the same fungicide, which appeared similar in efficacy by the leaf spot index alone, and the efficacy of the fungicides on degree of sporulation.

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Parasitic Fitness Parameters of Benomyl-Resistant and Sensitive Isolates of Cercospora Arachidicola on Peanut cv. 'Tannut 74'. H. A. Melouk\* and D. H. Smith. USDA-ARS, Dept. of Plant Pathology, Oklahoma State University, Stillwater, OK 74078, and Texas A & M Univ., Yoakum, TX 77995.

Parasitic fitness parameters of three benomyl-resistant and five benomyl-sensitive isolates of Cercospora arachidicola, the causal agent of early leaf spot, were determined on peanut cv. 'Tannut 74'. Fitness parameters measured were: disease efficiency (the number of lesions resulting from a given amount of inoculum), sporulation capacity (number of conidia produced per mm<sup>2</sup> of diseased tissue), sporulation (number of conidia produced on an infected leaflet) and virulence (the relative ability to produce a given amount of necrosis). Shoots of cv. 'Tannut 74' were inoculated with the isolates of C. arachidicola, and fitness parameters were determined as previously described (Phytopathology 73: 556-558). Significant differences (P=0.01) among isolates occurred in the measured fitness parameters; however, there was no relation between sensitivity or resistance to benomyl and parasitic fitness of isolates. Therefore, benomyl resistant isolates of C. arachidicola do not appear to pose a threat in inducing more destructive leaf spot on peanut than benomyl-sensitive isolates.

Resistance to Early Leafspot in Peanuts. P. Subrahmanyam\*, ICRISAT, Patancheru, Andhra Pradesh 502324, India; S.N. Nigam, ICRISAT Regional Groundnut Program for Southern Africa, P. Ngwira and A.J. Chiyembekeza, Chitedze Agricultural Research Station, Lilongwe, Malawi.

Early leafspot caused by Cercospora arachidicola Hori. is a serious disease of peanuts in Malawi. Disease surveys in the 1982/83 crop season showed that early leafspot was causing severe damage to peanuts throughout Malawi and was especially severe in the Central region where the bulk of the crop is grown. Preliminary field screening of 1975 germplasm and breeding lines for resistance to this disease was carried out at Chitedze Agricultural Research Station, Lilongwe, using the 9-point disease scale (1 = no disease, and 9 = extensive damage to the foliage). Most entries showed extensive defoliation (70-100%) due to early leafspot. However, some entries had little defoliation [(TG3 x NC Ac 17090) F2-B2-B1-B2-B1-B1], low infection frequency [(NC Ac 17133-RF x TMV2) F2-B-B1], and small lesions with poor sporulation (ICG 5216, ICG 8528 and ICG 8529). None of the entries combined all these factors for resistance. It is interesting that the genotypes NC 3033, P1 270806, P1 259747 and P1 350680 reported resistant to early leafspot in the USA were susceptible to this disease in Malawi.

Factors Influencing Yield Responses of Peanuts Following Seed Treatment with *Bacillus subtilis*. \*John T. Turner and P. A. Backman, Dept. of Botany, Plant Pathology and Microbiology, Alabama Agr. Exp. Sta., Auburn University, AL 36849.

Bacterization of peanut roots by *Bacillus subtilis* has been shown to increase seed germination and often to produce more vigorous plants, resulting in increased yields. In 1983, studies were undertaken to more precisely identify those fields that would benefit from this biological seed treatment. Twenty-four randomly selected fields were planted with seeds which received standard fungicide treatments and seeds treated with fungicides plus the bacterium (ABG-4000®). In fourteen fields yield increases of more than 5% were recorded, while four locations resulted in yield increases in excess of 15% due to the bacterial treatment. Average yield increase for all fields was 8.5%. Field histories were examined to determine what common characteristics existed among responsive and nonresponsive locations. Crop rotation and planting date emerged as two factors determining the level of yield response. The sites which benefited most from the bacterial treatment were those which were planted early (prior to May 10) and had legumes as a crop in either or both of the previous 2 years.

## PRODUCTION TECHNOLOGY - PEST MANAGEMENT

Peanut Production at Various Management Levels. D. T. Gooden, C. E. Drye and J. W. Chapin. Edisto Expt. Stn. Clemson Univ., Blackville, SC 29817

Tests were conducted during 1982 comparing peanut production at two management levels and in 1983 three levels of management were compared. Management levels included; 1) all production practices and 2) extension recommended management in 1982. In 1983 a third level was added, 3) limited input. Extension recommended management required the greatest level of management and included traditional extention tools such as soil sampling, nematode sampling, weed mapping, insect scouting, leafspot monitoring and other proven techniques. Yields and grade were similar when recommended management was compared to using all known production techniques. Recommended production management resulted in lower variable cost and greater net returns than with all practice management. When management was reduced to a level that omitted certain critical steps, yield, quality and net profits were less than acceptable.

Determination of Growth Period Required for a Full-Season Runner to Exceed a Short-Season Spanish Peanut in Yield, Value and Seed Quality.  
A. C. Mixon\*, USDA-ARS, and Wm. D. Branch, University of Georgia, Coastal Plain Experiment Station, Tifton, Ga. 31793.

In a 3-year study (1980-1982) at the Georgia Coastal Plain Experiment Station, Tifton, Georgia, the full-season Florunner and the short-season Pronto cultivars were harvested over six growth periods at 10-day intervals beginning 90 days after planting. Florunner peanut plants harvested at the 110-day and each succeeding 10-day growth period up to 140 days in this study produced greater yields of pods, greater percentage of sound-mature seed, and greater calculated market value than the Pronto cultivar. This advantage of Florunner in yield and value was more pronounced in the peanuts harvested at the 120 to 140 days after planting, especially in 1981 and 1982.

Peanut Pest Management in South Texas. P.F. Lummus and C.T. Gasch, Texas Agricultural Extension Service, Pearsall, TX 78061.

An integrated pest management program was initiated in South Texas in 1983. This program is a cooperative effort between the Texas Peanut Producers Board, the Texas Agricultural Extension Service, and the Texas Pest Management Association. Infrared scanning, weather monitoring for prediction of foliar disease infection, light traps and pheromone traps were employed in conjunction with intensive field scouting to monitor pest populations on more than 3000 acres of South Texas peanuts. Primary pest problems encountered in 1983 included late leafspot, peanut rust, southern blight and burrowing bugs. An economic evaluation of the program indicated that pesticide costs of participating farmers were ca \$7/acre less than those of non-participants. Net yields of participants were substantially higher than those of non-participants for irrigated runner peanuts and Spanish peanuts.

Application of Current Technology to Achieve Maximum Profits in Peanut Production. A. H. Allison\*, P. M. Phipps, O. E. Rud, J. C. Smith, Tidewater Res. Ctr., VPI&SU, Suffolk, and G. G. Gallimore, VPI&SU, Emporia, VA.

The current conventional management program for peanut production in Virginia was compared to prescription management programs for diseases, weeds, insects, agronomic factors, and a combined or total prescription management program at various locations from 1980 to 1982. Plots were 8 rows wide (7.3 m) by 12.2 m long, arranged in a complete randomized block design, and replicated five times in 1980 and four times in 1981 and 1982. Florigiant peanuts were planted ca May 15 and harvested ca October 10 each year. Historical records of crop production, and soil fertility and nematode assay reports were used to make prescription management decisions prior to planting. Subsequent decisions were made on the basis of weekly scouting trips for early detection of potential problems and/or pests. Over the three years of testing, the prescription management program averaged \$418/ha less than the conventional in total variable cost inputs, and increased net profit by an average of \$306/ha. Although quality of yield was not affected, the prescription management programs tended to produce yields that were slightly lower than yields achieved by a conventional management program.

Irrigation And Tillage Effects On Peanut Yields In Virginia. F. S. Wright, D. M. Porter, USDA, ARS, Tidewater Research Center, Suffolk, VA 23437; N. L. Powell and B. B. Ross, Virginia Polytechnic Institute and State University, Blacksburg, VA 24061.

The effects of irrigation, underrow ripping, and four seedbed preparation methods on peanuts yields was determined over a 4-year period. Florigiant peanuts were grown on a Norfolk loamy fine sand using recommended practices for control of insects, weeds and diseases. Irrigation significantly increased yields in one of the four years. Yield reductions in irrigated peanuts were attributed primarily to greater disease pressures. Underrow ripping versus no ripping had no significant affect on peanut yield. Yields were not affected by seedbed types, (a- flat, b- rotary tiller with bed shaper, c- disk bed, and d- rolling cultivator) with or without irrigation. Irrigated peanuts were prone to attack by both soilborne and foliar pathogens. A several-fold increase in the severity of Sclerotinia blight (Sclerotinia minor), pod rot (Pythium myriotylum) and leafspots (Cercospora arachidicola and Cercosporidium personatum) was noted in irrigated peanuts.

Response of Three Peanut Cultivars to Different Rates of Gypsum.  
G. A. Sullivan\* and W. Ismail. Department of Crop Science, North Carolina State University, Raleigh, N.C. 27695-7620.

Three virginia type cultivars, NC 6, NC 7, and Florigiant, were each treated with 0,200,400 or 800 pounds per acre of gypsum at four locations during the 1983 crop year. A split-plot design with cultivars as the main plots was used at each location. All cultivars treated with gypsum had higher percentages of SMK's, total kernels, fancy pods and ELK's. Pod yields were higher for the gypsum treated plots at two locations. A location by rate of gypsum interaction existed for several dependent variables. The interaction is attributed to differing rainfall patterns. Analysis of soil (post-gypsum application) indicated soil pH was lower than the control in the gypsum treated plots. Tissue analysis (post-gypsum application) did not indicate any differences in element content attributable to gypsum applications. Calcium levels in both hulls and kernels were higher for the treated plots than for the controls.



Response of Florunner Peanuts to Gypsum (Landplaster). J. I. Davidson, Jr., USDA, ARS, National Peanut Research Laboratory, Dawson, Georgia, R. J. Henning, University of Georgia Cooperative Extension Service, Tifton, Georgia, P. D. Blankenship, T. H. Sanders, R. J. Cole, R. A. Hill, USDA, ARS, National Peanut Research Laboratory, Dawson, Georgia, and W. R. Guerke, Georgia Seed Test Laboratory, Atlanta, Georgia.

Although extensive research has been conducted to show the need for calcium in the pod zone during fruiting, there remains considerable differences in recommendations for applying supplemental calcium (gypsum). Most recommendations are based upon a minimum level of calcium in the soil at pegging. However, a three year study at the National Peanut Research Laboratory indicated that new strategies are needed for recommending gypsum. In addition to calcium levels, such strategies should consider soil type, calcium to potassium ratio, soil pH, and pod disease pressure. Overall application of gypsum provided only a 16 Kg/ha and a 0.4 percentage point increase in yield and grade respectively. However, application of gypsum when calcium to potassium ratio was less than 4.4 resulted in a 160 Kg/ha and 1.2 percentage point increase in yield and grade respectively. On sandy type soils (Americus, Norfolk and Red Bay) gypsum decreased yields and grades 118 Kg/ha and 0.3 percentage points respectively. Also on Greenville soils with pH greater than 5.8 gypsum decreased yields by approximately 180 Kg/ha. On Tifton soils, applications of gypsum increased yields and grades by 157 Kg/ha and 0.8 percentage points respectively. On Greenville soils with pH less than 5.8, applications of gypsum increased yields by approximately 252 Kg/ha. Increase in yield and grade from applying gypsum on Tifton soils with high pH appeared to be related to reduced disease pressure.

Evaluation of Fenitrothion as a Protectant for Stored Farmers Stock Peanuts. Leonard M. Redlinger\* and R. A. Simonaitis, USDA-ARS, Stored-Product Insects Research and Development Laboratory, Savannah, GA 31403

Tests were conducted for the evaluation of fenitrothion at dosages of 10, 20, 30 and 40 ppm as a protectant for stored farmers stock peanuts. Untreated peanuts and peanuts treated with malathion at 52 ppm were used as standards for comparison. All treatments were replicated five times, stored in small bins, and exposed to insect pressure under warehouse conditions for a 1-year storage period. The peanuts were sampled at selected intervals to determine biological efficacy, insect damage and insecticidal residue degradation. Fenitrothion was more effective at all applied dosages than the standard malathion treatment, but only the 30 and 40 ppm rates provided satisfactory protection. Chemical analysis of treated peanuts showed degradation of fenitrothion and malathion were similar with a mean loss of 83 and 85% respectively after 1-year's storage.

Evaluating Pest Management Programs Using Telephone Survey. J. C. French and J. R. Weeks, Cooperative Extension Service, Auburn University, AL 36849 and Wiregrass Experiment Station, Headland, AL 36345

The Alabama peanut pest management program was evaluated for 1983 using a telephone survey. The preparation and administration of the questionnaire will be discussed. Problems encountered using this method will also be covered.

Results of 1984 LPM Peanut Survey in Alabama. J. R. Weeks and J. C. French, Alabama Cooperative Extension Service, Wiregrass Experiment Station, Headland, AL 36345 and Auburn University, AL 36849

A telephone survey was conducted during fall and winter (1983/1984) to obtain base-line data from Alabama peanut growers.

Results from the 135 respondents were evaluated to determine the level of adoption of certain LPM practices. Each factor was weighted as to its importance to LPM.

The results indicated 61% adoption of extension recommended practices. This survey will allow extension LPM programs to target the areas of greatest need.

Yield Evaluation of Herbicide Tolerant Peanut Genotypes. M. S. Riffle, D. H. Teem, B. J. Brecke, and D. W. Gorbet, Agronomy Department, University of Florida, Gainesville, Florida 32611.

During 1982 and 1983, over 160 peanut (*Arachis hypogaea* L.) genotypes were visually evaluated for tolerance to ten broadleaf herbicides not currently used on peanuts. From these, six genotypes including 'Florunner' were chosen for a yield evaluation using four herbicides. The six genotypes included five runner-type peanuts (pods) and one Virginia-type peanut. Herbicide treatments were: cyanazine applied preemergence at 1.68 and 2.52 kg/ha, prometryn applied preemergence at 2.24 and 4.48 kg/ha, and two postemergence applications of 2,4-D at 0.84 kg/ha. Alachlor plus naptalam plus dinoseb (3.4 + 3.4 + 1.7 kg/ha) applied at cracking followed by dinoseb (0.8 kg/ha) applied postemergence was included as a standard treatment. All genotypes exhibited tolerance to cyanazine at the low rate, however, yields were reduced at the high rate. The genotypes exhibited tolerance to both rates of prometryn, although Florunner's yield decreased significantly when the rate of prometryn was increased. Yield of all genotypes was reduced by 2,4-D, however, yield of Florunner was significantly higher than the other genotypes.

Twin Rows as a Supplement to Yield and Weed Control in Peanuts.

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Alabama Ag. Exp. Stn., Auburn Univ., AL 36849.

Weed control requirements and yields were evaluated for peanuts (*Arachis hypogaea* L. 'Florunner') arranged in twin 18-cm rows and conventionally spaced 91-cm rows on a Dothan sandy loam (Plinthic Paleudult) at Headland, Alabama from 1981 to 1983. Twin rows enhanced peanut yields as well as suppressed weeds as evident by grass and broadleaf weed weights obtained prior to harvest. The ability of twin rows to significantly suppress grasses was only evident in the untreated checks where grass infestation was unacceptably high. Suppression of broadleaves was sporadic. While the twin row pattern enhanced yield, only in a few isolated incidences were optimum peanut yields achieved concomitant with a significant suppression of broadleaf weeds. Results indicate that twin rows enhance yields, and aid in weed control, but will not serve as a herbicide replacement.

Effects of Row Patterns and Weed Control Systems on Peanut Yield, Weed Control, and Net Returns. D.L. Colvin, Agronomy Dept., University of Florida, Gainesville, FL. 32611. R.H. Walker, M.G. Patterson, Agronomy Dept., Auburn University, Auburn, AL. 36849 and J.A. McGuire, Research Data Analysis, Auburn University, Auburn, AL. 36849.

Field experiments were conducted from 1981 through 1983 on a Dothan sandy loam (Plinthic Paleudult) at Headland, Alabama to investigate the effects of row patterns and weed control systems on peanut yield, weed control and net returns to land and management. Experimental variables included three row patterns: (i) conventional 91-cm rows, (ii) twin 18-cm rows, and (iii) triple twin 18-cm rows, and six weed control systems, ranging from no weed control to varying herbicide and mechanical inputs. A constant seeding rate (128 kg/ha) was used regardless of row pattern. Results generally showed that weed control was affected somewhat by row patterns with broadleaf weeds being more responsive to row pattern manipulation than grass weeds. Fresh weed weights were generally lower as row patterns narrowed from conventional 91-cm spacing, however, exceptions did occur. Highest yields and net returns were obtained when peanuts were planted in the twin 18-cm rows and weed control included benefin applied preplant incorporated, plus alachlor applied preemergence, plus two timely cultivations.

## PHYSIOLOGY, SEED TECHNOLOGY, PROCESSING AND UTILIZATION

Effect of Kylar on Fatty Acid Composition of Seed of Five Peanut Cultivars. R. W. Mozingo and J. L. Steele, VPI & SU and USDA-ARS, Tidewater Research and Continuing Education Center, Suffolk, VA 23437.

The effect of Kylar (succinic acid 2, 2-dimethylhydrazide), a plant growth regulator, on the fatty acid composition of seed of the peanut (*Arachis hypogaea* L.) cultivars Florigiant, NC 6, NC 7, VA 81B and NC 8C was determined in Martin County, NC and Suffolk, VA in 1981 and 1982. Seed from treated and untreated peanut plots at each location were evaluated for fatty acid composition, iodine value and oleic/linoleic (O/L) ratio. Duplicate laboratory analyses by gas chromatography of three pooled field replicates from 1981 demonstrated that Kylar applied to the foliage reduced the iodine value and increased the O/L ratio for Florigiant, NC 7 and NC 8C. Each of the three field replicates in 1982 was analyzed in duplicate and an analysis of variance performed. Significantly lower linoleic acid contents and iodine values were shown for all cultivars except VA 81B. Likewise, significant increases in the O/L ratio were recorded for Florigiant, NC 7 and NC 8C but significant changes were not noted in NC 6 and VA 81B. The greatest alterations in fatty acid composition occurred with NC 7. Palmitic, linoleic, eicosenoic, behenic, and lignoceric content significantly decreased while oleic content significantly increased with Kylar application. Thus, from the results of this two year study, the application of Kylar to reduce foliage growth also affected the fatty acid composition of seed from several peanut cultivars.

Changes in the Polypeptide Composition of the Peanut (*Arachis hypogaea* L.) Seed During Roasting. Sheikh M. Basha\* and Clyde T. Young, Peanut Research Laboratory, Div. of Agricultural Sciences, Florida A&M University, Tallahassee, FL 32307 and Dept. of Food Science, North Carolina State University, Raleigh, NC 27650.

It has been postulated that the free amino acids which serve as roasted peanut flavor precursors are released during roasting following the hydrolysis of an unknown polypeptide. This study was initiated to identify and characterize the polypeptide involved in roasted flavor. Peanut seeds of CV. Florigiant were roasted in pure peanut oil at 147 C for 0 to 13 min. The samples are drained, cooled, blanched and ground into a meal. The meals were defatted with diethyl ether and protein was extracted (100 mg) with 3 ml of 9.3 M urea, 5 mM  $K_2CO_3$ , 0.5% DTT, and 2% nonidet P-40. The protein extract was then resolved by two-dimensional polyacrylamide gel electrophoresis. The results showed no significant changes in the major polypeptide (arachin) content during the first 4 min of roasting. After 4 min there was a gradual decrease in the content of a high molecular weight (70,000) polypeptide. Unlike the major polypeptides there was a dramatic decrease in the content of four low molecular weight (between 16,000 and 20,000) polypeptides between 0 to 4 min roasting period. By 4 min of roasting these polypeptides had completely disappeared. Based on the initial studies it appears that these polypeptides may be involved in development of the roasted flavor. Additional studies are in progress including a spanish, runner and virginia market-type peanuts and shorter roasting periods.

Trypsin Inhibitors in Peanut Seed Protein. E. M. Ahmed and K. Bieshiada, University of Florida, Gainesville, Florida 32611, and M. B. Shaik, Florida A&M University, Tallahassee, Florida 32307.

Peanut proteins were extracted with 0.02 M HCl, precipitated with 70% ammonium sulfate and freeze-dried. The lyophilate was chromatographed on DEAE-cellulose (14x1.5 cm), with 0.01 M phosphate buffer (pH 7.6) as the eluant. Monitoring was accomplished by both the Lowry method for total protein and the test for anti-tryptic activity developed by Kakade, et al. (1974).

Three fractions which inhibited trypsin were collected. Respectively, these cuts inhibited  $0.73 \pm .09$ ,  $0.45 \pm .07$  and  $1.02 \pm .23$  mg of trypsin per mg of total protein. The first two fractions also exhibited the ability to retard the action of  $\alpha$ -chymotrypsin. Their respective strengths were about 0.12 and 0.14 mg of chymotrypsin inhibited per mg of total protein.

Response of Two Commercial Cultivars of Peanuts to Hot Water Treatment and Accelerated Storage. A. L. Branch, R. E. Worthington, M. S. Chhinnan, T. O. M. Nakayama, GA Agric. Expt. Station, Dept. of Food Science, Experiment, GA 30212.

An 8 month peanut storage study was conducted using Virginia type NC-7 and Fla Early Bunch cultivars both low and high in linoleic acid, respectively. The objective was to determine if hot water blanching of peanuts before storage would enhance non-refrigerated storage stability. Both treated and untreated peanuts were stored at various conditions of 23°C, 55% RH; 27°C, 45% RH; 36°C, 65% RH. Unblanched kernels were stored at recommended conditions (2°C, 65% RH), and served as controls for the investigation.

The NC-7 peanuts appeared to be more stable in storage than the Fla Early Bunch peanuts as measured by lower peroxide and free fatty acid values. Rancid aromas were observed in all unblanched raw peanuts of the Fla Early Bunch cultivar. Lipoxygenase activity was found to be greatly reduced by the hot water treatment. Organoleptic evaluation data showed that blanching did not seriously alter sensory characteristics of the treated nuts. Hot water blanching appeared to improve stability of the stored peanuts. Varietal differences showed that oil unsaturation content influences storage stability.

A Determination of the Relative Storage Life of Raw Peanuts. N. V. Lovegren\*, and F. W. Parrish, USDA, ARS, Southern Regional Research Center, P. O. Box 19687, New Orleans, LA 70179 and R. O. Hammons, USDA, ARS, Georgia Coastal Plain Experiment Station, Tifton, GA 31793.

Determination of the volatile profile by direct gas chromatography can be used to indicate relative storage life. Peanuts stored at room temperature in the shell will keep for a long time (months) and still be acceptable. The major changes in the peanut volatile profiles with time, after about one year at 70 to 75°F, are the increase in hexanal, hexanol and some other mould area peaks. These mould area peaks are from N-methyl pyrrole to just beyond nonanol. Most of the compounds in this area of the volatile profile are involved with lipid oxidation reactions. By increasing the test storage condition to the maximum temperature that might be in normal farm storage, i.e. 104°F, and accelerated storage test can be run in about two months by examining the rates at which the lipid oxidation compounds are produced. The SRRC volatile profile procedure is an ideal method of determining the amount of lipid oxidation volatile products in raw peanut samples.

