Minutes

of the

Meeting of the S-9 Technical Committee

"New Plants"

The Introduction, Multiplication and Evaluation
of New Plants for Industrial and Agricultural
Use and Preservation of Valuable Germ Plasm

University of Puerto Rico
Rio Piedras, Puerto Rico

December 13-15, 1961

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Appendix
(Progress Reports Presented by Committee Members)

Motions Presented and Accepted

1. Revision of motion found on page 46 of the 1961 meetings of the National Coordinating Committee as follows:

   "That four copies of Regional Station seed lists and (annual) reports be sent to the technical committee representative in each state through his regional coordinator."

2. "That the S-9 technical committee request that P.I. numbers be used for all accessions insofar as practicable."

3. "That each member of the technical committee review the project outline and send any and all suggestions to Director Lewis and to Coordinator Langford."

4. Crambe abyssinica be added to the list of introduction needs found in the 1960 technical committee minutes and that a wider sampling of germ plasm of this species be made available for evaluations. The 1960 S-9 request included Guar, Kenaf, Andropogoneae, Cotton, Crotalaria, Digitaria, Lupines, Paspalum, Sorghum, Subtropical legumes, Capsicum, Celery, Sweet potatoes, Tomatoes, Watermelon, Strawberry, Castorbean, Peanuts, Sesame, and Soybeans.

The meeting was called to order at 1:45 p.m. A.S.T. by Chairman Ralph Matlock.

Roll call of S-9 Technical Committee members is shown below:

Administrative Advisor	R. D. Lewis	Texas
Regional Coordinator	W. R. Langford	
Alabama	C. S. Hoveland	Absent
Arkansas	A. M. Davis	Acting Secretary
Florida	G. B. Killinger	
Georgia	A. H. Dempsey	
Kentucky	W. H. Stroube	Absent
Louisiana	J. C. Miller	
Mississippi	H. W. Bennett	
North Carolina	W. T. Fike	
Oklahoma	R. S. Matlock	Chairman
Puerto Rico	Roy Woodbury	
South Carolina	J. A. Martin	
Tennessee	W. E. Roever	Absent
Texas	E. L. Whiteley	
Virginia	T. J. Smith	Absent
Coop. State Exp. Sta. Service	W. C. Kennard	Washington, D. C.
New Crops Research Branch, ARS	W. E. Whitehouse	Beltsville, Md.
New Crops Research Branch, ARS	J. R. Haun	Beltsville, Md.
Soil Conservation Service	A. H. Quintero	Mayaguez, P. R.
Northern Utilization Research and Development Div., ARS	I. A. Wolff	Peoria, Illinois
Visitor	G. Otey	Dallas, Texas

Minutes of the S-9 Technical Committee
Southern Regional Cooperative Project S-9, New Plants
Rio Piedras, Puerto Rico
December 13, 1961 - December 15, 1961

JOINT SESSION: The S-9 Technical Committee met jointly with the S-32 Technical Committee for welcome and tours from 9 a.m. to 1:30 p.m. A.S.T. on December 13. An outline of the program for the joint session follows:

Program Wednesday, December 13
Conference Room, Agricultural Experiment Station

9:00 a.m.	Welcome, Director Arturo Roque, Puerto Rico Agricultural Experiment Station. Joint session S-9 and S-32.
9:15 a.m.	Philosophy of Regional Research, Director R. D. Lewis, Texas Agricultural Experiment Station.
9:30 a.m.	Effects of Light on Plants, Dr. H. A. Borthwick, Director, Plant Physiology Pioneering Research Laboratory, USDA.
10:15 a.m.	Visit to the phytotron.
10:45 a.m.	Visit to the Food Technology Laboratory and the Rum Pilot Plant of the Agricultural Experiment Station.
11:45 a.m.	Luncheon in the University Faculty Club (Courtesy of the Agricultural Experiment Station).
1:45 p.m.	S-9 Technical Committee meeting at the Library of the Tropical Forest Research Center, Agricultural Experiment Station Campus.
	S-32 Technical Committee meeting at the Conference Room of the Agricultural Extension Service, Agricultural Experiment Station Campus.

MINUTES AND AGENDA APPROVED:

The minutes of the 1960 Technical Committee meeting were approved as duplicated and distributed.

The agenda for the 1961 meetings was presented. Moved by Dempsey to add agenda items 12a, 12b, and 12c. Seconded by Killinger and approved by members.

The revised agenda follows:

1. Registration and roll call
2. Welcome
3. Agenda and committee appointments
4. Report Regional Station Activities (Fruit and Nut Inventory; Regional Bulletin)
5. State Reports - Highlight of Accomplishments, submit written report.
6. Report from New Crops Research Branch
7. Report from Soil Conservation Service
8. Current status of research on industrial crops - I. A. Wolff
9. Review of May 1961 Meeting of National Coordinating Committee
10. IBM card filing system
11. Discuss proposed revision of S-9 Project Statement
12. Specialized request for plant explorations
    a. Improved State Support for New Plants Research - Lewis
    b. Use and Responsibility of the National Seed Storage Laboratory - Lewis
    c. Plans for Future - Matlock
13. Next meeting (time and place)
14. Election of Chairman and Secretary
15. December 14 visit Pinewood area and Mayaguez
16. December 15 visit Fortuna Fruit Substation

The field trip schedule for S-9 members and guests mentioned in agenda items 15 and 16 follows:

Thursday, December 14, 1961

7:00 a.m.	Departure from University Student Center, Rio Piedras
9:00 a.m.	Stop at the Manati Pineapple Field Station
12:00 m.	Stop at the Isabela Agricultural Experiment Substation
3:00 p.m.	Visit to the College of Agriculture and Mechanic Arts of the University and to the Federal Experiment Station, both at Mayaguez.
6:30 p.m.	Dinner at the College Student Center (Courtesy of the College Administration. Luis Stefani, Vice-Chancellor)
7:30 p.m.	Visit to the Phosphorescent Bay at La Parguera, near Mayaguez

Friday, December 15, 1961

7:30 a.m.	Departure for the Fortuna Fruit Substation, near Ponce
9:30 a.m.	Arrival at the Fortuna Fruit Substation
10:30 a.m.	Return trip to Rio Piedras via Salinas
3:30 p.m.	Arrival at Rio Piedras
3:45 p.m.	Continue Technical Committee meeting

APPOINTMENT OF COMMITTEES:

Chairman Matlock made the following committee assignments:

1. Nominations for Executive Committee
   Killinger, Chairman; Whiteley, Dempsey

2. Meeting Place and Time
   Fike, Chairman; Langford, Davis

3. Resolutions
   Martin, Chairman; and Kennard

SOUTHERN COOPERATIVE SERIES BULLETIN 79:

"New Plants for the South" Southern Cooperative Series Bulletin 79

This 10 year summary report of introductions and their use was presented by Langford and a discussion followed as to costs to the various states. Langford reported that all states had ordered copies and that the cost would probably be about 50¢ each, based on original bids for printing. A copy was distributed to each person present.

An expression of appreciation was given Killinger and Langford for their work in assembling information and editing the report.

FRUIT AND NUT INVENTORY:

The progress of the Fruit and Nut Inventory was reported with six southern states reporting 367 items on the inventory. Two states reported no inventory available. Dr. Whitehouse stated that Mr. Hyland is drafting an apple inventory. Dr. Langford reminded the committee that the National Coordinating Committee voted to set a deadline of December 31, 1961 for completion of the fruit and nut inventory, and urged committee members who have not reported to submit inventories for their states before the deadline.

STATE AND FEDERAL AGENCY REPORTS:

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

Puerto Rico - Woodbury

Regional Station - Langford

Florida - Killinger

Georgia - Dempsey

South Carolina - Martin

North Carolina - Fike

Alabama - Hoveland (read by chairman)

Kentucky - Stroube (read by chairman)

Virginia - Smith (chairman read letter stating no accessions were tested in 1961)

Mississippi - Bennett

Louisiana - Miller

Arkansas - Davis

Texas - Whiteley

Oklahoma - Matlock

New Crops Research Branch, ARS - Whitehouse
Chemurgic Crop Investigations - Dr. Haun presented slides illustrating the highlights of his research with chemurgic crops during 1961

Cooperative State Experiment Station Service - Kennard

SCS Plant Materials Centers - Quintero

Utilization Research and Development Divisions, ARS - Wolff

DISCUSSIONS:

Pertinent discussions followed most reports.

A discussion was lead by Dr. Lewis regarding interpretation of the motion found on page 46 of the minutes of the National Coordinating Committee (May 18-19, 1961). It was interpreted as follows:

"That four copies of Regional Station seed lists and (annual) reports be sent to the technical committee representative in each state through his Regional Coordinator." This would result in 4 to each state plus 4 in the library of each regional station, or about 250 copies for each for distribution.

It was determined that Crambe abyssinica had been distributed under two numbers and since only one introduction was made, the correct number was determined as P.I. 247310.

Confusion from sending material to the Northern Utilization Laboratory as P.I.'s and having it reported as N.U. numbers by Dr. Wolff and Dr. Quentin Jones was discussed. Dempsey moved that, "the S-9 Technical Committee request that P.I. numbers be used for all accessions insofar as practicable." The motion was seconded by Fike and approved by the Committee. It was suggested

that for continuity and identification of material that the following system for numbering accessions would be satisfactory:

1. Accessions from state stations show P.I. numbers.
2. Accessions from Northern Utilization Laboratory show P.I. and N.U. numbers.
3. Accessions from Dr. Quentin Jones show N.U.+P.I.+state station of origin. It may optionally carry the N.U. number also.

