

MINUTES  
of the  
MEETING OF THE S-9 TECHNICAL COMMITTEE

"NEW PLANTS"

The Introduction, Multiplication, and Evaluation of  
New Plants for Agricultural and Industrial Uses and  
the Preservation of Valuable Germplasm

Georgia Experiment Station  
Experiment, Georgia  
August 16--17, 1962

TABLE OF CONTENTS

	<u>Page</u>
Summary of Motions Approved	2
Roll Call	3
Approval of 1961 Minutes and 1962 Agenda	4
Appointment of Committees	5
State and Federal Agency Reports	6
Status of S-9 Regional Project and Contributing Projects	6
Status of Development - New Plants for Industrial Use	6
Industrial Crop Prospects Which Should Be Adapted to States of the Southern Region	8
Explanation and Development of "Chart of Responsibility for 1963"	11
Requests for Specific Plant Materials Through Plant Explorations	11
Use of IBM Cards for Recording Information	11
Next Meeting	12
Election of Executive Committee	12
Resolutions	13
Necrology	13

APPENDIX A

(State and Federal Agency Reports)

Alabama	A-1
Arkansas	A-5
Florida	A-8
Georgia	A-13
Kentucky	A-15
Louisiana	A-16
Mississippi	A-17
North Carolina	A-18
Oklahoma	A-21
Puerto Rico	A-24
South Carolina	A-26
Tennessee	A-29
Texas	A-30
Regional Station	A-38
Cooperative State Experiment Stations Service	A-43
New Crops Research Branch	A-45
Soil Conservation Service	A-52
Utilization Research and Development Divisions	A-54

APPENDIX B

Outline - Regional Project S-9

APPENDIX C

Chart of Responsibility - 1963

MOTIONS PRESENTED AND APPROVED

1. "That a subcommittee be appointed to study further the industrial potential of new crops and as part of this responsibility to consider which species to study and how to study the problems concerning these new crops."
2. "That the S-9 Committee go on record as supporting a request to be made by Mr. Theodore Hymowitz to the New Crops Branch of ARS for expenses and per diem for collecting guar while he is in India during the fall of 1962."
3. "That the New Crops Research Branch cooperate with the Caribbean Organization, San Juan, Puerto Rico, by furnishing one or more men to help organize and conduct an exploration to the Pangola River Valley, South Africa to collect the following plant genera: Digitaria, Paspalum, Andropogon, Pennisetum, and Panicum; and, if the Caribbean Organization's exploration fails to materialize, that the New Crops Research Branch plan and conduct such an exploration."
4. "That if either Davis, Roever, Fike, or Langford cannot attend the National Coordinating Committee meeting in 1963, the executive committee shall select a replacement."

MINUTES OF THE MEETING OF THE TECHNICAL COMMITTEE  
SOUTHERN REGIONAL PROJECT S-9; "NEW PLANTS"

Georgia Experiment Station  
Experiment, Georgia  
August 16--17, 1962

W. E. Roever, Chairman; W. T. Fike, Secretary

The meeting of the S-9-Technical Committee was called to order by Chairman W. E. Roever at 8:30 a.m. August 16, 1962. Roll call of S-9 Technical Committee members is shown below. Others in attendance are also listed.

Roll Call of Members

Administrative Advisor	R. D. Lewis
Regional Coordinator	W. R. Langford
Alabama	C. S. Hoveland
Arkansas	A. M. Davis
Florida	G. B. Killinger
Georgia	A. H. Dempsey
Kentucky	W. H. Stroube Absent
Louisiana	J. C. Miller Absent
Mississippi	H. W. Bennett
North Carolina	W. T. Fike
Oklahoma	R. S. Matlock
Puerto Rico	Roy Woodbury
South Carolina	J. A. Martin
Tennessee	W. E. Roever
Texas	E. L. Whiteley
Virginia	T. J. Smith Absent
Coop. State Exp. Stations Service, Washington, D.C.	W. C. Kennard
New Crops Research Branch, ARS, Beltsville, Md.	W. E. Whitehouse
New Crops Research Branch, ARS, Beltsville, Md.	C. O. Erlanson
Soil Conservation Service, Athens, Ga.	W. C. Young Absent
Northern Util. Res. & Development Br., Peoria, Ill.	L. A. Wolff

Visitors Present

Hassan Azzam, University of Puerto Rico, Rio Piedras  
J. M. Elrod, Georgia Experiment Station, Experiment Georgia  
W. T. Fullilove, Director, Georgia Experiment Station, Experiment, Georgia  
J. H. Massey, Georgia Experiment Station, Experiment, Georgia  
Roy Oswald, Oklahoma State University, Stillwater, Oklahoma  
S. V. Stacy, Georgia Experiment Station, Experiment, Georgia  
Grover Sowell, Jr., Regional Plant Introduction Station, Experiment, Georgia

Welcome

The group was welcomed to the Georgia Experiment Station, Experiment, Georgia by Director W. T. Fullilove.

## Minutes and Agenda

The minutes of the 1961 meeting of the S-9 Technical Committee were approved as distributed. Dr. W. R. Langford announced plans for a buffet dinner at his home at 6:30 p.m., August 16. The agenda for the 1962 meeting was presented and approved. The agenda follows:

1. Registration - Conference Room in Stuckey Building, 8:30 a.m.
2. Roll call.
3. Welcome - Director W. T. Fullilove, Georgia Experiment Station.
4. Agenda and committee appointments.
5. Current Status of research on industrial crops - I. A. Wolff  
Northern Utilization Research and Development Division, ARS
6. State reports.
7. Regional Station Activities - W. R. Langford and Grover Sowell, Jr.
8. Report from New Crops Research Branch - W. E. Whitehouse
9. Report of the Soil Conservation Service - W. C. Yeung
10. Report of the Cooperative State Experiment Stations Service - W. C. Kennard
11. Status of the S-9 Regional Project and Contributing Projects - R. D. Lewis
12. Explanation of "Chart of Responsibility" - R. D. Lewis
13. Development of Chart of Responsibility for 1963.
14. Requests for specific plant materials through plant explorations.
15. Use of IBM cards for recording information - W. E. Whitehouse
16. Arrangement of next meeting (time and place)
17. Election of new chairman and secretary.
18. Tour of Plant Introduction Station Nursery and Greenhouse - 2:30 p.m., Thursday.
19. Highlights of 1961 Puerto Rican meeting (slides) - 7:45 p.m., Thursday.

## Discussion:

Director Lewis congratulated the S-9 Technical Committee on its regional program, giving as a reference the following excerpt from the minutes of the April 1962 meeting of the Committee of Nine:

### 5. Expenditures for regional research in fiscal year 1961.

.....,"Concern was expressed over the cumulative expenditures for regional research without adequate documentation of accomplishments and benefits of the program. Examples of regional research publications were discussed as an effective means of summarizing accomplishments, such as Southern Cooperative Series Bulletin 79, 'New Plants'."

## Appointment of Committees

Chairman W. E. Roever appointed the following committees:

<u>Nomination Committee</u>	<u>Time and Place Comm.</u>	<u>Resolutions Comm.</u>
R. S. Matlock, Chm.	Roy Woodbury, Chm.	A. H. Dempsey
J. A. Martin	E. L. Whiteley	H. W. Bennett
G. B. Killinger		

## Current Status of Research on Industrial Crops - I. A. Wolff

The utilization report for the 1962 annual meeting stressed presently available information on economics and end uses of several classes, and selected specific examples within those classes of potential new crops under consideration. Two publications were distributed as follows:

1. Agricultural Economics Report No. 10 - "New Industrial Crops - Some Economic Considerations." Published June 1962 by U. S. Department of Agriculture.
2. List of publications of the Northern Division on New Crops, 1944-1961 inclusive.

Comments on end use potential of selected oilseeds under study by the Utilization Research Division appear in the Appendix.

## Discussion

Director Lewis and the committee went on record stating dissatisfaction with ARS and AMS of the USDA for not giving credit in their publications on new crops to the State Experiment Stations for their research on these new crops.

Dr. Whiteley commented on the Crotalaria juncea and Crambe pilot programs in Texas which are being carried on in cooperation with industry.

### State and Federal Agency Reports

Reports by committee members were given in the following order. These reports are summarized in the Appendix.

<u>Oklahoma</u>	-----	Matlock
<u>Puerto Rico</u>	-----	Woodbury
<u>Arkansas</u>	-----	Davis
<u>Alabama</u>	-----	Hoveland
<u>North Carolina</u>	-----	Fike
<u>Mississippi</u>	-----	Bennett
<u>Texas</u>	-----	Whiteley
<u>Georgia</u>	-----	Dempsey
<u>Florida</u>	-----	Killinger
<u>South Carolina</u>	-----	Martin
<u>Tennessee</u>	-----	Roever
<u>Regional Station Activities</u>	-----	Langford and Sowell
<u>New Crops Research Branch</u>	-----	Whitehouse
<u>Cooperative State Exp. Stations Serv.</u>	-----	Kennard

Discussion by various committee members followed all reports.

Dr. C. O. Erlanson gave a brief summary of our exchanges with Russia of both plants and personnel. He mentioned Public Law 480 which allows agricultural research by native personnel in those countries which have received surplus agricultural goods from this country. This law benefits New Crops Research in that native workers can make plant explorations within their own countries and forward this material to the United States. Cooperating countries are Spain, Yugoslavia, Israel, Turkey, West Pakistan, Uruguay, Colombia, and India.

### Status of S-9 Regional Project and Contributing Projects

Director Lewis gave a brief review of the correspondence with the Southern Regional Research Committee concerning the proposed revision of Regional Project S-9.

Dr. Langford passed out copies of the latest revised project outline. A few minor corrections were made and the committee approved this final revision. Dr. Lewis will forward this outline along with copies of State Contributing Projects to the Southern Regional Research Committee for approval.

State Contributing Projects were collected by the chairman and were to be reviewed by the Executive Committee after adjournment of the regular S-9 meeting.

A copy of the proposed project outline appears in the Appendix.

### Status of Development - New Plants for Industrial Use. (S-9)

In the absence of Chairman Jones, Dr. Matlock discussed the functions of the temporary committee. He stated that Dr. Wolff's corrections on the reason

for omission of various crops - "page 11, 1961 Minutes of the Meeting of the S-9 Technical Committee" - be reported in the 1962 minutes. In addition, the list of industrial crop prospects which should be adapted to the states of the Southern Region, prepared by I. A. Wolff and Quentin Jones, should also be reported in the 1962 minutes.

Seed of four of the crops mentioned in this crop list--Cassia mimosoides, Ipomoea parasitica, Polanisia viscosa, and Zaluzania discoidea plus Solanum aviculare--were sent to Dr. Langford for distribution. Alabama, Arkansas, Georgia, North Carolina, Oklahoma, South Carolina, and Texas requested seed which they planted in 1962. Results of these plantings are found in each state report.

It was moved by Matlock, seconded by Whiteley, and passed that a subcommittee be appointed to study further the industrial potential of new crops and as part of this responsibility to give consideration to species to be studied and how to study the problems concerning these new crops. Chairman Roever appointed R. S. Matlock, Chm., and E. L. Whiteley and W. T. Fike to this subcommittee. This committee will communicate with Dr. J. R. Haun, New Crops Research Branch, concerning progress.

The corrections, as given in the letter from Dr. I. A. Wolff to Dr. J. R. Haun, and the crop list follow:

On page 1 you state for Cynara, "The oil from this seed is of the safflower type." The linoleic acid content of this oil is below 50 percent, so it is perhaps misleading to characterize it in this way. The oil is more closely like cottonseed or soybean oil. The Calendula seed is said to have oil "essentially like that of linseed." This oil contains conjugated trienoic acid in major amounts, none of which is found in linseed oil. The Calendula and Momordica are alike in this respect. However, it is an exaggeration for Momordica also to say that it is "essentially the same as tung oil." The amount of the conjugated triene present, while substantial, is considerably below that of tung oil. On either Calendula or Momordica oil, one would be required to carry out some end-use research in the field of protective coatings to ascertain just how the particular composition of these genera would affect their behavior.

INDUSTRIAL CROP PROSPECTS WHICH  
SHOULD BE ADAPTED TO STATES OF  
THE SOUTHERN REGION

Seed Crops

Anchuca hybrida Ten. (NU 41141) Bugloss

Family: Boraginaceae

Native to: Mediterranean region.

Herbs from perennial rootstocks: 14-20 inches tall.

Constituent of interest: Oil containing unusual trienes

Cassia mimosoides L. (NU 41610)

Family: Leguminosae

Native to: South America but now a pantropical weed.

A low, suberect, annual herb, slightly branched.

Constituent of interest: Seed gum, like locust bean and guar

Daucus pusillus Michx (NU 40878)

Family: Umbelliferae

Native to: S. Carolina to Florida, west to Missouri, Arizona,  
Washington, California, and Mexico.

Erect, caulescent annual, 1-2 1/2 feet tall; peduncles terminal,  
bearing compound umbels; prefers light soils. Good seeder.

Constituent of interest: Petroselinic acid in seed oil.

Euphorbia parryi Englm. (NU 40355)

Family: Euphorbiaceae

Native to: Colorado and western Texas to California and Chihuahua.

Prostrate, spreading annual; prolific seeder.

Constituent of interest: 76% trienoic acid in seed oil.

Hibiscus syriacus L. (NU 40985, 40867)

Family: Malvaceae

Native to: Eastern Asia

Erect growing shrub 10-20 feet tall; flowering first year  
and hardy in northern states.

Constituent of interest: Cyclopropenoic acid in seed oil.

Ipomoea parasitica (HBK.) Don (NU 36395)

Family: Convolvulaceae

Native to: Southern Sonora and southward to Central America. Climbing  
annual vine with a short life span; germinating in later  
June (in Sonora) and seeding abundantly in early fall.  
Support, perhaps plants of Sesbania or Crotalaria, should  
be provided.

Constituent of interest: Hydroxy acid, glycoside.

Ipomoea sp. (NU 40798)

Origin: Texas

Constituent of interest: Unusual acid, differing from I. parasitica.

Marshallia caespitosa Nutt. ex DC. (NU 40882)

Family: Compositae

Native to: Louisiana and Texas, north to southern Missouri and Oklahoma.  
Small perennial herb, flowering first year(?); leaves mostly crowded at the base; heads terminal; 8-20 inches tall. Fair seeder.

Constituent of interest: Long-chain fatty acids.

Physalis nicandroides Schlect. (NU )

Family: Solanaceae

Native to: Highlands of middle Mexico.

Vigorous, gross, summer-fall annual, 3-5 feet tall with broad spreading crown 3-5 feet in diameter; the large inflated calyces persistent and drying on the plant; prolific seeder.

Constituent of interest: Rich in dienoic acids.

Polanisia viscosa (L.) DC. (NU 36401, )

Family: Capparidaceae

Native to: Sinaloe, Mexico and West Indies.