Rapid Colormetric Test for Ethanol-Related Off-Flavors in Peanuts. H. E. Pattee, USDA-ARS, Botany Department, North Carolina State University, Raleigh, NC 27596-7625.

The acidic potassium dichromate-silver nitrate reagent has been evaluated as a rapid colormetric test for alcohol and aldehydes levels in peanuts. Increased levels of alcohols and aldehydes have previously been related to off-flavor in peanuts. The acidic potassium dichromate-silver nitrate colormetric test was found to give a linear response for peanut samples which had been spiked with known ethanol concentrations between 10 and 100 nL/g. A 200g peanut sample can be assayed in seven minutes, thus the method is rapid enough to be applicable to large numbers of samples such as would be analyzed at a peanut buying station. Forty-four samples from commercial lots of peanuts were analyzed and 20 samples were determined to have detectable levels of alcohol. Odor response analysis and subsequent statistical analysis showed a curvilinear relationship between alcohol level and odor response and thus confirms the previously published reports on the alcohol off-flavor relationship. The application of this method to quality control in peanut samples could be of significant value in improving the quality of peanuts being marketed and thus those being processed into consumer products.

Reproductive Response of Peanut Cultivars to Photoperiod. F. P. Gardner, Agronomy Department, Univ. of Florida, Gainesville, FL 32611

The effect of photoperiod on flowering and pegging of three cultivars of peanut (*Arachis hypogaea* L.) was observed in a greenhouse experiment during winter, 1984 at Gainesville, FL. Cultivars consisted of: 'Pronto' (Spanish), 'Florunner', and 'Dixie Runner'. Photoperiods were: normal day (<12-hr), 14-hr, and 18-hr. The flowering response, days to first flower and nodal position, were similar irrespective of photoperiod. The length of the basic vegetative period varied with cultivar, but was not affected significantly by photoperiod: i.e., the obligate vegetative period averaged over all day-lengths was 3 days and 6 days less for Pronto than Florunner than Dixie Runner, respectively. The number of pegs/plant was reduced by the 18-hr day compared to normal and 14 hours and was about 2-fold greater for Pronto and Florunner than for Dixie Runner. Except for the apparent adverse affect of the extremely long day on peg number, these data support the conclusion that peanut cultivars are day-neutral and should not be influenced by photoperiod differences due to latitude and planting date.

Effect of Soil Temperature on Yield Factors of Florunner Peanuts. Timothy H. Sanders and Paul D. Blankenship, USDA, ARS, National Peanut Research Laboratory, Dawson, GA

Florunner peanuts were grown in irrigated plots with soil temperature modified beginning 28 days after planting to produce mean soil temperatures warmer (28.9 C) and cooler (21.8 C) than ambient (24.6 C). Mean stem temperature of plants in the heated and cooled plots were ca. 1 C higher and lower than in the control plot (24.4 C). Flowering patterns were somewhat altered and profuse flowering continued approximately 14 days longer on plants in the cooled plot. Maturation, as determined by the hull-scrape method, was delayed in the cooled soil and accelerated in heated soil. Number and weight of pods per plant were highest in the cooled plot and lowest in the heated plot. The distribution of seed sizes was skewed toward smaller sizes in peanuts from the heated plot.

Membrane Thermostability of Peanut Genotypes. D. L. Ketring, USDA-ARS, Plant Science and Water Conservation Laboratory, P.O. Box 1029, and Agronomy Dept., Okla. State Univ., Stillwater, OK 74076.

Optimum mean ambient temperatures for vegetative growth of peanut (Arachis hypogaea L.) plants are in the range of 25 to 30°C, while those for reproductive growth may be somewhat lower (20 to 25°C). Under field conditions the crop is frequently subjected to temperatures in the range of 35 to 40°C. These investigations were undertaken to develop a field sampling procedure to use the in vitro leaf disc method as a means to evaluate peanut genotypes for membrane thermostability. Differences in heat tolerance among genotypes of other crops have been indicated by the extent of electrolyte leakage from injured leaf cells due to elevated temperature treatment. A preliminary test in 1981 with ten genotypes showed significant differences among the genotypes and a significant day after planting (DAP) effect. However, CV's were excessive (38%). Modification of the procedure and method of leaf sampling reduced CV's to an acceptable level for field data (15-20%). Significant genotype (G), DAP, G X DAP interaction, and G X Year interaction were found. These interactions will require consideration when using the in vitro leaf disc method as a means to evaluate peanut genotypes for heat tolerance.

In Vitro Culture of Peanuts and Preliminary Field Evaluation of Cloned Material. R. N. Pittman\*, D. J. Banks, USDA-ARS, and B. B. Johnson, Botany Dept., Oklahoma State University, Stillwater, OK 74076.

Immature leaves of cultivated and wild peanuts were cultured aseptically on a medium composed of Murashige and Skoog salts, Gamborg's B5 vitamins, and 0.8% difco agar containing 1 mg/L naphthaleneacetic acid (NAA) and N-6 benzyladenine (BA). Callus and/or regenerated plants were produced. Arachis villosulicarpa Hoehne leaflet cultures showed increased shoot primordia formation when major salts were reduced and BA/NAA was a high ratio. Roots differentiated from shoots when they were transferred to a medium with 6 to 8 µM NAA and reduced salts. In a preliminary study comparing embryonic axis growth of PI 267771 on 11 different media, significant differences were found for root lengths and number of secondary roots, but differences were not found for shoot growth. In the field, tissue culture-derived plants were similar in yield and morphology to control plants.



Effects of Duration, Timing and Intensity of Single and Multiple Droughts on Peanuts. R. C. Nageswara Rao and J. H. Williams, International Crops Research for the Semi Arid Tropics (ICRISAT), India.

Twenty five peanut (*Arachis hypogaea* L.) genotypes, belonging mostly to spanish or valencia types, were grown in the field and subjected to either single or multiple droughts occurring at different crop growth stages. Twelve different patterns of droughts were imposed on the crops with 8 intensities of water application rates in each pattern. The water application rates were varied in the field by using line source sprinkler irrigation (Hanks et. al., 1976). Some results on the response of these genotypes to single and multiple droughts were presented. A single short duration drought occurring at the seed filling phase was more damaging than drought during the vegetative phase. In this experiment a short drought during the early vegetative phase reduced the impact of a second drought imposed at the seed filling phase, indicating adaptative responses of peanuts to droughts. Intermittent irrigations during a long drought did not influence the nature of crops response to that drought.

Growth and Partitioning Responses of Four Peanut Genotypes to Cercospora Leafspot. K. V. Pixley\*, K. J. Boote, F. M. Shokes, and D. W. Gorbet, Dept. of Agronomy, Univ. of Florida, Gainesville, FL., AREC, Quincy, FL, and ARC, Marianna, FL.

Crop growth, development, and dry weight partitioning to fruits in four peanut genotypes were measured under two leafspot control programs. A parallel study assessed leafspot severity and compared disease-induced defoliation patterns. Leafspot diseases reduced Florunner yield by 40% at 127 days after planting (DAP) and by 80% at 141 DAP. By contrast, leafspot-resistant genotypes F80202, F81206, and MA72 x 94-12 were much less affected by disease and increased in yield with later harvest. Moreover, the two higher yielding resistant genotypes equalled or surpassed yields of Florunner under good leafspot control.

Yield differences corresponded with the ability of the resistant genotypes to maintain higher leaf area indices throughout longer pod filling periods despite intense disease pressure. Mechanisms of this resistance included the continued allocation of photosynthate to leaf production during the pod filling period, and the delay of disease-induced defoliation. The latter was associated with a slower rate of disease development on individual leaves as documented by tagging leaves and following disease progress versus leaf age. The degree of genotypic resistance to leafspot declined as the growing season progressed in apparent association with the crop's shift into reproductive growth and/or epidemic development.

Response of Florunner Peanuts to Application of Kylar. M. E. Walker\*, T. P. Gaines, A. S. Csinos, and B. G. Mullinix, Jr., University of Georgia, Coastal Plain Stn., Tifton, Georgia 31793.

Field experiments were conducted for three years (1980-82) at Tifton, Georgia on Lakeland sand and at Plains, Georgia on Greenville sandy clay loam to study the effect of Kylar, a growth regulator, on yield, grade, nutrient uptake, vegetative characteristics, and disease of Florunner peanuts (*Arachis hypogaea* L.). Kylar treatments consisted of 0, 1.12 (1 application), 1.68 (3 app.), 1.68 (6 app.), 2.52 (6 app.) kg/ha. The application of Kylar had no significant effect on yield of peanuts on Lakeland soil, but increased the yield more than 477 kg/ha with 2.52 kg/ha of Kylar on Greenville soil. On the Lakeland soil all Kylar treatments regardless of rate or number of application reduced peg and plant weight significantly. In general, Kylar increased only P and K concentrations in the leaf and stem. The number of disease loci (*Sclerotium rolfsii*) in peanuts tended to be less where Kylar had been applied.

Use of the CASAS (Computerized Automated Seed Analysis System) Dynamic Electrical Conductivity Analysis as an Indicator of Potential Freeze Damage in Peanut Seed. R. D. Keys\*, G. A. Reusche, and R. Margapuram, Department of Crop Science, North Carolina State Univ., Raleigh, NC 27695-7620.

The CASAS (Computerized Automated Seed Analysis System) dynamic electrical conductivity (DEC) analysis was tested for use as an indicator of freeze damage in peanut seed. Preliminary measurements of several freeze damaged 1983 commercial peanut seed lots from the northern North Carolina southern Virginia production area indicated that freeze damaged lots had a greater total ionic efflux throughout the 3 hr DEC analysis than did undamaged lots. The difference was observable within 2-10 minutes after the start of imbibition. In a survey of approximately 100 1983 commercial seed lots from the same production area, 10% of the lots had the higher rate of efflux. The mean DEC efflux rate of the high efflux rate group was 0.42 micromhos/g/1 hr, with a mean standard germ ination of 42%. A reference point electrical conductivity (EC) value at 10 minutes after the start of imbibition was 0.92 micromhos/g/1. In contrast to this, the highest quality lots (≥95% germination) had a mean DEC efflux rate of only 0.13 micromhos/g/1/hr, and a 10 minute EC value of only 0.20 micromhos/g/1. To date, freeze damage has been the only observed type of damage to affect major changes in the ionic efflux of peanut seed during the first 10 minutes of imbibition. Heat or mechanical damage, age, or general poor seed quality have not been observed to have such an effect. A general 10 minute EC value of greater than 0.50 micromhos/g/1 would indicate potential freeze damage in peanut seed.

Effect of Ethrel Seed Treatment on Growth, Yield, and Grade of Two Virginia-type Peanuts. T. A. Coffelt and R. K. Howell, USDA-ARS, Suffolk, VA, and Beltsville, MD.

Two virginia-type peanuts (*Arachis hypogaea* L.), NC 6 and NC 7, were observed to germinate slowly under field conditions. Three seed treatments (1%, 5%, and 10%) of ethrel were mixed with a recommended seed treatment (45% Difolitan and 25% PCNB) and dusted on the seed. The experimental design was a 2 (varieties) x 4 (3 ethrel treatments and an untreated check) factorial in a randomized complete block with four replications. The experiment was conducted for 2 years (1980 & 1981) at two locations (Suffolk and Beltsville). Factors studied were: Stand counts (10 and 14 days after planting), plant dry weight (18 and 42 days after planting), pod yield, grams/100 seed, % meat, % total sound mature kernels, % extra large kernels, and % fancy pods. No significant differences were found among ethrel treatments for any factor, except stand counts. Plots planted with ethrel-treated seed had significantly higher stand counts at 10 and 14 days than plots not planted with ethrel-treated seed. Highly significant differences occurred between locations for all factors. Highly significant differences occurred between years for all factors, except stand counts at 14 days and grams/100 seed. Highly significant differences occurred between varieties for all factors, except plant dry weight at 18 days, pod yield, and % fancy pods. These results indicate that, while stands may be improved with ethrel-treated seed, no significant increase in yield or grade factors was found.

Water Relations and Yield of Peanut Genotypes Grown under Irrigated and Rainfed Conditions. P. I. Erickson\*, Agronomy Dept., Oklahoma State Univ., D. L. Ketring, USDA-ARS, and Ming-Teh Huang, Agronomy Dept., Oklahoma State Univ., Stillwater, OK 74078.

Peanut (*Arachis hypogaea* L.) genotypes have been identified that differ in their adaptation to drought. However, peanut physiological responses to water stress have not been adequately investigated to explain dessication resistance differences among genotypes. The objectives of this research were to examine differences in the internal water relations of three peanut genotypes (one spanish, two runner types) grown under irrigated and rainfed conditions and to relate differences, if any, to the yield potential and dessication resistance of each genotype. Significant differences in water relations parameters were found among genotypes between 50 and 64 days after planting, a critical period for peanut growth and development. Genotypic differences in osmotic adjustment and turgor maintenance capabilities were noted. Higher yields appeared to be related to greater ability of genotypes to maintain turgor through osmotic adjustment and retention of apoplastic water. Relative resistances to dessication based on genotypic differences in water relations parameters and yield were determined.

Influence of Cultivar, Spacing and Sowing Date on the Performance of Peanut (*Arachis hypogaea* L). E. O. Auma and F. P. Gardner, Agronomy Department, Univ. of Florida, Gainesville, FL 32611.

A field experiment was conducted in 1982-83 in which 'Pronto' (Spanish) and 'Florunner' were compared over three sowing dates (May, June, August), three inter-row spacings (35 cm, 70 cm, 105 cm) and three intra-row spacings (10 cm, 15 cm, 30 cm). August sowing resulted in drastic biomass, leaf area index and pod yield reductions. May or June sowing gave comparable yields in these parameters for Florunner, while for Pronto, May sowing gave lower yields than June sowing. Closer spacings significantly increased light interception, biomass and pod yields of Pronto while Florunner tended to perform the same at the variable spacings (particularly with the May and June sowings). Light interception and utilization and resultant growth and yield parameters differed with cultivars, sowing dates and spacings.

## ENTOMOLOGY

Comparisons of Soil Insect Damage to Conventional and Conservation Tillage Peanuts. J.M. Cheshire, Jr., W.L. Hargrove, C.S. Rothrock and M.E. Walker, Departments of Entomology, Agronomy and Plant Pathology, University of Georgia, Georgia Station, Experiment, GA 30212 and Department of Agronomy, University of Georgia, Coastal Plain Station, Tifton, GA 31793.

Soil insect damage was compared between conventional and conservation tillage peanut cropping practices in two experiments at each of seven sites. Peanuts were planted either into a prepared seed bed or into killed wheat or rye. At each site, peanuts were planted in early May and also behind grain harvest. Pod damage was caused primarily by wireworms during 1982 and by the lesser cornstalk borer during 1983. No significant differences in soil insect damage were detected between the two tillage systems in any of the experiments, but differences were observed between early and late plantings. Peanut yields, quality and disease incidence were also similar for the two cropping systems and will briefly be discussed.

Relation of Lesser Cornstalk Borer Damage to Peanut Pods and the Incidence of *Aspergillus flavus*. R. E. Lynch and D. M. Wilson, USDA-ARS, Insect Biology and Population Management Research Laboratory, and Dept. of Plant Pathology, Coastal Plain Experiment Station, Tifton, GA. 31793.

During 1983, studies were conducted on the relationship between lesser cornstalk borer, *Elasmopalpus lignosellus* (Zeller), damage to peanut pods in the field, and the incidence of *Aspergillus flavus* Link. Florunner peanuts were planted on April 8, April 27, May 18, and June 10. Peanut pods were sampled on September 1, 8, and 15, and separated into undamaged, externally damaged, and pod penetrated classes according to lesser cornstalk borer feeding damage. The pods and kernels were assayed for the presence of *A. flavus* and *A. niger*. The incidence of *A. flavus* on the pods and kernels was significantly greater on pods that had been penetrated by lesser cornstalk borer feeding.

Control of Lesser Cornstalk Borer With Granular Chlorphrifos.

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Lorsban 15G was applied at .97 lb. formulation per 1000 linear feet of row to Florunner peanuts with a heavy lesser cornstalk borer infestation ( $\bar{x}$  = 2.45 larvae/plant). The field was drought stressed at application and received .26" rainfall 8 days post treatment. During 5 days of this interval maximum air temperature exceeded 100°F. Larval mortality increased significantly in treated plots following rainfall. A total of 4.46" rainfall occurred from treatment to harvest. Larval suppression was measured up to 51 days post treatment. Mean yield was 1300 lbs. higher in treated plots of the 4 most heavily infested replicates. SMK + SS was 71% vs. 64% in check plots. The value of treated plots was greater by \$405 per acre.

Summary of Peanut Insect Control with Chemicals Applied through Irrigation Systems.  
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A study, conducted over a three-year period, has included several insecticides which have been applied to peanuts through a solid-set irrigation system for evaluation as a means of controlling insect populations. The system was checked for uniformity of insecticide distribution and time needed for delivery. As no standard type formulations have been established for use in irrigation equipment, materials used in these experiments were applied as received from the suppliers. Damage by foliage-feeding insects, primarily corn earworm and fall armyworm larvae, and soil insect larvae, was evaluated. Significant differences in percent control among treatments were obtained, but yield differences were not significant. The necessity of using large plots in these studies possibly influences the significance of the results, because of non-uniformity in soil composition. In general, the synthetic pyrethroids, Pounce®, Pydrin®, and Ambush®, used at ca. 0.1 lb. AI/A were as effective as any of the other insecticides used.

Evaluation of Collections of International Peanut Germplasm for Insect Resistance. W. V. Campbell, J. C. Wynne, Dept. of Entomology and Agronomy, respectively, N. C. State University, Raleigh, N.C. 27695, M. Keerati - Kasikorn, Dept. of Entomology, Khon Kaen Univ., Khon Kaen, Thailand, E. P. Cadapan, Dept. of Entomology, Univ. of Philippines, Los Banos, and S. Sirisingh, Entomology, Dept. of Agriculture, Bangkok, Thailand.

Peanut germplasm from collections in North Carolina, ICRISAT (India) and Thailand was evaluated in single row field plots in 1981-1983 for resistance to tobacco thrips, potato leafhopper, corn earworm, southern corn rootworm and the twospotted spider mite. The 569 genotypes were rated for insect foliage and pod damage and 58 genotypes were evaluated for leaf chlorosis due to spider mite feeding. Genotype differences in feeding damage from this pest complex will be presented. Fifty-two selected genotypes from the North Carolina collection were evaluated in Kalasin, Thailand for insect resistance. The multiple insect resistant cultivar NC 6 and its insect resistant parent NC-GP 343 exhibited cross resistance to leafhopper and leaf miner. These data indicate a beneficial reciprocity from international germplasm testing for insect resistance.

## BREEDING AND GENETICS

Agronomic Response of Two Resistant Lines to Leafspot Management. D. W. Gorbett\*, A. J. Norden, F. M. Shokes, and D. A. Knauff, University of Florida, Agricultural Research Center, Marianna, Florida, Department of Agronomy, Gainesville, Florida, and Agricultural Research and Education Center, Quincy, Florida.

UF 80202 and UF 81206 are leafspot resistant runner market-type peanut (*Arachis hypogaea* L.) breeding lines from the University of Florida breeding program derived from crosses made in 1972 with the primary objective of improving leafspot disease resistance. PI 203396 is the main source of resistance in both lines, especially to late leafspot caused by *Cercospora personatum* (Berk. and Curt.) Deighton. In tests conducted at Marianna, including multiple harvest dates and different fungicide treatments for leafspot control, pod yields of UF 80202 and UF 81206 were 106% of 'Florunner', when sprayed with a fungicide (Bravo), and 195% and 219%, respectively, when no fungicide was applied. Grading factors (% total sound mature kernels, 100-seed weight, and % extra large kernels) and % oil were positively affected by fungicide applications on Florunner with little or no response on the breeding lines. In unsprayed harvest-date tests at Gainesville and Marianna during 1981-83, Florunner usually exceeded UF 80202 and UF 81206 in pod yields and grade up to 122 days after planting, after which Florunner yields dropped dramatically and the two breeding lines continued to increase in pod yields and grade. Florunner disease ratings were frequently 10 (dead) in unsprayed tests at 135 days or later whereas UF 80202 and UF 81206 typically rated <5.

Genetics of Solid Purple and Purple Striped Peanut Testa Colors. W. D. Branch, University of Georgia, Coastal Plain Exp. Stn., Dep. of Agron., Tifton, GA.

Seed phenotypes of *Arachis hypogaea* L. are known to have uniform purple and purple stripes on flesh colored testae. The latter variegated characteristic has been found on some rust (*Puccinia arachidis* Speg.) resistant germplasm lines. Prior knowledge of purple striped inheritance could thus be advantageous in a breeding program.  $F_1$ ,  $F_2$ , and  $F_3$  data from flesh x purple and reciprocal cross combinations confirmed a one-gene model with incomplete dominance for the solid purple color. However, results from flesh and purple stripes on flesh crosses suggest two genes with stripes being partially dominant to non-striped.

A Wild Arachis Winter Nursery in South Texas. D. J. Banks and R. N. Pittman, USDA, ARS, Plant Science Research Laboratory, Stillwater, OK 74076; and C. M. Heald, USDA, ARS, Subtropical Research Laboratory, Weslaco, TX 78596.

A wild Arachis species field nursery was established in 1981-82 at the Subtropical Research Station, Weslaco, TX (26° 05' N, 98° 00' W, 21m) to test the feasibility of using that location as an overwintering germplasm repository for selected species. The entries represented a wide range of tetraploid rhizomatous taxa and ecotypes and two perennial Arachis section species, A. diogeni Hoehne and A. helodes Martius ex Krap. et Rig. Altogether, 78 accessions were transplanted to microplots spaced 1.5 m apart in sandy loam soil. Sunken, bottomless plastic containers (38 cm deep x 44 cm dia.) were employed to prevent rhizome penetration across plots. The plants were watered and fertilized during the summers to maintain good growth. An exceptionally cold winter in 1983, which resulted in severe cold injury to citrus trees and tropical palms, provided a challenge for species survival. During December 23-25, temperatures at the site remained at 0 C or below for 54 hours, with the minimum temperature reaching -8 C. In the spring of 1984 all but two accessions, PI 338266 and PI 468177 (both rhizomatous species but weakly established), showed renewed growth when warm weather returned. The results suggest that long-term clonal preservation of most of the tetraploid rhizomatous and selected Arachis section species is possible at suitable sites on the U.S. mainland where winters are relatively mild.

Development of Foliar Diseases Resistant Groundnut Lines at ICRISAT  
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Breeding for resistance to the most devastating foliar diseases of groundnut, the leafspots and rust has received the highest priority in the groundnut breeding program at ICRISAT. More than 400 single, triple and double crosses were made using 12 rust and 9 late leafspot resistant germplasm lines. Several high yielding agronomically superior lines with high levels of resistance to rust and with moderate levels of resistance to late leafspot have been developed through mass pedigree method. Thirty lines possessed combined resistance to both rust and late leafspot. A few resistant lines gave more than 3000 kg/ha pod yields under rainfed condition. Some of the resistant lines showed better stability of yield performance across 5 environments in India.