A similar system was noted by Matlock in which SP, M or some other letter code and number are used for the records of Oklahoma workers. When shipping materials both the P.I. and state number are given.

Dr. Whitehouse discussed the New Crops Research Branch program. Considerable discussion resulted from his proposal that new material of a genus and/or species which had never been requested from a regional station where it is on file be destroyed. It was decided that all material should be made available to someone in the southern region; although the accession will not necessarily be placed in storage at the regional station.

The meeting adjourned at 11:00 p.m. A.S.T., Wednesday, December 13th.

REVISION OF PROJECT OUTLINE:

The committee continued the business session beginning at 3:45 p.m. A.S.T., Friday, December 15th.

The proposed revision of the Regional Project Outline was discussed and the following motion by Whiteley and seconded by Killinger was approved: "That each member of the Technical Committee review the project outline and send any and all suggestions to Director Lewis and to Coordinator Langford." January 15, 1962 was set as the deadline for submitting suggestions for improving the outline. Dr. Lewis suggested the section on introductions and use of introductions be strengthened, and that the paragraph pertaining to the liaison between agencies and state S-9 representative be improved.

EXPLORATION NEEDS:

Following the discussion of needs for new explorations a motion was made by Lewis and seconded by Miller that Crambe abyssinica be added to the list found in the 1960 minutes, and that a wider sampling of germ plasm of this species be made available for evaluations. Motion carried.

It was further emphasized by Dr. Whitehouse that if even a single item was desired by a worker that requests should be made and this will be obtained if at all possible by men in the field.

BUDGET STUDY REPORTS - Lewis

The budget of S-9 was discussed by Dr. Lewis and he stated that for the

functioning of an intensified program more pooled funds would be required. In August 1959 the Southern Directors went on record for supporting this. Funds spent on S-9 are shown in Tables 1 and 2.

The question of contract growing of introduced plant materials arose and it was decided that due to the diversification of material handled by the southern station workers and the very diverse ecology of the states making up the S-9 work area that contract growing of material was essential for the continuation of the program. Dr. Lewis in reply to a question from Dr. Miller concerning a travel budget for S-9 Technical Committee members stated that the philosophy of Southern Directors was to leave the travel costs to each state or agency.

NATIONAL SEED STORAGE - Lewis

Due to our close association with the National Seed Storage Laboratory we should be more cognizant of its function and see that seed of each new variety is placed on deposit. Also those varieties going out of common use should be placed there.

The question of breeders' lines was raised and the revised rules of the National Seed Storage Laboratory were emphasized, viz, a breeder may place germ plasm in the storage facility under the 5 year recall program. At his request it will not be released to anyone during this period except to the breeder and he may withdraw it at his discretion. After the five year period it becomes public property and may be distributed in accordance with the rules for seed distribution from the National Seed Storage Laboratory.

Table 1. Funds expended directly by state stations in support of regional project S-9 "New Plants" fiscal year 1960-61

(Does not include RRF or USDA allotted to Regional Plant Introduction Station)

STATION	RRF	HATCH	STATE OR LOCAL	GRANTS, CONTRACTS ETC.	TOTAL
Alabama		1,000.00			1,000.00
Arkansas			2,222.67		2,222.67
Florida	4,400.00		5,000.00		9,400.00
Georgia	4,000.00		4,119.99		8,119.99
Kentucky			100.00		100.00
Louisiana			1,700.00	1,500.00	3,200.00
Mississippi					----
North Carolina	7,000.00	12,000.00	8,000.00	2,000.00	29,000.00
Oklahoma	5,200.00		4,815.00		10,015.00
Puerto Rico	11,000.00	9,349.03	4,818.00		25,167.03
South Carolina	5,168.00	7,988.00	1,086.00	6,000.00	20,242.00
Tennessee		2,000.00			2,000.00
Texas		9,500.00	28,000.00		37,500.00
Virginia					----
TOTALS	$ 36,768.00	$ 41,837.03	$ 59,861.66	$ 9,500.00	$ 147,966.69

Table 2. Funds available to the Southern Regional Plant Introduction Station

Source of Funds	1960-61	1961-62
Regional Research Funds (Pooled)	$20,000.00	$20,000.00
Regional Research Funds (Allocated to Georgia)	4,000.00	6,000.00
State Appropriations (Georgia)	4,870.00	4,175.00
A.R.S. (New Crops Research Branch, C.R.D.)	21,875.00	21,875.00
TOTAL	50,745.00	52,050.00

Expenditures of the Southern Regional Plant Introduction Station

	1960-61	1961-62 (Proposed)
Salaries - Coordinator, Pathologist, Agronomist, Research Assistant, and Secretary	$30,807.46	$28,475.00
Labor	11,496.91	16,051.00
Travel		
Coordination of S-9 Activities	742.48	800.00
For Collection of Fruit Stocks by State Station Workers (Ala. 181.45; La. 116.35; Miss. 141.75; Texas 31.90)	471.45	500.00
Contracts with State Stations for Seed Increase		
Ga. Coastal Plain Exp. Sta. 628.00		
Puerto Rico Agr. Exp. Sta. 384.00	1,012.00	230.00
Capital Outlay	2,448.71	2,494.00
Supplies and Operating Expenses	3,586.81	3,500.00
TOTAL	$50,565.82	$52,050.00

Compiled for R. D. Lewis
by W. R. Langford 9/29/61

PLANS FOR FUTURE - Matlock

Dr. Lewis re-emphasized the need for revising the project outline and encouraged more research on industrial crops. He further suggested the executive committee include the past chairman. There was no opposition to this and this was made an appointment by acclamation.

Dr. Wolff reported on several plants having interesting chemical constituents, one of which was Commandra. Dr. Fike suggested that it not be included in the plans for the future due to its parasitic characteristic.

Dr. Matlock presented a list of plants and phases of research needed for developing each into an economic crop. A committee consisting of Haun (Chairman), Wolff, Whiteley, Fike, and Matlock was appointed to review the list and revise it in accordance with research now in progress. Following is a report of that committee:

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

In view of the increased interest in research on potential new chemurgic crops by members of the S-9 Regional Technical Committee the following list of promising species has been assembled to provide guidance in the selection of species for investigation.

A number of species that have been mentioned in earlier reports to the technical committee have been omitted because crop or utilization studies have indicated that further attention is not justified at this time. With relatively large numbers of new species under investigation at all times, it is to be expected that continuous re-evaluation will be necessary as reasons arise for the elimination of species.

Examples of species not included:

Plant	Reason for omission
Brassica	This genus has been studied for sources of erucic acid. Large groups of accessions have been screened at several locations. Until a better source of erucic acid is found, effort should be concentrated on the related - Crambe abyssinica.
Calendula	The oil from this seed is essentially like that of linseed.
Commandra	This may need a host plant which would be impractical from a crop standpoint.
Cynara	The oil from this seed is of the safflower type.
Limnanthes	Is probably adapted only to cool, wet areas.

Momordica — The oil will be essentially the same as Tung oil.

It is possible that a potential new crop may be of relatively little importance to a particular region or to the entire nation, but may be of significance to an individual state. Therefore, the degree of adaptability and special economic factors should be considered in the selection of species for study by individual states.

Attention is called to the revised (Dec. 1961) S-9 project description under item IV Procedure, paragraph 5 "Species that appear promising from the standpoint of chemical composition will be evaluated under a wide range of conditions to determine their area of adaptation." This activity is indicated by phase "C" in the following listing of crops. "Those found to be adapted to areas in the Southern Region will be studied further to determine their cultural requirements, productivity, and the procedure for harvesting. This will be accomplished through state contributing projects." This activity is indicated by phase "D" in the following listing of crops.

This plan should result in a more concentrated attack on the problems of new crop development in that it requires statements of objectives, and procedure for each species or group of species under advanced investigation. It should provide for improved coordination among the states in accomplishing the regional evaluation of new chemurgic crops. To implement this program, specific contributing projects should be formulated to define the crop development program at each location.

Phases in the Development of a New Crop
(as applied to following list of crops)

Phase	Studies involved in each phase
A.	1. Literature search 2. Exploration, collection, identification
B.	1. Chemical and physical screening for industrial uses
C.	1. Seed increase for further chemical evaluation 2. Preliminary cultural evaluation
D.	1. Advanced Utilization research 2. Advanced Agronomic research a. Environmental and climatic requirements b. Cultural requirements - rate, date, and methods of planting etc. c. Fertilization d. Pest control - weeds, diseases and insects e. Harvesting and storage
E.	1. Commercial trials

New Chemuric Crops Under Development

Crop Use	Crop	Phase (see previous page)	State or Agency* Presently Involved (1961 season)
1. Oilseed			
	Aster	C	NCRB, Tex.
	Crambe	D	NCRB, NURDD, three W-6 states, Six NC-7 states, N.C., Ky., Tex.
	Cuphea	C	NCRB, SURDD, Tex.
	Daucus	C	Five NC-7 states
	Dimorphotheca	D	NCRB, WURDD, three W-6 states, six NC-7 states, N.C., Tex.
	Eruca	C	Six NC-7 states
	Foeniculum	C	Seven NC-7 states
	Lesquerella	D	NCRB, WURDD, two W-6 states, one NC-7 state, N.C., Tex.
	Lunaria	C	NCRB, one NC-7 state
	Vernonia	D	NCRB, EURDD, five NC-7 states, Ky., N.C. Tex.
2. Gum			
	Cassia	C	NCRB, six NC-7 states, N.C., Tex.
	Crotalaria intermedia	D	NCRB, NURDD, six NC-7 states, N.C., Tex.
3. Pulp			
	Bamboo	D	NCRB, S.C., Ala.
	Crotalaria juncea	D	NCRB, NURDD, seven NC-7 states, N.C., S.C., La., Ky., Tex.
	Kenaf	D	NCRB, NURDD, seven NC-7 states, N.C., S.C., La., Ky., Tex.
	Okra	C	NCRB, NURDD, La., S.C.
	Sesbania	C	NCRB, Tex.