Rare summer annual with a bushy appearance the tops consisting of erect capsules mainly along the terminal 1/3 of the several branches. Prolific seeder.

Constituent of interest: About 20% unidentified acids.

Sahia texana (Sheele) Torrey (NU 40914)

Family: Labiatae

Native to: Texas from Dallas and Denton counties south and west.

Perennial herb to 2 feet tall, branching at the base from a woody root crown; inflorescence a terminal strict raceme; Good seeder; seed retention good; apparent calciphile; occupies disturbed, open habitats.

Constituent of interest: Oil rich in dienoic acids.

Schkuhria wrightii Gray (NU 40357)

Family: Compositae

Native to: Northern Sierra Madre to southeastern Arizona and southwestern New Mexico.

Summer annual; single erect stem, 1-2 feet tall. Good seeder; occupies disturbed areas.

Constituent of interest: Oil rich in dienoic acids.

Zaluzania discoidea Gray (NU 40249)

Family: Compositae

Native to: Sierra Madre of Mexico.

Annual herb, 3-4 feet tall with a terminal panicle of large-headed flowers. Fair seeder; holds seed well, good habit.

Constituent of interest: Oil rich in dienoic acids.

PULP CROPS

Cassia leptadenia Greenm. (NU )

Family: Leguminosae

Native to: Western Texas to Arizona and Mexico.

Summer annual, 1 m or more tall; growing in dense colonies.

Cassia occidentalis L. (Gentry #19552)

Family: Leguminosae

Native to: Northern and central Mexico

Bushy, 1.3-1.5 m tall; seeding prolific.

Cassia akta L. (Gentry #19622)

Family: Leguminosae

Native to: Michoacan, Mexico

Spreading shrub 1.5-3.0 m tall; seeding freely.

Cassia leptocarpa Benth. (Gentry #19632)

Family: Leguminosae

Native to: Mexico

Summer annual, about 1.5 m tall.

Crotalaria longirostrata H.&A. (Gentry #19449)

Family: Leguminosae

Native to: Mexico

Summer annual 1-k.2 m tall.

Crotalaria sp. (Gentry #19494)

Family: Leguminosae

Native to: Mexico

Summer annual, 1-1.5 m tall with single stem; seeds heavily.

Sesbania sp. (Gentry #19586)

Family: Leguminosae

Native to: Mexico

Tall annual growing in standing water but apparently also adapted to drier sites.

### Explanation and Development of "Chart of Responsibility for 1963"

Director Lewis discussed the Chart of Responsibility and how the development of this chart clarifies the responsibilities of the individual state stations, federal agencies, and the regional station. The procedure of filling out the chart was discussed and all states are to have their Charts of Responsibility in to Dr. Langford's office by September 1, 1962.

### Requests for Specific Plant Materials Through Plant Explorations.

Mr. Theodore Hymowitz of Oklahoma State University has worked during the past two years on his Ph.D. dissertation using the available introductions of guar. From September 1962 to August 1963, Mr. Hymowitz will be studying guar cytogenetics at New Delhi (India Agricultural Research Institute) as a Fulbright Scholar.

After Mr. Hymowitz completes his Fulbright scholarship in August 1963, he would like to collect guar in either the northern latitudes of India and Pakistan or in the high rainfall areas of Burma and Ceylon. A collector with his training and experience on guar is a valuable asset to the potential of the guar industry in the United States.

Mr. Hymowitz will not be able to do this unless arrangements can be made to pay his expenses and per diem while collecting.

It was moved by Matlock, seconded by Woodbury, and passed that S-9 go on record as supporting the future request to be made by Mr. Hymowitz to New Crops Branch of ARS for expenses and per diem for collecting guar while he is in India during the fall of 1963.

Dr. Whitehouse reported that the Caribbean Organization headquartered in San Juan, Puerto Rico, has been considering plans for collecting tropical grasses in Africa, including Digitaria spp.

It was moved by Killinger, seconded by Fike, and passed that the New Crops Research Branch support an exploration to the Pangola Valley, South Africa, by furnishing one or more men and organizing in cooperation with the Caribbean Organization, San Juan, Puerto Rico, this exploration to collect the following plant genera: Digitaria, Paspalum, Andropogon, Pennisetum and Panicum, and if the Caribbean Organization exploration does not take place, that the New Crops Research Branch plan an exploration to Africa on its own.

### Use of I.B.M. Cards for Recording Information - W. E. Whitehouse

At the 1960 National Coordinating Committee meeting, Dr. T. E. Randall presented a report on the need for a uniform, rapid, and inexpensive system for filing information obtained in the evaluation of plant introductions. After a brief discussion, a committee consisting of the Coordinators, representatives of the Technical Committees, and myself was appointed to study this proposal.

Any system of information accumulation and retrieval must contribute materially to the improvement of existing methods of meeting regional program objectives; thus a clear understanding of regional program objectives is a prerequisite to the selection of a satisfactory system.

Dr. Robert E. Perdue, a member of the New Crops Research Branch staff, has been coping with the need of storage and retrieval of information relative to plant utilization. As a result of his comprehensive study of the various systems in use today, he is able to be of material assistance to the committee studying the problem. The merits of the linear (IBM) cards and the coordinate searching systems have been studied.

Plans are underway for a meeting of the regional station pathologists at Beltsville in November 1962; the pathologists will, as representatives of their stations, present (1) a detailed written report covering methods now employed to meet each objective, and (2) be prepared in general to contribute to the evaluation of the usefulness to the regional stations of any system discussed at this meeting. Dr. Perdue and a representative of the Biometrical Services will be present at the discussion.

A written description of any system agreed upon will be sent to the Coordinators. The Coordinators and their staffs will then have an opportunity to discuss the proposed systems fully. Plans are underway for a Beltsville meeting of the Coordinators in the spring of 1963. At this meeting the Coordinators should be able to make a final decision as to the merits of employing an information accumulation and retrieval system, and if favorable, to agree on the type best qualified to meet the regional program needs.

It was moved by Davis, seconded by Killinger, and passed that Dr. W. E. = Whitehouse's report be accepted.

#### Next Meeting

The 1963 meeting of the Technical Committee of the Southern Regional Cooperative Project S-9 will meet at Gainesville, Florida, at a time from July 16 to July 31. The exact time will be set by the Executive Committee, the Florida Experiment Station, and the new Administrative Advisor.

#### Election of Executive Committee

The nominating committee nominated A. M. Davis for chairman and W. T. Fike as secretary. The nominations were seconded by Woodbury and unanimously passed.

A. M. Davis, W. E. Roever, W. T. Fike, and W. R. Langford will attend the National Coordinating Committee Meeting in 1963.

It was moved by Whiteley, seconded by Davis, and passed "that if either Davis, Roever, Fike, or Langford could not attend the National Coordinating Committee Meeting in 1963, the Executive Committee should select a replacement."

### Preparation of Annual Report

The 1962 annual report will be prepared by A. M. Davis. The report should summarize the accomplishments of contributing projects and the activities of the regional station. Dr. Lewis will call for state reports by December 1, 1962.

### Resolutions

The Resolutions Committee moved that:

A special note of thanks be directed to Director W. T. Fullilove of the Georgia Experiment Station and to Dr. and Mrs. Langford for the gracious hospitality and delicious dinner given the S-9 Technical Committee members during the meetings. The many courtesies extended helped to make the meeting personally enjoyable and professionally profitable. It is further moved that a copy of this resolution be sent to these individuals by the secretary.

The resolutions committee further moves that: The committee extend a special note of thanks to Dr. R. D. Lewis, Dr. W. C. Kennard, and Dr. R. O. Woodbury for their many contributions to the S-9 New Plants Project. Our best wishes go with them as they leave this project.

### Necrology

Mr. Roy M. Hardin, a private breeder and retired farmer at Geary, Oklahoma, passed away May 13, 1962, at the age of 69. Mr. Hardin's loss will be felt because of his ambition in observing so many plant introductions, his cooperation with public agencies, and his keen ability for finding genetically interesting characters. His seed collections were given to the Department of Horticulture, Oklahoma State University. The germplasm will be made available to any plant breeder through the Southern Regional Station and/or the National Seed Storage Laboratory.

The 1962 meeting of the S-9 Technical Committee adjourned at 3:15 p.m., August 17, 1962.

APPENDIX A

State and Federal Agency Reports

REPORT OF S-9 (PLANT INTRODUCTION)  
ACTIVITIES IN ALABAMA DURING 1961

C. S. Hoveland, Associate Agronomist

A total of 128 new plant accessions was received by personnel of the experiment station and private nurseries through the Regional Station since the annual S-9 meeting in December 1961. Of these introductions, 79 were ornamentals, 21 forage grasses and legumes, 10 cowpeas, 8 cantaloupes, 5 turf grasses and 5 industrial crops.

Plant introduction materials involving various plants adapted to southern Alabama have been collected, propagated, and are now being sent to the regional collecting point in Louisiana. Foreign introductions, particularly those of apples, are being tested on dwarf and semi-dwarf rootstocks for Deep South adaptation evaluations. Contrary to previous opinions, Dr. H. J. Amling, Horticulture Department, has found that apples can be grown in the Deep South with excellent success, providing that considerable attention be paid to variety and cultural practices. Several varieties with good color and flavor can be harvested from June through August before other major apple-producing areas market their fruit. Alabama growers have planted over 250 acres of apples during the last two years and more acreage is expected this next year.

Dr. Walter Greenleaf, Horticulture Department, screened 105 pepper accessions with a new strain of tobacco mosaic virus during the winter of 1961-62. There was no immunity or localized lesion reaction among them although one of them showed a good tolerance level. Pepper accessions (P.I.'s 159236, 159261, and 159282) had a high level of resistance to ripe rot disease and this was transmitted in crosses with Tabasco in a dominant manner. This resistance is being used to breed ripe rot resistance into the tobacco-etch-resistant

Tabasco which Dr. Greenleaf developed from a cross with P.I. 152225.

One large ornamental nursery at Mobile states that Eurya emarginata var. 'Microphylla' (P.I. 240914) appears certain to become a popular ornamental in the trade. Magnolia Fremon and Azaleas (Bayou, Green Mist, Pink Ice, and Whitehouse) look very promising. However, many ornamental introductions in the Mobile area were killed this past winter when temperatures plunged to a record of 5° F.

Dr. H. P. Orr, Ornamental Horticulture Department, reported the following about ornamental introductions:

Ilex altaclarensis "Wilsonii", P.I. 241325--very poor growth.

Osmanthus "Gulftide", P.I. 213308--growth very upright, has possibilities for exotic use in landscape.

Eurya sp., 235502--well shaped, light green foliage, possibilities for filler plant in landscape.

Eurya japonica, P.I. 237871--one plant nearly dead and the other has good compact growth, planted in garden.

Other introductions are too small to evaluate at this time.

Dr. E. D. Donnelly, vetch breeder, had previously crossed Vicia angustifolia (P.I. 121275) with V. sativa. The latter, an advanced generation line developed at the Alabama Agricultural Experiment Station, produces high yields of seed and herbage; however, it has little or no hard seed. Although very low in vigor, P.I. 121275 was found to be non-dehiscent and to possess a very high percentage of hard seed. Both parents apparently are resistant to the vetch bruchid or weevil. F<sub>1</sub> and F<sub>2</sub> results of this cross have been published.

F<sub>3</sub> and F<sub>4</sub> vetch data substantiate F<sub>2</sub> findings that the desirable characteristics of the two parents can be combined. Sterility apparently has been overcome, and vigorous F<sub>4</sub> plants of both V. sativa and V. angustifolia types,

which produce high seed yields, a very high percentage of hard seed, and are non-dehiscent, have been selected. No bruchid damage has been observed in seed of these plants. A reseeding study is being initiated using  $F_5$  seed of a number of lines to study reseeding ability in summer grass sods.

Twenty-seven Lathyrus introductions were grown at the Black Belt Substation and at Auburn. None of these introductions produced spring herbage growth earlier than the common Caley pea grown in the Black Belt area.

Continued testing of arrowleaf clover (Trifolium vesiculosum) showed variable results as in past years. Total yields of P.I. 234310 and P.I. 233816 are similar, but the seedling vigor of the latter has been better. At some test locations, plantings of arrowleaf clover were a complete failure due to very poor inoculation. Inoculation of this clover has been a serious problem, particularly in regions with sandy soil. Where inoculation has been satisfactory, arrowleaf yields have equaled or exceeded those of crimson clover. At the Gulf Coast Substation this clover produced over 3 tons of oven-dry forage per acre, which was nearly twice the amount of that produced by crimson clover. However, this is a late spring clover, and like ball, has been seriously damaged by May droughts. At Union Springs, Alabama, a poor stand of arrowleaf (P.I. 233816) on 25 acres was harvested for seed. Seed production was excellent where stands were satisfactory.

Ball clover acreage in Alabama has increased in recent years. A recent survey of county agents and SCS personnel showed over 18,000 acres of ball clover in the state this spring. Two counties had over 2200 acres each. Most of the acreage is in a belt extending from east to west across the central part of the state. The major reason for the popularity of the clover is its excellent reseeding ability.

Mike clover appears to be of little interest and acreage is very small. The productive season parallels crimson and reseeding properties are not as good as ball.

#### MANUSCRIPTS PREPARED

- (1) Donnelly, E. D. and E. M. Clark. Hybridization in the genus Vicia.  
Crop Sci. 2:141-145. 1962.
- (2) Hoveland, C. S. Arrowleaf clover. Auburn Univ. Agric. Exp. Sta. Leaflet.  
(In press). 1962.
- (3) Hoveland, C. S. Ball is Rolling! Crops and Soils Sept.-Oct. (In press).  
1962.
- (4) Hoveland, C. S. Gulf-improved Ryegrass Variety. Highlights of Agric.  
Res. (Alabama). Vol. 9, no. 3. Fall, 1962.

ANNUAL REPORT (ARKANSAS) S-9

Experiment, Georgia  
August 16, 17, 1962

A. M. Davis

Due to the fact that it has been less than a growing season since the last meeting, little has been accomplished.

Plant introductions received are as follows:

39	Horticultural
128	Nematode Studies
32	Private Individuals
24	Grass Breeding
5	Bamboos
5	Industrial Uses
<u>233</u>	TOTAL

The horticultural entries have not been evaluated. The nematode resistance material is either reported in Report Series 110 or is being processed at present. All other materials are being grown out at Fayetteville, except the bamboo. This is at the Southwest Branch Experiment Station, Hope, Arkansas.

Industrial Crops. Those furnished through Dr. Joe Haun have grown well and show little disease (photos). All are setting seed except Zaluzania discoidea, which has failed to flower. The Cassia is growing particularly well and as yet has not been invaded by the Vetch weevil, which attacks our native Cassia species.

The following is a report from the Entomology Department which has worked on screening egg plant lines for insect resistance.