The genetic analysis of parents  $F_1$ ,  $F_2$ ,  $BC_1$  and  $BC_2$  generations of resistant x susceptible crosses revealed that rust resistance is controlled predominantly by additive, additive x additive and additive x dominance gene effects.

Disruptive selection and backcross procedures would be adopted in future to increase the levels of late leafspot resistance in good agronomic backgrounds.

Recently a few early leafspot resistant sources have been identified and these lines will be intermated to accumulate the favourable alleles for resistance.



Application Of IBPGR/ICRISAT Minimum Descriptors To Arachis Hypogaea L. Germplasm.  
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Sixty-seven minimum descriptors set forth by the IBPGR/ICRISAT descriptor list are being applied to the collections of Arachis hypogaea L. which have been made in South America from 1976 through 1983.

The descriptors are being applied to approximately 1600 accessions of material collected in Argentina, Bolivia, Brazil, Ecuador, Paraguay, and Peru. These collections have been made under projects sponsored by IBPGR and supported by several agencies in North and South America and ICRISAT.

The minimum descriptors include passport and collection data and characterization as shown in items 1.1 through 4.7.6 in the IBPGR/ICRISAT "Groundnut Descriptors" (ACP:IBPGR/80/66, September 1981).

Our oral presentation will describe some of our techniques and procedures for applying the characterization descriptors.

Results of the work will be published in catalogue form and will be distributed to interested scientists by the International Board for Plant Genetic Resources (IBPGR), Rome.

An Investigation of Oil Quality in Ontario-grown Peanuts.  
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A study of oil quality in Ontario-grown peanuts was undertaken in summer 1983. Nineteen lines comprising Valencia, Spanish, and Virginia market types were analyzed for total oil content and percent fatty acids. Maturity effects were also investigated by tagging first-appearing pods and leaving later-appearing pods untaged. In general, maturity effects were not significant for total oil, % oleic, and % linoleic acid. Significant varietal differences were found for these three characters. Total oil content ranged from 42-55% (on a dry wt. basis); % oleic ranged from 35-47% (as % of total fatty acids) and % linoleic 34-45%. Significant differences were found between the market types for these characters. Overall, Spanish exceeded Valencia exceeded Virginia for total oil; Virginia exceeded Spanish exceeded Valencia for % oleic; Valencia exceeded Spanish and Virginia for % linoleic. A subgroup of Chinese lines within the Virginia market type were found to differ significantly from the other Virginia lines overall. A high negative correlation ( $r = -0.92$ ) between % oleic and % linoleic was found.

## EXTENSION TECHNOLOGY, HARVESTING, AND STORING

Evaluation of Soil Extracting Reagents for Determining Available Calcium to Peanut Fruit. T. P. Gaines, A. S. Csinos\*, and M. E. Walker. Departments of Agronomy and Plant Pathology, University of Georgia, Coastal Plain Experiment Station, Tifton.

Soil tests generally presume that available nutrients will be absorbed by the plant's root system. The peanut fruit is unique in that it must absorb its own Ca from the soil in the immediate fruiting zone. For this reason, the most available form of Ca to the fruit is the most soluble form. Recent studies have shown that Mehlich No. 1 double acid extracting reagent ( $0.05 \text{ N HCl} + 0.025 \text{ N H}_2\text{SO}_4$ ), the soil extracting reagent commonly used on Southeastern soils, extracts more Ca from soil than is actually available to developing fruit. The purpose of this study was to assess the availability of Ca to peanut fruit grown on a Stilson fine sand by comparing 10 soil Ca extractants: Mehlich No. 1, No. 2, and No. 3 reagents; water,  $0.01 \text{ M NaNO}_3$ ,  $0.5 \text{ M NH}_4\text{Cl}$  (pH 7.0),  $1 \text{ M KCl}$ ,  $1 \text{ M NH}_4\text{OAc}$ , Morgan's, and Olsen's reagents. Plots were treated with three rates of three Ca sources: gypsum and dolomitic and calcitic limestones. Soil samples were taken on three dates: 17 days after applying Ca treatments, mid-season, and at harvest. Soil Ca test results were correlated with peanut yield, value, sound mature kernels, pod rot, and seed and hull Ca. The results showed that  $0.01 \text{ M NaNO}_3$  soil extractable Ca had highly significant correlations ( $P = 0.0001$ ) with all six peanut parameters for all three sampling dates. Water rated second in the number of significant correlations. Salts at or near normal strength rated third. The acidic Mehlich soil extractants rated last with no significant correlations.

A Microcomputer Program to Aid County Agents in CBR Disease Management Decision Making. J. E. Bailey, North Carolina Agricultural Extension Service, North Carolina State University, Raleigh, North Carolina 27695-7616.

A microcomputer program was developed to aid county agents in giving recommendations to growers for CBR (causal organism Cylindrocladium crotalariae) management. Inputs are: growers name, address, phone, planting date, yield last time peanuts were grown, estimated yield of non-diseased peanuts, price per pound for crop, rotational crops, cost per gallon of fumigant, disease distribution in field, and percent infestation in diseased area. Outputs are: yield and dollar value lost to disease, evaluation of rotation, advice of cultural control and variety selection, and an analysis of the appropriateness on fumigating the whole field, the infested area or not fumigating. A report containing this information may be printed out for agent and/or grower records.

Cation Exchange Constants For A Gapon Model From Peanut Production Soil.  
F. J. Adamsen, USDA-ARS, Tidewater Research Center, Suffolk, VA 23437.

An experiment was designed to determine the exchange constants for  $\text{Na}^+$ ,  $\text{Ca}^{2+}$ ,  $\text{K}^+$ ,  $\text{Mg}^{2+}$  and exchangeable acidity in a Gapon model. Fifty, 100 and 200 gram samples of the Ap horizon of a Kenansville loamy sand were extracted with 100 ml of solutions containing six concentrations of  $\text{Na}^+$  and  $\text{Ca}^{2+}$  and distilled water. Samples were shaken for 1 hour, centrifuged and filtered to remove soil particles. The concentrations of  $\text{Na}^+$ ,  $\text{Ca}^{2+}$ ,  $\text{K}^+$  and  $\text{Mg}^{2+}$  and pH of each solution were determined. Each solution and moisture level combination was replicated four times. The data were used to calculate the exchange constants for the 5 competing cations for a Gapon exchange model. The data treatment assumes that exchangeable acidity is in the form of  $\text{Al}^{3+}$  on the exchange complex and that  $\text{Al}^{3+}$  is in equilibrium with Gibbsite in the soil. The pH of the solution obtained from the soil decreased by increasing concentration of either  $\text{Ca}^{2+}$  or  $\text{Na}^+$ . This change was due to displacement of exchangeable acidity from the soil by  $\text{Ca}^{2+}$  or  $\text{Na}^+$ . The exchange capacity of the soil was estimated to be 10 mmoles (+)/kg of soil. Therefore, the exchange sites could be saturated by  $\text{Ca}^{2+}$  or  $\text{Na}^+$  at relatively low concentration (<0.05N) of added cations. Exchange constants calculated for this soil appeared to be more like those reported for organic soils rather than mineral soils suggesting that the exchange complex is dominated by the organic fraction in the soil. Changes in the constants involving Na and Ca occurred when Na was added to the soil which suggests Ca is held on sites not available to Na.

Peanut Nodule Mineral Content. R. K. Howell and L. P. Rose, Jr. ARS, USDA, Beltsville, MD 20705.

A void in knowledge of mineral metabolism of the root nodule is evident. To substantially improve the peanut-rhizobium nitrogen-fixation system a need to understand mineral metabolism of the symbionts with respect to soil mineral content is required. 'Florunner' was seeded on 5/28/83 into a Galestown silt loam with a pH of 6.2 and a P, K, and Mg content in medium to high range. The experiment was in a RCB with 3-row plots and 8 replications. On 10 October all plants within a 3 M row were dug and treated as one sample. Plants were washed thoroughly with tap and followed by distilled water. All plant samples were sub-divided into leaves, stems, roots, nodules, meat, and shells. Each sub-sample was dried, ground, weighed and analyzed for N, P, K, Ca, Mg, Mn, Fe, B, Cu, Zn, Al, and Na. Nodules contained significantly higher levels of Fe (446 ppm) than other tissues and had the second highest quantities of N, P, K and Ca, 4.8, .3, 1.7, and 1%, respectively. The shells contained significantly higher concentrations of Ca (.4%) than the seed (.2%). Iron, Al, and Na, too, were significantly more concentrated in shells than in seed. Our data suggests that the nodule is in a state of high metabolic activity until harvest.

Electronic Moisture Measurement of Peanuts. J. H. Young, Biological and Agricultural Engineering Department, North Carolina State University, Raleigh, North Carolina 27695-7625.

During the 1983 peanut harvest season, peanut samples were evaluated for further calibration of the Dickey-John GAC-II moisture meter. Samples were also collected by the Federal-State Inspection Service (FSIS) for subsequent comparisons of the GAC-II meters with oven moisture contents and with the readings obtained by several meters currently used by the FSIS for peanut moisture measurement. Within the moisture range from 6 to 11% wet-basis moisture, the Dickey-John GAC-II meters using the constants provided by Dickey-John gave average meter errors as compared to oven moisture contents of -0.04, 0.15, and 0.13 percent moisture for Virginia-, runner-, and Spanish-type peanuts respectively. Moisture readings for high-moisture Virginia-type peanuts recently removed from dryers varied considerably from oven readings while readings for high-moisture runner-type peanuts which had thoroughly equilibrated prior to testing were quite accurate. There is a need for further tests to determine equilibration time needed for peanuts removed from a dryer.

Effects of Microwave -- Vacuum Drying on Quality of Florunner Peanuts. J. L. Pearson<sup>1</sup>, W. L. Shupe<sup>2</sup>, T. H. Sanders<sup>1</sup>, J. L. Butler<sup>2</sup>, J. L. McMeans<sup>1</sup>, S. R. Delwiche<sup>2</sup>, <sup>1</sup>USDA, ARS, National Peanut Research Laboratory, Dawson, GA, 31742, <sup>2</sup>USDA, ARS, Southern Agricultural Energy Center, Coastal Plain Experiment Station, Tifton, GA 31793.

Four processing levels (X, 2X, 4X, 8X) of microwave--vacuum drying of shelled 1983-crop, Tifton, Georgia-grown Florunner peanuts and a traditional drying method for in-shell peanuts, as a control, were compared for their effects on 35 parameters of peanut quality. Flavor rating was not significantly (5%) affected by drying method or other recognized variables, but free fatty acids, raw kernel color and four sugars had pooled microwave--vacuum means significantly ( $P \leq 0.05$ ) different from their control means. Various planned and unplanned variables correlated significantly ( $P \leq 0.05$ ) with different quality parameters. Variation of samples in length of cold storage time before drying and in moisture content during cold storage after drying appeared to be major sources of variation in peanut quality.

Cooling a Peanut Warehouse with Aeration and/or Mechanical Ventilation. J. S. Smith, Jr. and J. I. Davidson, Jr., USDA, ARS, National Peanut Research Laboratory, Dawson, GA.

Isotherms depicting the cooling patterns in cross sections of the peanut mass in a warehouse at bi-monthly intervals for a conventional mechanical ventilation system and a conventional mechanical ventilation system plus mechanical aeration system are presented and discussed. A typical steel building type warehouse 24.4 m by 48.7 m by 7.3 m at the eaves with a 45° roof slope was used for the study. Semi-circular perforated aeration duct was installed on the floor in half the warehouse with a fan blowing into the duct forcing air up through the peanuts. The operation of the aeration fan was controlled by a thermostat and a humidistat. The fan on the conventional ventilation system for the overspace operated continuously. The isotherms show that the addition of the aeration system hastened the initial cooling of the peanut mass thereby reducing the possibility of A. flavus growth and possible aflatoxin contamination of the peanuts.

Separation and Removal of Aflatoxin Contaminated Peanuts at Peanut Cleaning and Shelling Plants. P. D. Blankenship, J. I. Davidson, Jr., T. H. Sanders, and C. T. Bennett, USDA, ARS, National Peanut Research Laboratory, Dawson, GA.

Approximately 7 tonnes of Segregation 3 official grade check samples from farmers stock peanuts marketed in 1980 were cleaned and shelled in the USDA pilot shelling plant. Large samples were removed at 28 different points in the shelling process within the plant. The portion of material that was removed from each point was blended and divided into four samples, ground, blended and subsampled. The subsamples were analyzed for aflatoxin using minicolumn chromatography. Measurements of pod damage and pod strength were directly correlated with aflatoxin levels while pod size, seed density, and pod terminal velocity were inversely correlated with aflatoxin levels. Use of these findings in designing farmers stock cleaning and shelling systems are discussed.

Variability in Grade Determinations for Farmers' Stock Peanuts. J. W. Dickens\*, T. B. Whitaker, USDA, ARS, N. C. State University, Box 7625, Raleigh, NC 27695-7625 and J. I. Davidson, Jr., USDA, ARS, National Peanut Research Laboratory, Dawson, GA 31742.

A sample which weighed approximately 30 kg was taken from each of 20 lots of runner-type farmers' stock peanuts. Each sample was thoroughly blended and subdivided into 16 subsamples of approximately 1800 g each. Each subsample was graded according to the procedures of the Federal State Inspection Service. Subsample variances with regard to grade factors and indicated price/ton based on the 1982 price support were computed for each of the 20 lots. The coefficients of variation averaged across all 20 lots were 16.3, 11.0, 2.3 and 2.2% for % foreign material, % loose-shelled kernels, % sound mature kernels plus % sound splits and price/ton, respectively. The difference between the highest price/ton and the lowest price/ton averaged \$38.79/ton across all 20 lots. The average price/ton for the 20 lots was \$478.19.

Factors Affecting Flavor and Headspace Volatiles of Cooked Peanuts. Clyde T. Young, Department of Food Science, North Carolina State University, Raleigh, NC 27695-7624 and R. Walton Mozingo, Tidewater Research and Continuing Education Center, Suffolk, VA 23437.

Peanuts were grown at TRACEC, VA and Northampton County, NC in 1982 and 1983 using recommended cultural and harvesting practices. Rainfall for both years was adequate at TRACEC but deficient at Northampton. Shelled extra large kernels (ELK) were processed as roasted, oil cooked, and old fashion cooked. These processed peanuts were evaluated for flavor and analyzed for volatiles, using a seven point hedonic scale and a headspace analysis system, respectively. Peanuts grown under normal rainfall usually had a higher acceptance and lower volatiles whereas those grown under drought conditions had lower acceptance and higher amounts of volatiles. The cooking method had the next greatest effect followed by variety effect. The lower scores of these peanuts was usually due to above threshold amounts of musty flavor and musty aftertaste.

## MYCOTOXINS

Relation of Preharvest Aflatoxin Contamination to Duration of Environmental Stress. R. J. Cole<sup>1</sup>, P. D. Blankenship<sup>1</sup>, T. H. Sanders<sup>1</sup>, and Robert A. Hill<sup>2</sup>  
<sup>1</sup>USDA, ARS, National Peanut Research Laboratory, Dawson, GA; <sup>2</sup>Southern Regional Research Center, New Orleans, LA

Previous experiments have established the optimum conditions of temperature and moisture for preharvest aflatoxin contamination of peanuts. The optimum conditions are a mean temperature in the geocarposphere of 29.5–30°C with a moisture level of between 40–60 bars. Visibly-undamaged peanuts subjected to these stress conditions during the last 45–50 days of the growing season were highly contaminated with aflatoxin at harvest. The objective for CY 1983 studies was to determine the length of stress period required for preharvest contamination of peanuts. Stress conditions were imposed 20, 30, 40 and 50 days before harvest. A stress period of 20 days before harvest was not sufficient to cause contamination. Peanuts subjected to stress conditions for 30, 40 and 50 days were contaminated, therefore, a threshold stress period for preharvest aflatoxin contamination of peanuts was between 20–30 days before harvest.

Colonization of Organic Matter Substrates in Soil by *Aspergillus flavus*.  
J. P. Stack and F. E. Pettit, Dept. of Plant Pathology and Microbiology, Texas A&M University, College Station, Texas. 77843.

An investigation of the activity and survival of *Aspergillus flavus* in soil has been initiated. The ability of *A. flavus* to compete with the natural soil microflora in the colonization of a variety of substrates was studied. Peanut root segments (5 mm) were buried in nonsterile sandy-loam field soil (pH 6.8) adjusted gravimetrically to different initial moisture levels corresponding to -0.1, -0.33, and -1.0 bars as determined with a pressure plate apparatus. *A. flavus* was buried in the soil 1.0 cm from the root segments (RS). Soils with no added *A. flavus* were also used. RS of cotton, soybean, snapbean, and sorghum were buried in soil at -0.33 bars. After 7 days at 20, 30, or 35 C, the RS were retrieved, washed, and plated on a selective medium. Additional RS were plated prior to placement in soil to determine the initial *A. flavus* population. Peanut RS became colonized in soil at all temperatures and moistures tested. Approximately one half of the RS yielded *A. flavus* on the selective medium. RS of cotton, soybean, snapbean, and sorghum also became colonized in soil by *A. flavus*. Colonization occurred whether hyphae, conidia, or sclerotia were used as the source of *A. flavus*.

Development of Statistical Models to Simulate the Testing of Farmers' Stock Peanuts for Aflatoxin Using Visual, TLC, and Minicolumn Methods. T. B. Whitaker\*, J. W. Dickens, USDA-ARS, N. C. State University, Raleigh, NC 27695-7625, J. I. Davidson, USDA-ARS, National Peanut Research Laboratory, Dawson, GA 31742, and V. Chew, USDA-ARS, University of Florida, Gainesville, FL 32611.

The negative binomial equation was used to simulate the distribution of sample aflatoxin test results when replicated grade samples from farmers' stock peanuts are analyzed by the TLC and minicolumn methods. The Poisson equation was used to simulate the distribution of samples according to the number of kernels with visible Aspergillus flavus growth found in replicated grade samples from farmers' stock peanuts when the visible A. flavus method is used. The probability of accepting a lot of farmers' stock peanuts with a given aflatoxin concentration when using a 465-g grade sample and 4 different accept/reject levels were predicted with the models and compared to observed acceptance probabilities for each of the 3 methods. Comparisons between predicted acceptance probabilities and observed acceptance probabilities from a previous study were good for each method at each accept/reject level.

Comparison of Methods for the Analysis of Cyclopiazonic Acid in Peanuts. John A. Lansden, USDA, ARS, National Peanut Research Laboratory, Dawson, GA

Three methods for the determination of cyclopiazonic acid contamination in peanuts are compared for efficiency, precision and ease of use. The colorimetric method of Rathinavelly and Shanmugasudram is easy to use and has a high extraction efficiency but may seriously overestimate the concentration of toxin. Thin layer chromatographic techniques are relatively easy to use, have good recovery efficiencies but may lack precision and require preparation of oxalic acid impregnated silica gel thin layer plates. High pressure liquid chromatography is more difficult, requires a special solvent and considerable sample processing but has better precision and accuracy than the other methods.



Flavonoids and A. Flavus Resistant Peanuts. D. J. Daigle, Southern Regional Research Center, P.O. Box 19687, New Orleans, La. 70179; A. Mixon, Coastal Plain Experiment Station, Tifton, Ga.; A. J. DeLucca, II, Southern Regional Research Center, P. O. Box 19687, New Orleans, La. 70179; and T. A. Coffelt, TRACEC, P.O. Box 7098, Suffolk, Va. 23437.

Acetone extracts of a variety of peanuts were shown by Lindsey and Turner (1975), to inhibit the growth of *A. flavus*. They identified one of the inhibitory substances as 5,7-dimethoxyisoflavone. This present work with the use of standards and high performance liquid chromatography shows that a large number of peanut genotypes contain not the dimethoxy compound but 5,7-dihydroxyisoflavone. Twenty genotypes were laboratory screened for *A. flavus* resistance. The resistance of these peanuts and their correlation to 5,7-dihydroxyisoflavone content will be discussed. The fungal inhibition characteristics of the dehydroxyisoflavone will also be presented.

Effect of Lesser Cornstalk Borer Peanut Pod Damage on Colonization by a Mutant of Aspergillus Parasiticus. D. M. Wilson, University of Georgia, Coastal Plain Station and R. E. Lynch, USDA-ARS, Insects Biology and Population Management Research Laboratory, Tifton, GA 31793.

Lesser cornstalk borer (LCB) larvae were fed peanut pods, maturity stage 2-6, as described by Lynch (1984). In one half of the laboratory test the LCB larvae were infested with a color mutant of Aspergillus parasiticus; the remaining larvae were not infested. After 10 days the peanuts were sorted according to damage category and the surviving larvae were recovered. Peanut hulls, kernels and larvae were placed on 10% malt salt medium and incubated at 30 C for 6 days before observation. Infestation of the larvae with A. parasiticus decreased LCB damage but did not influence larval survival. LCB damage was stage related. Kernels from penetrated pods contained more green A. flavus group and A. parasiticus than kernels from pods with no damage or external damage. Damage by LCB did not affect the incidence of fungi recovered from hulls. Aspergillus flavus was recovered from uninfested more often than infested treatments. Aspergillus parasiticus was recovered more often from kernels in stage 3 than those in 2, 4, and 5. Stage 6 kernels had the least A. parasiticus. These results show that LCB larvae can be vectors of A. parasiticus and that kernels in penetrated pods are often colonized.

## IRRIGATION SYSTEMS

Irrigation Equipment, Scheduling, and Limitations of Each System.  
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Tifton, GA 31793.

Irrigation equipment for peanut production can be classified into five groups: surface, drip/trickle, traveling gun sprinkler, stationary sprinkler, and continuous move sprinkler. Surface systems are not well adapted to the topography and soils of most of the peanut production area. Drip/trickle is currently uneconomical due to the high capital cost of installation. Traveling gun sprinkler is well suited to small irregular shaped fields but is quite labor intensive and its popularity and use are generally declining. The stationary sprinkler was quite popular during the early days of irrigation but due to the intensive labor requirements is currently used on a very limited basis. The continuous move sprinkler systems (center pivot and linear move) are well suited to peanut irrigation and are used extensively for that purpose. The recent availability of small towable center pivots which can be adapted for irrigating small irregular shaped fields has greatly encouraged the increased use of center pivots throughout the peanut belt. Linear move systems are quite expensive and become economical only for large scale systems.

The use of irrigation systems for chemigation is becoming increasingly popular. Chemigation is primarily suited to irrigation systems of the continuous move sprinkler type. Mechanical components such as injection pumps, tanks and safety devices are now readily available for all types of chemigation systems. Safety considerations for chemigation are well defined and appropriate consideration must be given to both human and environmental safety when chemigation is practiced.

The potential benefits offered by irrigation with any irrigation system can only be realized when irrigation is properly scheduled. Several scheduling techniques are available with tensiometers being the most popular. Other techniques such as moisture blocks, checkbook and pan evaporation are used to some degree. Proper irrigation scheduling requires knowledge of the water requirements with respect to the age of the crop of various peanut types and varieties.

Irrigation alone will not solve the problems caused by poor management; however, it does offer the potential for consistently good peanut production. Irrigation should be considered as a crop input just like seed, fertilizer, etc., rather than only as insurance. This philosophy will help insure the proper use of irrigation in peanut production systems.