4. Drug

Dioscorea	D	NCRB, EURDD, La., Fla., P.R.

5. Insecticide

Tephrosia	D	NCRB, P.R., S.C.

* NCRB - New Crops Research Branch - Crops Research Division
NURDD - Northern Utilization Research and Development Division
WURDD - Western " " " " "
SURDD - Southern " " " " "
EURDD - Eastern " " " " "

BROCHURE FOR S-9 - Lewis

Dr. Lewis asked permission of the group to develop a brochure on Project S-9 similar to the one he developed for S-43 last year. His efforts were commended and approval was granted.

REPORTS OF TEMPORARY COMMITTEES:

The nominating committee nominated Dr. W. E. Roever, Chairman, and Dr. W. T. Fike, Secretary, for 1962. It was moved by Whiteley and seconded by Bennett that the report be accepted. Motion carried.

The committee to select the place and time of the next meeting reported that it had been three years since we had visited the Regional Station, therefore, we should return there next year. The date was left open, but August or September was suggested. It was moved by Fike, and seconded by Whiteley, that the committee report be accepted. Motion carried. Subsequent to the meeting, the executive committee chose August 16-17, 1962 as the date for the next meeting.

The resolutions committee moved that:

A special note of thanks be directed to Director Arturo Roque of the Puerto Rico Experiment Station and the following named persons for the gracious hospitality shown the S-9 Technical Committee members during the meetings at Rio Piedras and during the trips to other parts of the island.

Puerto Rico Agricultural Experiment Station
- Miguel Lugo-Lopez
- Roy Woodbury
- Hassan Azzam
- William Pennock

Isabela Substation
- Arturo Riollano

Fortuna Substation
- Carlos J. Clavell
- George C. Jackson

College of Agriculture
- Luis Stephani

Nuclear Center, Mayaguez
- H. J. Teas

Federal Experiment Station, Mayaguez
- H. E. Warmke

The many courtesies extended, including meals, transportation, guidance, and translation helped to make the meetings personally enjoyable and professionally profitable. It is further moved that a copy of this resolution be sent to each of the above named persons by the secretary.

The resolutions committee further moved that:

The committee extend a special note of thanks to Gordon Killinger and Robert Langford for the major effort in collecting information, writing and editing the excellent report "New Plants for the South" which ably summarized the S-9 activities and accomplishments during the first 10 years of its existence.

On December 14 and 15, by courtesy of the Puerto Rico Agricultural Experiment Station, the committee visited experiment stations at Rio Piedras, Monati, Isabela, Mayaguez, and Fortuna. At each of these stations studies with new crops were observed.

The 1961 meeting of S-9 Technical Committee adjourned at 5:15 p.m. A.S.T. December 15.

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

C. S. Hoveland, S-9 State Representative

A total of 348 new plant accessions were received in Alabama during the past year by personnel of the agricultural experiment station and private ornamental nurseries. Of these introductions, 137 were ornamentals, 111 forage grasses and legumes, 83 peppers, 11 apples, and 6 pears.

Dr. W. H. Greenleaf is currently using in his tabasco pepper breeding program germ plasm of P.I. 152225 which is resistant to tobacco etch virus and that of P.I. 159236 which is resistant to ripe rots of the fruits. A large number of new pepper accessions are currently being screened for use in the breeding program.

Mr. James H. Hughes, Warrior, Alabama is using a number of camellia introductions in a breeding program to develop bud hardiness and bloom satisfactorily in the mid and upper South. Observations on some of the introductions:

C. rusticana 228186 - winter hardy foliage but unattractive.

C. rusticana 228187 - excellent foliage and beautiful flowers. To be used for crossing with C. salvenensis and hardy japonicas.

C. rusticana 228188 - excellent foliage and growth habit. To be used for crossing as above.

C. japonica 227568, 230319 - extremely winter hardy.

Observations on promising ornamentals were made at Auburn by Dr. H. P. Orr:

Osmanthus "Gulftide" 213308 - desirable leaf and stem, hardy.

Cinnamonum daphnoides 24661 - interesting indoor foliage plant.

Pittosporum undulatum 249505 - indoor conservatory plant.

Ruellia squarrosa 241870 - valuable for conservatory.

Sarcococca ruscifolia var. Chinensis 239378 - may be valuable in shady locations.

Eucalyptus niphophiba 220246 - using as conservatory plant.

Eucalyptus simmondsii 254677 - using as conservatory plant.

The collection of Coleus cultivars from England were well received by the Garden Club of Alabama members and florist-nurserymen visitors to the campus

collection. Many of these varieties are now being used in the commercial trade.

Dr. Wiley Johnson, white clover breeder, is screening a large number of white clover accessions for resistance to root knot nematodes. No data are available as yet.

Plant introductions are playing an important role in the vetch breeding program of Dr. E. D. Donnelly. Vicia angustifolia (P.I. 121275) was crossed with Vicia sativa (Ala 1894). This is now in the F_4 generation with an attempt to incorporate hard seed coat and non-dehiscence from P.I. 121275 with desirable characteristics of Ala. 1894. Vicia sativa (P.I. 220917) has been crossed with Vicia sativa (Ala 1894). This work now in the F_4 generation is studying inheritance of white seedcoat color from P.I. 220917. This breeding program also is developing good agronomic lines with white seed and white flower color. Ala. 1894 has white flower and produces good yields of forage and seed.

Bromus catharticus P.I. 217593 under clipping in a yield trial produced more total forage than other varieties. Autumn forage production by this accession was much greater than for the Chapel Hill variety.

Several Bothriochloa species have looked especially promising in the nursery at Auburn over the past two years and will be tested more extensively next year. The highest yielding entries were B. intermedia A-5407, A-5410, A-5297, and A-2654. The latter three accessions also made excellent early forage production. No diseases were observed on any of these accessions.

Seven accessions of Phalaris tuberosa (240280, 240254, 240261, 240279, 240282, 240272, 240263) having desirable plant characteristics were increased and are being tested under clipping.

Trifolium vesculosm 233816 gave slightly more total forage than crimson clover but it was later coming into production. Yields of oven dry forage per acre were: T. vesiculosm 233816 - 3065 lbs., crimson - 2615 lbs., and T. vesiculosm 234310 - 1933 lbs.

Indigofera hochstetteri P.I. 201502 made excellent growth of leafy material and may possibly be useful for summer forage production. It has been increased for further testing.

Publication:

(1) Bahiagrass for forage in Alabama. Auburn Agr. Expt. Sta. Cir. 140. 1961.

11/16/61

Annual Report
Arkansas Agricultural Experiment Station
Fayetteville, Arkansas

Project title: (Investigations with New Crops)
Contributing to Regional Project S-9

Department leadership: Agronomy

Principal Project leader: A. M. Davis

Results of years work:

1. Use of plant introductions.

In the past year Arkansas received a total of 973 introduction accessions. Of this number 546 came from the Northcentral Regional Station. The remainder were from the Southern Station. 835 of these went into the host range study of the Soybean Cyst Nematode. (See Table 1). There are still some 300 accessions to be tested in this program. This work is very rewarding, but without the availability of this world-wide collection of germ plasm this work could not have been carried on at its present intensity and scope.

Table 1 Following is a list of genera, members of the Leguminosae, species of which were tested for susecptibility to the soybean cyst nematode, Heterodera glycines. Other accessions are being tested and will be reported at a later date.

Genus	Number of accessions Tested	Number of Species Represented	Number Susceptible	Others With Some Reproductions
Vicia	26	16	3	
Trifolium	53	26	1	3
Lupinus	12	5	4	1
Vigna	23	4	1	
Ononis	2	2	0	
Tetragonobolus	2	2	0	
Scorpiurus	2	2	0	
Coronilla	2	1	0	
Melilotus	16	12	1	2
Cassia	8	8	0	
Lathyrus	10	5	2	4
Desmodium	15	15	2	1
Crotalaria	20	20	4	5
Indigofera	12	12	1	3
Dalea	1	1	0	
Glycine	1	1	0	
Psoralea	1	1	1	
Astragalus	11	11	3	2
Onobrychis	6	3	0	1
Lotus	18	9	0	3
Medicago	90	17	3	3
Pisum	198	3	0	47
Total	529	176	26	75

During the past year P.I. 142449 a citron-type melon from "Andrews" was found to contribute Fusarium Wilt resistance to crosses with desirable table qualities. It was originally used as a source of Anthracnose resistance. In a Fusarium screening trial in the greenhouse crosses envolving this P.I. showed 80% survival while "White Hope" had 20% survival and Charleston Grey had no survival. Duration of test was 40 days. P.I. 204485 Poa compressa from Turkey has been essentially immune to mildew and/or rust. The other Poa (sps) have been seriously damaged by both diseases.