Report on screening test on P.I. lines against Nuzonia pallidula Boh.  
 L. H. Rolston, Entomology Department, University of Arkansas, Fayetteville, Ark.

Entry	Beetles Per Plant	Rating Foliage Injury (1)	Entry	Beetles Per Plant	Rating Foliage Injury
115511	.87	2	174369	.96	3
116536	.43	2	175914	1.20	3
140460	.72	4	175916	1.10	3
141970	1.40	3	182300	1.31	3
143402	1.13	3	199516	.86	1
166995	.93	2	246932	.41	3
167208	.92	2	251506	1.41	3
169641	1.00	3	Black Beauty	.68	1
169643	.64	2	Fla. High Bush	.33	2
169658	2.20	3	Fla. Market	.60	2
173105	1.15	3	Ft. Meyer Mkt.	1.13	3
173107	1.17	3	N. Y. Spineless	.70	1

(1) Least--1, most--4

Entries were planted in a randomized block with three replications of ten plants of each entry in each replication. Foliage injury was caused mostly by several species of flea beetles and the eggplant tortoise beetle. Data were taken between June 23 and July 9.

P.I. 122878 B, a normal sorghum, has been made as sterile as P.I. 122878 A and has gone through 3 backcrosses. This carries the bitter endosperm for bird resistance and is a schrock type. This material is available to other breeders from Mr. J. O. York of this station.

Other crops of interest grown under State 323:

#### Flax

Seedflax yields, which were lower than in previous years, varied from 8.5 to 13.5 bushels per acre at Fayetteville. Planting was delayed nearly a month due to wet cold weather. Late February and early March plantings have been more successful.

### Safflower

Safflower planted at Fayetteville was a failure. Leaf disease killed the plants just as the seed was forming. Yields of seed were less than that planted.

### Sugar Beets

After a moderate success in 1961, further plantings were made this year. The indicated success is nil. Foliage diseases have eliminated the stands in spite of fungicide applications. This destruction has been aided by secondary invaders of the crown and root. Whole sections of rows 25 feet long are dead. Early (March) planting seems to be the most seriously affected.

Publications reporting use of P.I. material:

Riggs, R. D. and M. L. Hamblin. Soybean Cyst Nematode Root Studies in the Family Leguminosae. Arkansas Agricultural Experiment Station Report Series 110, June 1962.

Regional Project S-9 "New Plants"  
The Introduction, Multiplication, and Evaluation of  
New Plants for Agricultural and Industrial Uses and the  
Preservation of Valuable Germplasm

Gordon B. Killinger  
Florida Cooperative Project Hatch 767  
August 16, 1962

Over 3000 accessions of seeds and plants were introduced into Florida through the Southern Regional Plant Introduction Station, other United States Department of Agriculture Introduction Stations and agencies, and through private contacts. Many accessions were received by nurserymen and private individuals; however, the bulk of material was received by the Florida Agricultural Experiment Station system for screening and evaluation.

A number of accessions of Cucumis were received by Dr. J. A. Mortensen at the Watermelon and Grape Investigations Laboratory, Leesburg. Dr. Mortensen reports that none are acceptable in present form but is keeping 18 for crossing with commercial cantaloupe in a breeding program to obtain cytoplasmic male-sterility. Likewise Dr. J. M. Crall, Head of the same station, is using five Citrullus accessions in a study of male-sterility factors in the production of F<sub>1</sub> hybrid watermelon varieties.

W. H. Chapman at the Quincy Station received 259 corn accessions from the NCPIS and hopes to find genes carrying prolificness under thick populations and high fertility. Such lines will be incorporated in a hybrid breeding program.

Dr. Harold Young at the Quincy Station reports favorably on 32 camellia accessions received, with 10 of the accessions flowering during their first season. Coleus accessions are being maintained, and a study is being made to determine inheritance of certain leaf patterns. Chrysanthemums, tomato,

cantaloupe and asparagus accessions are being evaluated. Dr. Young suggests that it would be helpful and that there would be less material wasted if fruit stocks were rooted before sending them out for evaluation or if root-stock material were furnished.

Dr. Charles C. Seale reports from the Everglades Station that ramie (Bochmeria nivea (L.) 'Gaudi') accessions, crossed and/or selected, derived from P.I. 162942 (Java, April 1948) and P.I. 87521 (Japan, May 1930), have produced high fiber yield. B. nivea, P.I. 205492 (Brazil, December 1949), has a high fiber content of stalk. Hibiscus cannabinus (kenaf), BE-52-71 derived from P.I. 207883 (Cuba 1949), has given high fiber yields, too. H. acetosella Welw. ex Hiern, P.I. 161343 (Brazil, 1951), is highly resistant to root-knot nematodes, and H. radiatus Cav. P.I. 200834 (Burma, 1951) is resistant to root rot (Pythium sp.). Dr. Seale also reports a promising variety of Sansevieria, (Florida H-13\_ from S. deserti N.E. Brown P.I. 183582 (Ethiopia, 1949) and S. trifasciata Prain, clone C-7 (collected at Arcadia, Florida, 1946 by J. F. Joyner). A selection of Dioscorea, D. floribunda P.I. 201783 (Mexico), has given a high yield of sapogenin.

Dr. R. J. Allen, Jr. of the Everglades Station reports the testing of 272 legume and 131 grass accessions. Eight of these accessions are being grazed for further evaluation. At present Trifolium spp., (alexandrium, nigrescens, pallidum, resupinatum and vesiculosum) look best of all forage legumes. This year 260 accessions, primarily grasses, and largely guineagrass and buffelgrass will be evaluated.

Dr. A. E. Kretschmer of the Indian River Station, Ft. Pierce, reports on observations of 300 Trifolium species. Favorable first year data were obtained from F.C. 34248, Berseem clover (Var. Fahli), and Persian clovers (P.I.'s 220057

and 222123). Lotus uliginosus (P.I.'s 190349 and 180712) produced outstanding spring growth. Other legumes showing promise in the Ft. Pierce area are Centrosema pubescens (P.I. 200731), Glycine javanica (Australia), and Lotonis bainesii (P.I. 234409).

Dr. J. E. McCaleb of the Range Cattle Station reports the testing of 286 legumes and 681 grasses. Cynodon plectostachyum (P.I. 224152) is being replaced in a pasture which has been grazed for several years by C. plectostachyum (P.I. 225957). P.I. 225957 has performed well in small plots for several years and may be a good pasture grass.

At the Gainesville Station, Dr. A. P. Lorz reports that Vigna sinensis (Southern pea, cowpea--P.I. 269667) has several characters which would recommend it as a breeding stock for the improvement of southern peas. These characters are earliness, determinate bearing, resistance to defoliation, high borne pods, excellent productivity and vigor, and apparent resistance to most diseases and pests. Twenty accessions of Sechium edule (Chayote) on trial were all inferior to the type commonly grown in the area because of fiber in the ecto- and endocarp. Four accessions (P.I.'s 271760, 271765, 213553 and 273559) have some characters of potential value in a breeding program. An attempt is in progress to maintain these four accessions. Material has been sent to the U. S. Plant Introduction Station, 13601 Cutler Road, Miami 56, Florida.

Dr. J. R. Edwardson reports genetic studies and evaluation of 37 accessions of Cajanus cajan, Lupinus albus, Euchlena mexicana and Zea mays.

Dr. A. A. Cook at the Gainesville Station reports that P.I. 264281 (Capsicum sp.) derivatives with virus disease resistance have been selected for varietal testing. Of 50 additional Capsicum accessions (ranging from P.I. 200727 to P.I. 273429), no resistance to cucumber mosaic was found. Sources of resistance to

bacterial spot are being studied in P.I.'s 163184, 163189, 163192, 183922, and 246331.

Dr. A. J. Norden at the Gainesville Station reports on the evaluation of 507 Sorghum vulgare accessions. Completely unadapted lines were screened out in 1961. In 1962 the 30 superior accessions were planted in replicated plots for studies of head compaction, seed size and color, degree of awns, disease resistance, and palatability of the seed to birds. Effects of temperature, moisture, and daylength between planting dates, and various other interactions will be studied.

Dr. Gordon Prine at the Gainesville Station has an evaluation study of nine wild peanut accessions underway. These accessions include P.I.'s 116979, 151982, P.I. 263393 - 263396 and are planted in pure stands and in sods of Coastal Bermudagrass, Pensacola Bahiagrass, and Pangolagrass. Compatability of the peanuts and grass, as well as total and seasonal forage yield will be determined.

Dr. W. A. Carver of the Gainesville Station, testing five new peanut accessions (Arachis hypogaea) from Brazil (P.I. 279953-57) and five from Mexico (P.I. 280687-91), found one accession P.I. 280688, with deep purple colored markings valuable in breeding new varieties.

Two new Digitaria sp. from Taiwan (P.I. 279651 and 279652) appear very promising and are reported to have insect resistance by investigators in Taiwan.

A Paspalum notatum selected from P.I. 227832 has qualities possible desirable both as a forage and turf grass.

Erucastrum abyssinica (P.I. 243913), a rape-like oil seed and forage crop, shows promise as a cash crop for North Central Florida. The seed con-

tain 33.5 percent oil and 31.8 percent protein. Seed yields of 1500 pounds per acre were harvested by combine with 2000 to 2200 pounds of seed per acre from small plots, hand harvested. When 18 to 24 inches in height, protein content of the entire plant ranged from 16 to 22 percent on a dry matter basis over a period of two seasons.

Indigofera hirsuta (P.I. 213523) first grown in 1959, volunteered in 1960-61 and appears to have several desirable characteristics. Early growth following germination and the production of mature seed before November coupled with good leafiness and vigor are a few of its better qualifications. Indigofera suffruticosa (P.I. 206323) has perenniated at Gainesville for two seasons and may be valuable as a cover crop.

Vegetables, fruits, ornamentals, and turf, forage and pasture grasses, legumes, and miscellaneous crops for industrial purposes will be grown and evaluated at the various stations in Florida during 1962-63. Kenaf strains received from Dr. Haun and Dr. Langford will be harvested for dry weight yield with pulp and paper as the end product use.

Report to Technical Committee Project S-9 "New Plants"  
Experiment, Georgia  
August 16, 1962  
A. H. Dempsey

There is increased interest in introductions of peanuts and sorghum. A total of 832 plant introductions were received by state and federal workers in Georgia during this year. Requests included Capsicum spp., sorghum, peanuts, corn, Coleus, and also ornamental and fruit stocks direct from Glenn Dale, Maryland.

Research under the supporting project Hatch No. 96 is being conducted by Dr. Robert Langford and Dr. John Massey.

Crotalaria juncea: A number of Crotalaria juncea lines were planted at Experiment this spring for evaluation. Several of these lines appear outstanding for plant type, and they produced a good seed crop. Seeds of the best lines will be collected for planting in the 1963 replicated yield trials. About seventy-five percent of the plants were damaged by recent winds, although some lines were not damaged as badly as others.

Crambe abyssinica: The 1962 spring planting of Crambe abyssinica was a failure due to dry weather during April and May. There is a need for a study of planting dates and production practices for this crop at Experiment.

Observational plantings of okra, castorbean, Cassia, and Pennisetum were made this year.

#### Other Research

Mr. Julius Elrod of our Agronomy Department is conducting adaptation studies for alfalfa, clover, flax, and castorbean. Sorghum introductions are being studied in a search for dwarfness, quality, and low prussic acid content.

The research in the Agronomy Department is supported by Hatch Project 39, "The Introduction, Testing, and Improvement of Forage and Pasture Plants."

Sorghum: Several of Dr. Harris's sorghum lines with P.I. parentage have superior yielding ability. His objectives are to develop combine types with disease resistances and high yield of grain and forage.

Pepper (Capsicum frutescens): In our pimento breeding program, P.I.'s 163192, 163189, and 246331 are being used as sources of genes for bacterial spot resistance. With the assistance of Dr. Sowell, F<sub>2</sub> and F<sub>3</sub> pimento breeding lines are being artificially inoculated and then evaluated for resistance to bacterial spot, caused by Xanthomonas vesicatoria. P.I. 264281 has been reported to carry resistance to tobacco etch virus as a single recessive gene. Our line of P.I. 264281 appears to be segregating for TEV resistance. Progeny from a cross of P.I. 264281 with Truhart Perfection, the commercial pimento variety, are being evaluated for TEV resistance.

UNIVERSITY OF KENTUCKY  
Agricultural Experiment Station  
Lexington, Kentucky  
August 6, 1962

Dr. W. R. Langford, Coordinator  
Regional Project S-9  
Regional Plant Introduction Station  
Experiment, Georgia

Dear Dr. Langford:

I am very sorry that I will be unable to attend the S-9 Committee meeting this year. I had a previous commitment for those dates that I could not change.

As I am a new member of the committee, I am not fully familiar with the procedure expected for the work sheets you sent. I have enclosed them with this letter with brief statements where I thought them pertinent. As you will notice, about the only thing that I have been able to pinpoint here is Norman Taylor's interest in the Trifolium species.

The contributing project here is in the process of being revised. I hope to get it done and circulated to the proper persons before the end of this year.

Sincerely yours,

William H. Stroube  
Associate Professor of Agronomy

LOUISIANA STATE UNIVERSITY  
Department of Horticulture and Landscape Architecture  
Baton Rouge, Louisiana  
July 19, 1962

Dr. W. R. Langford, Coordinator  
Regional Project S-9  
Regional Plant Introduction Station  
Experiment, Georgia

Dear Dr. Langford:

I am returning the draft sheets on the S-9 Chart of Responsibility--1963. I have completed the two objectives in which we are interested, that is, (1) to participate in the coordinated program of foreign and domestic plant exploration and introduction to obtain new plants for agricultural, industrial, and other uses, and (6) to make preliminary crop evaluation of new plants having potential industrial utilization. I am interested in the whole program, but these two hold particular interest for me.

I am also attaching a copy of my old project, which I will revise sometime during the coming year.

I am growing about the same crops that I reported at the meeting in Puerto Rico, and the one that I think has great promise is the Kaki pigeon pea. As you saw, I have a very satisfactory planting of it this year. I have seed on hand for others who might wish to have some, as well as seed of P.I. 218066. I have about a fourth acre of P.I. 218066 and about an eighth acre of the Kaki.

Again, we have made plantings of okra for Dr. Wolff for fiber strength tests. We are also growing kenaf, Crotalaria, and castorbeans. I can still send out dwarf castorbean and okra seed to anyone who might wish it.

As mentioned in the attached copy of my letter to Dr. Roever, I am leaving here on the 27th for Hawaii and will probably not be back until around the 20th of August. Therefore, I will not be able to attend the meeting. Please express my regrets to the group.

In regard to objective 4 in the chart, we will be glad to maintain and distribute germplasm of certain plants.

Personal regards and best wishes.