The Technology for Successful Chemigation. Clyde C. Dowler, USDA/ARS, Coastal Plain Experiment Station, Tifton, GA 31793

The need and interest for effectively and economically utilizing center pivot sprinkler irrigation systems have resulted in cooperative research that has led to development of new application technology for applying agricultural chemicals through irrigation. This technology includes the application of insecticides and herbicides to plant foliage and soil, nematicides to soil, and fungicides to plant foliage. In general, the present chemigation research has been conducted on soils that include sands or loamy sands low in organic matter that are common to the Southeastern U.S. Rate of water application has ranged from 0.25 to 1.3 cm depending on soil type, soil moisture, chemical being applied, equipment capability, and specific pest management needs or objectives.

Commercially available equipment is used for injection of all chemicals into the irrigation systems. The pesticides have been injected as formulated commercial product or in mixing ratios of 1:1 to 1:15 or more in water or various nonemulsified oil carriers depending on equipment capability and research objectives.

Successful chemigation is dependent on a well-designed and properly functioning irrigation system, accurate calibration, and good management.

Chemigation of soil-applied materials has given good to excellent results. These include the soil fumigant metham, the nematicide phenamiphos, and herbicides such as alachlor, benefin, vernolate, and metolachlor. Chemigation to plant foliage has been somewhat more erratic, but research results are encouraging. Agricultural products can be applied to plant foliage through irrigation especially if some formulation adjustments are made. Agricultural chemicals that have been successfully applied through irrigation to plant foliage include the insecticides chlorpyrifos, carbaryl, permethrin, methylparathion, and acephate; the fungicides maneb, metalaxyl, and chlorothalonil; and the herbicides naptalam + dinoseb, fluazifop, acifluorfen, and lactofen.

Irrigation Schedules for Peanut Production. E. W. Rochester, Agricultural Engineering Department, Alabama Agricultural Experiment Station, Auburn University, Auburn, Alabama 36849

A 6-year study of peanut yield and quality responses to soil moisture levels was conducted to determine the most effective irrigation scheduling policy. Tensiometers used to measure soil moisture were placed at 6-, 12-, 18-, and 30-inch depths. Decisions to irrigate were based on values at 6 and 12 inches.

Several observations were noteworthy. There was an overall increase in yield of 520 pounds per acre for the irrigated peanuts compared to nonirrigated peanuts. The time for maturity was not necessarily the same for the irrigated and nonirrigated peanuts. Also, use of the 6 and 12-inch tensiometers to trigger irrigation resulted in the unneeded application of irrigation water in several years. In these years, the 30-inch tensiometer indicated that water was available and this value appeared to be a relatively good indicator of peanut yield. Because of the difficulty in applying adequate amounts of water to wet the soil to 30 inches, a 12- or 18-inch tensiometer or a combination of tensiometers at various depths might be used.

Differences in quality between irrigated and nonirrigated peanuts were indicated for some years. Typically, the irrigated peanuts had the same or slightly higher quality than the nonirrigated peanuts.

Late planting dates were evaluated during a 2-year period. Moisture availability appeared to be the only yield limiting factor. When irrigated, yields around 4000 pounds per acre were maintained. Peanut quality was improved by the later planting.

During the same 2-year period, an alternate planting pattern utilizing two rows spaced 7 inches apart were evaluated. Equal or greater yields were experienced for all treatments except for nonirrigated later plantings.

## FOLIAR DISEASE MANAGEMENT

Management of Peanut Cultivars With Genetic Resistance. F. M. Shokes\*, North Florida Research and Education Center, Quincy, FL 32351, D. W. Gorbet, Marianna Agricultural Research and Education Center, Marianna, FL 32446, and R. H. Littrell, Department of Plant Pathology, Coastal Plain Experiment Station, Tifton, GA 31793.

Resistance to the peanut leafspot diseases caused by Cercospora arachidicola (Hori) (CA) and Cercosporidium personatum (Berk. & Curt.) Deighton (CP) is available in plant introductions and some breeding lines. In the Florida breeding program, several lines have been identified with resistance, especially to CP. This resistance is insufficient for control of CA and CP under high inoculum loads, without the aid of a fungicide. However, yield losses in selected genotypes are only 12-35% without fungicide protection, compared to 50% loss with 'Florunner'. After 5 years of testing in Florida, and 2 years of testing in Georgia, a minimal spray program (4 sprays or less) seems feasible. Two breeding lines have been identified with moderate levels of resistance which have good agronomic potential. Sustained high yield on these genotypes (ca 4000 kg/ha) without fungicide use, can be attributed in part, to maintenance of a higher leaf area index and a lower disease level than Florunner. The nature of all of the resistive components have yet to be determined but repeated observations of disease progress indicate that the resistance is rate-reducing (quantitative). A line should be available as a cultivar in the very near future. Some strategies that might be employed in use of such a cultivar are as follows:

1. Integration of fungicide programs with resistance.
  - A. Protectant fungicides may be used with minimal management programs.
  - B. Systemic fungicides might be employed to maintain disease below threshold levels.
  - C. Combinations of the above might be used to allow integrated control with minimal risk.
2. Disease forecasting might be used in conjunction with established thresholds to determine spray schedules
3. Resistant cultivars might be used in some low risk areas in conjunction with good cultural practices to grow peanuts without leafspot sprays.

Performance of Tilt 3.6EC in Peanut Leafspot Control. H. G. Hancock\* and John D. Weete. Depart. of Botany, Plant Pathology, and Microbiology, Ala. Agric. Exp. Stn., Auburn University, Ala. 36849.

Propiconazole (Tilt 3.6EC), a member of the triazole class of sterol-inhibiting fungicides, was tested to determine the optimum field application rate for peanut leafspot control and to determine the effects of Penetrator 3 (a blend of petroleum oil and non-ionic surfactant) on its performance. Four rates of Tilt 3.6EC (49, 74, 99, and 124 g a.i./ha) were applied alone or as tank-mixes with Penetrator 3 at 0.15 and 0.30% (v/v) in 140 L/ha. Bravo 500 (1235 g chlorothalonil/ha) and no treatment were included as controls. All fungicide treatments significantly reduced leafspot severity. Disease severity decreased quadratically with increasing Tilt and Penetrator 3 rate. A minimum rate of 99 g propiconazole/ha was found to reduce infection equivalent reduction of defoliation. Tank-mixes of Tilt and Penetrator 3 were better (by <3%) than Tilt alone in reducing infection. However, plots treated with Bravo were less defoliated (by 3 to 6%) than those treated with Tilt (+ Penetrator 3). Yield increased linearly with increasing Tilt rate, but Penetrator 3 failed to have any impact on yield of Tilt-treated plots. Minimum rates of 49 and 74 g propiconazole/ha were required for yields equivalent to that of Bravo-treated plots at 138 and 150 days post plant, respectively.

Management Strategies for Optimal Use of Chlorothalonil on Florunner Peanuts in the Southeast. P. A. Backman, Dept. of Botany, Plant Pathology, and Microbiology, Alabama Agr. Exp. Sta., Auburn University, AL 36849.

Presently almost all of the peanut acreage in the Southeast is sprayed with chlorothalonil for control of leafspot diseases; optimization of performance would mean reduced costs and increased profits. Frequent formulation changes made by industry have partially achieved this goal. During wet springs, spray programs initiated within one month of planting were superior to those started 6 weeks after planting. However this was not detectable in a dry season. Early season programs were found to control leafspot equally well if banded over-the-row at 1/3 rate, or if broadcast at full rate. High application rates and shortened spray intervals in the latter half of the crop season were found to achieve superior year-end disease control, but yield benefits were usually detected only with delayed harvest. Adjuvants (oil + surfactant) added to spray tanks were found to alter deposition (both positive and negative changes) and also to improve tenacity. Hot-dry weather was more destructive to chlorothalonil residues than was warm-wet weather. Leafspot disease prediction systems have not been successful in the Southeast due to localized weather phenomena, and the few spray applications eliminated by the practice.

Effect of Fungicide Application Technique on Deposition, Disease Control and Pod Yield. Robert H. Littrell and Fred H. Shokes, University of Georgia, Plant Pathology Department, Coastal Plain Station, Tifton, GA 31793 and University of Florida, Research and Education Center, Quincy, FL 32351.

Coverage of peanut foliage with effective fungicides is necessary to ensure economic pod yields. Without spraying yields could be reduced up to 50% as a result of defoliation caused by Cercospora arachidicola and Cercosporidium personatum. Fungicides are applied using hydraulic nozzles with spray volumes approximately 100 to 200 liters per hectare. A new concept in applying fungicides has been developed and is called controlled droplet application (CDA). This technique is well established as an efficient method for applying pesticides in uniform droplet sizes. CDA eliminates wasteful large spray droplets which contain excessive dosages and the large number of small droplets that do not reach the target area.

The CDA sprayer is compared to the conventional boom sprayer for coverage of foliage and deposition of chlorothalonil (applied as Bravo 500) on the leaf surfaces. Efficacy in disease control and influence on pod yields are compared at various dosages of chlorothalonil. No differences in coverage in the target area nor in deposition of fungicide were detected between the two appliances when the CDA spray volume was 9 liters per hectare. The conventional boom sprayer applied 94 liters per hectare. However, when spray volume of the CDA was increased to 27 liters, improved coverage and better canopy penetration was achieved as well as improved in disease control. It appears that should CDA be adopted spray volume should be no less than 27 liters per hectare and fungicide dose should not be reduced below the standard recommended level. There were indications of pod yield depression when the lower volume of spray was used in peanuts grown without use of irrigation. Additional research is underway to determine more precisely the influence of spray volume and effectiveness in controlling foliar diseases using the CDA.

Population dynamics and the management of Meloidogyne arenaria in peanuts. R. Rodriguez-Kabana, Department of Botany, Plant Pathology, and Microbiology, Auburn University, Alabama Agricultural Expt. Sta., Auburn, Alabama 36849.

Population development of the root knot nematode Meloidogyne arenaria in Florunner peanut can be described with the logistic equation. The rate of development of the population increases continuously during the first 12 weeks after planting. Typically 50% of the final population size is attained within 100 days after planting. This finding suggests that nematicide treatments be applied at planting or soon after to impede rapid population development of the nematode. Nematicide applications effected after 2-4 weeks of the crop are not as effective as those performed earlier. Maximal population size of the nematode is attained within 1-2 weeks before harvest. Consequently, the best time to sample for nematode analysis is at or near harvest time. Final population values for the nematode are negatively correlated with peanut yield. The type of population development exhibited by M. arenaria indicates that the value of corn or sorghum as rotation crops for the management of the nematode is questionable. Corn and sorghum sustain smaller populations of M. arenaria than peanut; however, only a small surviving population of the nematode is necessary to regenerate the "problem" when peanut is put back in the field after any of the 2 grass crops.

#### Management of Meloidogyne arenaria in Peanut During the Past Ten Years.

D.W. Dickson, Department of Entomology and Nematology, University of Florida, Gainesville, FL 32611.

During the past 10 years peanut growers have managed the peanut root-knot nematode (Meloidogyne arenaria) primarily with either dibromochloropropane or ethylene dibromide. Both chemicals were suspended by the Environment Protection Agency during 1977 and 1983, respectively. Growers generally applied these chemicals by injecting them into the soil with 2 - chisels per row spaced 8 to 10 inches apart, or with a single chisel per row at-time of planting. At this time there is no viable alternative at-plant soil fumigant available for use on peanut. 1, 3-dichloropropene or related compounds can be applied safely in certain peanut growing regions up to 7 days preplant (currently unavailable for several peanut growing counties in Florida). Alternative nematicides include nonfumigants which may be applied preplant or at-plant. Aldicarb, carbofuran, oxamyl, ethoprop are also approved for application at growth stages R1 to R2 (beginning bloom to beginning peg). The additional application of one of these three nematicides at R1 or R2 is suggested in peanut fields known to contain damaging population densities of M. arenaria.



Nematicides for Nematode Control on Peanut. N. A. Minton, USDA, ARS, Coastal Plain Experiment Station, Tifton, Georgia 31793.

Nematicides serve a major role in maintaining high peanut yields and quality in the United States. Several major nematode species, Meloidogyne arenaria, M. hapla, Belonolaimus longicaudatus, and Pratylenchus brachyurus, cause economic loss of peanut. All cultivars in use today are susceptible to all of the above nematodes. Cultural practices such as rotations and fallow often are not effective and/or economical.

The number of nematicides available for nematode control of peanuts has always been limited. The cancellation by the Environmental Protection Agency (EPA) of DBCP in 1978 and ethylene dibromide in 1983 and the termination of the manufacture of DD in 1984 has reduced the number of nematicides available even further. The loss of DBCP and ethylene dibromide has been especially costly to peanut producers. These two materials could be applied at seeding without crop injury and were often superior to nonfumigant nematicides in soils heavily infested with M. arenaria. In addition, the cost of applying these two materials was usually less than for any other nematicide.

The only fumigant nematicide now available is 1,3-D which requires a waiting period between application and planting of peanuts. However, its use in Florida is now restricted by EPA to certain geographical areas because of the possibility of ground water contamination. In addition to this nematicidal fumigant, there is a group of products referred to as "multipurpose fumigants". These materials, in addition to containing the nematicidal component usually contain materials that have activity on some soilborne fungi. Included are a mixture of 1,3-D and chloropicrin, a mixture of 1,3-D and methyl isothiocyanate, and metham. All of these materials require a waiting period between application and seeding of peanut and are expensive.

The third group of nematicides, often referred to as nonfumigants, include aldicarb, carbofuran, ethoprop, fensulfothion, oxamyl, and phenamiphos. All of these materials may be applied at planting and certain ones of them may be applied postplant either as a nematicide or in combination with a fungicide for the control of Sclerotium rolfsii. Aldicarb has been detected in ground water in several locations in the United States and in specific geographical locations its use has been discontinued or restricted by EPA. The movement and degradation of other nematicides in the soil is being investigated. Hence, the longevity of the remaining nematicides is uncertain.

Development of new nematicides is progressing at a very slow pace. Presently there are very few proprietary nematicides being field tested, most of which are in very early stages of development. Therefore, replacements for those that have been withdrawn from use may not be forthcoming soon.

## PEANUT STRIPE VIRUS

Peanut Stripe Virus Infecting U.S. Peanuts: An Overview. J. W. Demski,  
Department of Plant Pathology, Georgia Experiment Station, Experiment, GA 30212.

Peanut stripe virus (PStV) was first observed naturally infecting peanuts in the Plant Introduction plots at Experiment, Georgia, in the late summer of 1982. The virus was isolated from field peanuts to peanuts and other hosts by mechanical transmission in the greenhouse. During the winter of 1982-1983, pure cultures were obtained and methods developed for identification. During the early summer of 1983 the virus was again detected in peanuts at Experiment, Georgia, and also at the Plant Materials Center near Americus, Georgia, and the Coastal Plain Experiment Station at Tifton, Georgia. Only at this time did we perceive that PStV could be widespread and pose a threat to peanut production. Thus surveys of peanuts were made in Georgia (July 1983), North Carolina and Virginia (August 1983), and Texas and Florida (September 1983). PStV was found infecting peanuts in all states surveyed, but the virus was primarily restricted to institutional plantings and was not established in commercial peanut fields. Research during the summer of 1983, established that: PStV is seed transmitted in peanuts; was probably introduced into the U.S. from the Peoples Republic of China; the exchange of contaminated peanut seed is the primary source of inoculum; the virus is aphid transmitted in a nonpersistent manner; caused a 20% yield loss in one greenhouse test; is not serologically related to the endemic peanut mottle virus, but is related to soybean mosaic, blackeye cowpea mosaic and clover yellow vein viruses. Peanut seed harvested from the contaminated 1982 and 1983 field plots at Experiment, Georgia, were assayed for seed contamination. Twelve peanut seed from each of 56 entries were planted in the greenhouse and the seedlings individually assayed for PStV. Of the 672 seedlings, 39 were infected for a 5.8% seed transmission rate from field grown parents. If PStV does become established in commercial peanuts, the potential for annual epidemics is high because of the high seed transmission rate, the four and one half month growing season and the abundance of aphid vectors in all peanut growing areas. Assuming the U.S. peanut production is approximately 1,700,000 tons, with a value of \$500.00 per ton, the total production value would be near \$850 million. Therefore, by extrapolating, we can determine the range of yield losses that could occur. Using the formula: % plants infected x % yield loss = % total loss or total dollar loss, we obtain a range of possible losses;  $5 \times 5 = 0.25$  or 2.1 M,  $10 \times 10 = 1.0$  or 8.5 M,  $20 \times 20 = 4.0$  or 34.0 M,  $50 \times 20 = 10.0$  or 85.0 M, and  $100 \times 20 = 20.0$  or 170.0 M.

Use of cytological and immunodiffusion techniques to aid virus identification.

D. E. Purcifull, R. G. Christie, E. Hiebert, Z. Xiong, and S. R. Christie

Departments of Plant Pathology and Agronomy, University of Florida,  
Gainesville, Florida 32611

Virus-induced symptoms alone are often unreliable for diagnosing the specific causes of virus diseases because different viruses may induce similar symptoms and also because symptoms may be modified by environmental factors, stage of infection, host cultivar, virus strain, and the presence of other viruses. Rapid laboratory diagnostic tests are suitable for this purpose. Differences in the morphology of cytoplasmic inclusions aid in distinguishing between infections caused by peanut stripe virus(PStV) and peanut mottle virus(PMV). Epidermal strips of infected leaves are stained with calcomine orange-brilliant combination and examined by light microscopy(Christie and Edwardson, 1977, Monograph No. 9, Univ. of Fla. Agric. Expt. Stn., 155 pp.). Individual samples can be processed in as little as 15 minutes. Immunodiffusion tests with sodium dodecyl sulfate-treated antigens(Purcifull and Batchelor, 1977, Univ. Fla. Agric. Expt. Stn. Technical Bulletin No. 788, 39 pp.) also are useful for distinguishing PStV from PMV. Results are obtained within 12-48 hours. Both light microscopy and immunodiffusion have been used to test mechanically inoculated peanut plants in the greenhouse and seedlings infected through seed.

Plant Introductions and the Distribution of Peanut Seed. Gil Lovell, Southern Regional Plant Introduction Station, Experiment, GA 30212.

Peanuts (*Arachis spp.*) form one of the largest and most active collections maintained and distributed by this Plant Introduction Station. We currently have 6,225 peanut introductions (PI's) from 101 countries. This plant germplasm was received by the USDA Plant Germplasm Quarantine Center (PGQC), Beltsville, Maryland. There, routine inspection was made to determine possible presence of insects, diseases, and soil. If insects or fragments thereof were found, the samples were fumigated with methyl bromide. Plant Introduction numbers were assigned to individual germplasm samples (collection or accessions) and then forwarded to us. Over the years (since 1950) a small percentage of the peanut introductions assigned to the National Plant Germplasm System have been distributed from the PGQC simultaneously to a requesting scientist and to the SRPIS. Since 1972, plant scientists receiving new peanut germplasm directly from the PGQC also received informational guidelines with reference to basic steps for observation and inspection during the initial grow-out season. Under the supervision of a Staff Research Plant Pathologist we carried out these guidelines during each year's grow-out of new peanut introductions.

In 1979 we began receiving and increasing peanut germplasm received through exchanges with the People's Republic of China (PRC). In the successive years of 1979-80-81-82 our increase plantings included a total of 94 accessions that were grown with a total of 300 other peanut accessions from numerous countries. In the summer of 1982, for the first time, Dr. Grover Sowell, Jr., Research Plant Pathologist, ARS, noted symptoms that did not match those of the endemic Peanut Mottle Virus. He requested the expertise of Dr. Jim Demski, Virologist, Georgia Experiment Station to confirm his findings. By early January, 1983 enough laboratory data was collected to allow us to alert all peanut breeders in the U. S. of the symptoms of a peanut virus that had not been previously described in this country. We were also able to inform scientists and concerned administrative units in USDA and University Experiment Stations that experimental plots grown in association with peanuts from the PRC should be carefully observed for any unusual disease symptoms. Following the 1983 field surveys coordinated by Dr. Demski it was perceived that this new virus could be widespread. In planning our germplasm increase plantings for 1983 we included 33 new peanut introductions from PRC. As a necessary precaution we did not include any other peanut accessions. The plantings in 1983 did prove to be heavily infected with virus.

Following the first observation of the new virus symptoms in July of 1982, we placed an "in-house quarantine" on all peanuts from PRC and Taiwan. We also included all peanut introductions grown in the same increase plantings. This group of introductions will be tested through Dr. Demski's assay procedures. Because we have given priority to clearing breeding lines and new cultivars that are suspect, it will be the end of 1985 before we expect to be completed with the assay and clean-up of the PI germplasm.

Peanut Stripe Virus, Infection of Peanuts, and Breeding Programs. J. C. Wynne, Department of Crop Science, North Carolina State University, Raleigh 27695.

Germplasm is the foundation of an effective peanut breeding program. Diverse germplasm provides the necessary building blocks for future varietal improvement and the genetic diversity essential to maintain high levels of productivity. The introduction and use of diverse germplasm, although beneficial, involves risks of introducing a new pest or having the introduced germplasm being susceptible to a minor pest in the area.

Whenever a new pest or disease such as peanut stripe virus is discovered, the first effect on the breeder is the restricted movement of germplasm from both foreign and domestic locations. It is clear that plant quarantine measures can play an important role in minimizing the risks of spreading diseases to disease-free areas. It is desirable, however, that regulations imposed should not be more stringent than required to prevent the spread of the disease. Regulations that are too strict could seriously limit the effectiveness of plant breeding. The USDA/APHIS/PPQ restriction on peanuts from the Peoples Republic of China and the voluntary restriction by breeders on the movement of virus-suspicious germplasm are proper measures that have been investigated.

Since the peanut stripe virus has been confined to research stations, the breeders are attempting to eradicate PStV by eliminating the virus from their breeding stocks. Germplasm suspected to be infected was not planted. Early and frequent inspection and roguing of planted stocks are also being practiced. Valuable germplasm that is infected will be grown in isolation in the greenhouse and increased from virus-free plants.

Breeders seed of each variety are being inspected since the use of virus-free seeds would eliminate the primary source of inoculum. Breeders seed is produced in virus-free areas. Seed fields will be frequently inspected and fields with virus-infected plants will not be used as foundation seed stocks if other seeds are available. Breeders in Georgia and Florida are attempting to plant virus-free breeders seed by testing seed lots using the ELISA test. However, with low infection frequencies a few virus-infected plants might not be detected in a large seed lot.

The breeders are also trying to assess the seriousness of PStV. If the virus is likely to be a serious problem, the breeder may need to expend considerable resources in attempting to find resistant germplasm or germplasm that does not transmit the virus through its seed. The reported high seed transmission rate and 20% yield loss indicate that PStV could become a serious problem. Of four lines introduced into North Carolina from China in 1981, only one line was found to be infected. Nine percent of the progeny from the line grown in the field during 1982 was virus-infected. However, the virus did not spread to adjacent plots during the 1982 growing season. The 18 virus-infected plants had a 20% reduction in yield and size of pods and seeds when grown in the greenhouse. The potential seriousness of PStV cannot be determined until the frequency of infection is determined for the 1984 crop.