2. Crops investigated under this project:

In the past,Sesame, Flax and Sugar Beets were grown.

Sesame was grown at Fayetteville, Stuttgart, and Hope. Yields of the better varieties at each location were in excess of 900 pounds of cleaned seed per acre equivalent. The Hope test was planted in late June and yields were decreased due to this factor.

Flax was produced at Fayetteville and Stuttgart as a spring seeded crop. The Stuttgart test as in previous years was disappointing, the best yield being 14.81 bushels per acre. While at Fayetteville a maximum of 26.36 was obtained. This is a yield resulting from seeding on March 1, 1961. It would seem from this that in years when early seeding is possible this could be a cash crop.

Sugar beets were grown at Fayetteville and at Clarksdale. Yields were generally disappointing. Tonnage was less than 15 tons/acre but sugar content was good, some strains were up to 19%. Unfortunately the higher yields did not come from the higher sugar content lines. The major apparent deterent to sugar beet production is cercospora leaf spot. Without control our beets were completely defoliated three times during the summer.

We plan to discontinue Sesame but continue Flax and Sugar beets for another season.

We experienced failure with the Bamboo rhizomes. Foliage diseases killed all but 2 plants out of 45 we started last March 23. The surviving plants are from P.I. 195284 Phyllostachys makinoi.

Florida Report
Regional Project S-9 "New Plants"
1961
Gordon B. Killinger

University of Puerto Rico
Rio Piedras, Puerto Rico

December 13-15, 1961

Over 2000 accessions were received by Florida Experiment Station workers, nurserymen and private citizens during 1961.

Dr. H. W. Young, Assistant Horticulturist at the North Florida Experiment Station, Quincy, reports that 33 camellia accessions received from Glenn Dale, Maryland are growing well with P.I. 233638 blooming in September and 12 others with buds. At the same station 33 coleus introductions P.I. 249769 to P.I. 249807 are being maintained with seed from both selfed and open-pollinated flowers being saved. Muskmelons are still being evaluated. With tomatoes, P.I. 126409 from China, because of genes for resistance, is being used in a fruit cracking genetic study. P.I. 193399 and 193403 are being used as genetic marker lines in this same study.

Dr. A. J. Norden at the Gainesville Station evaluated the collection of 576 sorghum accessions. Planting in mid-April, May, June and July, Dr. Norden determined the number of days required from planting to heading and to maturity with corresponding plant height. A rating on general appearance was also made on each strain for each planting date.

Two Bromus catharticus (rescue) introductions, P.I. 189612 and 202359 are showing promise. P.I. 189612 yielded 54 percent more winter forage and P.I. 202359 yielded 32 percent more than the commercial check variety and both were free of loose smut.

Vigna sinensis, P.I. 244571, a tan speckled seed variety was a very good competitor of weeds and has potential as a cover and green manure crop. P.I. 246132, a brown seeded variety, very vigorous, decumbent type growth, produced well planted in spring or late summer and has potential value as cover and green manure crop.

Dr. A. E. Kretschmer at the Indian River Field Laboratory, Fort Pierce, reported over 300 Trifolium accessions involving 33 species were planted in the fall and spring to study adaptation to the area. In the spring planting, 15 Lotus and several varieties of Glycine javanica, Centrosema and Lotononis were planted. All are summer legumes which grew sufficiently to warrant further testing. Preliminary testing of 100 grass accessions is under way with adaptability and summer and winter growth habits to be noted.

Dr. J. E. McCaleb at the Range Cattle Station, Ona reports on 72 grass

accessions and 33 legumes, however, due to either poor seed or dry weather conditions none of those under test appear to have promise.

The Flordahome peach a double pink ornamental was released by the Florida Station and developed by Dr. R. H. Sharpe, Fruit Crops Department, Gainesville. The Flordahome is a second-generation seedling of Chico II (P.I. 146130) x Prunus davidiana (C-26712). The original cross was made by Lloyd E. Joley at the U. S. Plant Introduction Station, Chico, California, in 1949 at the request of Dr. Leon Havis. Chico II is a seedling selected from the Shau Thai peach (P.I. 65821), which was introduced from China as seed. Chico II bears small to medium size fruits and has large, attractive, semi-double pink fragrant flowers.

A number of Medicago sp. were grown for the first time at Gainesville, and several made sufficient growth to warrant further testing. Introduction P.I. 208095 Eragrostis superbe from South Africa was received from Pullman, Washington on March 29, 1960 and has made excellent growth of good quality forage in 1960 and 1961. Seed of this grass is being saved for future plantings. Erucastrum abyssinica P.I. 243913 from Ethiopia was received from Experiment, Georgia and Pullman, Washington in 1959. This plant produces rape-like seed in abundance with 1960-61 plot yields running over 2000 pounds per acre. It is being increased and seed will be sent to Peoria for erucic acid analyses and other industrial properties. A sample of Aegilops crassa from Iran P.I. 227832 was received from Ames in April 1960. One plant from this seed turned out to be a Paspalum notatum with different growth characteristics than other Paspalum species being grown. Seed are being saved and increased plantings are planned to determine value as a forage or turf plant. Hyparrhenia rufa P.I. 241378 from Panama received from Pullman, Washington in March 1960 has been more vigorous than all other introductions of this genus. This introduction winterkilled during the 60-61 winter but will be planted again when more seed are received.

A new blue lupine will be released shortly by Florida and has been developed by Dr. John Edwardson. The parentage dates back to some earlier introductions of the bitter blue variety.

Georgia Report to Technical Committee Project S-9 "New Plants"
Rio Piedras, Puerto Rico
December 13, 1961
A. H. Dempsey

Georgia - A total of 596 plant introductions were received by State and Federal workers in Georgia during 1960-61 season. The requests included lupines, desmodium, peanuts, corn, grasses, clovers, fruits, vegetables and ornamentals. There is a real interest by growers in pears and apples that may be adapted to the Peach Belt in the Georgia Coastal Plain. Commercial nurserymen and Cooperators continue to obtain direct from Glenn Dale, Maryland most of the ornamental stocks. The Coleus collection received publicity in the local press and there were many requests for this material.

Suhi-1 Hybrid Sudan Grass: This F_1 hybrid Sudan Grass developed at the Georgia Experiment Station was released officially in January 1961. This hybrid excels in forage yield, has a long production period, and is disease resistant. This hybrid is characteristically tall (6 to 12 feet high at maturity), vigorous, and late maturing, producing more forage throughout the season and for a longer period of time than other varieties. In 1956 seed of P.I. 156549 were crossed by Dr. Julian Craigmiles to Combine Kafir 60, which contains the sterile-cytoplasm of Day Milo. A cytoplasmic male-sterile Rhodesian Sudan grass was developed by transferring the genetic factor of Rhodesian Sudan grass to this sterile cytoplasm in a series of back-crosses, using Rhodesian as the recurring male parent.

Breeder seed of Suhi-1 will be maintained by the Georgia Experiment Station. Seed of Suhi-1 can be certified through the Georgia Crop Improvement Association.

Dr. Craigmiles is attempting to incorporate triple dwarf genes from grain sorghum into Suhi-1 to facilitate machanical harvesting. He continues to select for low prussic acid content, leafiness, and high quality in parent lines of Suhi-1.

Sorghum: Replicated yield trials of twelve F_1 sorghum hybrids conducted in 1961 by Mr. Haskell Harris of the Georgia Experiment Station indicate that several lines with P.I. parentage have superior yielding ability. His objectives are to develop combine types with disease resistance and good yields of grain and forage.

Alfalfa: In adaptability studies with plant introductions of alfalfa Mr. J. M. Elrod of the Georgia Experiment Station reports three lines with good vigor, disease resistance that appear well adapted to the Georgia Piedmont.

Desmodium: Dr. Ian Forbes, ARS, USDA Tifton, Georgia evaluated ninety desmodium introductions in 1961 for hardseededness and seedling vigor. Complete notes of characteristics for Desmodium spp. grown at Tifton, Georgia

have been prepared by Dr. Forbes.

Pepper (Capsicum frutescens): In the pimiento breeding program crosses of P.I. 163192 and P.I. 163189 with Truhart Perfection and Georgia Station breeding lines have been made in an effort to improve resistance to Xanthomonas vesicatoria.

P.I. 264281 which has been reported to carry resistance to tobacco etch virus as a single recessive gene, was crossed with pimento and California Wonder. The fruits of P.I. 264281 are small and very pungent which complicates the development of a desirable type pimento with tobacco etch resistance.

Lupines, Lupinus spp.: Recent advances have been made toward further improvement of Blanco lupine by crossing it with introduced lines known to be resistant to gray leafspot, caused by Stemphylium solani Weber. These resistant lines are P.I.'s 167938 - 167940 - and 168527. Selections from the progeny of these crosses have been made that are resistant to gray leafspot and possess the desirable characteristics of Blanco. A definite decision relative to a name has not been made, but plans for release are being developed.