Sincerely yours,

Julian C. Miller, Head  
Department of Horticulture  
and Landscape Architecture

1962 REPORT S-9 MISSISSIPPI

H. W. Bennett

Since the last meeting, agricultural workers in Mississippi have requested 105 accessions. Plant Materials Center, Soil Conservation Service, has been quite enthusiastic about plant introductions.

Domestic exploration in the southernmost counties of Mississippi has resulted in the tagging of six apples, three pears, one pecan, six plums, five peaches, and two fig plants for subsequent propagation.

A new crimson clover, Frontier, is being released by the Mississippi Station and the USDA. This variety was derived from P.I. 233812. 'Williams' is a new blackberry being released jointly by the Mississippi and the North Carolina Experiment Stations.

NORTH CAROLINA - NEW PLANTS PROJECT  
Report to S-9 Technical Committee

W. T. Fike

The cooperators received 1213 plant introductions from December 1, 1961, to August 1, 1962. The breakdown is as follows:

Crops	P.I.'s	Number		Cooperators
		Genera	Species	
Vegetables	312	1	3	1
Milletts, etc. (Grain)	295	4	31	1
Sunflowers	224	1	2	1
Forage Grasses	180	3	29	1
Legumes	72	11	20	4
Ornamentals	68	6	14	4
Misc. crops	37	4	5	2
Fiber	20	2	10	1
Industrial	<u>5</u>	<u>5</u>	<u>5</u>	<u>1</u>
TOTAL	1213	37	119	-

The majority of the above plant introductions were planted during 1962 and data are still being taken on them.

A list of 15 Rubus introductions available from the North Carolina Rubus project was circulated by Dr. Langford to all of the regional projects. Breeders from Arkansas, Kentucky, Louisiana, Oregon, South Carolina, and Texas requested a few or all of these plant introductions. A few have already been sent out, but most of them will be sent out in the spring of 1963.

The following industrial crops were planted in cooperation with S-9 to determine adaptation and yield: Cassia mimosoides, P.I. 194854; Ipomoea parasitica, P.I. 279698; Solanum aviculare, P.I. 280049; Polanisia viscosa, P.I. 279699; Zaluzania discoidea, P.I. 279702; and Foeniculum vulgare, G-11912. All species were drill seeded in the field. In addition, plants of Ipomoea, Solanum, and Polanisia were transplanted from the greenhouse. An excellent seed yield of Cassia is expected and an undetermined yield of Polanisia and Ipomoea. Potato beetles destroyed the 500 transplants of Solanum as well as the drilled seed. Seed of Zaluzania and Foeniculum did not establish a stand. Foeniculum will be planted again in the fall.

Cajanus cajan (P.I. 218066) does well in our area and is now being tested as pigeon feed. There seems to be a small demand from pigeon fanciers for a feed crop and this may be it. This line is resistant to the incognita, hapla, arenaria, and javonica species of root knot nematode which also makes it fit in as a green manure crop. Seed is being increased.

Dr. J. W. Dudley reports the following:

"In our search for resistance to the alfalfa weevil, we have found that P.I. 239953, Medicago sativa var. 'Gaetula,' has increased resistance to egg laying by the adult weevil as measured by eggs per cluster and eggs per inch of stem in greenhouse studies. More specifically, in one test this introduction averaged 3.8 eggs per inch of stem and 4.7 eggs per cluster compared to 20.7 eggs per inch of stem and 11.5 eggs per cluster for the variety 'Atlantic.' In another test, it averaged 1.5 eggs per inch of stem and 4.0 eggs per cluster compared to 9.1 eggs per inch of stem and 10.6 eggs per cluster for a number of Cherokee plants. Although this source of resistance has yet to be tested under field conditions, it appears very promising on the basis of our greenhouse tests."

The use of wild bird feed mixtures by North Carolinians is amazing--- a fact which opens a whole new market for the millets and sunflower introductions. Plant introductions from these species are now being tested and will be tested for adaptation and disease resistance. Summer warm season grasses, Panicums and Pennisetums, are being tested for winter hardiness and yield. Summer yield is high in many of the lines. Many introductions of turf-grasses are being tested, and in the future, all available introductions will be tested. Screening of the Cucurbita for scab resistance will be continued. All new industrial crops from the New Crops Branch will be grown also next year.

Bamboo tests (Molded Bamboo Products Co.) \$15.00/ton, \$30.00/ton harvested. Eight species look excellent. In addition - Vernonia, kenaf, Crambe are being grown, but these crops are still in the field.

Fall legumes - Vesi clover needs a special inoculum.

T. balense also looks good.

1962 OKLAHOMA REPORT ON NEW PLANTS  
Experiment, Georgia  
August 16 and 17, 1962

R. S. Matlock

GUM CROPS:

Guar - P.I.'s 183400 and 179930 produced more seed and tolerated more disease than 'Texsel' and 'Groehler.' However, the plant introductions mature later.

As of March 1962, three species of Cyamopsis are available for study. This includes about 110 accessions of C. tetragonoloba (L.) Taub, two accessions of C. senegalensis Guill and Perr. (G-341 P.I. 271025 and G-259 P.I. 263525) and apparently two accessions of C. serrata Schinz. (G-413 P.I. 279564 and G-447 P.I. 275573). Unfortunately, we do not have guar accessions from northern latitudes and areas of high rainfall. No seed are available from accessions previously collected from these areas.

Eleven guar accession, out of 79 seeded where no guar had been grown before, showed plants dying on August 5, 1962, from bacterial blight (Xanthomonas cyamopsidis). Accessions badly diseased were:

G-266	P.I. 263698	G-275	P.I. 263886
G-270	P.I. 263881	G-236	P.I. 255928
G-276	P.I. 263887	G-154	P.I. 212987
G-289	P.I. 263900	G-143	P.I. 179928
G-430	P.I. 271550	G-43	P.I. 179685
G-284	P.I. 263895		

Crotalaria - Obtained good stands of C. spectabilis, C. purilla, C. retusa, C. incana, C. mucronata, C. paulina, and C. verrucosa. Very poor stands were obtained from the seven selections of C. intermedia.

Cassia - Cassia occidentalis, Cassia mimosoides, and domestic selections of Cassia are productive but shatter easily.

PULP CROPS:

Crotalaria juncea - Good stands, growing good.

Sesbania - Excellent stands, excellent growth.

Okra - Nine plant introductions, two varieties and four selections are being evaluated for pulp.

Kenaf - Grows well and yields are good, but will not make seed in Oklahoma.

(Samples of the preceding list of pulp crops which were sent to Champion Paper Company were not acceptable for their purposes. Okra had the highest rating.)

### PULSE CROPS:

Vigna vexillata (P.I. 190262, C-595) is the most vigorous wild cowpea that we have grown. It shatters readily upon maturing. It may have a possibility for wild life purposes as a reseeding annual. We received another source from the plant breeder at Mareeba.

Mungbean - Twenty-one new mungbean accessions were grown this summer.

M-732 P.I. 271401 from India has jumbo seed (dull) and short plants and should make good material for breeding and inheritance studies.

M-735 P.I. 271406 and M-738 P.I. 271490 from India have shiny medium-sized seed, medium plant height and excellent seed yielding ability. Ten accessions are very late in maturity and will make little or no seed.

M-136 P.I. 211613, M-137 P.I. 211614, M-138 P.I. 211615, and M-139 P.I. 211735 from Afghanistan are very similar and each matures late.

Pigeon Pea - Four new accessions and four selections are being grown beside Sp-46 P.I. 218066. The new accessions appear to be later than P.I. 218066 but have made excellent growth.

Chickpea - Seed of 80 chickpea accessions and 23 single plant selections were grown for increase and observation. Each of the accessions and selections had a moderate-to-severe leaf rust rating. Sufficient seeds were produced of approximately 40 accessions to send to the primary station.

### POTENTIAL NEW CROPS:

We obtained good stands and growth of Ipomoea parasitica Don. (Sp-254, NU 36395, P.I. 279698), Cassia mimosoides L. (Sp-253, NU41610, P.I. 194854).

No plants emerged from Solanum aviculare Forst. f. (Sp-255, P.I. 280049), Zaluzania discoides Gray (Sp-256, P.I. 279702) and Polanisia viscosa (L.) DC (Sp-257, NU 26401, P.I. 279699).

### OILSEED CROPS:

We produced about 5 pounds of Crambe seed from a small planting this year.

Domestic selection of Vernonia will be planted next year.

Momordica balsomina has made excellent growth with good production from an April 20 planting.

Euphorbia heterophylla from an April planting produced 400 pounds of seed per acre, but some has shattered before harvesting.

ARACHIS COLLECTIONS:

A student (Al Suaidy) succeeded in making stem cuttings from P.I. 231318 (P-221), P.I. 231319 (P-222), P.I. 261853 (P-226), P.I. 261870 (P-227), P.I. 261874 (P-230), P.I. 262270 (P-233), and P.I. 262808 (P-234). Forty-five accessions are being maintained for further study. Thirty-two Spanish Peanut introductions which outyielded Argentine are being evaluated by a graduate student.

THE 1962 REPORT OF NEW PLANTS, PROJECT S-9  
FUERTO RICO  
AUGUST 1962

Roy Woodbury

Through the combined efforts of local, USDA, and foreign agencies, 82 accessions were secured for trial and increase in Puerto Rico. They comprise the following materials:

1. Grasses--mostly Digitaria, Panicum, Brachiaria, and Sorghum species.
2. Fruits--Tree tomato, Annona, Carica, and Musa species.
3. Vegetables--Cabbage, melons, watermelons, squash, tomato, and pepper.
4. Legumes--Centrosema, Vigna, and Dolichos species.

Most of these accessions have been planted for evaluation.

A large number of Sorghums has just been received from the Regional Station for seed increase. These introductions will be planted in September at Lajas.

This is the second flowering year of the Aceituno which was planted in 1956 at different locations on the Island. Heavy flowering and fruiting were noted on a small percent of the trees. The best trees were selected for future work.

Narajilla appears to be best adapted to higher altitudes with light shade.

Temperate peach varieties, now thought to be unadapted to our conditions, again did not flower well or produce a crop. The Okinawa variety, on the other hand, continues to show promise as a "dooryard" fruit at higher elevations.

In spite of the heavy infection by downy mildew, the 52 varieties of achiote continue to produce well in Castaner. The harvest has not been analyzed as yet, but indications are that most of the varieties are outstanding producers. Also, several are quite ornamental.

New seed material of the five varieties of potatoes--catoosa, Redskin, Blanca, Navajo, and Erendira--was obtained and planted at Castaner for seed increase. They were harvested in July and were placed in cold storage until October when a replicated trial will be made. The Redskin appeared to be best adapted to our conditions.

The date palm plantings at Fortuna suffered a setback due to the fungus, Graphiola phoenicis. The recommended control is the removal and burning of infected parts and the use of a copper spray.

The passion fruit, Passiflora edulis var. 'Flavicarpa', which was planted at Isabela, developed a root disease which should be studied further before recommendations can be released for this crop.

Gardenia carinata (P.I. 222160) has now flowered at Trujillo Alto and is a very handsome ornamental with large creamy flowers, which become yellow with age, and large glossy leaves in clusters at the ends of the branches.

Many other long term fruit and nut crops such as loquat, litchi, rambutan, rubi, mangosteen, passion fruit, chirimoya, guanabana, grapes, and the condiment, cardamomum, are still being studied.

Several of the broom corns planted at Lajas show promise for our broom industry. Numerous grasses are in different stages of analysis.

The Queensland raspberry was found to be a bad weed, and an eradication program is underway to destroy the variety in Puerto Rico.

South Carolina - New Plants Project  
 Report to S-9 Technical Committee  
 Experiment, Georgia, August 16-17, 1962  
 J. A. Martin

There were 5,309 accessions of seeds and plants distributed to cooperators in South Carolina through the Southern Regional Plant Introduction Station since July 1, 1961. The breakdown is as follows:

Brassica oleracea var. Capitata	137
Capsicum frutescens	14
Cassia mimosoides	1
Chrysanthemums	3
Citrullus vulgaris	427
"    colocynthus	3
"    sp.	3
Cucumis melo	1133
"    sativus	5
"    longipes	4
"    sp.	334
Hibiscus esculentus	14
Ipomola perasitica	1
Luffa acertangular	10
"    aeghptiaca	7
Lycopersicon	1629
Phaseolus vulgaris	1214
Polanisia viscosa	1
Solanum aviculare	1
"    cilatum	1
"    gilo	1
Tolanum indicum	1
"    mammosum	1
"    melongena	294
Zaluzania discoidea	1
Zea Mays - Sweet corn	64
Salix sachalinensis "Sakke"	1
"    albe "Drankenburg"	1
"    cinerea	1
"    purpurea amphexiculis	1
X wimmeriana	1
	5309

All the above accessions were planted during spring of 1962 and data will be available in time for the annual report.

Tephrosia vogelli - one strain, highest in rotenone content, was planted at Clemson. Samples will be taken for rotenone assays.

Crotolaria juncea - A Brazilian strain obtained through Dr. J. R. Haun has

been planted at Sandhill Experiment Station, Pontiac, for observation. Seed of 108 strains of the same crop were found in the old office building at this station. This seed was 18 or 19 years old and germination was excellent. These strains are very similar in plant characters, and they all set seed readily. The Brazilian type does not set seed, but is more vegetative.

Sesame - 89 sesame breeding lines are being screened for Fusarium wilt resistance at Clemson. Approximately 100 sesame lines were received from Dr. D. G. Langham, Maracay, Venezuela, in 1962. In 1961, 75 lines were obtained. Seed from both groups will be available to S. P. I. S. at the end of the harvest season. Sesame yield tests, 16 varieties, are being conducted at Clemson, Blackville, Pontiac, and Florence stations. A pre-emerge weed control test, involving 9 herbicides, is underway at Florence.

Castorbeans - A yield test, 6 varieties, is being grown at Florence.

Eggplants - 294 accessions were planted at Sandhill Experiment Station at Pontiac for observation and evaluation. Apparently, there are some excellent plant and fruit types in the collection which can be used as is or in a breeding program. There is much variability for fruit shape, size, and color.

Peppers - Approximately 75 old and new accessions of pungent peppers are being tested and evaluated at Clemson.

Coleus - The domestic and foreign accessions of coleus are being evaluated and perpetuated at Clemson. Most of the accessions possess excellent foliage color which make them suitable for bedding, pots, boxes, and gardens, etc. A bulletin now in preparation will give some pictures and descriptions of the accessions.

Okra - The okra accessions are being screened for rootknot and wilt resistance at the Sandhill Experiment Station at Pontiac.

Bamboo - The three bamboo varieties, P. bambusoides, P. viridus, and P. vivax, planted in 1958 at Blackville, have been fertilized and managed as needed for good growth. At this time the plantings are almost solid. Weeds are beginning to disappear as the bamboo plants multiply and spread. Mr. J. C. Crawford is now project leader for bamboo. Five species of bamboo were obtained from U. S. P. I. S., Savannah, Georgia, namely:

P. bissettii, P. I. 143540  
P. bambusoides C. V. Castilion, P. I. 42569  
P. submarginata, P. I. 67398  
P. bambusoides C. V., allgold P. I. 89701

These are planted at Clemson.