Regulation of Seed Distribution as Influenced by New Diseases or Insect Pests.  
B. G. Lee and Al Elder, Survey and Emergency Response Staff, National Program Planning Staff, Plant Protection and Quarantine, Animal and Plant Health Inspection Service, U.S. Department of Agriculture, Hyattsville, Maryland.

Plant movement is of great interest to the U.S. Department of Agriculture. Many major agricultural catastrophes have resulted from the introduction of plant material that contained exotic plant pests. Powdery mildew and downy mildew of grape in France, Panama disease of banana in the Caribbean, and probably coffee rust in Brazil are examples of such catastrophes in foreign countries. The movement of plant germplasm poses a risk of moving exotic pests, particularly disease agents, along with the germplasm. This avenue of entry for exotic pests was recognized many years ago and provisions for regulating plant material for propagation including germplasm, was written into the Plant Quarantine Act.

The Act provides authority for the implementation of quarantine measures to keep exotic plant pests out of the United States. That authority, however, does not mean or dictate that all plant material is prohibited from being imported into the United States, but rather certain conditions must be met when importing material in order to prevent the inadvertent introduction of exotic pests. Judgment determinations are made relative to the likelihood of exotic pest introductions via plants or plant parts and conditions established for each plant genus. Some genera are denied entry, some allowed to be imported under permit and grown only under specified conditions at selected locations, and others under permit requiring treatment or other procedure.

Seeds, as parts of plants, are covered by the Plant Quarantine Act. All seeds imported into the United States are inspected on arrival. Those found to be infested with exotic insect pests, infected, or contaminated with exotic plant disease organisms are subject to treatment to eliminate the risk of pest or disease introduction. However, there are usually no effective quarantine treatments which will eliminate a fungus pathogen yet leave the seeds' viability relatively unimpaired. This means that most seeds infected or contaminated with pathogens are either reexported or destroyed. You recognize as we do that you cannot always detect a plant disease just by a visual examination of the seed, albeit a microscopic examination. Of course, we refer to the seedborne viruses and many internal seedborne fungi which require a more sophisticated laboratory detection method.

Animal and Plant Health Inspection Service recognizes the need of researchers and plant breeders to acquire new germplasm for the genetic improvement of plant species. We support that action and have developed biologically sound procedures to accommodate the acquisitions while protecting our existing agricultural production systems. Quarantine and regulation provisions are necessary components of the activities designed to prevent the introduction of exotic plant pests. Quarantine and regulation provisions include seeds since they provide an excellent pathway for new disease and insect pest introductions into the United States.

Generally, we view seeds as being innocent of exotic pest introductions until proven guilty. Some seeds are in the guilty category and, consequently, are prohibited entry into the United States. Wheat, rice, corn, cotton, cassava, sugarcane, and true potato seed fall into this category. Prohibited entry means they may be imported only under Departmental permit under strict quarantine conditions and for scientific purposes. Evidence of pest introduction and potential or subsequent adverse impact on agriculture led us to take such action against these seed. You will recognize these as seed of crops of great value in the United States. Until recently, peanut seeds were considered to be in the innocent category.

The seeds of certain plant genera are of particular quarantine concern and are permitted entry only under special procedures for their growing in the United States. The nature of the quarantine conditions or safeguards prescribed for each kind of seeds will depend on a number of factors. These include the kinds of exotic diseases known to exist in the country of origin, the method of collection of the seeds, the possibility of disease organisms being transported with the seeds and whether in fact these organisms were transported, where and when the seeds are to be grown in the United States, and what safeguards can be employed to prevent the possible dissemination of exotic disease organisms. With the confirmation of peanut stripe virus in seed from the Peoples Republic of China, we are now considering prohibiting peanut propagative material from that country.

Seeds of most crop plants other than those already mentioned may be imported under permit without restrictions other than inspection on arrival. That inspection must indicate that the seeds are free from exotic plant pests and disease organisms.

## EXTENSION AND INDUSTRY

Peanut Disease Loss Estimates for Major Peanut Producing States in the United States for 1983. The cooperation of the Plant Pathologists and Nematologists from those states reporting is greatly appreciated and acknowledged. Peanut disease loss estimate compiled by R. V. Sturgeon, Jr., Extension Plant Pathologist, Oklahoma State University.

Throughout the peanut producing areas of the United States, diseases continue to be a major limiting factor in producing maximum peanut yields. Peanut disease losses from the eleven states reporting ranged from a low of 5.02% reported by New Mexico to the highest loss of 26% reported by Florida (reported in Table I). This amounted to an approximate loss of 397,390 tons reported by ten of the states, and at 27 cents per pound the peanut growers from those reporting states lost over \$215,590,862 (reported in Table II).

Weather and control practices carried out by growers have an influence on disease incidence and loss. The severity of the disease is dependent on several environmental factors interacting with one another affecting both pathogen and peanut plant simultaneously. These conditions will vary between infection sites and seldom are they the same each year. Therefore, disease severity varies according to existing conditions.

The disease control programs growers maintain have a great influence on disease incidence and loss. The performance of these control practices become increasingly important because heavy loss in production can critically affect growers financially. Disease control and an economic dollar return depends greatly on early detection and accurate identification of the disease, selection of control practice and proper application. Commercial scouting or growers closely monitoring their peanut fields can reduce disease losses by providing early accurate identification of disease problems.

How much of this 215 million dollar loss that has been reported could have been prevented will never be known, yet we are confident that much of this loss could have been reduced by properly using available disease control practices.

Early and late peanut leafspots, Cercospora arachidicola and Cercosporidium personatum caused the greatest yield losses. The greatest loss of 15% was reported by Florida. Losses caused by nematodes were reported to have caused the next greatest loss; however, Southern blight, Sclerotium rolfsii, reportedly caused almost as much as all kinds of nematodes combined. Pod and root rot disease complex did not seem to cause as much of the damage as in past years. Seedling disease losses were greater in certain states and lower in others; yet, overall loss credited to the seedling disease complex was about the same as recent years. The peanut leafspots, nematodes and southern blight continue to be reported as the major disease problems as in past years. Pythium wilt reported by Virginia as a disease that should be recognized.

Estimating disease losses is difficult because of the many factors that influence the diseases and yields. However, loss estimates can be reliable when proper techniques are used such as field monitoring programs, disease control trials, crop reporting service, and surveys. Accurate disease loss estimates alert agricultural scientists, stimulate needed research and make the public aware of the existing problems.

There is a tremendous challenge for extension and research plant pathologists, nematologists and industry to reduce disease losses. More effective and economical disease control practices and management programs are needed by the peanut growers.



TABLE 1- ESTIMATED PERCENT LOSS OF PEANUT YIELDS IN 1983 AS RESULT OF DISEASE DAMAGE

DISEASE	PATHOGEN	ALA	ARK	FLA	GA	N.C.	N.MEX	OKLA	S.C.	TEX	VA	LA
Seedling blight	<u>Penicillium</u> spp. <u>Pythium</u> spp. <u>Rhizoctonia solani</u> , <u>Fusarium</u> spp, <u>Rhizopus</u> spp, and etc.	-	3.0	2.0	-	T	1.5	1.0	0.5	2.0	T	4.0
Crown rot	<u>Aspergillus niger</u>	T	-	-	-	0.5	-	T	1.0	1.0	T	T
Southern blight	<u>Sclerotium rolfsii</u>	7.2	1.0	2.0	8.5	1.5	0.5	4.0	4.5	5.0	0.2	3.0
Sclerotinia blight	<u>Sclerotinia sclerotium</u>	-	-	-	-	1.0	0	1.5	0	T	3.0	T
Pod and Root Rot Complex	<u>Pythium</u> spp, <u>Rhizoctonia</u> <u>solani</u> , <u>Fusarium</u> spp.	1.0	1.0	2.0	4.0	1.0	1.5	3.0	4.6	3.0	0.4	2.0
Seg. 3 <u>A. flavus</u>	<u>Aspergillus flavus</u>	1.09	-	-	1.5	T	0	0.16	1.0	1.82	T	0.2
Black rot	<u>Cylindrocladium crotalariae</u>	0.2	-	-	-	8.0	0	-	3.5	0	3.0	0
Verticillium wilt	<u>Verticillium</u> spp.	-	-	-	-	T	0.02	0.3	-	0	0.1	0
Fusarium wilt	<u>Fusarium</u> spp.	-	-	-	-	0	0	0	-	T	0	0
Bacterial wilt	<u>Pseudomonas solanacearum</u>	-	-	-	-	0	0	0	-	0	0	0
Early and Late Leafspot	<u>Cercospora arachidicola</u> <u>Cercosporidium personatum</u>	6.5	4.0	15.0	4.0	1.0	1.0	3.5	3.0	5.0	2.0	4.0
Web blotch	<u>Phoma arachidicola</u>	-	-	-	-	T	T	T	-	T	0	0
Leaf rust	<u>Puccinia arachidis</u>	0.01	-	T	-	0	0	0	-	T	0	0
Other leafspot	<u>Alternaria</u> spp. <u>Leptosphaerulina crassiasca</u>	-	-	-	-	T	T	T	0.5	T	T	T
Botrytis blight	<u>Botrytis cinerea</u>	-	-	-	-	T	0	0	-	0	0.1	0
Virus		T	-	-	1.0	T	0	0	-	T	T	1.5
Other disease											0.1 (Pythium Wilt)	
Nematodes	All kinds	5.0	1.5	5.0	2.5	5.0	0.5	3.0	4.0	5.0	4.0	5.0
N. Root knot	<u>Meloidogyne hapla</u>				(0.3)	(1.0)		(1.75)		(3.0)	(3.5)	
PEANUTS Root knot	<u>Meloidogyne arenaria</u>	(4.9)			(2.2)	(T)					(0)	
Lesion	<u>Pratylenchus brachyurus</u>	(0.1)				(2.0)		(0.75)		(2.0)	(T)	
Sting	<u>Belonolaimus longicaudatus</u>										(0.5)	
Ring	<u>Criconebella</u> sp.					(2.0)		(0.5)				
Total Percent Loss		21.0	10.5	26.0	21.5	18.0	5.02	16.8	22.6	22.82	12.9	19.7

Compiled by R. V. Sturgeon, Jr., Extension Plant Pathologist, Oklahoma State University  
with cooperation of Plant Pathologist and Nematologists from reporting states.

TABLE II  
Estimated Loss of Peanut Production in 1983  
as Result of Disease Damage

State and Total % Loss	Acres Harvested	Pounds Produced	Pounds <sup>1/</sup> Loss	Dollar <sup>2/</sup> Loss
Alabama 21.0	183,000	455,670,000	121,127,468	32,704,416
Arkansas 10.5	2,800	5,700,000	668,715	180,553
Florida 26.0	56,000	160,160,000	56,252,432	15,188,157
Georgia 21.5	562,000	1,556,740,000	426,368,280	115,119,436
Louisiana 19.7	877	1,974,000	484,282	130,756
N. Carolina 18.0	141,000	303,150,000	66,545,122	17,967,183
New Mexico 5.02	11,000	25,850,000	1,626,615 *	439,186
Oklahoma 16.8	92,000	179,540,000	36,253,269	9,788,383
S. Carolina 22.6	13,000	23,400,000	6,832,558	1,844,791
Texas 22.82		363,792,000	48,764,135	13,166,316
Virginia 12.09	96,000	201,600,000	29,858,094	8,061,685

<sup>1/</sup> Pounds Loss = Potential yield minus pounds produced.

Potential Yield = Pounds produced ÷ (100% minus % estimated loss)

<sup>2/</sup> Dollar Loss based on 27¢ per lb x pounds loss.

Compiled by R. V. Sturgeon, Jr., Extension Plant Pathologist, Oklahoma State University with cooperation of Plant Pathologist and Nematologists from reporting states.

No EDB! Now What? for Root Knot Nematode Control on Peanuts. T.A. Lee, Jr., Extension Plant Pathologist, Texas A & M University, Stephenville, TX.

Root knot nematodes continue to be on the minds of many peanut farmers. Since each year something different in the area of chemical control limits their choices. There are methods available other than chemical control such as long term crop rotation, but for many producers this has not been a feasible method. In studying the history of nematode control for the last 10 to 15 years, somewhat of an evolution in chemicals has resulted. Ten years ago the principal chemical used to control nematodes was a material referred to as DBCP. This material was relatively inexpensive using 3/4 gallon per acre at a cost of about \$10 to \$12. Unfortunately, there were some environmental problems with this compound and the Environmental Protection Agency (EPA) saw fit to cancel its use and peanut growers lost a very valuable and inexpensive control tool. With the loss of DBCP, granular compounds began to make minor entries into the marketplace along with another compound, Ethylene dibromide (referred to as EDB). EDB like DBCP, was in its time the cheapest, most effective and probably the easiest to use of chemicals available for root knot nematode control. But again, the EPA stepped in and deemed the EDB to be harmful to human health and its use on peanuts was cancelled.

In the spring of 1984 many growers were asking "what am I going to do now?" There was one compound remaining with fumigant action (1,3-D). The 1,3-D compound is definitely not as easy to use as either DBCP or EDB and is more expensive. Therefore, many growers are taking a closer look at the granular compounds. These compounds are highly effective on nematodes but are almost out of the question for the dryland farmer since they require moisture for activation. Ideally, these compounds should be used in combination with the soil fumigant 1,3-D. A grower should determine his nematode problem in the fall just prior to harvest of the previous crop and should budget \$5Q00/A for chemical control.

New Developments from Helena Chemical Company.  
Allen Underwood, Helena Chemical Company, Cayce-West Columbia, SC.

Testing of sterol inhibiting fungicides at full and reduced rates with the addition of Helena's Agri-Dex, Penetrator, and Soydex spray enhancement adjuvants continues in VA, AL, GA, SC and FL. Previous tests indicate that lower rates of fungicides plus Agri-Dex or Penetrator give equal results when compared to the higher rates of fungicides when used alone.

BRAVO-S, Paraquat Plus, Copper FF, Crop Oil Concentrate, and Surfactant WA are products bearing the Setre Chemical Company name that are being tested and marketed by Helena. Helena is a marketing agent for Setre Chemical Company.

A unique source of liquid Boron for foliar and soil application is being introduced this year.

QUANTUM<sup>tm</sup> 4000 - A New Type of Seed Treatment for Peanuts  
W.G. Hairston, Gustafson, Inc. Dallas, TX.

QUANTUM<sup>tm</sup> 4000 is a new type of seed treatment that is made up of a unique strain of *Bacillus subtilis* bacteria. When germination begins, the bacteria colonize the developing root system and provide protection from root diseases. QUANTUM 4000 has in laboratory test been demonstrated to give off several antibiotics. These antibiotics, along with competition for growth sites with pathogens, appears to protect the peanut root system from several root diseases. In grower trials conducted in TX, OK, GA, and AL in 1982 and 1983 growers have averaged an increase in yield of 10%.

Product Characteristics of Lorsban 15G in Peanut.  
Dennis B. Hale, Dow Chemical Company, Atlanta, GA.

A review of the stability, persistence, moisture requirements, and metabolite formation of the granular formulation of chlorpyrifos will be given. These product characteristics help define the activity of Lorsban 15G on soil insects and white mold in peanut.

Actellic; An Update. Chris Weed, ICI Americas, Inc.,  
Montgomery, AL.

Annual losses due to stored grain insects average between 10%-20% of the total crop produced. These losses are valued at \$200 to \$600 million. Insects spoil the grain directly by feeding on the kernels and indirectly by contaminating the crop with their waste, webbing, body parts, cast skins, and even the odor created by the infestation along with the distribution of fungi. Even the heat and moisture created by infestations contribute to storage losses.

The Environmental Protection Agency granted ICI Americas, Inc. an Experimental Use Permit for Actellic use on peanuts on September 2, 1983. This allowed the use of 22% of active ingredient on up to 57,000 tons of peanuts. An Experimental Use Permit for small grains was granted on October 25, 1983. This allowed the use of 16% of active ingredient on up to 133,629 tons of small grains.

Actellic 7E is an organophosphorus insecticide which provides excellent control of stored grain insects. It is active against a wide range of insects, including strains resistant to malathion. Actellic will provide protection of stored grain for up to 12 months for "in pile" feeders and up to 6 months for surface feeders.

Actellic will control the major economic insect pests of stored grain and peanuts at the following rates:

- A. Corn, wheat, and grain sorghum (6.4-8.8 fluid ozs) in 5 gallons of water applied to 30 tons of grain.
- B. Rice (10.4-16 fluid ozs) in 5 gallons of water applied to 30 tons of rice.
- C. Peanuts (11 fluid ozs) in 5 gallons of water applied to 15 tons of peanuts.

Actellic will be evaluated during 1984 as a can spray and also as a premise disinfestation spray.

Harvest Plus: A High Analysis, Complete Foliar Nutritional  
R.E. Woodward, PhD., Director, Business Development, Stoller  
Chemical Company, Inc., Houston, TX

Recently patented chemistry provides a method of combining phosphate and potash with high levels of divalent metals in a soluble format. Foliar application of Harvest Plus supplies all the essential nutrients required for active metabolism even when root mediated delivery is impaired by water relations, nematodes, root diseases or soil chemistry. Field observations of Harvest Plus treated blocks included increased yield, improved quality, earlier maturity and better stress tolerances.

New Products for the Control of Sclerotinia Blight of Peanut. P. M. Phipps, Tidewater Res. Ctr., Suffolk, VA 23437.

More than 50 fungitoxics (registered and experimental) were tested for activity against Sclerotinia minor utilizing the soil plate method. Ten chemicals were found to provide good suppression of mycelial growth and sclerotial production by S. minor. Five of these chemicals were subsequently shelved by industry and are no longer available. Four of the remaining five (PCNB, dicloran, iprodione, vinclozolin) have been evaluated over three years in field trials of peanuts. PCNB applied as a 10% granule at 5 lb a.i./A banded over the row ca Jul 15 and Aug 30 provided good disease suppression. PCNB as a 75W formulation sprayed over the row at similar timings and rates was ineffective in disease suppression. Dicloran applied as a 75W formulation at 3 lb a.i./A on demand and subsequently at 2.25 lb a.i. in two additional demand sprays gave fair to good disease suppression. Good disease suppression was also achieved with iprodione as a 50W formulation at 1 lb a.i./A on ca Jul 15, Aug 12 and Sep 10. Vinclozolin gave excellent disease suppression when applied as a 50W formulation at 0.75 lb a.i./A on a similar calendar schedule. Tank mixes of iprodione or vinclozolin with the 2nd, 4th and 6th sprays of benomyl plus flowable sulfur for leafspot control gave good to excellent suppression of both Sclerotinia blight and Cercospora leafspot. Only vinclozolin provided disease suppression when chlorothalonil was substituted for benomyl and sulfur in the tank mix. PCNB, dicloran and vinclozolin have received emergency approvals for utilization to control Sclerotinia blight of peanut in Virginia in 1984.

Standardized Systems for Nematicide Evaluation -

Variable Data: Why and How?

C.H. Baldwin, SDS Biotech Corp,; J. Bailey, N. Carolina State; D. Dickson, University of Florida; R. Kabana, Auburn University.

FACTORS RESPONSIBLE FOR DATA VARIATION

1. Test site selection
  - a. Nematode population
  - b. Size of test
  - c. Soil type
  - d. Cropping history
2. Experimental design
  - a. Number of treatments
  - b. Number of replications
3. Application techniques used
  - a. In furrow
  - b. Band and broadcast
4. Nematicide rates
  - a. Formulations
  - b. Method of calculation

SUGGESTIONS TO REDUCE VARIATIONS

1. Standardize
  - a. Protocols from industry
  - b. Calculation
  - c. Labels
  - d. Reporting

APRES BOARD OF DIRECTORS MEETING  
Riverview Plaza Hotel, Mobile, Alabama  
17 July 1984

President Fred Cox called the meeting to order at 7:30 P.M. The following board members were present: Fred Cox, Ron Sholar, David Hsi, Gale Buchanan, Johnny Wynne, Darold Ketring, Gerald Harrison, Max Grice and Perry Russ. Also attending were O. D. Smith, Don Smith, W. E. Dykes, Terry Coffelt, J. M. Troeger, Sydney Fox, Charles Simpson, Mike Schubert, Walt Mazingo, and Aubrey Mixon.

O. D. Smith reported on the American Society of Agronomy Meeting. Approximately 1,600 attended the 1983 meeting. Seventeen papers on peanuts were presented.

Fred Cox discussed several subjects of the past year. Dr. Durward Bateman of N.C. State has been appointed as representative from the Southern Agricultural Experiment Station Directors. A questionnaire to learn more about APRES members and their interest in different committees was sent to all members. A change in status and pay for the assistant to the Executive Officer was approved during the past year. The new assistant will begin work officially on July 30, 1984. Prior to that she will spend some time in training with the current assistant. A calendar of events has been established. A change in the financial reporting format has been established. The subject of changing the APRES fiscal year has been discussed with no decision made. A letter from Harold Pattee concerning the use of society funds to be combined with personal funds to purchase a word processor was discussed. President Cox indicated the consensus of the board was that the society should be using its own equipment.

David Hsi presented the report of the Nominating Committee. Gerald Harrison moved that the report be accepted. Seconded by Perry Russ. Motion passed.

W. E. Dykes presented the report of the Finance Committee. Perry Russ moved and Max Grice seconded that the report be accepted. Motion passed.

The Publications and Editorial Committee report was presented by Terry Coffelt. David Hsi moved and Darold Ketring seconded that the report be accepted. Motion passed.

The Peanut Quality Committee report was presented by John Troeger. Gale Buchanan moved and Perry Russ seconded that the report be accepted. Motion passed.

Gale Buchanan presented the report of the Golden Peanut Research and Education Award Committee. Perry Russ moved and Gerald Harrison seconded that the report be accepted. Motion passed.

David Hsi presented the Fellows Committee report. A discussion ensued and it was agreed that the Fellows Committee should be structured to include previous winners. Perry Russ moved and Max Grice seconded that the report be accepted. Motion passed.

Charles Simpson presented the report of the Bailey Award Committee. A discussion of how the Bailey Award recipient should be selected ensued. Johnny Wynne moved and Gale Buchanan seconded that only volunteer papers be in competition for the Bailey Award. Motion passed. The committee recommended that a certificate (in addition to trophy bookends) be sent to the senior author of the winning paper. The possibility of presenting the current award and lesser awards was discussed as interest earned on the account is resulting in increases in the Bailey Fund with yearly expenditures less than interest earned. President-elect Buchanan will inform the Bailey Award Committee of the availability of funds for additional awards. Perry Russ moved and Gerald Harrison seconded that the report be accepted. Motion passed.

Mike Schubert presented the report of the Site Selection Committee. The 1985 meeting will be held July 8-15 at the El Tropicano in San Antonio, Texas. The 1986 meeting will be held in Virginia Beach, Virginia, and the 1987 meeting to be held in Florida with the Orlando area as the most likely location. Gale Buchanan moved and Perry Russ seconded that the report be accepted. Motion passed.

Gale Buchanan presented the report of the Program Committee. Perry Russ moved and Max Grice seconded that the report be accepted. Motion passed.

Perry Russ moved and Darold Ketring seconded that the registration fee be \$30 for members and \$35 for non-members. Motion passed.

President Fred Cox adjourned the meeting at approximately 10:10 p.m.