Publications:

1. Forbes, Ian, Jr. and Homer D. Wells. 1961. Inheritance of resistance to anthracnose in blue lupines, Lupinus angustifolius. Crop Science. Vol. 1 : 139-141.

2. Craigmiles, J. P. and S. V. Stacy. 1961. Suhi-1 Hybrid Sudan Grass. Ga. Exp. Sta. Leaflet N.S. 26.

New Plants Project S-9

Report of the Kentucky Agricultural Experiment Station

for the year 1961

The University of Kentucky received thirty accessions of seeds and plants from the Federal Plant Introduction Station in 1961. Twenty-one of the accessions consisted of plants of five species of Pinus, Picea, Ligustrum and Salix. These accessions are being grown in the field or in containers by the Department of Horticulture in the Agricultural Experiment Station; but no evaluation of them has been attempted. Six of the accessions consisted of seeds of six species of Trifolium. Plants grown from these seeds are in initial stages of establishment. They will be used in connection with the red clover breeding program of the Agronomy Department in the Agricultural Experiment Station. One accession each of Euchlaena mexicana, Zoysia matrella, and Vicia faba is being used in the research of the Botany Department in the College of Arts and Sciences of the University--Zoysia matrella in winterhardiness studies, the other two in cytological or anatomical studies.

LOUISIANA - (State 687) - J. C. Miller

The 1961 year was a productive one for new crops in Louisiana. Around 222 accessions were introduced of seed and propagating material by research workers of several major departments, nurserymen and private individuals. These included the following:

Ornamentals	89 introductions
Dioscorea	61 introductions
Lupines	42 introductions
Fruits	10 introductions
Pigeon Peas (Cajanus cajan)	9 introductions
Cantaloupe	6 introductions
Onions	3 introductions
Corn	2 introductions

Cantaloupe

Several species of cantaloupe have been introduced to determine their resistance to the various mildews. This testing was conducted by Mr. Ralph T. Brown at the Plaquemines Parish Experiment Station. He is taking advantage of a selection which was made by Godfrey and is crossing it with a local variety which carries some resistance to downy mildew but does not possess desired quality. Brown has selected and tested a large number of lines and recently introduced a variety known as Delta Gold which is very similar to Hale's Best in shape and has a soluble solids ranging from 10 to 14 per cent, which is an exceptional reading for any high quality cantaloupe.

Castor beans

Castor beans are being grown at Baton Rouge, at the Sweet Potato Research Center at Chase and at the North Louisiana Experiment Station at Calhoun. Selections for large seeded, dwarf types are being made. Stocks of a large number of selections are maintained. Castor beans probably require a drier area for best production, therefore, it is not expected that this crop will be produced commercially. However, it could be grown in north Louisiana, and, if the price of beans would advance, the farmers in that area would be encouraged to grow the crop. It would not be a profitable venture at the present price, and, if the government wishes to have castor beans produced for oil, then, the price should be stabilized.

Dioscorea

Sixty-one new plant introduction lines, including seven species, ranging from 0.0 to 15.8 per cent original sapogenin content, were received on May 19, 1961. These introductions included 141 plants. They will be grown in a plastic greenhouse during the winter months and crosses will be made between the high selections just as fast as they can be brought into blossom.

Dioscoreas have been grown in Louisiana for five years and the best cultural methods have been determined. It is felt that roots can be pro-

duced in sufficient quantity for a commercial crop if the sapogenin, which is a pre-cursor of cortisone, can be increased.

Fruit

The fruit introductions date back to 1960 and are still a little too young to make any definite determinations. These introductions consisted mostly of pear and apple scion wood, therefore, the plants have not fruited but have given us some ovservations for adaptability based on leaf spot resistance and apparent rest perior requirements. We will continue to observe this material for adaptability and fruit characters.

Introduction 209939, identified as Malus sylvestris from Africa, has made excellent growth and regular crops for the past three seasons. The quality of fruit is low, but it would appear to be a good potential parent.

Fruit Exploration

It is anticipated that the 35 selections, P.I. numbers 268019 through 268053 (mostly plums), which were planted at the Idlewild Experiment Station, 30 miles north of Baton Rouge, will fruit in the 1962 season. It is pointed out again that most of the introduced material must be used as parental stocks and that, in many cases, it will take from three to five generations in order to produce a commercial variety that will possess some superior character which was brought in through the introduced material.

While this project has not progressed as satisfactorily as we had hoped, considerable interest is now being shown in it. At the Southern Agricultural Workers meeting at Jackson, Mississippi, last year, a conference was held and a number of horticulturists throughout the Gulf Coast area gave assurance that they would take advantage of this opportunity and are searching for promising material for propagation. This conference will be followed up at Jacksonville, Florida, to determine the progress which has been made. This is a worthwhile project and it should be continued for a number of years.

Okra

Thirteen P.I. lines of okra were planted in 1961. Of these, P.I. 120833 shows possibilities for use as a fiber plant and is also highly resistant to nematodes.

In addition to improving the commercial varieties of okra for the fresh market and for canning, breeding to increase the oil content remains one of the objectives in the breeding program, and some of the present selections contain from 18 to 20 per cent oil.

Cooperative research is also being conducted with the Arthur D. Little Company on the mucilaginous properties of okra, and it is our opinion that it is one of the best crops that can be grown in the United States for this purpose.

Additional studies on okra consist of cooperative work with Dr. Wolff of the Peoria Laboratory on its use as a fiber crop. He has requested a 500 pound

sample of field dry stalks of the Louisiana Green Velvet for laboratory tests this season. As mentioned above, P.I. 120833 shows great possibilities as a fiber plant. In connection with these fiber studies, Kenaf (Everglades 71) and Crotalaria juncea are being grown in replicated plantings. Samples are being sent to Dr. Wolff for testing for fiber length and strength along with the okra samples.

Ornamentals

Plant Introduction 239684 (Plectranthus ciliatus) has appeared to be very well adapted during the spring and summer in this area and appears promising as a ground cover. P.I. 260987 (Tacca macrantha) has made little growth at Baton Rouge but is under observation. A 12-inch growth has been reported on this accession from Avery Island. The three Ilex selections (P.I.'s 267824, 267825, and 231948) sent to Dr. O'Rourke are still very small but are alive and under observation. He has also reported that the Lycoris bulbs which he received in 1960 are now making their first growth. These are alive with the exception of L. chinensis (P.I. 162443).

Of the 15 Japanese azaleas received in 1959, P.I.'s 227079, 227104, 230609, 230611, and 230976 have died. The others are still alive and are being observed.

All of the 19 camellia introductions received on April 24, 1961, are alive and under observation.

Sixty-two other introductions of ornamentals have been received at Baton Rouge since 1959; however, Dr. Kimbrough has indicated that it is still too early to report on their possible use in the ornamental program.

From brief, preliminary observations by commercial nurseries, it would seem that some of the introductions might have possibilities in Louisiana. Pyrus calleryana "Bradford" (P.I. 209840) appears to be a good blooming, shade tree at St. Martinville, while the report from the Opelousas area on the same accession is that it has not borne as yet. Jasminum polyanthus (P.I. 239481), Tocoma sp. (P.I. 266388), Quercus gilva (P.I. 237893), Quercus glauca (P.I. 237894), Quercus sp. (P.I. 237895) are all reported as being from two to three feet high at Avery Island.

A further report from a commercial source indicates that Podocarpus gracilior (P.I. 241377) appears to be good for tub specimens and that Nolina recurvata (P.I. 249498), Kohleria amabilis (P.I. 238875) and Strobilanthus lactatus (P.I. 240766) seem good as pot plants. The Boehmeria biloba (P.I.'s 236017 and 239076) is reported as unusual as a potted plant, and the Hedera helix 'Buljaria' (P.I. 244685) was specifically mentioned for its hardiness.

Pigeon Peas

For several years collections from various plant introduction agencies have been made of varieties of pigeon peas with the hope of finding some that will fruit under Louisiana conditions. Last year P.I. 218066 was received from Dr. Langford, Dr. Matlock of Oklahoma and Dr. Velez-Fortuno of Puerto Rico. This introduction was grown in 1960 and again in 1961 and produced as many as three successive crops from the same planting. From our two years'

experience it would seem that P.I. 218066 would be an excellent variety for hay and could be cut three or four times a year when the stalks were 18 inches high. It could also be allowed to seed for various types of wild life, such as doves and partridges. These possibilities will be given consideration next season.

Out of nine additional lots, P.I. 249632 produced one crop of peas, but they were slightly late and will probably be frosted in some years. P.I. 249633 produced white seeded peas at midseason. However, the large pea, var. Kaki, which we have been seeking for years was obtained from Dr. Velez-Fortuno of Puerto Rico. The peas are as large as an English pea, and the pods contain around five large seed. It would serve as a good forage crop as well as an edible crop similar to English or southern peas. Crosses have been made between the early varieties and the better, late maturing ones.

Pepper

A total of 59 introductions have been tested and several commercial selections made. One of the objectives in this program is to obtain resistance to virus etch. We have selections from crosses between one of our ornamental type peppers, known as the Harper line, and the Tabasco. The Harper possesses many of the phenotypic characters of the Tabasco, that is, the pods are small and wax color when green and red when fully mature similar to the Tabasco, but are more heart shaped and the plants are also somewhat more dwarf than the Tabasco. We have found that the Harper crosses readily with Tabasco and is very resistant to the etch virus. We now have selections in the F_4 and F_5, which are pure enough to be used as Tabasco and which have the approval of the Tabasco industry. These resistant lines are being tested at Baton Rouge and in the commercial area, and several have shown satisfactory resistance and good commercial type.