A 3 x 3 x 3, N-P-K, factorial fertilizer test will be initiated at Clemson as soon as plants are available.

Ornamentals - Mr. J. P. Fulmer, who is in charge of ornamentals, has been

too busy with work and has had little time for writing a report. However, we are expecting a full report for 1962 annual report. Much emphasis and work have been placed on the above ornamental area for improving all facilities. A pond has been built and irrigation equipment installed. A shade house has been constructed and is now in use. A wooded area for growing shade loving plants has been developed. Two large private orchid collections has been donated to Clemson College. These collections consist of many orchid types. There are about 1100 large pots and these fill a greenhouse 35' x 25'.

Domestic Plant Exploration - Professor H. J. Sefick

A red-leafed plum from an abandoned farm in Edgefield County was successfully topworked into 1-year-old plum. Trunk diameter 6 inches above soil equals 15 inches. Fruit reputed to be fair size, red-fleshed, and resistant to brown-rot.

A seedling re-fleshed plum with very large fruit, excellent quality obtained from Greenville, South Carolina.

A grape from a farm abandoned 60 years ago was obtained and propagated successfully. Another grape from North Augusta, probably 100 years old (fruit eaten by 88-year-old lady when a child) was not propagated successfully, nor was a Vitis aestivalis seedling with bunches 7 inches long.

Pear - One promising pear from Augusta seemed relatively free of disease and fruit low in grit cells. It is possibly 'Richard Peters,' and it has been topworked. Another pear, seedling selection Tenna. 348363, appears very promising. It was tested by Mr. Van Blaricom for baby food puree, and it appears as good as Bartlett. It must be harvested early, with 18 lbs pressure, be refrigerated, and then ripened at room temperature to be at its best. When it is ripened on tree, the skin has excessive tannins.

A peach tree found in area of Augusta by Mr. W. Knight, Augusta, has circumference of 52 inches. This to be propagated as possible nematode resistant stock.

1962 Preliminary Annual Progress Report for Tennessee  
on S-9 Project--Evaluation of New Plants (Hatch 57)

W. E. Roever

Eighty-one P.I. accessions have been received to date in 1962 and eight during December of 1961. These included flowers, shrubs, trees, and grasses.

Dr. L. M. Josephson tested P.I. 217413 for corn earworm resistance under Tennessee (Knoxville) conditions. He recorded 92.8% worm-free ears and a mean damage grade of 0.12, based on 0.0 equals no damage and 5.0 maximum damage. This accession has a tight, tough husk. About 60 new accessions are now being tested for smut resistance.

Reporting on fifty-one ornamental acquisitions, Harvey Templeton (Phytotektor Nursery) found P.I. 237880 to be a fine, fast grower but not hardy. He reported P.I. 271431 as "the most beautiful holly I ever saw" but very tender. P.I. 271431 grew beautifully and survived -5°F under snow. It is considered very promising.

Of 134 P.I. entries evaluated or in process of evaluation by J. K. Underwood, the following have promise for breeding or direct use. Only those yielding 2 tons or more of air dry forage per acre are included here:

253716	<u>Panicum antidotale</u>	238290	<u>Digitaria swazilandensis</u>
253718	<u>Panicum maximum</u>	243199	<u>Pennisetum ciliare</u>
196291	<u>Echinochloa crusgalli</u>	246353	<u>Setaria sphacelata</u>
217911	<u>Echinochloa frumentacea</u>	173696	<u>Dactylis glomerata</u> (nearly rust-free)
177543	<u>Setaria italica</u>		
239225	<u>Chloris gayanna</u>	202534	<u>Bromus sitchensis</u>
241912	<u>Lolium multiflorum</u>	236754	<u>Bromus carinatus</u>

Detailed data are available on these accessions.

ANNUAL REPORT ON NEW CROPS RESEARCH IN TEXAS  
Contributing to Southern Regional Project S-9  
Prepared by Eli L. Whiteley  
August 16 and 17, 1962

The 1961-62 crop year was about usual for Texas. The fall of 1961 was very favorable for the germination and growth of fall seeded plants. Unusually cold weather occurred in January (12<sup>o</sup>F.) and April and May were very dry. Rainfall in June was much above normal.

A total of 2057 accessions were received by research workers, individuals and commercial concerns in Texas during 1961-62.

#### Crops for Industrial Uses

The number of plants tested for industrial uses was reduced this year in order to concentrate on the plants that showed the most promise. It was hoped that by concentrating on a few genera with advanced cultural studies (Phase D of our "Status of Development of New Plants for Industrial Use") that we could advance one or more of our new crops into commercial trials. The genera selected for these advanced studies were: Lesquerella, Vernonia, Crambe, Dimorphotheca, Crotalaria and Hibiscus. The results obtained with these genera and species are discussed below with the other crops for industrial use that were grown in Texas during 1961-62.

Lesquerella gracilis (Barclay No. 730): About 0.04 acre of L. gracilis was planted on the Agronomy Farm on November 21, 1961. The plants emerged December 7, and the first flowers were observed March 14, 1962. The seed were mature by May 22 and were harvested with a combine. Losses from shattering were estimated at 50 percent. The yield was 135 pounds per acre.

Lesquerella grandiflora (Barclay No. 733): About 0.05 acre of L. grand-

iflora was planted on the Agronomy Farm on November 21, 1961. The plants emerged December 5 and the first flowers were observed March 6, 1962. The seed were mature by May 22 and were harvested with a combine. Losses from shattering were estimated at 50 percent. L. grandiflora continues to be the most promising species of this genus. The yield was 298 pounds per acre.

Seven other species of Lesquerella were planted in November 1962, but poor or no stands were obtained and no seed were harvested.

Brassica napus var. Golden (NU 40431): This variety was planted on November 21, 1961, in 20 inch rows on the Agronomy Farm. The plants emerged November 27 to a perfect stand. First flowers were observed on February 8, 1962. The seed were mature by May 4 and were harvested with a combine on May 22. The yields were low due to a period of dry weather during April and May. The yield was 1160 pounds per acre.

Brassica napus var. Regina (NU 40432): This variety was planted November 1, 1961 and the plants emerged November 7. The first flowers appeared February 15, 1962. The seed were mature on May 4 and were combined May 22. The yield was 1230 pounds per acre. This planting was made in 20 inch rows. Dry weather in April and May reduced the yields about 400 to 600 pounds per acre.

Brassica campestris var. Polish (NU 40433): This species was planted on October 17, 1961 and the plants emerged October 22. Nearly half of the plants were killed by the 12°F. temperature in January 1962. Those plants that were flowering were the ones killed or most severely damaged. First flowers appeared on December 21. No attempt was made to measure the yield due to the poor stand.

Dimorphotheca aurantiaca (P.I. 263145): Eight lines of Dimorphotheca were planted on October 16, 1961. These lines emerged on October 22 and were

growing well until the low temperatures occurring on January 8-12. All plants were killed by the 12°F. temperature during this period.

A planting of bulk seed (C. D. 17733) was made on February 1. The plants emerged February 15 and the first flowers appeared on April 20. The stand was very poor and no yields were taken. The seed were hand harvested from May 15 to June 29. Several selections of superior type plants were harvested separately and will be planted this fall.

Dimorphotheca annua (C. D. 37657), D. sinuata (C. D. 37659), and D. calendulacea (C. D. 37658) were planted on October 16 and emerged on October 22. These species were killed by the low temperatures occurring the following January.

Vernonia anthelmintica (NU 40159): Considerable difficulty was encountered in obtaining a stand of Vernonia this year. A one acre block on the A. & M. Plantation was planted four times between May 1 and June 18, 1962. The last planting (June 18) emerged to about 50 percent stand. A one acre block on the Agronomy Farm was planted three times during the above period and no plants were obtained. Germination tests showed that the seed were viable (95 percent germination). The only explanation that can be offered at this time is that the seed failed to germinate due to high soil temperatures.

Crotalaria intermedia (PQX 56206): About one acre of C. intermedia was planted June 6, 1962. The plants emerged to a fair stand in about 7 days. These plants are growing well at this time. There has been considerable commercial interest in this plant for gum production.

Cassia mimosoides (P.I. 194854): This species was planted May 20 and emerged June 3 after rain which fell May 30. Due to prolonged rains in June and the poorly drained land on which the species was planted, the plants were

lost in grass and weeds. These plants were disked under in late June.

Ipomoea parasitica (P.I. 279698), Polanisia viscosa (P.I. 279699), Solanum aviculare (P.I. 280049), and Zaluzania discoidea (P.I. 279702) were lost to weeds and grass due to prolonged wet soil.

Bamboo: Eight species of Phyllostachys--P. bambusoides (P.I. 40842), P. vividis (P.I. 77257), P. vivax (P.I. 82047), P. nigra (P.I. 49505), P. meyeri (P.I. 116768), P. purpurata (P.I. 128771), P. rubromarginata (P.I. 67398), and P. dulcis (P.I. 73452) were planted on April 4, 1962. All species emerged during April and they are growing well at this time.

Erucastrum abyssinica: Seed of this species was supplied by Gordon Killinger. It was planted March 26 and emerged April 4. First flowers appeared May 23 and some seed were mature by June 22.

Crotalaria juncea (FC 25053): The screening work with C. juncea has been moved from the Agronomy Farm to the A. & M. Plantation. About 450 lines representing all types of plants were planted May 1. The plants emerged some 6 to 10 days after planting. The early types began flowering on June 25 and the later plants began to flower around July 9. Some of the better lines are 8 to 10 feet high at this date (July 10). The prospects for very high yields are very promising. About 58 lines are being evaluated at Prairie View and several lines are being evaluated at Weslaco.

About 15 acres of C. juncea are being grown under a memorandum of agreement between Rio Farms, Incorporated, Champion Papers, Incorporated and the Texas Agricultural Experiment Station. The plant material is to be harvested and shipped to the west coast for a pilot plant test. An economic evaluation of both the production and processing of C. juncea should provide the guide lines for further work on this new crop.

Crambe abyssinica (P.I. 247310): A date of planting and exploratory fertilizer test was started in the fall of 1961. Seed were planted at two row spacings, 20 and 40 inches across 10 fertilizer treatments every 15 days beginning September 1, 1961. The fertilizer treatments were as follows: 0-0-0, 60-0-0, 0-48-0, 0-0-50, 60-48-0, 60-0-50, 0-48-50, 60-48-50, 120-96-0 and 126-96-50. The two September plantings were in full bloom on December 13 and were killed by the 24<sup>o</sup>F. temperature occurring on that date. All plantings from October 1, 1961, to January 2, 1962, inclusive, were killed by the 12<sup>o</sup>F. temperature occurring January 9-12, 1962. Wet weather delayed planting from February 1 to February 9. This planting looked better than any of the subsequent plantings. It emerged February 16 and first flowers were observed April 24. This planting was destroyed by a work crew using a road maintainer to move some soil along the edge of the field. Yields were estimated at about 1500 pounds per acre. Also lost due to the same work crew were 8 selections of high yielding plants. Stands in the March and April plantings were too poor for yield tests. The May plantings were killed by mildew.

A commercial planting under a memorandum of agreement between Rio Farms, Incorporated, Anderson Clayton Company and the Texas Agricultural Experiment Station was made on Rio Farms in December, 1961. This planting was killed by 12<sup>o</sup>F. temperature in January, 1962. Eight acres of the Crambe was replanted about February 1. This area was harvested May 10 with a yield of 450 pounds per acre. The seed from this planting has been used for a pilot plant test at Texas A. & M. College.

About 125 pounds of oil has been processed and is being evaluated by Anderson Clayton Company. The residual meal is being evaluated by Dr. C. M. Lyman of the Biochemistry and Nutrition Department. In preliminary tests, the

Crambe meal was about as good as soybean meal in chick rations. Pathological studies on the chicks will be necessary after extensive feeding trials before definite conclusions can be drawn on use of meal in chick rations.

A planting of about 5 acres was made on the A. & M. Plantation on October 24. This planting was killed by the low temperatures in January. The area was replanted March 6 and emerged March 16. First flowers were observed April 30 and the seed were combined May 22. The yields were low due to the lateness of planting on the 40 inch row width. The 40 inch row width was used so that a number of individual plant selections could be made from the bulk seed. About 55 selections of variable plant types were made from this field.

A 0.6 acre planting of Crambe was made on the Lubbock station on April 20, 1962. The plants grew well and were setting a good crop of seed until fusarium wilt developed and by July 20, 95% of the plants were dead.

A one acre planting was made on the Lubbock station on June 6. This planting is growing well and it will be observed for disease resistance or tolerance.

An exploratory planting was made on the Prairie View station on February 21. The plants emerged March 5 and first flowers were observed May 3. The seed were mature by May 30 and the yield was estimated at 800 pounds per acre.

Germination of Crambe seed: Germination tests on the seed stored under three conditions is continuing.

The results of the last test are as follows:

Vault	93%
Seed house	71%
Laboratory (air conditioned)	85%.

### Horticultural Plants

Three cantaloupe, four cucumber and nine squash and pumpkin accessions were evaluated at Weslaco by R. T. Correa. These cucurbits were tested for

resistance or tolerance to powdery mildew. A few of the squash were tolerant to powdery mildew, but **all** failed to survive the mildew infection in the greenhouse. Most of these accessions had been reported as being resistant to powdery mildew by the Geneva station. This indicates that there may be different races of powdery mildew involved.

#### Sorghum

All sorghum accessions were planted in the spring and cannot be evaluated until after harvest this fall. A report on the evaluation of these plants will be included next year.

#### Ornamentals

A number of species of Salix (willow) were introduced by two commercial nurseries. It is too early to evaluate these plants at this time.

#### Castorbeans

The Ricinus cummunis accessions were planted by Dr. R. D. Brigham at Lubbock and will not be evaluated until fall.

#### Guar

Seed of 109 Guar accessions were sent to the regional coordinator by Dr. M. L. Kinman. These accessions were grown at Iowa Park in 1961. Seed of 18 accessions are being increased this year in order to obtain seed for storage at Ft. Collins, Colorado.

#### Plants Released

The Lynn castorbean variety was released to seed growers in April, 1962. Seed for commercial growers will be available in 1963. Lynn is an early, disease-resistant, dwarf-internode castorbean variety.

### Work Planned for Next Year

The date of planting and exploratory fertilizer test will be continued next year with Crambe. Seed of all selections will be increased for further evaluation. Ten accessions from Russia will be evaluated in the field and greenhouse.

Two species of Lesquerella, L. grandiflora and L. gracilis, will be planted in the fall. About 1/4 acre of each species will be planted.

A planting of about 1/4 acre of Dimorphotheca bulk seed will be made in the fall. These plants will be used for a yield test. About 15 selections will be evaluated in fall and late winter plantings.