Minutes of the Regular Business Meeting of the  
AMERICAN PEANUT RESEARCH AND EDUCATION SOCIETY  
Riverview Plaza Hotel, Mobile, Alabama, 20 July 1984

The meeting was called to order at 8:10 a.m. by President Fred Cox.

The minutes from the 1983 meeting were approved and accepted.

The Executive Officer report was presented by Ron Sholar.

The Nominating Committee Report was presented by David Hsi.

The Finance Committee Report was presented by William Dykes.

The Publications and Editorial Committee Report was presented by Terry Coffelt. Harold Pattee presented certificates to outgoing Associate Editors for Peanut Science.

The Peanut Quality Committee Report was presented by John Troeger.

The Public Relations Committee Report was presented by Sidney Fox.

The Site Selection Committee Report was given by Mike Schubert.

The American Society of Agronomy Liaison Report was presented by O. D. Smith.

The President's Report was presented by Fred Cox.

The Program Committee and President-Elect Reports were given by Gale Buchanan.

The meeting was adjourned at 9:20 a.m.

AMERICAN PEANUT RESEARCH AND EDUCATION SOCIETY

BALANCE SHEET AS OF

June 30, 1984

June 30, 1983

ASSETS

CURRENT ASSETS

Cash in Checking Account	36,749.49	15,472.82
Certificate of Deposits	10,000.00	31,355.02
Savings Accounts	965.04	3,350.15
Inventory of Books	<u>47,274.64</u>	<u>41,243.84</u>
<u>TOTAL ASSETS</u>	<u>94,989.17</u>	<u>91,401.83</u>

LIABILITIES AND FUND BALANCE

LIABILITIES

Advanced Payments for Peanut Science & Technology	<u>-0-</u>	<u>23,049.69</u>
<u>TOTAL LIABILITIES</u>	<u>-0-</u>	<u>23,049.69</u>

<u>FUND BALANCE</u>	<u>94,989.17</u>	<u>68,352.14</u>
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<u>TOTAL LIABILITIES AND FUND BALANCE</u>	<u>94,989.17</u>	<u>91,401.83</u>
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For More Complete Financial Statements  
See Accountant's Review Report

APRES STATEMENT OF ACTIVITY FOR YEAR ENDING

	<u>June 30, 1984</u>	<u>June 30, 1983</u>
<u>RECEIPTS</u>		
Membership & Registration	19,766.87	15,831.12
Proceedings & Reprint Sales	28.50	80.77
Special Contributions	3,400.00	3,795.00
Peanut Science & Technology	13,155.89	23,049.69
Peanut Science Page Charges & Reprints	11,604.12	13,311.33
Institutional Membership	1,632.50	1,196.50
Differential Postage Assessment - Foreign Members	2,167.50	1,375.24
Checking Account Interest	1,108.96	1,119.99
Savings Acct. - Wallace K. Bailey	2,511.60	51.60
Ladies Activities	-0-	18.00
Proceeds from Certificates of Deposits (Principal & Interest)	22,819.55	887.11
APRES Method Books	<u>1,175.63</u>	<u>357.00</u>
<u>TOTAL RECEIPTS</u>	<u>79,371.12</u>	<u>61,073.35</u>
<u>EXPENDITURES</u>		
Proceedings - Printing & Reprints	4,380.48	4,078.54
Annual Meeting - Printing	3,912.86	3,045.25
Secretarial	3,150.00	3,000.00
Postage	555.00	1,123.70
Office Supplies	587.69	913.84
Travel - Executive Officer	421.24	-0-
Registration - State of Georgia	20.00	5.00
Miscellaneous	467.95	253.60
Peanut Science	15,059.00	14,750.00
Peanut Science & Technology	26,806.63	21,243.84
Bank Charges	350.72	72.17
Peanut Research	1,384.30	1,107.58
Purchased Certificate of Deposit	-0-	10,000.00
Membership	54.33	-0-
Secretary - Self-Employment Tax	210.38	150.06
Legal Fees	62.00	85.00
APRES Method Books	389.20	618.00
Sales Tax	<u>282.67</u>	<u>266.71</u>
<u>TOTAL EXPENDITURES</u>	<u>58,094.45</u>	<u>60,713.29</u>
<u>EXCESS RECEIPTS OVER EXPENDITURES</u>	* <u>21,276.67</u>	<u>360.06</u>
Cash in Checking Acct. - Beginning of Period	<u>15,472.82</u>	<u>15,112.76</u>
Cash in Checking Acct. - End of Period	<u>36,749.49</u>	<u>15,472.82</u>

\*Over 20,000 of this excess came from Certificates of Deposits.

Statement of Changes in Fund Balance for the Year Ending

	<u>June 30, 1984</u>	<u>June 30, 1983</u>
<u>Fund Balance - Beginning of Year</u>	68,352.14	58,340.75
<u>ADD:</u>		
Interest Income	2,719.98	3,515.88
Membership & Registration	21,399.37	17,027.62
Special Contributions	3,400.00	3,795.00
Peanut Science Paper Changes & Reprints	11,604.12	13,311.33
APRES Method Book Sales	1,175.63	357.00
Postage Assessments	2,167.50	1,375.24
Proceedings & Reprint Sales	28.50	80.77
Ladies Activities	-0-	18.00
Peanut Science & Technology Sales	36,205.58	-0-
Less: Cost of Books	<u>20,775.83</u>	
Net Proceeds	<u>15,429.75</u>	
<u>Total</u>	<u>57,924.85</u>	<u>39,480.84</u>
<u>DEDUCT:</u>		
Proceedings - Printing & Reprints	4,380.48	4,078.54
Annual Meeting - Printing	3,912.86	3,045.25
Secretarial	3,150.00	3,000.00
Postage	555.00	1,123.70
Office Supplies	587.69	913.84
Registration - State of Georgia	20.00	5.00
Miscellaneous	467.95	253.60
Peanut Science	15,059.00	14,750.00
Bank Charges	350.72	72.17
Peanut Research	1,384.30	1,107.58
Secretary - Self Employment Tax	210.38	150.06
Legal Fees	62.00	85.00
APRES Methods Book	389.20	618.00
Sales Tax - Texas, N. Carolina, Georgia	282.67	266.71
Membership	54.33	-0-
Travel - Executive Officer	<u>421.24</u>	<u>-0-</u>
<u>Total</u>	<u>31,287.82</u>	<u>29,469.45</u>
 Net Increase in Fund Balance	 <u>26,637.03</u>	 <u>10,011.39</u>
 <u>Fund Balance - End of Year</u>	 <u>94,989.17</u>	 <u>68,352.14</u>

## PRESIDENT'S REPORT

F. R. Cox

This, the 16th year for the American Peanut Research and Education Society, has been a year of change. It has not been that transition from adolescence to maturity, as those of the "sweet sixteen" vintage might imagine. Rather, we have gone through our second change in Executive Officer. Yes, after 16 years, we are now just calling on the third person to serve in this capacity. Such an infrequent change has the potential of being quite disastrous, but that certainly was not the case. Both Don Smith and Ron Sholar are to be commended for their patience and detailed attention to the transfer of the duties of that office.

That office is an extremely responsible position for our Society, the Executive Officer guides the operational headquarters. He has the business office that responds to a multitude of questions and notices, keeps our finances straight, and generally rides herd on all contingents of our Society. Why he does this might be questioned, - for we pay him nothing, though we expect a lot from him and his assistant.

The change we have just gone through has helped identify just how much work and effort is involved in these operations. Awareness of this is not new, as a number of past presidents, and an Ad hoc committee, have urged the Society to increase its commitment to that office. This was the time, though, when the need became so obvious it could not be brushed aside. As a result, we have more than doubled the amount paid to the assistant to the Executive Officer. We are now paying our fair share and should be proud of it.

Our Society is not alone in increasing its commitment to help the Executive Officer. Oklahoma State University has agreed to provide an office and equipment for the assistant to our Executive Officer. Just the close proximity of personnel will increase efficiency tremendously. We are truly appreciative of the thoughtfulness shown by that University.

With such assistance, the Executive Officer should continue to handle the routine business of the Society efficiently. This will allow our officers, committees, and especially individual members freedom to pursue the goals of our Society - namely to promote scientific research on peanuts through significant meetings and publications. By these means we instruct and educate on the management and value of this great commodity.

Our meeting is singular - this one - but it has a quality and breadth that is to be admired. The research reported here is timely and well conceived. But experiencing the breadth of this meeting is likely the greatest reward for those attending. Each of us has a narrow field of specialization. All year we live within that field, barely acknowledging others. At our annual meeting, however, one cannot help but be amazed at the many diverse research and extension programs, all of which are increasing our knowledge of peanuts. This is a broadening experience and a noted advantage of being associated with a commodity group.

We also enhance scientific research on peanuts through our publications. A subcommittee of the Publication and Editorial Committee put out a nice brochure on our publications this year. This is assisting in the sales of our book Peanut Science and Technology. There is no doubt that this text is a classic in the field, and that sales will continue to progress well. We must plan now to set aside the returns from the sale of this book so that we will be in a good financial position to publish again in the future. That time will come sooner than we think.

Our journal, Peanut Science also is continuing to be a highly respected scientific publication. The editor, Harold Pattee, and his associate editors, have done well in maintaining the high quality of manuscripts that are included. The real credit for quality, however, goes to the numerous authors - to each of you as members of this society. Your record is excellent both here and in other writings on peanuts. The Compendium of Peanut Diseases edited by Morris Porter, Don Smith, and Rodriguez-Kabana is a recent example of an excellent publication on peanuts. The list will go on, just as we continue adding sections to the Quality Methods book published by our society. In all of these efforts we are indeed fulfilling our objective of promoting scientific research on peanuts.

We would not fulfill our objectives, or even operate as a Society, without considerable input from each of you as members. Some of this input is in service on committees. As you know, we have nine standing committees, and usually a few Ad hoc ones, that do considerable work and initiate policy for the Board of Directors to act upon. They have continued to do an excellent job and I would like to thank each committee member, but especially the chairmen and retiring members who have served so well for the outstanding jobs they have done this past year. They are, indeed, hard workers and this administration sincerely appreciates their efforts.

Report of the Executive Officer  
James R. Sholar

Although the fiscal year has officially ended, concluding our Annual Meeting is somewhat like putting the capstone on that year. As we conclude this meeting in the great state of Alabama, our Texas delegation is already planning bigger and better things for our 1985 meeting. But they will have a tough act to follow. Preliminary figures show that we have 290 registrants for this meeting and, according to Don Smith, this established a new registration record. Typically, attendance is in the 240-250 range. More importantly, our members have profited by the sharing of information to be carried back to our places of work and used to further our individual and collective efforts.

Our meeting continues to grow in international participation with the countries of Burma, the Philippines, India, Thailand, Japan, Canada, Senegal, Malawi, and France participating. Additionally, individuals from Virginia, Texas, Oklahoma, North Carolina, Maryland, Florida, Georgia, Alabama, New Mexico, South Carolina and California participated.

Our Society has grown to approximately 700 members in 5 categories - Sustaining, Organizational, Individual, Institutional, and Student. Among our individual memberships, international participation continues to grow at the most rapid pace.

I won't give the complete financial report as the finance committee is prepared to that. However, I can tell you that our net worth now exceeds \$94,000.

I would like to thank Don Smith for his help during the past year. Don has made every effort to make the transition in Executive Office as smooth as possible.

I look forward to serving as your Executive Officer for the next year.

Respectfully submitted,

James R. Sholar  
Executive Officer

## PROGRAM COMMITTEE REPORT

The responsibilities for this committee were divided among three sections: (1) Technical Program, (2) Local Arrangements, and (3) Ladies' Program. The leadership of each of these sections is listed below. These individuals contributed enormously to the success of the meeting and deserve a heartfelt thanks.

Arrangement of presentations by the Technical Program section is given in the program. There were 97 presentations, including symposia on irrigation systems, on foliar disease management, on nematodes and a panel discussion on peanut stripe virus. The papers and discussions were excellent and the sessions were ably conducted by those who presided. All the participants are commended for making the program an outstanding success.

The Local Arrangements section provided the logistical support for the meeting. This section provided for hotel accommodations, on-site registration, exhibits, and other activities, including the golf tournament, the Uniroyal family picnic, the SDS Biotech social, the awards presentation, business meeting, and sightseeing tours. Each of those who contributed to the local arrangements is acknowledged in the program and is hereby commended.

The Ladies' Program provided information on the area, arranged tours and provided a hospitality room for spouses and families of members. Tours included a shopping spree and fashion show and visits to Bellingrath Gardens and the battleship Alabama. The ladies program was outstanding.

### Program Committee

G. A. Buchanan, Chairman

#### Local Arrangements:

H. R. Griggs, Chairman  
L. J. Chapman, Co-Chairman  
S. Fox  
G. Gregory  
J. E. Mobley  
J. W. Everest  
A. K. Hagan  
J. O. Donald, Jr.  
L. M. Curtis

#### Technical Program:

R. L. Guthrie, Chairman  
D. L. Hartzog, Co-Chairman  
P. A. Backman  
U. L. Diener  
J. C. French  
T. P. Mack  
N. R. Martin  
R. Rodriguez-Kabana  
R. E. Stevenson  
J. R. Weeks  
G. R. Wehtje

#### Ladies' Program:

C. Griggs, Chairman  
L. King  
J. Hartzog  
B. French  
M. A. Bowden



PROGRAM  
for the  
Sixteenth Annual Meeting  
of the  
American Peanut Research and Education Society, Inc.

TUESDAY, JULY 17

1:00-8:00 APRES Registration - Foyer, 2nd Floor  
1:00-5:00 Ladies Hospitality - Room 510

COMMITTEE MEETINGS AND DISCUSSION GROUPS

1:30 Finance - W. E. Dykes, presiding  
1:30 Editorial - T. A. Coffelt, presiding  
3:00 Site Selection - J. E. Mobley, presiding  
3:00 Public Relations - S. Fox, presiding  
4:30 Peanut Quality - J. M. Troeger, presiding  
4:30 Bailey Award - C. Simpson, presiding  
7:30 Peanut Commodity Advisory Committee on Germplasm - J. Wynne, presiding  
7:30 Board of Directors - F. R. Cox, presiding

WEDNESDAY, JULY 18

GENERAL SESSION - F. R. Cox, presiding

8:30 Invocation - J. F. McGill  
8:40 Welcome to Mobile - L. C. Mims, Mayor of Mobile  
8:50 Welcome to Alabama and the Role of Agriculture in Alabama -  
Albert McDonald, Commissioner, Agriculture and Industries, State of  
Alabama  
9:10 Importance of the Land Grant Universities in Peanut Research and  
Extension - Dr. G. A. Buchanan, Dean and Director, Alabama  
Agricultural Experiment Station, Auburn University  
9:30 Role of the Alabama State Docks in Southeastern Agriculture -  
E. G. Browning, Jr., General Traffic Manager, Alabama State Docks  
9:50 Announcements  
G. A. Buchanan, Program Chairman  
R. Griggs, Local Arrangements Committee  
R. L. Guthrie, Technical Program Committee  
10:00 Break

TWO CONCURRENT SESSIONS

1. SESSION A -- SYMPOSIUM: IRRIGATION SYSTEMS FOR PEANUT PRODUCTION
2. SESSION B -- PLANT PATHOLOGY - NEMATOLOGY

SESSION A. SYMPOSIUM: IRRIGATION SYSTEMS FOR PEANUT PRODUCTION  
D. H. Teem, moderator

- 10:20 Irrigation Equipment, Scheduling, and Limitations of Each System. E. D. Threadgill.
- 10:50 The Technology for Successful Chemigation. C. C. Dowler.
- 11:20 Irrigation Schedules for Peanut Production. E. W. Rochester.
- 11:50 Lunch
- SESSION B. PLANT PATHOLOGY - NEMATOLOGY  
M. Porter, presiding
- 10:20 Population Dynamics of Meloidogyne arenaria in a Peanut Field. R. Rodriguez-Kabana, A. K. Culbreath, and D. G. Robertson.
- 10:35 Combinations of 1,3-D and Aldicarb for Control of Meloidogyne arenaria in Peanut. C. F. Weaver, R. Rodriguez-Kabana, and P. S. King.
- 10:50 Corn and Sorghum as Rotational Crops for Control of Meloidogyne arenaria in Peanuts. P. S. King, R. Rodriguez-Kabana, and J. T. Touchton.
- 11:05 Occurrence of Peanut Pod Rot in Oklahoma and Phytopathogenic Fungi and Nematodes Isolated from Diseased Plants. A. B. Filonow and M. W. Andrews.
- 11:20 Evaluation of Chlorpyrifos and the Breakdown Product 3,5,6-trichloro-2-pyridinol for Sclerotium rolfsii Control. A. S. Csinos.
- 11:35 White Mold Suppression on Peanuts with Lorsban 15G. A. K. Hagan and J. R. Weeks.
- 11:50 Practical Implications of Resistance to Dicarbimoxime Fungicides in Sclerotinia minor from Peanuts. T. B. Brenneman, P. M. Phipps, and R. J. Stipes.
- 12:05 Lunch

### THREE CONCURRENT SESSIONS

1. SESSION A -- PLANT AND SEED PATHOLOGY
2. SESSION B -- PRODUCTION TECHNOLOGY
3. SESSION C -- PROCESSING AND UTILIZATION

- SESSION A. PLANT AND SEED PATHOLOGY  
D. H. Smith, presiding
- 1:15 Comparisons of Hollow Cone and Flat Spray Nozzles for Peanut Leafspot Control. T. Kucharek and R. Cullen.
- 1:30 An Assessment Method for Evaluating Foliar Fungicides for Control of Leaf Spot of Peanuts. K. E. Jackson and H. A. Melouk.
- 1:45 Parasitic Fitness Parameters of Benomyl-Resistant and Sensitive Isolates of Cercospora arachidicola on Peanut cv. 'Tamnut 74'. H. A. Melouk and D. H. Smith.
- 2:00 Resistance to Early Leafspot in Peanuts. P. Subrahmanyam, S. N. Nigam, P. Ngwira, and A. J. Chiyembekeza.
- 2:15 Factors Influencing Yield Response of Peanuts Following Seed Treatment with Bacillus subtilis. J. T. Turner and P. A. Backman.
- 2:30 Discussion
- 3:00 Break

SESSION B. PRODUCTION TECHNOLOGY  
Larry Curtis, presiding

- 1:15 Peanut Production at Various Management Levels. D. T. Gooden, C. E. Drye, and J. W. Chapin.
- 1:30 Determination of Growth Period Required for a Full-Season Runner to Exceed a Short-Season Spanish Peanut in Yield, Value and Seed Quality. A. C. Mixon and W. D. Branch.
- 1:45 Peanut Pest Management in South Texas. P. F. Lummus and C. T. Gasch.
- 2:00 Application of Current Technology to Achieve Maximum Profits in Peanut Production. A. H. Allison, P. M. Phipps, O. E. Rud, J. C. Smith, and G. G. Gallimore.
- 2:15 Irrigation and Tillage Effects on Peanut Yields in Virginia. F. S. Wright, D. M. Porter, N. L. Powell, and B. B. Ross.
- 2:30 Response of Three Peanut Cultivars to Different Rates of Gypsum. G. A. Sullivan and W. Ismail.
- 2:45 Response of Florunner Peanuts to Gypsum (Landplaster). J. I. Davidson, Jr., R. J. Henning, P. D. Blankenship, T. H. Sanders, R. J. Cole, R. A. Hill, and W. R. Guerke.
- 3:00 Break

SESSION C. PROCESSING AND UTILIZATION  
L. J. Chapman, presiding

- 1:15 Effect of Kylar on Fatty Acid Composition of Seed of Five Peanut Cultivars. R. W. Mozingo and J. L. Steele.
- 1:30 Changes in the Polypeptide Composition of the Peanut (Arachis hypogaea L.) Seed During Roasting. S. M. Basha and C. T. Young.
- 1:45 Trypsin Inhibitors in Peanut Seed Protein. E. M. Ahmed, K. Bieshiada, and M. B. Shaik.
- 2:00 Response of Two Commercial Cultivars of Peanuts to Hot Water Treatment and Accelerated Storage. A. L. Branch, R. E. Worthington, M. S. Chhinnan, and T. O. M. Nakayama.
- 2:15 A Determination of the Relative Storage Life of Raw Peanuts. N. V. Lovegren, F. W. Parrish, and R. O. Hammons.
- 2:30 Rapid Colorimetric Test for Ethanol-Related Off-Flavors in Peanuts. H. E. Pattee.
- 2:45 Discussion
- 3:00 Break

TWO CONCURRENT SESSIONS

1. SESSION A -- PANEL DISCUSSION: PEANUT STRIPE VIRUS
2. SESSION B -- MYCOTOXINS

SESSION A. PEANUT STRIPE VIRUS INFECTING U.S. PEANUTS  
J. W. Demski, moderator

- 3:15 Peanut Stripe Virus Infecting U.S. Peanuts: An Overview. J. W. Demski.

Use of Cytological and Immunodiffusion Techniques to Aid Virus Identification. D. E. Purcifull, R. G. Christie, E. Hiebert, Z. Xiong, and S. R. Christie.

Plant Introductions and the Distribution of Peanut Seed. G. R. Lovell.

Peanut Stripe Virus, Infection of Peanuts, and Breeding Programs. J. C. Wynne.

Regulation of Seed Distribution as Influenced by New Diseases or Insect Pests. B. G. Lee and A. Elder.

Providing Peanut Stripe Virus Free Certified Seed. E. Elsner.

4:15 Discussion

SESSION B. MYCOTOXINS  
U. L. Diener, presiding

3:15 Relation of Preharvest Aflatoxin Contamination to Duration of Environmental Stress. R. J. Cole, P. D. Blankenship, T. H. Sanders, and R. A. Hill.

3:30 Colonization of Organic Matter Substrates in Soil by Aspergillus flavus. J. P. Stack and R. E. Pettit.

3:45 Development of Statistical Models to Simulate the Testing of Farmers' Stock Peanuts for Aflatoxin Using Visual, TLC, and Minicolumn Methods. T. B. Whitaker, J. W. Dickens, J. I. Davidson, and V. Chew.

4:00 Comparison of Methods for the Analysis of Cyclopiazonic Acid in Peanuts. J. A. Lansden.

4:15 Flavonoids and A. flavus Resistant Peanuts. D. J. Daigle, A. Mixon, A. J. DeLuca, II, and T. A. Coffelt.

4:30 Effect of Lesser Cornstalk Borer Peanut Pod Damage on Colonization by a Mutant of Aspergillus parasiticus. D. M. Wilson and R. E. Lynch.

6:30 Uniroyal Family Picnic

THURSDAY, JULY 19

THREE CONCURRENT SESSIONS

1. SESSION A -- EXTENSION TECHNOLOGY AND HARVESTING
2. SESSION B -- SYMPOSIUM: CHEMICAL, GENETIC, AND ENGINEERING ASPECTS OF FOLIAR DISEASE MANAGEMENT
3. SESSION C -- PHYSIOLOGY AND SEED TECHNOLOGY

SESSION A. EXTENSION TECHNOLOGY AND HARVESTING  
A. E. Hiltbold, presiding

8:00 Evaluation of Soil Extracting Reagents for Determining Available Calcium to Peanut Fruit. T. P. Gaines, A. S. Csinos, and M. E. Walker.

8:15 A Microcomputer Program to Aid County Agents in CBR Disease Management Decision Making. J. E. Bailey.