We have also used the introductions in crosses to obtain commercial types of Cayenne, Paprika and Pimiento.

Irish potatoes

Seed potatoes of Solanum acaule were obtained several years ago from the Potato Introduction Station at Sturgeon Bay. Crosses have been made between it and Katahdin and also Red LaSoda (Solanum tuberosum) and selections are now in the F_3 and F_4. A large population is being grown at the present time. Half of the selections is being grown outside to test for cold resistance. As previously mentioned, Solanum acaule will withstand temperature as low as 25° C. without damage. A commercial variety carrying resistance to even slight frost damage will be of great value to the Gulf Coast area of the South as well as other areas where frost damage occurs. Efforts are also being made to determine how frost resistance is inherited.

Sweet potatoes

We are continuing to bring in breeding material of sweet potatoes from all parts of the world through plant introduction and through cooperative work with various experiment stations and breeders of other countries. This program has been very productive, and most of our releases within recent years show resistance to one or more diseases. We now have some varieties with resistance to as many as three or four diseases. While trying to incorporate resistance, we are also trying to increase the yielding ability. In the Centennial, for example, we have a variety which possesses resistance to four diseases and produces a yield of around 100 bushels more per acre than other commercial varieties. We consider this a real accomplishment. Again, it has required five to six generations of crossing and backcrossing in order to combine and bring out all of these characters.

Progress Report S-9

Mississippi Agricultural Experiment Station

Workers with the Mississippi Agricultural Experiment Station, USDA and private individuals during 1960 and 1961 made use of 316 plant introductions. When number of cuttings was considered the total number of plants introduced numbered 391 for the two years. These, by years, were as follows:

1960	Pennisetum	12
	Paspalum	33
	Cynodon	8
	Phalaris	1
	Medicago	56
	Trifolium	8
	Helianthus	47
	Citrullus	24
	Vitus	12
	Sweet potato (7)	42
	Eurya (2)	8
	Magnolia	1
	Passiflora	1
	Rhododendron (2)	10
	Brassica	39
	Ilex (3)	21
	Jasminum	2
	Tecoma	2
	Sarcococca	1

1961	Zea	15
	Sweet potato (4)	12
	Trifolium	4
	Paspalum	1
	Euchlaena	1
	Brassica	29

In addition, domestic exploration in 8 South Mississippi counties has resulted in the following collections:

Apples	28	Peaches	20
Chestnut	1	Pears	16
Crab Apple	2	Pecans	9
Figs	3	Plums	22

Some of the selections have been propagated and assigned PI numbers from 277084 to 277107. Further exploration is planned in June or July, 1962.

Several observations should be made relative to this project as concerns Mississippi.

1. Forage Crops

   (a) A disease, Sclerotinia homeocarpa, is attacking Bahiagrass and Coastal Bermudagrass in the southern half of the State to such an extent that resistance is being sought. Argentine Bahia appears less susceptible.

   (b) Paspalum species introductions have been used to produce 43 species hybrids. The F_2 of the Dallisgrass x Bahiagrass shows great promise for seed production in Dallisgrass.

   (c) Wide variation in resistance to rootknot nematode is being shown in forage legumes, especially red clover.

2. Horticultural workers are showing great interest in vegetable and ornamental introductions.

3. Turf workers are very interested.

4. All interested workers are continually looking for disease and insect resistance, quality characteristics, and new characteristics for specific conditions, cytological studies, and character transfers.

5. Many introductions are now being used as parents or backcrosses for breeding programs.

NORTH CAROLINA - NEW PLANTS PROJECT

Report to S-9 Technical Committee - Rio Piedras, Puerto Rico, Dec. 13, 1961

Fifteen cooperators received 1507 introductions from December 1, 1960 to December 1, 1961. The breakdown is as follows:

	Number			
Crops	PI's	Genera	Species	Cooperators
Vegetable	514	4	4	4
Legume	406	20	130	2
Oil	321	3	11	1
Ornamental	228	30	43	6
Grass	15	4	4	3
Fiber	14	2	5	1
Fruit	8	1	1	1
Misc.	1	1	1	1
Total	1507	65	199	-

During 1961 the 269 cultivated peanut introductions Dr. Gregory brought back in 1959 from South America were sent to Experiment, Georgia. In addition the wild types were sent out to cooperators in the area. Dr. Gregory made a second exploration early in 1961 and collected 179 introductions of both cultivated and wild types. The wild types will be sent out as soon as possible due to the difficulty in maintaining them in the greenhouse. The cultivated lines will be sent to Experiment as soon as the seed has been increased.

The greatest number of introductions were vegetable lines. All lines of Solanum melongena are to be screened for root knot resistance. All introductions of Cucurbita pepo are being screened at the mountain station for disease resistance. Nine introductions of Daucus carota were screened for adaptability in the mountain area. One introduction of Lycopersicon esculentum PI 247089 has been crossed with a number of named varieties to incorporate its earliness into the breeding program. This PI, the Australian variety Kyi, is early, flat, rough, and cracks.

Summer annual legumes, numbering 106 introductions are being tested for adaptation and yield. Advanced tests on summer annuals for green manure have given encouraging results in our search to find a replacement crop for the banned Crotalaria striata and Crotalaria spectabilis. Cajanus cajan PI 218066 Crotalaria grantiana PI 68849, Crotalaria incana PI 247408, Crotalaria juncea, Texas 374 and others, Crotalaria usaramoensis PI 171960, and common hairy indigo yielded better than the check C. striata. These lines are now

being screened for nematode resistance and toxicity. In addition 46 introductions of the legumes grown in 1960 were sent to Peoria for analysis. Twelve of these had viscous properties.

Winter annual legumes, 300 lines, are being screened for adaptation, winter hardiness, and potential as pasture and green manure crops. These introductions aredoing very well despite a very dry Fall.

All available introductions of Brassica spp and Eruca spp., 321 lines, are being screened for adaptation and winter hardiness. All introductions were fall planted and the stands have been spotty due to very low rainfall. A good winter annual cash crop would give many farmers an excellent opportunity to double crop their present small crop acreages.

Two hundred twenty-eight ornamental introductions have been received. Two new testing locations for ornamentals have been initiated, one in the southern mountain region and the other in the upper coastal plain region. All available introductions will be tested in the future at these three locations or at the one station of adaptability.

The fescue and orchardgrass introductions received are being screened along with other lines received in past years. A new turf grass management position was established in September, 1961. Dr. W. B. Gilbert is in charge of this project. Many introductions suitable for turf will be screened in the future.

Four species of bamboo, Phyllostachys, were received in 1961. Shooting percentages were still low but increased over 1960: P. viridis PI - 77257, 12%; P. bambusoides PI - 40842, 22%; P. makinoi PI - 195284, 36%; and P. rubromarginata PI - 67398, 48%.

Many crops known to be of value to industry are being grown in conjunction with the New Crops Branch of U.S.D.A. A few of these follow:

Potential Oil Crops for Industry - Fall planting, two dates at Clayton: 1960.

Crop	Stand 9/9	Stand 10/4	Winter Survival	Yield 9/9	Yield 10/4
Dimorphocheca aurantiaca	None	None	—	—	—
Crambe abyssinica	Ex	Ex	No	—	—
Brassica napus (Golden)	Fair	Ex	Yes	Poor	Good
Brassica compestris (Polish)	Fair	Ex	Yes	Poor	Good
Eruca sativa	Ex	Ex	Yes	Good*	Good
Vernonia anthelmintica	Fair	None	No	—	—
Calendula officinalis	Tr	Tr	No	—	—
Daucus carota (Wild)	None	None	No	—	—
Limnanthes douglasi	None	Ex	Yes	—	Good**

* First date of seeding looked best.
** Good seed set, but not feasible for harvest as is.

Potential New Crops for Industry - Grown Summer, 1961

Constituent of Interest	Crop	Location	Stand	Flowering Date	Disease	Yield #/Acre	Comments
Oil	Hibiscus cisplatinus	1	Excell.	8/15	None	N.C.*	Enough for analysis
	Dimorphotheca aurantiaca	1	Good	7/26	50% killed	N.C.	Abandoned
	Hibiscus grandifolorus	2	Good	9/15	None	No seed	
	Vernonia anthelmintica	4	Excell.	8/10	None	300-800	Was combined. Good possibilities
	Hibiscus syariacus	2	None				
	Vernonia pallens	4	None				
	Thalictrum dipterocarpum	1	Transplanted but wouldn't grow				
	Heracleum lanatum	4	None				
	Iesquella densipila	1	None				
	" globosa	1	None				
	" lescurii	1	None				
	" stonenis	1	None				
	Crambe abyssinica	2	Good	Plants don't set seed in summer in our area.			
Fiber	Hibiscus cannabinus	4	Excell.	None	None	N.C.	Good at some locations
Seed Gum	Crotalaria intermedia	1**			5% virus in all lines	Not. calc.	
	NU 28786		Ex.	9/15		Good	
	NU 28786 NC		Ex.	9/15		Good	Cassia marilandica None
	PI 106972		Ex.	9/15		Good	(Seed need light to
	PI 225881		Ex.	9/28		Good	germinate)
	PI 213378		Ex.	9/15		Good	
	PI 244587		Ex.	9/15		Good	
	PI 244585		Ex.	8/22		Good	
	PI 22820		Ex.	9/15		Good	*N.C. = Not calculated
	R-71		Ex.	9/15		Good	**Planted at 3 other locations but no seed set
Crotal	Crotalaria lanceolata	1**					
	NU 17233		None	---		---	
	PI 244589		Ex.	9/6		Good	
	R-182		Ex.	8/22		Good	
	R-204		Ex.	9/6		Good	

Two new North Carolina crop varieties were released in 1961 which had plant introductions in their parentage.