Two 1 acre plantings of Vernonia anthelmintica will be made in the early spring. These plantings will be used in harvesting tests.

Crotalaria juncea lines will be evaluated and seed from the better lines will be increased. Yield tests will be run on the better lines from which enough seed are available for planting the yield tests.

A yield test on Kenaf will be run under two fertility rates.

Adaptation studies will be made on a number of plants that have shown promise in the chemical screening program. These plants include Cassia mimosoides, Ipomoea parasitica, Solanum aviculare, and Zaluzania discoidea.

### Publications

ACCO Press. Crambe: A new crop promise in South Texas. Houston, Texas. In Press.

DuBeau, Norman. Uncommon crops with interesting potentials. A & M Press. College Station, Texas. August, 1962.

Texas Agricultural Experiment Station Leaflet No. \_\_\_\_\_. Lynn, an early disease-resistant, dwarf-internode castorbean variety. In Press.

## Report of Regional Station Activities

W. R. Langford & Grover Sowell, Jr.

Interest in the S-9 New Plants Project has increased consistently since it was initiated in 1949 (Figures 1 and 2). In 1951, 115 people requested 5980 lots of seed. Ten years later, 245 people were participating in the program and they were supplied with 14191 packets of seed.

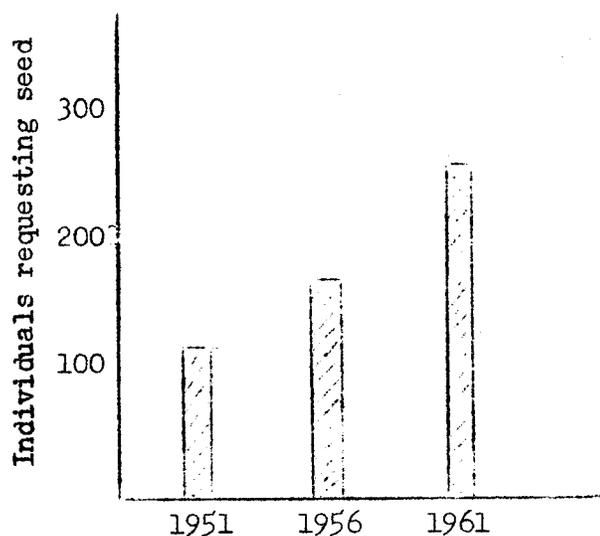


Fig. 1. Personnel in Southern Region participating in S-9 "New Plants" evaluation.

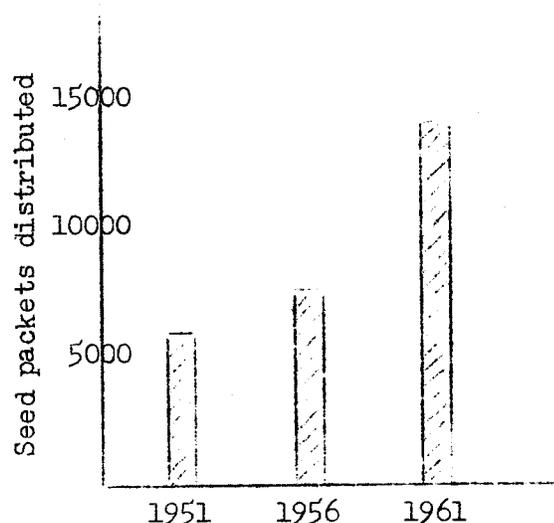


Fig. 2. Distribution of seed from Southern Regional Plant Introduction Station.

A summary of introductions processed by the regional station during the last fiscal year is shown in Table 1.

Table 1. Introductions processed by the Southern Regional Plant Introduction Station, July 1, 1961 to June 30, 1962.

New introductions received	1923
Number grown at Experiment, Ga.	3247
Number grown under contract	340
New material catalogued	975
Seed packets distributed	14191
(a) Within Southern Region	10237
(b) Outside Southern Region	3964
S-9 cooperators received from other stations	7651

Almost 2000 new items were received last year. About one-half of them were peanuts of which 900 accessions were received at one time from Rhodesia. Other large collections were peppers from Dr. Paul Smith's South American exploration in 1958, sorghums from Ethiopia, and Panicum maximum from South Africa.

In addition to the large collection from abroad 142 additional items were collected under the Domestic Fruit Stocks Collection Project. These have not been assigned P.I. numbers but are being held by the various collectors to make sure the material is living and can be propagated. These stocks will be transferred to LSU this winter and P.I. numbers will be requested for them. To date 207 items have been collected under this project but only 65 have been assigned P.I. numbers. A large number of stocks have been located as a result of publicity given the project by the Progressive Farmer. Mr. Hyland has agreed to support the project again this year and I believe if the materials that have been located thus far are collected next winter the project can be successfully terminated at the end of this fiscal year.

In the seed production program 3587 accessions were grown for seed increase and preliminary evaluation. Arrangements were made with stations in Oklahoma and Puerto Rico to increase 340, and 3247 were grown at the regional station. Materials grown under contract include some late maturing sorghums and other grasses that are being increased by the Puerto Rico Experiment Station, tropical legumes at the Federal Experiment Station, Mayaguez, and 106 accessions of guar that Dr. Matlock is increasing in Oklahoma.

New materials catalogued last year totaled 975. From plantings this year we expect to add about 1500 more items to the regional seed lists.

Requests for seed increase from year to year. Last year the regional station supplied 14191 packets of seed to research workers. Slightly over 10,000 went to personnel in the Southern region, and 3964 were sent outside the region. In addition to the 10,000 seed lots that we supplied to workers in this region, they obtained 7651 from other regional stations and the Federal Station at Glenn Dale.

Screening for Disease Resistance: The major factors which have been considered in selecting new problems in this phase of the pathology program of the Regional Station are as follows:

- (A) Adequacy of facilities for the particular problem.
- (B) Value of research.
  - 1. Economic losses caused by the disease involved.
  - 2. Probability of utilization of resistant germplasm by plant breeders.
- (C) Probability of success in the research.

The Regional Station pathologist requests that S-9 committee members call to his attention plant disease problems needing attention.

Upon completion of the last test on the resistance of watermelon for resistance

to gummy stem blight, caused by Mycosphaerella citrullina, it was concluded that P.I. 189225 has the highest level of resistance available in our collection. This introduction has been crossed with Charleston Gray to produce a resistant F 1 progeny.

Results from the replicated screening test of Cucumis melo for resistance to Mycosphaerella citrullina indicated that the commercial variety Edisto is equal or superior in resistance to all introductions screened to date. This demonstrates the importance of knowing the level of resistance present in commercial varieties before screening introductions for resistance. The evidence indicates that the literature cannot be relied upon for this information in the case of bacterial spot of pepper and gummy stem blight of cantaloupe.

None of 172 introductions of Cyamopsis spp. tested for resistance to Alternaria leafspot exhibited resistance. It is possible that low levels of resistance which would be of some value to plant breeders in developing tolerant varieties may be present. Introductions carrying such resistance could be separated only by the use of a more sensitive screening technique than has been used at the Regional Station.

Prevention of the Introduction of Pathogens: Research at the Regional Station to date indicates that the danger of introducing new pathogens of the major crops on plant introductions is relatively minor.

Our temporary withholding of certain groups of introductions from distribution would not be as frequent if adequate data were available regarding the present distribution of the diseases involved. Introductions withheld from distribution during the past year include the following:

1. Vigna sinensis: The entire collection of 429 introductions of this species was screened for the presence of seed-borne viruses. Although the technique used proved inadequate to allow the selection of virus-free introductions, it demonstrated that a minimum of 25 percent of the introductions in the Regional Station collection carries seed-borne viruses. In the opinion of the pathologist, the most prevalent virus is acquired by the introductions while they are being increased. Consequently, this virus would not represent a new disease problem. As a precaution against the distribution of any virus possibly new to the United States, however, all introductions of Vigna spp. are being withheld temporarily from distribution. All new introductions received during the last year have been indexed for viruses and should be available for distribution by the 1963 planting season.
2. Cyamopsis tetragonoloba: The causal organism of anthracnose of guar has now been established as Colletotrichum dematium (Pers. ex Fr.) Grove. The fungus which attacks guar is a distinct pathogenic form of fungus on pepper. Consequently, all guar has been withheld from distribution until it is established whether or not this fungus is present on commercial guar plantings in the United States. Results from further studies of the hot water treatment indicate that while this treatment will reduce the incidence of disease organisms in the seed, it will not eliminate them.

It has not been definitely established that anthracnose and a second disease, previously undescribed in the United States, are present in commercial plantings of guar. However, since both disease organisms are seed-borne and inasmuch as guar seed have been imported for a number of years, it seems likely that both diseases are present. Nevertheless, as a precaution all introductions of guar are being withheld until this has been established. The results of studies conducted with specimens supplied by Dr. Ralph Matlock indicate that it will be permissible to distribute all introductions of guar early in 1963.

Several diseases which have not been observed previously were observed in the Regional Station nursery. These diseases are not new to the United States, however, with the possible exception of a Pseudomonas sp. on Vicia narbonensis.

Field Evaluation: Field notes on the incidence of diseases on plant introductions were taken as usual. These notes are of limited value, because of relatively mild epidemics and irregular distribution of diseases between plots.

The financial statement for the regional station during the last and present fiscal years is shown in Table 2.

Table 2. Funds available to the Regional Station, 1961-62 and 1962-63.

Source of Funds	Amount	
	1961-62	1962-63
Regional Research Funds (pooled)	20,000	20,000
Regional Research Funds (allocated to Ga.)	6,000	6,000
State appropriations (Ga.)	4,175	4,175
ARS (New Crops Res. Br., CRD)	<u>21,875</u>	<u>19,875</u>
TOTAL	52,050	50,050

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Expenditures, Fiscal Years 1961-62 and 1962-63

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Expenditures	Amount	
	1961-62	1962-63 (proposed)
Salaries	26,775	34,375
Labor	16,051	8,881
Travel		
(Coordinator of S-9 activities)	800	800
(Collection of Fruit Stocks)	284	500
Seed increase contracts	230	
Capital Outlay	2,788	2,000
Supplies & Operating Costs	3,492	3,994

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A number of improvements and additions have been made in the regional station facilities since you met here in 1958. During the past year the major additions were:

1. Installation of cooling equipment in one section of the greenhouse.
2. Purchase of a precision nursery row belt-type seeder.
3. Acquisition of five more acres of land for nursery plots.
4. Exchanged old station wagon for a new one.

This year we plan to replace some of the worn out field equipment with new machinery and finish the installation of a seed dryer.

General Comments and Report on Activities  
of Other New Crops Technical Committees

William C. Kennard

The technical committees of regional projects NC-7 and W-9 have not met since their activities were reported upon at the December 1961 S-9 meeting. However, NE-9 met on August 14 and 15, 1962. The following actions taken by that committee will be of interest to this group.

1. A representative, Dr. C. F. Krewson, was appointed to NE-9 by the Eastern Utilization Laboratory at Philadelphia. Dr. Krewson met with the committee and discussed new crop potentials from the chemist's point of view.
2. The regional project outline will be revised this autumn.
3. A subcommittee was appointed to prepare a 10-year report of NE-9 activities.
4. Preliminary studies on the feasibility of converting accession information to IBM cards had been carried out, mainly by the Regional Coordinator Dolan. Interest was expressed in the idea and a subcommittee was named to study the matter further.

I also would like to bring the following general items to the attention of the technical committee members:

1. At the June 19-23, 1961, meeting of the Committee of Nine, discussions were held and three subcommittees appointed to study: a) the setting aside of 25 percent of the regional research funds for emergency problems, facilities and equipment, and existing work needing additional support, b) the leadership role of the Committee of Nine, and c) simplification of work procedures. Action was taken on these proposals at later meetings.

At the September 25-27, 1961, meeting of the Committee of Nine, the monies held under their control were redesignated as the "Central Research Fund." The weed control project was designated CRF-1. At their November 12 and 13, 1961, meeting, the Committee asked each region to submit two proposals for possible support from the Central Research Fund.

At the June 19-22, 1962, meeting, the Committee discussed at length possible uses of the Central Research Fund. Disposition of unallocated funds will be decided at the next Committee of Nine meeting. Also at this meeting reports of the special subcommittees were given. It is apparent that the Committee will assume greater leadership in directing regional research. Under simplification of procedures, it was suggested that annual progress reports be reduced in size. Also, the plan of future work should be clearly apparent.

2. At the last S-9 meeting, I reported on the designation of my office as the Cooperative State Experiment Stations Service and on some of the implications of that change. At that time Dr. G. A. Selke, Special Assistant to Secretary Freeman, was Acting Administrator. On May 1, 1962, Dr. T. C. Byerly, formerly Deputy Administrator for Farm Research of ARS, was appointed Administrator.
3. The manual of procedures for regional research is being revised. Each technical committee member will receive a copy when the manual is published, and extra copies will be sent to the regional coordinator.
4. The Ensign proposal (by Idaho Associate Director R. D. Ensign) continues to receive review by the Committee of Nine and by the Regional Directors Associations. Under this proposal, contributing projects, as separate documents, would be eliminated for a more fully developed regional project outline in which each state's responsibilities and proposed procedures would be given in detail.

Report to S-9 Technical Committee for the New Crops Research Branch

W. E. Whitehouse

PLANT INTRODUCTION INVESTIGATIONS (CR il-11; CR il-12; CR il-13)

Specific requests for plant breeding stocks are reviewed periodically which have been recorded in the minutes of the S-9 Technical Committee and National Coordinating Committee meetings. Sufficient time and attention should be given on the annual meeting agenda to discussion and priority of regional needs. Only through this procedure can the New Crops Research headquarters at Beltsville conduct efficient exploration. Requests of rather wide regional interest will be brought to the attention of the other three New Crops Projects (NE-9, NC-7, and W-6) before final commitment or financial support is given.

Foreign Exploration

Reference is made to Motion 4, page 1 of the 1961 Technical Committee meeting minutes listing numerous genera and crop plant names on request by S-9 cooperators. Many of these are automatically considered both through direct exploration and the correspondence and/or exchange approach since, in many cases, specialists outside S-9 are also interested. The greater the interest and need, the more priority given in procurement. Crambe was added to the list in 1961 and it may be of interest that 10 seed lots were recently received from the Soviet Union.

There seem to be more opportunities for special collecting abroad, largely due to plant specialists traveling on sabbatical or grants. In some instances these individuals alert the New Crops Research Branch in order to obtain permits or shipping instructions, and also to get their collections ultimately into the regional programs by having them inventoried. This arrangement should be encouraged whenever possible. Chances are increasing for getting material through technical missions and P.L. 480 projects.

In handling requests of rather limited interest, especially those from individual workers, we quite often run into the problems of synonymy of plant names and need for literature citations where available. The more basic facts or known information individuals can supply, the greater the chance for immediate procurement action.