8:30 Cation Exchange Constants For A Gapon Model From Peanut Production Soil. F. J. Adamsen.

- 8:45 Peanut Nodule Mineral Content. R. K. Howell and L. P. Rose, Jr.
- 9:00 Discussion
- 10:00 Break
- SESSION B. SYMPOSIUM: CHEMICAL, GENETIC, AND ENGINEERING ASPECTS OF FOLIAR DISEASE MANAGEMENT  
P. A. Backman, moderator
- 8:00 Management of Peanut Cultivars with Genetic Resistance. F. M. Shokes, D. W. Gorbet, and R. H. Littrell.
- 8:25 Performance of Tilt 3.6 EC in Peanut Leafspot Control. H. G. Hancock and J. D. Weete.
- 8:50 Management Strategies for Optimal Use of Chlorothalonil on Florunner Peanuts in the Southeast. P. A. Backman.
- 9:15 Effect of Fungicide Application Technique on Deposition, Disease Control and Pod Yield. R. H. Littrell and F. H. Shokes.
- 9:40 Discussion
- 10:00 Break
- SESSION C. PHYSIOLOGY AND SEED TECHNOLOGY  
J. P. Bostick, presiding
- 8:00 Reproductive Response of Peanut Cultivars to Photoperiod. F. P. Gardner.
- 8:15 Effect of Soil Temperature on Yield Factors of Florunner Peanuts. T. H. Sanders and P. D. Blankenship.
- 8:30 Membrane Thermostability of Peanut Genotypes. D. L. Ketring.
- 8:45 In Vitro Culture of Peanuts and Preliminary Field Evaluation of Cloned Material. R. N. Pittman, D. J. Banks, and B. B. Johnson.
- 9:00 Effects of Duration, Timing, and Intensity of Single and Multiple Droughts on Peanuts. R. C. N. Rao and J. H. Williams.
- 9:15 Growth and Partitioning Responses of Four Peanut Genotypes to Cercospora Leafspot. K. V. Pixley, K. J. Boote, F. M. Shokes, and D. W. Gorbet.
- 9:30 Discussion.
- 10:00 Break

#### THREE CONCURRENT SESSIONS

1. SESSION A -- SYMPOSIUM: MANAGEMENT OF NEMATODES IN PEANUTS.
2. SESSION B -- ENTOMOLOGY
3. SESSION C -- HARVESTING AND STORING

- SESSION A. SYMPOSIUM: MANAGEMENT OF NEMATODES IN PEANUTS  
R. Rodriguez-Kabana, moderator
- 10:15 Population Dynamics and the Management of Meloidogyne arenaria in Peanuts. R. Rodriguez-Kabana.
- 10:35 Nematicides for Nematode Control on Peanut. N. A. Minton.

- 10:55 Management of Meloidogyne arenaria in Peanut During the Past Ten Years. D. W. Dickson.
- 11:15 Discussion
- 12:00 Lunch
- SESSION B. ENTOMOLOGY  
T. P. Mack, presiding
- 10:15 Comparisons of Soil Insect Damage to Conventional and Conservation Tillage Peanuts. J. M. Cheshire, Jr., W. L. Hargrove, C. S. Rothrock, and M. E. Walker.
- 10:30 Relation of Lesser Cornstalk Borer Damage to Peanut Pods and the Incidence of Aspergillus flavus. R. E. Lynch and D. M. Wilson.
- 10:45 Control of Lesser Cornstalk Borer with Granular Chlorpyrifos. J. W. Chapin.
- 11:00 Discussion
- 11:15 Summary of Peanut Insect Control with Chemicals Applied Through Irrigation Systems. L. W. Morgan and M. H. Bass.
- 11:30 Evaluation of Collections of International Peanut Germplasm for Insect Resistance. W. V. Campbell, J. C. Wynne, M. Keerati-Kasikorn, E. P. Cadapan, and S. Sirisingh.
- 11:45 Discussion
- 12:00 Lunch
- SESSION C. HARVESTING AND STORING  
D. W. Gorbet, presiding
- 10:15 Electronic Moisture Measurement of Peanuts. J. H. Young.
- 10:30 Effects of Microwave -- Vacuum Drying on Quality of Florunner Peanuts. J. L. Pearson, W. L. Shupe, T. H. Sanders, J. L. Butler, J. L. McMeans, and S. R. Delwiche.
- 10:45 Cooling a Peanut Warehouse with Aeration and/or Mechanical Ventilation. J. S. Smith, Jr., and J. I. Davidson, Jr.
- 11:00 Separation and Removal of Aflatoxin Contaminated Peanuts at Peanut Cleaning and Shelling Plants. P. D. Blankenship, J. I. Davidson, Jr., T. H. Sanders, and C. T. Bennett.
- 11:15 Variability in Grade Determinations for Farmers' Stock Peanuts. J. W. Dickens, T. B. Whitaker, and J. I. Davidson, Jr.
- 11:30 Factors Affecting Flavor and Headspace Volatiles of Cooked Peanuts. C. T. Young and R. W. Mozingo.
- 11:45 Discussion
- 12:00 Lunch

#### THREE CONCURRENT SESSIONS

1. SESSION A -- EXTENSION AND INDUSTRY
2. SESSION B -- PEST MANAGEMENT
3. SESSION C -- PHYSIOLOGY AND SEED TECHNOLOGY

SESSION A. EXTENSION AND INDUSTRY

H. R. Smith, presiding

- 1:00 Peanut Disease Loss Estimates for Major Peanut Producing States in the United States for 1983. R. V. Sturgeon, Jr.
- 1:40 No EDB! Now What? for Root Knot Nematode Control on Peanuts. T. A. Lee, Jr.
- 1:50 New Developments from Helena Chemical Company. A. Underwood.
- 2:00 Quantum™ 4000 - A New Type of Seed Treatment for Peanuts. W. G. Hairston.
- 2:10 Product Characteristics of Lorsban 15G in Peanut. D. B. Hale.
- 2:20 Actellic; An Update. C. Weed.
- 2:30 Harvest Plus: A High Analysis, Complete Foliar Nutritional. R. E. Woodward.
- 2:40 Break

SESSION B. PEST MANAGEMENT

H. Womack, presiding

- 1:00 Evaluation of Fenitrothion as a Protectant for Stored Farmers Stock Peanuts. L. M. Redlinger and R. A. Simonaitis.
- 1:15 Evaluating Pest Management Programs Using Telephone Survey. J. C. French and J. R. Weeks.
- 1:30 Results of 1984 IPM Peanut Survey in Alabama. J. R. Weeks and J. C. French.
- 1:45 Yield Evaluation of Herbicide Tolerant Peanut Genotypes. M. S. Riffle, D. H. Teem, B. J. Brecke, and D. W. Gorbet.
- 2:00 Twin Rows as a Supplement to Yield and Weed Control in Peanuts. G. Wehtje, R. H. Walker, M. G. Patterson, and J. A. McGuire.
- 2:15 Effects of Row Patterns and Weed Control Systems on Peanut Yield, Weed Control, and Net Returns. D. L. Colvin, R. H. Walker, M. G. Patterson, and J. A. McGuire.
- 2:30 Break

SESSION C. PHYSIOLOGY AND SEED TECHNOLOGY

E. Elsner, Presiding

- 1:00 Response of Florunner Peanuts to Application of Kylar. M. E. Walker, T. P. Gaines, A. S. Csinos, and B. G. Mullinix, Jr.
- 1:15 Use of the CASAS (Computerized Automated Seed Analysis System) Dynamic Electrical Conductivity Analysis as an Indicator of Potential Freeze Damage in Peanut Seed. R. D. Keys, G. A. Reusche, and R. Margapuram.
- 1:30 Effect of Ethrel Seed Treatment on Growth, Yield, and Grade of Two Virginia-type Peanuts. T. A. Coffelt and R. K. Howell.
- 1:45 Water Relations and Yield of Peanut Genotypes Grown Under Irrigated and Rainfed Conditions. P. I. Erickson, D. L. Ketring, and Ming-Teh Huang.

2:00 Influence of Cultivar, Spacing, and Sowing Date on the Performance of Peanut (Arachis hypogaea L.). E. O. Auma and F. P. Gardner.

2:15 Discussion.

2:30 Break

#### TWO CONCURRENT SESSIONS

1. SESSION A -- EXTENSION AND INDUSTRY

2. SESSION B -- BREEDING AND GENETICS

#### SESSION A. EXTENSION AND INDUSTRY CONTINUED

R. V. Sturgeon, Jr., presiding

2:55 New Products for the Control of Sclerotinia Blight of Peanut. P. Phipps.

3:25 Standardized System for Nematicide Evaluation - Variable Data: Why and How? C. H. Baldwin, J. Bailey, D. Dickson, R. Kabana.

4:30 Business Meeting

#### SESSION B. BREEDING AND GENETICS

W. C. Johnson, presiding

2:45 Agronomic Response of Two Resistant Lines to Leafspot Management. D. W. Gorbet, A. J. Norden, F. M. Shokes, and D. A. Knauff.

3:00 Genetics of Solid Purple and Purple Striped Peanut Testa Colors. W. D. Branch.

3:15 A Wild Arachis Winter Nursery in South Texas. D. J. Banks, R. N. Pittman, and C. M. Heald.

3:30 Development of Foliar Disease Resistant Groundnut Lines at ICRISAT. L. J. Reddy, S. N. Nigam, P. Subrahmanyam, S. L. Dwivedi, R. W. Gibbons, and D. McDonald.

3:45 Application of IBPGR/ICRISAT Minimum Descriptors to Arachis hypogaea L. Germplasm. C. E. Simpson, E. R. Howard, and D. L. Higgins.

4:00 An Investigation of Oil Quality in Ontario-grown Peanuts. E. E. Sykes and T. E. Michaels.

4:15 Discussion

9:00-10:30 Sweet Tooth Special - Sponsored by SDS Biotech Corp.

#### FRIDAY, JULY 20

7:30 Breakfast and Awards Ceremony

8:30 President's Address and Business Meeting

10:00 Adjourn



#### SPONSORS

Acknowledgement--On behalf of APRES members and guests, the Program Committee wishes to thank the following organizations for their generous monetary and material contributions in support of this meeting.

American Cyanamid Company

Chevron Chemical Company

CIBA-GEIGY Corporation

Columbian Peanut Company

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Seabrook Blanching Corporation

SDS Biotech Corporation

The Nitragin Company, Inc.

TUCO, Inc.

Union Carbide Agricultural Products, Inc.

Uniroyal Chemical

Valmont Industries, Inc.

## FINANCE COMMITTEE REPORT

The Finance Committee met at 1:30 p.m. on July 17, 1984. The auditor's report and Peanut Science Editor's report were reviewed and found to be in order.

The committee prepared a proposed budget for fiscal year 1984-1985, and submitted the following recommendations to the Board of Directors:

1. It is proposed that the inventory of Peanut Science and Technology be insured against loss or damage.
2. It is proposed that the Bailey checking account be closed and the monies be placed with the general fund for greater interest earning potential.
3. It is proposed that a committee be appointed to assess the need of a micro-computer/word processor.

Respectfully submitted,

Finance Committee  
W. E. Dykes, Chairman  
W. V. Campbell  
T. E. Boswell  
H. A. Melouk  
T. West  
J. Bone

AMERICAN PEANUT RESEARCH AND EDUCATION SOCIETY  
1984 - 1985 BUDGET

Receipts

Membership & Registration	\$20,000.00
Proceedings & Reprint Sales	100.00
Special Contributions	4,000.00
Peanut Science & Technology	9,500.00
Peanut Science Page Charges & Reprint	14,000.00
Institutional Membership	1,800.00
Differential Postage Assessment- Foreign Members	2,500.00
Checking Account Interest	1,200.00
Proceeds from Certificates of Deposits (Principal & Interest)	3,000.00
APRES Method Books	<u>1,500.00</u>

Total Receipts \$57,600.00

Expenditures

Proceedings - Printing & Reprints	\$ 5,000.00
Annual Meeting - Printing	5,000.00
Secretarial	7,500.00
Postage	1,000.00
Office Supplies	1,000.00
Travel - Executive Officer	1,000.00
Miscellaneous	700.00
Peanut Science	25,000.00
Peanut Science & Technology	800.00
Bank Charges	700.00
Peanut Research	1,600.00
Secretary - Self-employment Tax	700.00
Legal Fees	1,000.00
APRES Method Books	<u>1,000.00</u>

Total Expenditures \$52,000.00

Excess Receipts over Expenditures

	\$ 5,600.00
Cash - Beginning of Period	\$47,714.53
Cash - End of Period	\$53,314.53

## PUBLICATION AND EDITORIAL COMMITTEE

Eight committee members and three guests were present at the annual meeting, July 17, 1984, at Mobile, Alabama.

Book sales of Peanut Science and Technology are continuing with 854 copies sold as of June 30, 1984. A brochure advertising Peanut Science and Technology, Quality Methods, and a membership form was printed and distributed. All orders for publications should be sent to Ron Sholar, who will ship all orders.

Peanut Science: 39 manuscripts were submitted for publication from July 1, 1983, through June 30, 1984. The January-June 1983 Issue consisted of 14 articles and 51 pages printed. The July-December 1983 Issue consisted of 18 articles and 63 pages printed plus 3 index pages. The January-June 1984 issue has 16 articles in press. In addition, 20 articles have been accepted or are in review. The average article length was 3.6 pages.

New Associate Editors recommended for Peanut Science with their areas of responsibility are: F. Scott Wright - Engineering, and Robert E. Lynch - Entomology. Thomas B. Whitaker - Engineering, and Sidney L. Poe - Entomology, have completed 6-year terms as Associate Editors. Paul Backman - Pathology, Terry Coffelt and Olin Smith - Breeding and Genetics, and Mike Schubert - Biochemistry - Physiology, have completed 3-year terms and are recommended for a second 3-year term.

Peanut Research: Four quarterly issues with 41 total pages were circulated to about 700 members and libraries. Reporters were recruited from Virginia, North Carolina, Georgia, Florida, Alabama, Texas, Oklahoma, and Industry to help supply news of people, grants, research thrusts, updates on peanut scientists, APRES meetings, business of interest to members, and literature citations. One hundred ninety selected references plus 25 theses and dissertations were cited.

Quality Methods: New methods are continuing to be added to those already available. The 3-year terms for the Editor, Associate Editors, and Assistant Editor have expired. Clyde Young, Editor; Walt Mozingo, Associate Editor, and Ruth Ann Tabor, Assistant Editor, are recommended for a second 3-year term. Tim Sanders is also recommended for a 3-year term as Associate Editor.

Proceedings: The proceedings of the 1983 meetings were printed and mailed to the membership in December. Committee reports, papers, and abstracts relevant to the 1984 meeting should be delivered to Terry Coffelt by July 31, 1984.

### Other Business:

President Cox has suggested that a calendar of events for APRES be developed. The committee recommends that it be published in each issue of Peanut Research.

The committee recommends that the Editor of Quality Methods be added as an Ex-Officio member of the committee.

The committee also recommends the purchase of insurance to cover the replacement costs of the unsold copies of Peanut Science and Technology in case of fire, theft, etc.

The committee, in behalf of the Society, expresses appreciation to our editors, authors, reviewers, and other contributors to our Society publications.

Respectfully submitted:

Olin Smith  
E. B. Browne  
Leland Tripp  
Don Banks  
W. T. Mills

Norfleet Sugg  
Terry Coffelt, Chairman  
A. C. Mixon, Ex-Officio  
H. E. Pattee, Ex-Officio

## PEANUT QUALITY COMMITTEE REPORT

The peanut quality committee discussed:

1) Grading of farmer's stock peanuts.

Present grading equipment has been used for over 20 years with only minor changes. There is a need to adopt procedures that more adequately reflect quality. New varieties developed in recent years have larger seeds so that more immature kernels are graded as sound mature kernels. Aflatoxin detection at the buying point is inadequate. More automation of the grading procedure will alleviate the need to hire and train many inexperienced workers during the buying season. Quick and easy methods need to be developed to evaluate off-flavor, blanchability, roasting and other quality factors. A sub-committee chaired by Bill Dickens, was appointed to define and recommend grading procedures that more adequately reflect quality.

2) Report of ad-hoc sub-committee to recommend peanut marketing standards and handling practices (Harold Pattee, ch.)

- a) An inflection point in the moisture equilibrium curve between 6 and 8% suggests that certain enzyme systems may be changing at this point. Research is needed on quality changes in this region.
- b) Past research suggests that peanuts in storage go through a 'ripening' process of several months. Research is needed to identify quality changes that may occur during this period.
- c) Additional research is needed to identify the relationship between screen size and quality. Data for virginia-type peanuts (primarily Florigiant) showed higher flavor ratings for larger seed size. Information is needed for other types and varieties so that grading will more realistically reflect quality.

3) Quality Methods Handbook

Clyde Young reported that 24 quality methods have been approved and distributed. Five more methods should be ready within a few months.

Submitted by J. M. Troeger, chairman

Other members present: D. T. Bateman, G. M. Grice, K. W. Rushing, L. D. Tripp, H. E. Pattee, R. E. Worthington and C. T. Young (ex-officio)

Visitors: E. J. Williams, Craig Kvien, Walt Mozingo, Wilbur Parker, Doyle Welch, Wilda Martinez, Joseph Pominski, Norman Lovegren, J. W. Dickens, L. M. Redlinger and Gordon Monroe.

## REPORT OF SITE SELECTION COMMITTEE

The meeting was called to order by J. C. Mobley, chairman. There were five members and one guest present.

Mr. Fleet Sugg requested that efforts be made to arrange APRES convention discounts with airlines in future years. Chairman Mobley instructed the committee to attempt to arrange this in the future.

The committee approved a report by Mike Schubert representing the Texas members which proposed holding the 1985 APRES Convention July 9-13, 1985, at the El Tropicano Hotel in San Antonio, Texas. In summary, the proposal involved daily rates of \$45 for single or double rooms with an \$8 charge for children over 12 years old staying in their parents' room; and a fairly standard package of convention services, complimentary rooms for officers, and meeting facilities. The hotel is near and readily accessible to tourist, shopping, and food facilities.

After reviewing proposals for the 1986 meeting presented by Walt Mozingo representing the Virginia members, the committee voted to recommend holding the convention at Pavilion Tower in Virginia Beach, Virginia, July 15-18, 1986. Proposed facilities, rates, and convention services were acceptable, and the Virginia members were instructed to finalize arrangements with the hotel pending approval by the APRES Board of Directors.

Dan Gorbet, Florida, reported that discussions had begun on possible meeting sites for the 1987 meetings. He reported that they were strongly considering the Orlando area.

### Committee Members:

J. E. Mobley, Chairman, Alabama

John French, Alabama

Bob Pettit, Texas

Mike Schubert, Texas

Walt Mozingo, Virginia

Jim Steele, Virginia

Dan Gorbet, Florida

Ben Whitty, Florida

Report prepared by:

Mike Schubert

## Report of the Public Relations Committee

The Public Relations Committee on March 23rd and May 25th sent letters to all Farm publications in the peanut production area announcing the meeting on July 17-20th. They were asked to send representatives to the meeting. The Mobile T.V. and newspaper sent reporters for the Wednesday meeting.

No deaths were reported since our last meeting.

Respectfully submitted:

S. Fox, Chairman  
W. Flannagan  
P. Blankenship  
G. A. Sullivan  
C. Warnker  
W. H. Bordt

## GOLDEN PEANUT AWARD ADVISORY COMMITTEE REPORT

Documentation for candidates for the Golden Peanut Research and Education Award were forward by the National Peanut Council to individual members of the Golden Peanut Research and Education Award Advisory Committee for evaluation. Each member of the Committee evaluated the materials that were submitted and the candidates were ranked accordingly. Each individual's evaluation was returned directly to the National Peanut Council which selected the recipients for the award.

Gale A. Buchanan  
K. H. Garren  
J. L. Butler  
J. F. McGill  
T. B. Whitaker  
D. A. Emery

## BAILEY AWARD COMMITTEE REPORT

The 1984 Bailey Award for best paper presented at the 1984 meetings in Charlotte, N.C., went to C. S. Kvien, R. J. Henning, J. E. Pallas, and W. D. Branch for their paper entitled

"Population and Pod Production."

This is the second consecutive year for Dr. Kvien to be senior author of the award winning paper.

The selection process was basically as in the previous year (see the 1983 APRES Proc. Vol. 15, p. 163) except that only one paper from each of seven areas of specialization was nominated for the final judging. The following is a listing of the dates and activities of the Bailey Award Committee for 1983-84:

- 1) All nominees (7) were notified of their selection by mail on August 9, 1983.
- 2) President F. R. Cox selected D. W. Gorbet to fill a vacancy on the committee in September 1983.
- 3) Five (5) manuscripts were received by December 31, 1983.
- 4) Members of the Committee were sent copies of manuscripts and score sheets on January 16, 1984.
- 5) All score sheets were received by chairman before April 1, 1984. The scores produced a distinct winner.
- 6) Committee members notified to destroy manuscripts, April 2, 1984.
- 7) President F. R. Cox, President elect G. A. Buchanan and Executive Officer J. R. Sholar were notified of the winning paper on April 2, 1984.

The other four papers judged by the committee were, alphabetically by senior author:

- 1) Gardner, F. P. Peanut cultivar response to plant growth regulators.
- 2) Lovegren, N. V., A. J. St. Angelo and F. W. Parrish. Evaluation of raw peanuts using the SRRC volatile profile procedure.
- 3) Phipps, P. M., and N. L. Powell. Criteria for effective utilization of peanut leafspot advisories in Virginia.
- 4) Wilson, D. M., and D. K. Bell. Aflatoxin production by Aspergillus flavus and A. parasiticus on visibly sound rehydrated peanut, corn and soybean seed.

The new screening process seemed to work well at the Charlotte meetings. The task of reviewing the manuscripts was not so great a burden for the committee and the papers nominated were probably more representative of the "best papers" presented at the 1983 meetings.

Seven areas of specialization to be used in nominating papers presented at the 1984 meeting are:

- (1) Plant Pathology - Nematology
- (2) Production Technology - Pest Management
- (3) Physiology, Seed Technology, Processing and Utilization
- (4) Entomology
- (5) Breeding and Genetics
- (6) Extension Technology, Harvesting and Storing
- (7) Mycotoxins

Also requested that Board of Directors decide if Symposium papers are to be considered for Bailey Award. Board voted the Symposium papers not be considered for Bailey Award.