Nugget, a sweet potato variety is a high yielder and has shown high consumer preference. Nugget is adapted to North Carolina, Virginia and Maryland and acreage is expanding as fast as the seed is produced. It is field tolerant to wilt and expresses a symptomless carrier reaction when inoculated with the internal cork virus. Genes for sweet potato wilt resistance from PI 153655 were incorporated into this variety.

Cherokee, an alfalfa variety, resulted from a program of seven cycles of recurrent phenotypic selection for disease and insect resistance in North Carolina. The original material upon which selection was practiced consisted of400 selected plants of about equal numbers each from Buffalo, Williamsburg, four Kansas synthetics, DuPuits PI 158837, Oklahoma Common, and Kansas Common. Yield data in percent of the mean yield of Atlantic and Williamsburg, the generally recommended varieties in North Carolina, yielded 110.8 percent of the average of Atlantic and Williamsburg. Stand data indicate definite increased persistance over Buffalo and Du Puits and possible increases over Atlantic and Williamsburg. Data indicate increased survival, resistance to leafhopper yellowing, and rust for Cherokee as compared to the above varieties. Reaction to Stemphyllium leafspot was intermediate between that of Du Puits and the other commercial varieties tested. In North Carolina Atlantic, Williamsburg and Oklahoma Common would be expected to be replaced by Cherokee and in Arkansas Buffalo might be replaced by Cherokee. A bulletin on Cherokee is now being published.

During 1962 an increased use will be made of the plant introductions available through the various Regional Stations.

1961 S-9 Report for Oklahoma
Prepared by Ralph Matlock and Roy Oswalt
Oklahoma Agricultural Experiment Station

Forage Crops: P.I. 220882 (Vicia dasycarpa) was winter hardy and both the latter and P.I. 234051 made early growth. Other Vicia introductions were held for additional evaluation. (Bates at Ardmore).

Six plant introductions of four Sorghum species were grown for observation and to increase seed for further evaluation. (DeWet at Stillwater).

Four introductions of Phaseolus aconitifolius were grown and P.I. 218101 (M-723) produced the highest forage and seed yields. (Matlock at Perkins).

Pulse Crops: Selections of Cajanus cajan for early maturity from P.I. 218066 (Sp-46) produce high forage but low seed yields like parents.

One introduction of Dolichos biflorus (Sp-162, P.I. 212636) produced good seed yield when planted June 21. Other introductions produced good forage but low seed yields.

Fourteen plant introductions of Voandzeia subterranea did not mature in time to survive. Ten introductions produced some seed under conditions at Stratford. P.I. 240869 (p-131) has the best vine growth and P.I. 241984 (p-135) has the best pod yield. (Matlock at Perkins and Stratford.)

Four plant introductions of Pisum sativum were early. Winter hardiness and tolerance to aphids were important characteristics noted in the above. (Hardin at Geary and Bates at Ardmore).

Certain chickpea (Cicer arietium) introductions produced well in observation plots. Seven failed to germinate. (Matlock at Paradise).

Oilseed crops: Introductions of Guizotia abyssinica bloomed too late to produce a good seed crop at Paradise. Crambe abyssinica flax and Euphorbia were grown and performed reasonably well under conditions at Paradise.

Pulp crops: Eight Okra (Hibiscus esculentus) introductions produced from 2931 to 4388 pounds of dry matter in replicated test at Perkins. Single replications of four Sesbania accessions produced 3430 to 6534 pounds per acre of dry matter. Plant introductions and selections of five species of Crotalaria showed considerable variability in yield of dry matter. Yields from observation plots with good stands ranged from 780 to 4320 pounds per acre of dry matter. No seed yields were taken but the C. spectabilis and C. retusa had the most productive introductions and selections. Pod drop and hard seed could pose a severe volunteer problem. (Matlock at Perkins).

Gum crops: Three new guar introductions were grown to obtain seed for further evaluation.

Vegetable Crops: Earliness, compace plant type, thick walls, determinate growth, fruit free of cracks were important characterists noted for tomatoes among the introductions screened by M. H. Hardin at Geary.

Certain field and garden beans were crossed and early productive types were noted. P.I. 229815 was particularly early and productive at Geary.

The sweet potato introductions from Ethiopia were lacking in most of the characters valued in this country. Preliminary screening indicated that P.I.'s 259165, 251602 and 260613 carry resistance to root knot (Meloidogyne incognita acrita). (Cordner and Struble at Perkins).

Curcurbita moschata introductions P.I.'s 162889 and 195311 were each crossed with other types and these have resulted in some very promising lines. (Hardin at Geary).

Of the 49 grape (Vitis) introductions evaluated and valuable characteristics noted to date include excellent growth and winter hardiness while some showed weak, slow growth and others did not survive. (Earl Johnson, Oklahoma City and Herman Hinrichs, Stillwater).

Ornamental and house plants - Jerry Matlock, Stillwater.
P.I. 235915 was one of the outstanding introductions of chrysanthemum received. P.I.'s 267824 and 267825 (Ilex) appear to be hardy enough to survive on a north exposure at Stillwater. P.I. 237644 (Anthurium scherzerianum) is a very attractive foliage plant that can be seed propagated.

State Report -- New Crops

Puerto Rico

Submitted by Roy O. Woodbury
December, 1961

A total of 100 accessions were received during the past year. The following list gives a breakdown of the varieties received.

Cardomon (spice) 6 accessions

Corn.....7
Sugar cane.....18
Grapes.....19
Carica species..... 9
Passiflora (fruit)..... 2
Anones (fruit)..... 2
Citrus..... 1
Jaboticaba..... 1
Tomatoes..... 1
Pepper..... 1
Bixa..... 1
Naranjillo..... 1
Melon..... 1
Pumpkin..... 2
Ornamentals..... 8
Watermelon..... 1
Grasses & legumes.....19

Grasses continue to do well especially the Digitarias and Panicums (especially the dwarf forms from Africa). More work is needed on these for analysis. Papaya studies have progressed rapidly in screening for disease and production of papain. Further testing is necessary.

Grapes have been transferred to the fruit substation for further evaluation. They are very subject to mite damage.

Aceituna - Several of these trees bore this spring for the first time. One tree in the Gurabo planting appears outstanding in production.

The corn and sorghum varieties which were planted for seed increase were harvested and sent to Dr. Langford. The corn did very well with us but we had very poor germination and behavior with the sorghum.

The strawberry variety test at Castaner continues to show good results, especially with the two commercial varieties Florida-90 and Missionary. The Corozal planting on the other hand was badly infected by disease with

most of the plants being destroyed. The leaf and root infections contained Cladosporium herborum on the leaves, and Physolospora, Glomerella, and probably Phytophthora on the roots.

The five varieties of commercial potatoes which were increased for seed were lost due to malfunctioning of the cold storage equipment.

The following fruits have not been transferred to the fruit station in Fortuna:

Grapes, Dates, Sapucayo nut, and Macadamia nut

Work planned for next year:

1) To continue the work in progress.

2) To continue the introduction and testing of plant material.

3) To continue cooperative work with the Southern Region in the multiplication of seed and in speeding up breeding programs in winter seasons.

South Carolina
December 6, 1961

by J. A. Martin

During the year 1961 South Carolina workers have received approximately 5,000 P.I. accessions through the S-9 Regional Plant Introduction Station. All workers in South Carolina who have received material were asked to submit a report on the "highlights" of their findings to date for inclusion in this report. Only about a half of the cooperators have filed reports covering their findings in testing P.I. material. A brief report is hereby submitted and based on all reports received to date.

Special Crops

Okra: During the 1961 growing season 246 P.I. okra accessions were grown at the Sandhill Experiment Station, Pontiac, S. C., on a nematode infested soil. Clemson Spineless okra was used as check and it was planted at every eight row interval. The seed was planted on May 31. By July 25 - it was clearly evident that both root knot nematodes and Fusarium wilt were killing a number of accessions. The wilt was cultured by Dr. W. M. Epps, Pathologist at Clemson, and identified as F. oxysporum f. vasinfectum. The root-knot nematode was not checked, but it was believed to be cotton root-knot nematodes. The following accessions were judged to possess some resistance to both wilt and nematodes:

P.I. 109215-4	P.I. 167108
116803	169705
117095	169710
120660	171659
120833-1-3	171660
120841	172672
124398	173672
140317	174005
140318	174007
164564	176383
165496	176384
165501	176386
167027	

The following breeding lines involving the use of P.I. accessions in the original crosses showed promise as having resistance to either or both of the pests:

Clemson Spineless okra x P.I. 109215-3-5
" " " x P.I. 178808-3-10

It is planned to evaluate the above okra accessions and breeding lines in a more extensive test in 1962 using the same land on which the 1961 test was conducted.