Only one foreign exploration has been planned for the present. This will be a trip to Nepal during October-December 1962 with ornamental breeding stocks the major objective. Other specific requests for horticultural crops will be considered as time permits.

A recent expression from southern grass breeders for Paspalums may lead to a South American trip in the near future. We also learned recently that the Caribbean Organization headquartered in San Juan, Puerto Rico, has been considering plans for collecting tropical grasses in Africa, including Digitaria spp. There may be sufficient need for these in the southern

United States as well as other genera which could be procured through collaborations with the above organization. Discussion and an expression from S-9 members and/or cooperators might warrant the New Crops Research Branch's supporting the proposed work.

#### Domestic Exploration

The only project supported for S-9 pertains to collecting native fruits along the Gulf Coast. Page 14, Appendix A of the 1961 Technical Committee meeting minutes lists 101 collections made in Mississippi although all have not received P.I. numbers. Good progress has been reported but attention is called to a statement on page 11, Appendix A, which intimates the need for "Several years of work." It is recognized that propagation, distribution, and evaluation of fruit stocks is a long time process. However, some consideration should be given by the S-9 members as to how most efficient progress can be made. New Crops Research Branch funds will be allocated for a given project for a reasonable length of time but only as long as progress warrants. This point is determined largely by number of collections in proportion to funds allocated and strength of Technical Committee recommendations. Should interest develop in other domestic exploration proposals, the above points should be taken into consideration.

#### Clonal Inventory of Fruits and Nuts

Approximately 5,000 items are being processed for the apple inventory which will comprise the first listing of asexually propagated crops. The December 31, 1961, deadline for submitting entries was honored by most regional cooperators, and while a few clerical problems have arisen, the apple inventory should appear well in advance of the 1963 meeting of the National Coordinating Committee. Further discussions and plans will be presented at that time.

#### National Seed Storage Laboratory

Operations at this facility are now functioning smoothly, and the first inventories covering corn, cotton, forage plants, oilseeds, sorghum, tobacco, vegetable crops, and small grains, covering approximately 20,000 accessions, have been processed. Distribution of these initial inventories is somewhat limited to determine general response and comments useful in preparation of future supplements. One field of valuable germplasm quite often overlooked is that material held by specialists until death or retirement, which remains in local storage (usually poor condition) until a successor can use it or is completely forgotten until viability is negligible. Alertness on the part of all research workers as to the value and need of preservation, and bringing such collections to the attention of Dr. Edwin James of the Laboratory in Fort Collins seems desirable.

The transfer of P.I. material from the regional stations has been largely limited to those collections which have been fairly well evaluated. Representative of these are the 1,546 tomato accessions from Ames, a sesame collection and a number of better pepper introductions from Experiment, and some of the better safflower introductions from the western region.

A large part but not all numbered material goes to one or more of the regional plant introduction stations for increase, evaluation, and distribution. The working stock developed after increase is offered by the regional station to research workers. Any material remaining has been held by the regional station. At this point the regional coordinator must now use his best judgment as to what to do with his seed. There is no policy that he must keep everything that has been sent him. If he believes that the material is of no value whatever, he should return all of it to Branch headquarters for such disposition as the Branch wishes to make. If he believes the material to be valuable either as proven or in potential, but is not being requested, or any longer requested by research workers, all or all but a small withheld amount should go on to the National Seed Storage Laboratory. Should the Coordinator receive a request for material deposited with the National Seed Storage Laboratory, the Coordinator shall request the return of whatever amount he needs to fill the request.

Much of the varietal material now in storage has been collected through invitational letter from the Laboratory. Even though Experiment Station publications and trade magazines are carefully examined for the announcement of new varieties, the Head of the Laboratory welcomes the advice of the Coordinators as to releases in their respective regions.

#### CROP BREEDING STOCK INVESTIGATIONS (CR i2-1; CR i2-5; CR i2-7; CR i2-15)

##### Fruit and Tree Nut Evaluations

In support of general fruit and nut crop research, 500 new introductions were received for propagation and 83 introductions were offered to federal and state experiment stations.

**Pomaceous Fruits:** A publication describing some 60 early-ripening introduced apple varieties evaluated at the U.S. Plant Introduction Station, Glenn Dale, Maryland, will soon be available to apple breeders.

**Drupaceous Fruits:** The Prunus virus-indexing program for 1961 included 38 introductions budded on two trees each of seven indicators and 34 introductions budded on two trees each of two indicators. The total numbers of introductions undergoing tests in the virus-indexing program are as follows: sweet and sour cherries - 142; ornamental cherries - 5; almonds - 3; apricots - 4; peaches - 12; and plums - 3. About one-half of these should receive the final inspection for the presence of virus infections during the growing season of 1962. Those which prove to be virus-free shall be released for distribution at the end of the 1962 season.

A semi-technical article on the Chinese gooseberry (Actinidia chinensis) was published during the year in a leading fruit growers' magazine serving the West Coast.

### Vegetable Evaluations

During 1961 a total of 1,679 new vegetable introductions were processed by the Branch. Two hundred and eight introductions of potato were indexed for viruses. Thirty-three were infected with one or more of the viruses X, M, A, Y, and leafroll. Fifty-two were infected with atypical strains of viruses widely distributed in this country, unidentified viruses, or viruses of limited distribution. These will be studied further. Dr. R. P. Kahn of the Technical Services Branch, Plant Quarantine Division, cooperates closely in indexing all potato introductions received.

Four sweetpotato introductions from Kenya, New Zealand, and Mexico were indexed for the presence of virus diseases and released to plant breeders during the year.

### Forage and Range Evaluations

A total of 2,937 field crop introductions were handled during the fiscal year 1961-62. The number of accessions does not deviate appreciably from that handled in the immediate past; however, the type, i.e., requests for genera, has changed somewhat from past requests.

Field crop accessions obtained through domestic and foreign explorations are sometimes incorrectly identified or more often unidentified when received at the regional stations. Although some progress has been made in recent years in identifying accessions at these stations, a considerable backlog of unidentified species still remains. As a supplement to the work at the stations for which the Coordinators are responsible, certain species material is grown in the greenhouse at Glenn Dale for identification. Grasses make up the major portion of the unidentified plant material.

### Ornamental Evaluations

In 1962, the Crops Research Division released five azaleas to nurserymen for propagation and distribution. These are five from a group of ninety-six selections considered most promising for the azalea-growing areas of the southeastern United States from Washington, D.C. to Louisiana. They were developed by B. Y. Morrison and J. L. Creech at the U.S. Plant Introduction Station, Glenn Dale, Maryland, from a series of crosses made in 1947 and designed to incorporate some of the flower qualities of the Belgian-type azaleas into the hardy Glenn Dale hybrids. Coordinators will distribute copies of releases as soon as plants become available, probably in 1963.

In 1961, the University of Nebraska released to growers for increase and distribution, two Japanese chrysanthemum introductions, P.I. 235624 'Otome-no-hikari' (Virgin Elegance) and P.I. 235627 'Sie-un' (Blue Sky). The characteristics of each variety as tested at North Platte, Nebraska, are described in the release.

CHEMURGIC CROP INVESTIGATIONS (CR i2-10; CR i2-11; CR i2-16; CR i2-20; CR i2-21)

In the program for evaluating potential new crops selected by virtue of their chemical or fiber characteristics, the following summary statements can be made.

Experimental yields of seed indicate that Foeniculum vulgare could be a better prospect than Daucus carota as a seed source of petrosalinic acid. This is particularly true if it is found that cultivation as a perennial on a large scale is practical.

It has been determined that Limnanthes will not grow during the summer months typical of Iowa, Missouri, and areas further south. It also appears to require a relatively high level of soil moisture. Further plantings will be needed to find locations where temperatures are low enough, and to determine the minimum temperature tolerance. Limnanthes is a low-growing plant with flowers borne singly on short pedicle. This plant stature will tend to make harvesting difficult. Relative to other species in this report, Limnanthes is considered a poor crop prospect.

From the very limited tests thus far, prospects for development of Cuphea do not look very good. It is possible that some of the new introductions obtained on the recent Mexican plant exploration may provide more satisfactory material for crop-development studies.

Experimental plantings of many species of Lesquerella have not been successful. The reasons for these failures are not known. It has been estimated, from observations of natural stands of L. fendleri, that seed yields of over 1000 pounds per acre should be possible. Since the species under test are native to some of the areas of intended productions, the prospects for development of Lesquerella as a crop will continue to be considered as very good, subject to solution of germination and stand establishment problems.

As potential annual fiber sources, kenaf, Crotalaria juncea and Sorghum alnum are considered promising prospects for crop development. Yields of 3-5 tons dry matter per acre are common. Five tons is considered necessary for successful production.

A most encouraging prospect for crop development is that of Crambe abyssinica as a source of erucic acid in the seed oil. This plant has been grown in a variety of sites in the United States for several seasons and no outstanding problems of production have developed. It can be seeded and harvested with existing equipment, with no unusual production expense. It has not been subject to diseases and insects. The prospects are good for developing cultural recommendations after the 1962 experiments are completed. Based on relatively limited results it is estimated that we can produce yields of 1000 to 2000 pounds per acre in many locations of the United States, and that higher yields should be possible in the more favorable sites. The prospects for development of Crambe as a crop are excellent, providing sufficient demand is developed for the seed by industries.

In the research on Dioscorea, further information was obtained on the influence of temperature on the initiation of growth of tubers following dormant periods. Differences in sapogenin content of morphologically different portions of roots were discovered.

In the studies of Dimorphotheca, most of the data obtained were negative with respect to the selection of better yielding species and more favorable sites of production.

The large scale planting of bamboo at Camden, Alabama, was partially replanted and further propagations were developed at Savannah for final replanting in the spring of 1962. Studies have been made on time of digging and length of storage relative to the success in propagating bamboo stocks. Further study will be necessary before final conclusions can be made.

Tephrosia - Rotenoid analysis of foliage samples harvested in October from a date of planting study indicated that rotenoid percentage is highest in plantings made in May and early June, and declines rapidly in successive plantings. Phenological observations were made during the season, establishing growth and development rates under changing weather and environmental conditions.

The work has continued in breeding and rotenoid analysis of thousands of individual plants produced from crosses among and between high-yielding hybrids and inbred lines. Several populations of relatively uniform moderately high rotenoid content were discovered.

Vernonia - At Lincoln, Nebraska, seed yields of about 500 pounds per acre were obtained. Combine harvesting was tried with moderate success. The long period of flowering plus the shattering character of seed heads was found to be a significant problem for further study.

At College Station, Texas, seedlings were made on March 19, 1960, and greenhouse plants were set in the field on April 15. First flowers were noted May 15 and the plants continued to flower until late August. Yields were not recorded. Fall plantings, made with transplants between October 15 and 28, were killed by temperatures of 30-31°F on November 24.

Field plantings that were made April 15, 1961, emerged on April 25, and the first flowers were noted on June 15. Seed began to mature about July 14, and harvests were made twice a week from then until September 8. The total yield was 475 pounds per acre.

Another species, Vernonia pallens, was planted in the greenhouse in 1961. The few plants that developed were transplanted to the field in the spring. They grew well for about a month and died before flowering.

In North Carolina, plantings were made in 1960 at Willard on April 14, and at Rocky Mount on April 21. In general, the development was similar at both locations. The plants reached a height of about 48 inches and flowered over

a period of 6-8 weeks. The seed shattered badly when it matured. Seed was hand-harvested at three dates from each location with total yields as follows: 369 pounds per acre at Willard and 785 pounds per acre at Rocky Mount. In 1961, excellent stands of Indian ironweed were obtained at Plymouth and Willard. Plants began flowering from 6-8 weeks after planting and continued to flower until frost in October. Very little seed shattering occurred, so seed was combined. Much seed was lost as seed on the row next to the combine were shaken loose from the plant and fell to the ground. Even with this loss, seed yields reached 700 pounds per acre at Plymouth. During 1962, every third or fifth row, depending on combine width, will be skipped so that this loss will not occur.

UNITED STATES DEPARTMENT OF AGRICULTURE  
Soil Conservation Service  
P. O. Box 832  
Athens, Georgia  
August 10, 1962

Dr. W. R. Langford, Coordinator  
Regional Project S-9  
Regional Plant Introduction Station  
Experiment, Georgia

Dear Dr. Langford:

I regret that I cannot be with the Committee this year; also that I will be unable to send a representative. We are holding our Field-Plant Materials Technicians' Workshop at this time and it is necessary that I attend. It is unfortunate that we had this conflict, but as you know, neither could be readily changed. (I hope you can get the time of next year's meeting decided upon early this winter!)

There follows a brief resume of some better plant introductions that the Service is working with at this time.

Mr. Quintero reported to you last year on a group of plant introductions of promise being evaluated by the Soil Conservation Service at its centers. These include the following:

Echinochloa crusgalli - BN-8963 - a rogue in Setaria italica, P.I. 196293  
Glycine ussuriensis - P.I. 163453  
Lespedeza virgata - P.I. 218004  
Lotononis bainesii - P.I. 195478  
Panicum maximum var. 'Trichoglume' - P.I. 202497  
Stylosanthes sundaica - P.I. 187098  
Trifolium vesiculosum - P.I. 234310 (early), P.I. 233382 (medium), and P.I. 233816 (late)

All of them continue to show promise and are in initial increase plots for field testing.

Stylosanthes sundaica - P.I. 187098 - was put into field plantings in the past year and shows promise in Florida as a potential summer reseeding legume grown in combination with bahiagrass.

Two of the Trifolium vesiculosum varieties (early and mid-season) have been tested sufficiently at Americus, Georgia, to warrant certification, and they will be recommended for release in Georgia to the CIA at their fall meeting.

Additional plants warranting notice include:

Arachis glabrata (P.I. number lost) the perennial wild peanut, is showing promise in mixture with several summer grasses. Establishment of field plantings in Florida shows that mixtures can be obtained and that the grass is improved in color with it.

Arachis sp. - P.I. 263393 - an annual wild peanut that has grown well and volunteered at both Arcadia, Florida, and Americus, Georgia. It has potential as an annual summer forage legume in sod grasses.

Lotus corniculatus - P.I. 260012 - has made remarkable growth at Arcadia. It is rapid enough as a seedling to be promising as an annual winter legume, even if it does not grow as a perennial. Clipping off all seeded material in the spring at Arcadia has shown a production of from 2-3 tons dry weight per acre. Seed production and volunteering of seedlings are good. The plants are subject to the usual diseases and most of the stand of old plants is lost during the summer.

Trifolium diffusum - P.I. 238362 - shows considerable promise at Coffeetown, Mississippi. It withstood the winter and grew off well on sites where Trifolium vesiculosum was almost a complete loss due to heaving. Other numbers of this species compare favorably with this one.

The others listed in the tables of last year's report are still being carried but have not been sufficiently evaluated to warrant additional comment.