Bailey Awards Committee 1984:

Respectfully submitted, C. E. Simpson, Chairman  
G. D. Alston substituting for R. J. Henning  
D. W. Gorbet  
R. F. Hooks  
M. K. Beute  
J. C. Smith



## NOMINATING COMMITTEE REPORT

The Nominating Committee nominates the following to fill the positions identified:

President-Elect	Donald H. Smith Texas A & M University, Yoakum
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Executive Officer	J. Ron Scholar Oklahoma State University, Stillwater
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### Board of Directors:

USDA Representative	Aubrey C. Mixon (1987) ARS, Tifton, Georgia
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State Employee Representative	Johnny C. Wynne (1985) North Carolina State University, Raleigh
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### 1982-83 Nominating Committee:

Elbert Long  
Aubrey Mixon  
David Hsi, Chairman

## FELLOWS COMMITTEE REPORT

The Fellows Committee nominates the following persons for election to fellowship by the American Peanut Research and Education Society:

Allan J. Norden

William V. Campbell

### Fellows Committee:

Darold Ketring  
Ronald Henning  
Kenneth Garren  
Dallas Wadsworth  
Astor Perry  
Ray Hammons  
David Hsi, Chairman

FELLOWS - 1984  
American Peanut Research and Education Society

Dr. William V. Campbell, Professor of Entomology, North Carolina State University, Raleigh, North Carolina, has been active in entomology research with peanuts for 25 years. He has authored or co-authored over 80 scientific and professional publications and abstracts, including three book chapters on soybean and peanut insects. His research has been concerned with chemical applications for control of pests, identifying resistant germplasm lines for insect complexes, and studying mechanisms of insect resistance. His contributions have included development of insect control measures for use by North Carolina peanut growers and identification of sources of pest resistance for use in breeding programs in North Carolina and at the international center in India. He cooperatively released 'NC 6', the only peanut cultivar selected specifically for insect resistance. In addition to research contributions, he has contributed significantly to the education and training of a large number of students. His recent research on integrated pest management has assisted peanut growers in reducing production cost by using the insect resistant cultivar and following recommendations on economic thresholds.

Dr. Campbell has served APRES as a member of the Technical Program Committee three times and as a member of the Finance Committee. He has chaired the Entomology sessions at the annual meetings. He has also served as an associate editor of Peanut Science and has worked as an editor for indexing of Peanut Science and the new book on Peanut Science and Technology.

Dr. Campbell has gained an international reputation and is currently participating in cooperative projects with scientists in several Asian countries. He is a recognized researcher and teacher.

Dr. Allan J. Norden, Professor of Agronomy, University of Florida, Gainesville, Florida, has been doing research on oil seed crops at the University of Florida since 1958. He has been a member of the Florida Peanut Improvement Project since 1960 and leader of the project since 1963. He is an author of 6 chapters in books on peanut science and technology, 39 publications in refereed journals, 13 in other journals, 57 technical reports and bulletins and some 50 other publications. He has developed or assisted in the development of the cultivars 'Florunner', 'Early Bunch', 'NC-Fla 14', 'Altika' and 'Sunrunner'. He also assisted in the basic breeding leading to the development of 'NC 17'. His Florunner cultivar was grown on more than 380,000 hectares and contributed about 70% of the U.S. production. No other peanut cultivar has had so great an impact on peanut production. In addition to his outstanding research accomplishments, he has supervised numerous graduate students in their research and degree programs at the University of Florida. He has received numerous honors including Fellow in the American Society of Agronomy, the Golden Peanut Research Award and was recently inducted into the Florida Agriculture Hall of Fame.

Dr. Norden has served APRES as President (1978-79), President Elect, a member of the Board of Directors, and on numerous committees. He has also chaired sessions, led numerous discussion groups, and contributed chapters in the two books published by APRES.

Dr. Norden is recognized internationally for his ability and accomplishments in the area of peanut breeding and genetic research. He has participated on consultative assignments in many countries of the world. He is truly an outstanding plant breeder, researcher, scientist, and teacher.

LIAISON REPRESENTATIVE BETWEEN THE  
AMERICAN PEANUT RESEARCH AND EDUCATION SOCIETY, INC., AND  
THE AMERICAN SOCIETY OF AGRONOMY

The 75th Annual Meeting of the American Society of Agronomy (ASA) was held in Washington, D.C., on 14-19 August 1983. The theme for the convention was "Seeds, Soil, and Society." There were nearly 1600 papers given at the meetings of ASA and its affiliates, the Crop Science Society of America (CSSA) and the Soil Science Society of America (SSSA). These were organized into 170 paper sessions and 7 poster sessions.

Kenneth J. Frey was installed as president and W. E. Larson as president-elect of ASA; W. F. Keim and Robert F. Barnes became president and president-elect of CSSA; and D. R. Nielsen and E. C. A. Runge are president and president-elect of SSSA for 1983-84.

At least 17 papers in the joint sessions were concerned with investigations on peanut. W. D. Branch chaired the CSSA session where five papers reported peanut research. Ray Hammons described "Peanut Research and Production in China" during a session on international agronomy.

R. Harold Brown and Ray Hammons received special recognition and certificates at the completion of terms of service as Technical Editor -- Crop Physiology and Associate Editor -- Breeding & Genetics, respectively of CROP SCIENCE. Dr. Brown was elected to the position of Editor of CROP SCIENCE.

The Liaison Representative met with Societal officers and served as communicator between APRES and ASA.

A Colloquium, "Agriculture in China: Today and Tomorrow," was held in conjunction with and immediately following the 1983 ASA meetings. The 2-day program was sponsored by the International Agricultural Development Service, in cooperation with the Association of Chinese Soil and Plant Scientists in North America. Dr. Hammons represented APRES at the colloquium.

Respectively submitted:

Ray O. Hammons (for O. D. Smith)

12 December 1983

BY-LAWS  
of  
AMERICAN PEANUT 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 the 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 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.

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 of such Committee may be temporarily replaced by an alternate selected by the agency or party served by such member, participant, or representative upon appropriate written notice filed with the president or Committee chairman 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.

#### ARTICLE IV. DUES AND FEES

Section 1. The annual dues shall be determined by the Board of Directors with the advice of the Finance Committee subject to approval by the members at the annual meeting. Minimum annual dues for the five classes of membership shall be:

- a. Individual memberships : \$ 15.00
- b. Institutional membership : \$ 15.00
- c. Organizational memberships: \$ 25.00
- d. Sustaining membership : \$100.00
- e. Student memberships : \$ 4.00

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 dues for the current year 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. The registration fee for student members shall be one-third that of members.

#### ARTICLE V. MEETINGS

Section 1. Annual meetings of the Society shall be held for the presentation of papers and/or discussions, 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. Also, opportunity shall be provided for discussion of these and other matters that members may 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, either on its own motion or upon request of one-fourth of the members. In either event, 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 chairman of each annual meeting of the society. Except for certain papers specifically invited by the Society president or program chairman 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 or projects by a portion of the Society membership, 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 to the extent they deem desirable.

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 project 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 immediate surviving 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 general meeting of this Society to the close of the next annual general meeting. The president-elect shall automatically succeed to the presidency at the close of the annual general meeting. If the president-elect should succeed to the presidency to complete an unexpired term, he 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 general 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 shall be elected by the members in attendance at the annual general meeting from nominees selected by the Nominating Committee or members nominated for this office from the floor. The president, president-elect, and surviving past-president shall serve without monetary compensation.

Section 4. The executive officer may serve consecutive yearly terms subject to re-election by the membership at the annual meeting. The tenure of the executive officer may be discontinued by a two-thirds majority 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 general 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 chairman, responsible for development and coordination of the overall program of the educational phase of the annual meetings.

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 immediate past president able to serve
- c. The president-elect
- d. State employees' representative - this director is one whose employment is state sponsored and whose relation to peanuts principally concerns research, and/or educational, and/or regulatory pursuits.
- e. United States Department of Agriculture representative - this director is one whose employment is directly sponsored by the USDA or one of its agencies, and whose relation to peanuts principally concerns research, and/or education, and/or regulatory pursuits.
- f. Three 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 National 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: e, 1972; d and f(1), 1973; and f(2) and f(3), 1974.

Section 3. The Board of Directors shall determine the time and place of regular and special meetings and may authorize or direct the president 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, operations, 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 desirable.

Section 7. An Executive Committee comprised of the president, president-elect, immediate surviving 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 chairman of each committee from among the incumbent committeemen. The Board of Directors may, by a two-thirds vote, reject committee appointments. Appointments made to fill unexpected vacancies by incapacity of any committee member shall be only for the unexpired term of the incapacitated committeeman. Unless otherwise specified in these By-Laws, any committee member may be re-appointed to succeed himself, and may serve on two or more committees concurrently but shall not hold concurrent chairmanships. Initially, one-third of the members of each committee will serve one-year terms, and one-third of the members of each committee shall serve two-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.

Section 3. The existing committees of the Society are:

a. Finance Committee: This committee shall include at least four members, one each representing State and USDA and two from Private Business segments of the peanut industry. 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 chairman

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 chairmanship, whichever is later.

b. Nominating Committee: This committee shall consist of at least three members appointed to one-year terms, one each representing State, USDA, and Private Business segments of the peanut industry. 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 general meetings) prior to the election. No person may succeed himself as a member of this committee.

c. Publication and Editorial Committee: This committee shall consist of at least three members for three-year terms, one each representing State, USDA, and Private Business segments of the peanut industry. The members will normally serve two consecutive three-year terms, subject to approval by the Board. Initial election shall alternate from reference years as follows: private business, 1983; USDA, 1984; and State, 1985. 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 include at least 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 include at least seven members, one each representing the State, USDA, Grower, Sheller, Manufacturer, and Services segments of the peanut industry, and a member from the university of 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 at least 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 peanut production and with balance among state, USDA and private business. Terms of office shall be for three years with initial terms as outlined in Section 1 of this ARTICLE. The committee shall select from nominations received, according to procedures adopted by the Society (P148-9 of 1981 Proceedings of APRES), qualified nominees for approval by the Board of Directors.

h. Golden Peanut Research and Education Award Committee: This committee shall consist of six previous Golden Peanut Award recipients, representing each of the three areas of peanut production. Terms of office shall be for three years as outlined in Section 1 of this Article. This committee shall serve as an advisory committee by screening nominations received by the National Peanut Council. The final selection shall be made by the National Peanut Council. For even-numbered years, the award shall be made for research accomplishments and for odd-numbered years, the award shall be made for educational accomplishments.

i. 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 chairman of the committee shall be from the state which will host the meeting the next year and the vice-chairman shall be from the state which will host the meeting the second year. The vice-chairman will automatically move up to chairman.

#### 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 a two-thirds vote of the general membership. Likewise, in a similar manner, a Division may be dissolved.

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

Section 3. Divisions 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 (chairman, vice-chairman to succeed to the chairmanship, and a secretary) and appoint committees, provided that 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 consistently with the provisions 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 Business Meeting of the American Peanut Research and Education Society, Inc., July 11, 1983, Charlotte, North Carolina

LIST OF APRES MEMBERS WITH ADDRESSES  
SEPARATED BY MEMBERSHIP TYPES

MEMBERSHIP TYPE: SUSTAINING

AL PEANUT PRODUCERS ASSN  
J. E. HOBLEY, PRES.  
P. O. BOX 1282  
DOTHAN, AL 36302  
205-792-6482

ANDERSON'S PEANUTS  
JAMES B. ANDERSON  
P.O. BOX 619  
OPP, AL 36467

BEST FOODS U.S.  
CPC INTERNATIONAL  
ROBERT E. LANDERS  
PO BOX 1534  
UNION, NJ 07083  
201-688-9000

THE BLAKELY PEANUT CO.  
265 N MAIN STREET  
BLAKELY, GA 31723

DOTHAN OIL MILL COMPANY  
JOE SANDERS  
PO BOX 458  
DOTHAN, AL 36301  
205-792-4104

ELI LILLY & CO.  
ELANCO PRODUCTS CO.  
CHARLES E. MOORE  
3035 DIRECTORS ROW, S. 408  
MEMPHIS, TN 38131

FLORIDA PEANUT PROD. ASSOC  
OLAN P. JOHNSON, EXEC. DIR  
PO BOX 447  
GRACEVILLE, FL 32440

FRITO-LAY RES. LIBRARY  
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900 NORTH LOOP 12  
IRVING, TX 75061  
214-579-2271

GA AGRICULTURAL COMMODITY  
COMMISSION FOR PEANUTS  
T. SPEARMAN  
110 EAST 4TH STREET  
TIPTON, GA 31794  
912-386-3470

GRIFFIN CORPORATION  
JIMMY L. WHATLEY  
PO BOX 1847  
VALDOSTA, GA 31603-1847  
912-242-8635

GUSTAFSON, INC.  
KYLE W. RUSHING  
PO BOX 660065  
DALLAS, TX 75266-0065  
214-931-8899

HERSHEY CHOCOLATE COMPANY  
CLARENCE J. CROWELL  
SENIOR STAFF TECHNOLOGIST  
19 EAST CHOCOLATE AVE.  
HERSHEY, PA 17033  
717-534-4595

ICI AMERICAS INC.  
R. A. HERRETT  
PO BOX 208  
GOLDSBORO, NC 27530  
919-736-3030

KEEL PEANUT COMPANY INC.  
RUFUS KEEL  
P.O. BOX 878  
GREENVILLE, NC 27834  
919-752-7626

LILLISTON CORPORATION  
WILLIAM T. MILLS  
BOX 3930  
ALBANY, GA 31708  
912-883-5300

NATL PEANUT COUNCIL  
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1000 SIXTEENTH ST. NW  
WASHINGTON, DC 20036  
202-775-0450

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P.O. BOX 1709  
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919-446-8060

OKLAHOMA PEANUT COMMISSION  
WILLIAM PLANAGAN  
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MADILL, OK 73446  
405-795-3622

PAUL HATTAWAY CO.  
B. F. HUDGINS, PRESIDENT  
P.O. BOX 669  
CORDELE, GA 31015

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WILLIAM T. PAIR  
PO BOX 246  
SEMINOLE, TX 79360

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MARKETING ASSN.  
B. E. MARKS, JR.  
PO BOX 59  
FRANKLIN, VA 23851

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GARY L. EILRICH  
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7528 AUBURN ROAD  
PAINESVILLE, OH 44077

SEABROOK BLANCHING CORP.  
J.W. GARDNER, PRESIDENT  
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EDENTON, NC 27932

SNACK-MASTER  
G. CURTIS BUSK  
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912-883-4000

SOUTH CAROLINA PEANUT BD  
CURT EDENS  
ROUTE 1, BOX 61  
DALZELL, SC 29040

SPRAYING SYSTEMS CO.  
STEVEN MITCHELL, JR.  
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WHEATON, IL 60187

STANDARD BRANDS  
J.J. EDELMANN  
RIVER RD., DEFOREST AVE.  
EAST HANOVER, NJ 07936

TEXAS PEANUT PRODUCERS BD  
MARY WEBB  
P.O. BOX 398  
GORMAN, TX 76454  
817-734-5853

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STEWART SMITH  
1101 W. CUSTER AVE.  
MILWAUKEE, WI 53209  
414-462-7600

H. S. GYPSUM CO.  
GERALDINE E. MASSOTH  
101 SOUTH WACKER DRIVE  
CHICAGO, IL 60606  
312-321-4399

VA PEANUT GROWERS ASSN.  
RUSSELL C. SCHOOLS  
CAPRON, VA 23829  
804-658-4573

MEMBERSHIP TYPE: ORGANIZATIONAL

ALFORD REFRIG. WAREHS INC.  
BRYANT SHUMPERT, VP INV. C  
P.O. BOX 5088  
DALLAS, TX 75222

AMERICAN PELLETIZING CORP.  
CONRAD DYER  
13 ISLAND DRIVE  
BRICK TOWN, NJ 08724

ANHEUSER BUSCH, INC.  
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1 BUSCH PLACE  
4TH FLOOR, BEVO  
ST. LOUIS, MO 63118  
314-577-3931

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EARLE BUTTERFIELD  
100 CHERRY HILL ROAD  
PO BOX 181  
PARSIPPANY, NJ 07054  
201-263-0200

BIRDSONG PEANUTS  
TOM WEST  
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BIRDSONG PEANUTS  
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BORDEN PEANUT CO., INC.  
BOBBY BORDEN  
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PORTALES, NM 88130  
505-356-8545

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BOX 802  
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CANADA, M5A 3R2  
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PO BOX 7068  
MACON, GA 31204

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GEORGE P. HARTNETT  
540 FRONTAGE ROAD  
NORTHFIELD, IL 60093

GPA PEANUT ASSOCIATION  
CHARLES P. COKER, MANAGER  
US 19 SOUTH  
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GILLAM BROS PEANUT SHELLER  
RUDY COBB, REPRESENTATIVE  
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HERSHEY FOODS CORP.  
DR. GIOVANNI BIGALLI  
HERSHEY FOODS TECH. CENTER  
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SUFFOLK, VA 23434  
804-539-0231

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DOUGLAS W. KINCAID, JR.  
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MINNEAPOLIS, MN 55412

STEVE K. HUBER  
ALL AMERICAN NUT PRODUCTS  
16901 VALLEY VIEW  
CERRITOS, CA 90701

J. R. JAMES BROKERAGE CO.  
RUTH J. MOORE  
P. O. BOX 220  
300 EXECUTIVE COURT  
SUFFOLK, VA 23434  
804-934-3211

JACK COCKEY BROKERAGE CO.  
JACK COCKEY, JR.  
P. O. BOX 1075  
SUFFOLK, VA 23434

LEAVITT CORPORATION  
JAMES T. HINTLIAN, PRES.  
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100 SANTILLI HIGHWAY  
EVERETT, WA 02149

NABISCO BRANDS INC.  
LIBRARY  
15 RIVER ROAD  
WILTON, CT 06897  
203-762-2500

NATL. PEANUT CORPORATION  
D. CARTER  
PLANTERS PEANUTS  
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SUFFOLK, VA 23434  
804-934-6200

NC CROP IMPROVEMENT ASSN.  
FOIL W. McLAUGHLIN  
3709 HILLSBOROUGH ST  
RALEIGH, NC 27607  
919-737-2851

OILSEEDS BOARD  
P.O. BOX 211  
PRETORIA  
0001  
REPUBLIC OF SOUTH AFRICA

OKLA CROP IMPROVEMENT ASSN  
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# AUTHOR INDEX

ADAMSEN, F. J.	41	DICKSON, D. W.	54,68
AHMED, E. M.	27	DOWLER, C. C.	49
ALLISON, A. H.	21	DRYE, C. E.	20
ANDREWS, M. W.	15	DWIVEDI, S. L.	38
AUMA, E. O.	34	ELDER, A.	60
BACKMAN, P. A.	19,52	ERICKSON, P. I.	33
BAILEY, J. E.	40, 68	FILONOW, A. B.	15
BALDWIN, C. H.	68	FRENCH, J. C.	24
BANKS, D. J.	30,38	GAINES, T. P.	32,40
BASHA, S. M.	26	GALLIMORE, G. G.	21
BASS, M. H.	36	GARDNER, F. P.	29,34
BENNETT, C.T.	43	GASCH, C. T.	21
BIESHIADA, K.	27	GIBBONS, R. W.	38
BLANKENSHIP, P. D.	23,29,43,45	GOODEN, D. T.	20
BOOTE, K. J.	31	GORBET, D. W.	24,31,37,51
BRANCH, A. L.	27	GUERKE, W. R.	23
BRANCH, W. D.	20,37	HAGAN, A. K.	16
BRECKE, B. J.	24	HAIRSTON, W. G.	66
BRENNEMAN, T. B.	17	HALE, D. B.	66
BUCHANAN, G. A.	11	HAMMONS, R. O.	28
BUTLER, J. L.	42	HANCOCK, H. G.	52
CADAPAN, E. P.	36	HARGROVE, W. L.	35
CAMPBELL, W. V.	36	HEALD, C. M.	38
CHAPIN, J. W.	20,35	HENNING, R. H.	23
CHESHIRE, J. M., JR.	35	HIEBERT, E.	57
CHEW, V.	46	HIGGINS, D. L.	39
CHHINNAN, M. S.	27	HILL, R. A.	23,45
CHIYEMBEKEZA, A. J.	19	HOWARD, E. R.	39
CHRISTIE, R. G.	57	HOWELL, R. K.	33,41
CHRISTIE, S. R.	57	HUANG, MING-TEH	33
COFFELT, T. A.	33,47	ISMAIL, W.	22
COLE, R. J.	23,45	JACKSON, K. E.	18
COLVIN, D. L.	25	JOHNSON, B. B.	30
CSINOS, A. S.	16,32,40	KEERATI-KASIKORN, M.	36
CULBREATH, A. K.	14	KETRING, D. L.	30,33
CULLEN, R.	17	KEYS, R. D.	32
DAIGLE, D. J.	47	KING, P. S.	14,15
DAVIDSON, J. I., JR.	23,43,44,46	KNAUFT, D. A.	37
DeLUCCA, A. J., II	47	KUCHAREK, T.	17
DELWICHE, S. R.	42	LANDSEN, J. A.	46
DEMSKI, J. W.	56	LEE, B. G.	60
DICKENS, J. W.	44,46	LEE, T. A., JR.	65

LITTTRELL, R. H.	51,53	SHAIK, M. B.	27
LOVEGREN, N. V.	28	SHOKES, F. M.	31,37,51,53
LOVELL, G. R.	58	SHUPE, W. L.	42
LUMMUS, P. F.	21	SIMONAITIS, R. A.	23
LYNCH, R. E.	35,47	SIMPSON, C. E.	39
MARGAPURAM, R.	32	SIRISHINGH, S.	36
MCDONALD, D.	38	SMITH, D. H.	18
MCGUIRE, J. A.	25	SMITH, J. C.	21
MCMEANS, J. L.	42	SMITH, J. S., JR.	43
MICHAELS, T. E.	39	STACK, J. P.	45
MINTON, N. A.	55	STEELE, J. L.	26
MIXON, A. C.	20,47	STIPES, R. J.	17
MELOUK, H. A.	18	STURGEON, R. V., JR.	62
MORGAN, L. W.	36	SUBRAHMANYAM, P.	19,38
MOZINGO, R. W.	26,44	SULLIVAN, G. A.	22
MULLINIX, B. G., JR.	32	SYKES, E. E.	39
NAKAYAMA, T. O. M.	27	TEEM, D. H.	24
NGWIRA, P.	19	THREADGILL, E. D.	48
NIGAM, S. N.	19,38	TOUCHTON, J. T.	15
NORDEN, A. J.	37	TURNER, J. T., JR.	19
PARRISH, F. W.	28	UNDERWOOD, A.	65
PATTEE, H. E.	28	WALKER, M. E.	32,35,40
PATTERSON, M. G.	25	WALKER, R. H.	25
PEARSON, J. L.	42	WEAVER, C. F.	14
PETTIT, R. E.	45	WEED, C.	66
PHIPPS, P. M.	17,21,67	WEEKS, J. R.	16,24
PITTMAN, R. N.	30,38	WEETE, J. D.	52
PIXLEY, K. V.	31	WEHTJE, G.	25
PORTER, D. M.	22	WHITAKER, T. B.	44,46
POWELL, N. L.	22	WILLIAMS, J. H.	31
PURCIFULL, D. E.	57	WILSON, D. M.	35,47
RAO, R. C. N.	31	WOODWARD, R. E.	67
REDDY, L. J.	38	WORTHINGTON, R. E.	27
REDLINGER, L. M.	23	WRIGHT, F. S.	22
REUSCHE, G. A.	32	WYNNE, J. C.	36,59
RIFFLE, M. S.	24	XIONG, Z.	57
ROBERTSON, D. G.	14	YOUNG, C. T.	26,44
ROCHESTER, E. W.	50	YOUNG, J. H.	42
RODRIGUEZ-KABANA, R.	14,15,54,68		
ROSE, L. P., JR.	41		
ROSS, B. B.	22		
ROTHROCK, C. S.	35		
RUD, O. E.	21		
SANDERS, T. H.	23,29,42,43,45		