Very truly yours,

W. C. Young  
W-F Plant Materials Technician  
Southeastern States

7/12/62 - I. A. Wolff  
Northern Utilization Research  
and Development Division

Comments for the Fall 1962  
Meetings of the NC-7 and S-9 Committees

1. Cited below are a few comments regarding use-potential of selected groups of raw materials which have passed into a development phase.

A. Erucic acid oilseeds - (Northern Division, Peoria)

1. Readymade market--4 million lbs. of rapeseed oil imported annually. Rubber additives is one major use.

2. Other potential markets:

(a) Brassylic acid and pelargonic acids derived from erucic acid. Estimated return about \$40 per acre with a potential of 65,000 acres at the estimated market prices for the oil.

Possible uses: Nylon-type polyamides, shrink-resistant woolens, plasticizers, jet lubricants, alkyd resins.

(b) Wax-like products, water-repellent compounds, surface-active agents. End-use research on these and other prospective uses remains to be done. Some of this effort is currently underway.

3. Coproduct protein feed must be specially processed to remove toxic, unpalatability, and/or growth-inhibiting materials.

B. Naturally occurring epoxidized oils - (Eastern Division, Philadelphia)

For processing and uses see pages 69-71, CHEMICAL AND ENGINEERING NEWS, June 18, 1962, "Possible uses include the stabilization and plasticization of polyvinyl chloride, the preparation of lubricants, rigid polyurethane foams, surface coatings, detergents, drugs, alkaloids, growth regulators, essential oils, and chemical conversion products." Estimated markets in the article cited as 60 to 70 million lbs. of epoxidized plasticizers by 1965.

C. Acids of Cuphea and Limnanthes seed oils - (Southern Division, New Orleans)

Projected uses for Cuphea oils are "in the fields of surface-active materials, plasticizers, and physiologically active compounds." Similar to coconut oil which is imported at an annual rate of 170 to 225 million lbs.

A liquid wax ester similar to that contained in seeds of jojoba can readily be prepared from Limnanthes seed oil. Jojoba oil has been said by Southern Division researchers to be "...a direct replacement of sperm whale oil..." "...an effective stabilizer (for vinyl plastics after its epoxidation)..." and to be generally useful in such fields as plastics, lubricants, pharmaceuticals and cosmetics.

D. Petroselinic acid oils of Umbelliferae - (Southern Division)

1. Petroselinic acid has been shown to have antimicrobial activity and may find usefulness in food preservation, in agricultural chemicals, etc.
2. Adipic and lauric acids can be obtained from petroselinic acid. Both have established markets of several hundred million pounds. Uses include plasticizers, nylon-type plastics, detergents and other surface-active agents, etc.

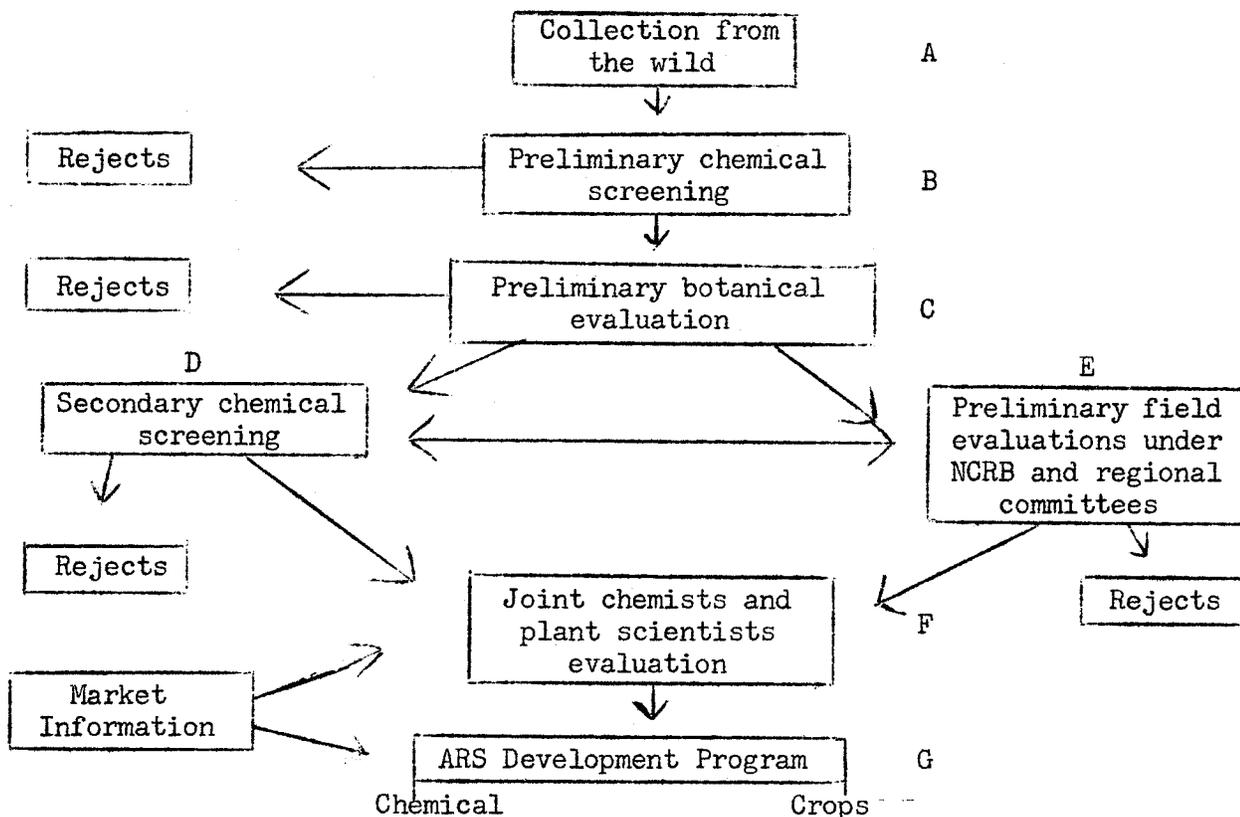
E. Hydroxy acids of Dimorphotheca, Lesquerella, etc. - (Western Division, Albany, California)

1. Dimorphotheca oils have been tested raw, dehydrated, and heat bodied, for technological potential in the coatings field. Prospects appear favorable.
2. Both Dimorphotheca and Lesquerella oils have been tested as components of urethane foams. They are at least equivalent to castor oil in this large and growing end-use category.
3. One industrial company has expressed definite interest in adding lesquerolic acid, derived from Lesquerella seed oil, to its line of industrial chemicals.
4. Valuable chemical intermediates such as the dibasic acid, dodecanedioic acid, are readily derived from Lesquerella. Derived from this acid could be a nylon referred to as 6-12 nylon, which is reputed to have an important outlet as insulating materials for telephone wires with a multimillion pound market possible.

The above end-use data are illustrative, not exhaustive. Similar data, suggestions, and projections could be made for other species. A critical point is always economics, and this will inevitable return to the agronomist in the form of "How much seed yield per acre can be obtained consistently using normal farming practices?"

II. A review of some of the philosophy of new crops research seems apropos in view of certain questions which have been raised.

A new crop will come only after a series of successive approximations by both chemists and plant scientists. The scheme is somewhat as follows:



At stages D and E it is often premature to settle questions such as "Potential dollar value," "price per pound" or to pinpoint exactly the end-uses and end-users. We simply don't know enough at that stage to do this, just as we cannot yet assess many agronomic traits. Large chemical companies consistently make new petrochemicals, and then take full-page ads in technical journals using the theme, "We have a new product--here are its properties--it's different from what's available now--here are a few suggested uses--samples are available--how can you use it--." Our new crops program may to some extent have to operate in this way, and the chemists, agronomists and horticulturists will have to use as their incentive faith in each other's judgment to keep them going on the best possible evaluations.

APPENDIX B

1962 Revision of Regional

Project S-9

APPENDIX C

Chart of Responsibilities for 1963

## CHART OF RESPONSIBILITY 1963

Objective	Type Activity	State Station and Federal Agency
1. To participate in the coordinated program of foreign and domestic plant exploration and introduction to obtain new plants for agricultural, industrial, and other uses.	1. Collection of fruit stocks near Gulf Coast and in coastal plains area of South Carolina and Georgia.	Agric. Expt. Stations in Ala, Georgia, Florida, Louisiana, Miss., S.C., & Texas. NCRB, ARS.
	2. Coordinate requests for new plant materials and forward them to the New Crops Res. Br., ARS.	Regional Plant Introduction Station, Experiment, Georgia
	3. Attend and participate in meeting of National Coordinating Committee for New Plants Research	Members of S-9 Executive Committee and NCRB, ARS.
	4. Seed lists and reports of S-9 activities will be exchanged for similar reports of the other three regional new plants projects. All such reports and seed lists, including those of the S-9 new plants project, will be distributed to plant scientists in the Southern Region.	Regional Plant Introduction Station, Experiment, Georgia, and the S-9 committee member representing each state station and the Soil Conservation Service.

## CHART OF RESPONSIBILITY 1963

Objective	Type Activity	State Station and Federal Agency
2. To multiply, evaluate, maintain and preserve germplasm of introduced plant materials for the Southern Region.	Increase new plant materials received since the last planting season and make them available for further evaluation at state stations and S.C.S. Plant Materials Center. Test germination of seed in storage and increase those low in viability or low in supply. New introductions will be observed for useful horticultural and agronomic characters and for the presence of disease and insects.	Regional Plant Introduction Station, Experiment, Georgia
C-2	<u>Cucumis melo</u> introductions will be screened for resistance to gummy stem blight if adequate techniques can be developed and results from screening commercial varieties justify this. Isolations will be made from introductions that appear to be carriers of new diseases to identify causal organisms. When necessary to prevent spread of new diseases, propagating material will be withheld from distribution.	Regional Plant Introduction Station, Experiment, Georgia
	Seed of introductions of potential economic value will be stored as working stocks for research workers in the Southern Region.	Regional Plant Introduction Station, Experiment, Georgia

## CHART OF RESPONSIBILITY 1963

Objective	Type Activity	State Station and Federal Agency
2. Continued.	Inventorying of asexually propagated plants will be continued.	Regional Plant Introduction Station, Experiment, Georgia
	Evaluation of turf grasses.	Ala., Ark., Fla., N.C., Okla., Tex., Tenn.
	Evaluation of ornamental plants	Ala., Fla., La., Okla., N.C., S.C., Tenn., Tex., Va.
	Evaluate introductions of the following species of agronomic crops as sources of new breeding lines or for commercial plantings in their present forms:	
	grain crops	
	corn	Ala., Fla., Ky., Puerto Rico
	sorghum	Ga., Fla., Okla., Puerto Rico, N. C., Tex.
	small grain	Fla., Ga.
	forage crops	
	<u>Trifolium repens</u>	Ala., La., S.C.
	<u>Trifolium</u> spp.	Ala., Ky., Soil Conservation Service
	<u>Lespedeza cuneata</u>	Ala., N.C., Soil Conservation Service
	<u>Vicia</u> spp.	Ala., Soil Conservation Service
	<u>Phalaris</u> spp.	Ala.
	<u>Cynodon</u> spp.	Ga., Fla.
	<u>Paspalum</u> spp.	Fla., Ga., La., N.C., Tex.

## CHART OF RESPONSIBILITY 1963

Objective	Type Activity	State Station and Federal Agency
2. Continued.	forage crops (cont.)	
	<u>Bothriochloa</u> spp. and <u>Andropogon</u> spp.	Ala., Okla.
	millets and misc. summer grasses	Ala., Fla., Ga., N.C., Miss., Texas
	Alfalfa	N. C.
	Misc. summer legumes	Ala., Fla., Ga., La., Okla., Puerto Rico, Soil Conservation Service
	Arachis spp.	Ala., Fla., Ga., N.C., Okla., Tex., Va., Soil Conservation Service
	Tobacco	Fla., N. C.
	Cool season per- ennial grasses	Ark., Ky., N.C., Va.
	Evaluate introductions of the following horticultural crops:	
	Cantaloupe	Ala., Ark., S.C., Texas
	Watermelon	Ark., Fla., Miss., S.C., Tex., Va.
	Tomato	Ala., Fla., Texas
	Pepper	Ala., Ga., S.C.

## CHART OF RESPONSIBILITY 1963

Objective	Type Activity	State Station and Federal Agency
	Evaluation of horticultural crops (cont.)	
	Southern pea	Ala., Fla., Ga., Miss., Okla.
	Fruits and nuts	Ala., Ark., Fla., Ga., Ky., La., Miss., N.C., Okla., Puerto Rico, S.C., Tenn., Tex., Va., NCRB, ARS
	Sweetpotato	Ga., La., N.C., Okla.
	Other vegetables	Fla., La., N.C., Puerto Rico, Va.
	Strawberries	La., N.C., Tenn.
	Adaptation and cultural studies of the following:	
	Oilseed crops	Ala., Ark., Fla., Ga., N.C., Okla., S.C., Tex., NCRB, ARS
	Fiber and pulp	Ala., Fla., Ga., N.C., Okla., S.C., Tex., NCRB, ARS
	Gum crops	Ala., Ark., Fla., Ga., La., N.C., Okla., S.C., Tex., NCRB, ARS
	Drug crops	La., Fla., NCRB, ARS
	Crops for insecticides	S.C., NCRB, ARS
	Chemical evaluation of new plant materials for new sources of oil, pulp, and gums.	URRD, ARS

## CHART OF RESPONSIBILITY 1963

Objective	Type Activity	State Station & Federal Agency
3. To provide plant and seed materials for assessments of their chemical and physical properties and industrial use potentials.	Plant and seed material from increase and evaluation nurseries will be supplied for chemical and physical evaluation.	Fla., Ga., Ky., La., N.C., Okla., Puerto Rico, S.C., Texas
4. To catalogue and distribute introduced plant materials and to maintain and publish records of their performance and use in the Southern Region.	<p>A complete list of available introductions will be prepared for distribution to research workers. The following manuscripts will be prepared for publication:</p> <p>(1) Results from screening selfed lines of pepper for resistance to bacterial spot.</p> <p>(2) Results from screening watermelons for resistance to gummy stem blight.</p> <p>(3) Seed treatment for the control of seed-borne pathogens on guar.</p> <p>(4) Two diseases of guar in Georgia.</p>	Regional Plant Introduction Station, Experiment, Georgia
5	Distribute <u>Rubus</u> introductions from N.C. to the states of Ark., Ky., Ill., La., Ore., S.C., and Texas.	North Carolina

## CHART OF RESPONSIBILITY 1963

Objective	Type Activity	State Station and Federal Agency
4. Continued.	Distribute seed lists and reports of new plant activities. Maintain records of new plant materials received within the state and report their performance and use to the S-9 Technical Committee.	S-9 Committee members representing each state station and the Soil Conservation Service.
	Prepare an annual report for S-9 'New Plants' Project.	A. M. Davis, Chairman S-9 Committee