Peppers: 161 new P.I. pepper accessions were evaluated in field tests to determine the various plant characteristics. Seed increase from most of the accessions were obtained. Tobacco mosaic virus was extremely severe over

the entire pepper nursery during the season. This disease made it difficult to properly evaluate many of the accessions for commercial use. However, it is planned to re-evaluate a number of lines next year. A report on the evaluation of the pepper accessions as well as deed stock may be obtained from Regional Plant Introduction Station, Experiment, Georgia.

Chufas: The 1960 and 1961 chufa nurseries were completely wiped out by an unknown disease. The plants had made excellent growth during the summer months, but the tubers were all affected by a "dry-fike" fungus at harvest time in late September. Samples were submitted to pathologists, but the disease could not be identified.

Coleus collection: The coleus accessions have added much to colorful displays during Farm and Home and other events at Clemson during the year. Sufficient information has been obtained to justify the publication of a bulletin on coleus. Lack of time has prevented the completion of this task, but plans are to go ahead and publish one as soon as a suitable color plate can be developed to show the true colors of each variety. The evaluation of the coleus accessions are listed on pages 41 and 42 of the Minutes of the Meeting of the Technical Committee, S-9, December 1-2, 1960.

Sesame: 35 new sesame lines were obtained from Dr. D. Y. Langham, Maracay, Venezuela , and New Haven, Connecticut, just in time to meet the planting date at the Sandhill Experiment, Pontiac, S. C. Among these new lines are a number of 8 row capsule types which are different from anything tested here before. Apparently, these new 8 row types hold the seed at maturity much better than any other 8 row type tested. All these lines will be tested again in 1962 and for possible use in making crosses. Seed is available to those interested in testing these new lines.

Kenaf, okra, and Crotalaria juncea for Paper testing: A test was initiated at Sandhill and Pee Dee Experiment Stations to study the effects of various rates of fertilizer, cultivation vs non-cultivation, and location on the yield and quality of Kenaf, crotolaria, and okra for paper manufactures. The field harvest has just been completed, but yield data and other measurements are not ready to include in this report. However, a brief summary is listed below to show progress made to date:

1. Kenaf, highly susceptible to root-knot nematodes, was a complete failure at Sandhill Station due to this pest. No samples or yield data available. At the Pee Dee Experiment the Kenaf produced well under both cultivated and non-cultivated plots. Some root-knot nematodes present, but damage was slight.

2. Crotalaria juncea produced an excellant crop at the Sandhill Experiment. The crop appears to be immune to root-knot nematodes. It competes well with grass and weeds. Apparently, with good seed bed preparation this crop would produce consistant high yields of good fiber.

3. Okra was a complete failure at both locations due to root-knot nematodes wilt, and other factors.

Vegetables: Report from Dr. James C. Hoffman, Horticulturist
U. S. Vegetable Breeding Laboratory
Charleston, S. C.

"Over 100 P.I. accessions of beans were grown during 1961. Most of these were field beans. In fact, about 95 percent of these would be used for eating as baked or boiled beans. We have some interest in this type as parents, but not as much as when the program was originally started. Great Northern and several others were used as parents and I believe these P.I. lines originally were developed from the old field bean types."

"We saved seed from 16 P.I. accessions and these will be observed more in detail another year. One line had green seed; this is a character that we need, however it has been linked with high fiber content. Possibly this new selection P.I. 174997 could be of real value. There was a regular pole bean type selected from the above bean that had good appearance. This pole bean had brown seed, not green."

"I have no unusual comments on the others before checking them another season. They include the following:

P.I. 175829	180752	264142
207203	229813	264240
251049	229815	186502
180733	261620	200958
180729	261621	207204"

Report from Dr. W. L. Ogle, Associate Horticulturist
Department of Horticulture
Clemson College, S. C.

Work continues with testing of Southern peas for wilt resistance. More detailed results of this work will be reported later.

Report from Dr. W. C. Barnes
Clemson College Truck Station
Charleston, S. C.

Release of a slicing cucumber, Polaris, and a pickle, Pixie, has been approved. Foundation seed will be distributed during the winter for increase in 1962. Seed sales to growers will begin in 1963. Both of these cucumber varieties have P.I. 197087 in their ancestry. Dr. Senn has copy of Pixie photo.

Both of these varieties have very good resistance to downy mildew, powdery mildew and race 1 anthracnose plus moderate resistance to race 2 anthracnose.

P.I. 196289 is being used in further breeding for resistance to race 2 anthracnose.

The P.I. 189028 broccoli has been used in crosses with SC lines to impart a high degree of resistance to downy mildew.

In the development of summer squash varieties resistant to squash mosaic virus, P.I. 172870 and P.I. (from Ames, Iowa, P.I. Station) and P.I. 135394 (from Geneva, New York P.I. Station) appeared to have the highest degree of virus tolerance. P.I. 172870 and P.I. 169454 were crossed with yellow-crookneck summer squash and P.I. 135394 was crossed with yellow straightneck summer squash. Seventh generation selections with high tolerance to squash mosaic virus are being tested in replicated yield trials.

Bamboo: Report from Mr. J. H. Crawford, Assistant Horticulturist, who has recently been placed in charge of the bamboo project. Most of the work to date has been conducted at the Edisto Experiment Station, Blackville, S.C., where 100 acres is devoted to the work.

Soil samples from bamboo plantings were taken by Mr. Bobby Skelton during August 1960 from 24 locations over the state. The samples were analyzed for P. K. and pH by Clemson College Soils Department. From these results there was an indication that the pH was too low in the plantings at Edisto for optimum growth.

During February 1961 two tons per acre of dolomitic limestone was applied to all plantings at Edisto. The same fertilizer program was maintained.

On July 5, 1961 a nitrogen test was set up in a young planting of Phyllostachys bambusoides. The plants began to respond within two weeks in that the leaves grew thicker and darker green in color.

During the last week in July nitrogen at the rate of 100 lbs. per acre was applied to forty acres of young bamboo.

The bamboo made excellent growth during 1961. Some of the older plantings of P. bambosoides and P. viridis are beginning to matt over the entire area.

A 3 x 3 N-P-K factorial experiment will be initiated at Clemson during the spring of 1962. This will help in establishing a fertilizer recommendation for bamboo. There also will be a replicated irrigation study installed.

Ornamentals: Report from Mr. Wm. C. Frierson

"Most valuable of the plants received are:
1. Ilex crenata, yellow berry.
2. Ilex glabra leucocarpa, white berry.
3. Camellia japonica kominata, very hardy.

Most azaleas and some oriental hollies were lost in freak freeze. Other plants do not impress us much. The above three are superb."

Fruits: Report from Mr. H. J. Sefick, Associate Horticulturist.

In 1959 scions of seven P.I. pear accessions 199762, 214185, 215325, 228014. 231798, 231802, and 231812 were top-worked into 15-year-old Richard Peters trees, one selection per tree. The first four listed above showed less susceptibility to pear-blight in 1960 and 1961 lead blight years. These four were budded into open pollinated Orient Nursery seedlings in 1960. None of the budded trees blighted in 1961.

1961 Annual Progress Report for Tennessee on S-9
Project Evaluation of New Plants (Hatch 57)

A total of 153 P.I. accessions were received by Tennessee cooperators during 1961 for study of agronomic or horticultural adaptation.

J. K. Underwood acquired 133 agronomic items during the year. Genera involved were principally Agropyron, Agrostis, Bromus, Dactylis, Festuca, Hordeum, Panicum, Setaria, Phleum, and Poa. J. S. Alexander obtained six woody ornamental species for test and L. M. Josephson received one Zea mays line for breeding. Four commercial nurseries acquired a total of thirteen P.I. ornamentals for evaluation or increase.

Twenty-nine forage grasses were evaluated during the growing season of 1961. A tentative report on yield and disease susceptibility was made. A near complete report was made on most of these accessions following the attached form. Some of the observations require two full seasons.

The lines showing the highest dry weight yield were P.I. 162704 (Euchlaena mexicana) 5.25 T/A. Harvesting for seed would be a special problem. The plant is very susceptible to bud-worm and cannot compare with corn for silage or grain. Panicum maximum (P.I. 253718) yielded 5.01 tons in two cuttings. Echinochloa frumentacea (P.I. 217911) in three cuttings gave 4.32 tons and Chloris gayana (239225) produced 4.16 tons per acre in one cutting. The remaining lines were either very low in forage yield or they possessed other undesirable characteristics.

Chlorophytum laxum varegatum is attractive as a pot plant having lax grass-like leaves with a silvery edge.

Fragaria vesca 'Attica' (P.I. 253536) is an Aberdeen type with a medium-large, round, soft fruit, sunken seed, a moist, bleedy surface and a flush attachment. I question whether this is F. vesca.

Among ornamentals, Ilex mutchagara seedling (P.I. 235583) is a narrow leaved, short-spined holly that is compact, dark green and slow growing. Three evergreen oaks continue to hold our interest, Quercus glauca (229887) with leathery, glossy, dark green leaves of chestnut type; Q. wrighti (P.I. 235433) a small-leaved evergreen of promise and Q. phillyraeoides (P.I. 229889). Degree of hardiness remains a questionable factor. Rapheolepis umbellata (P.I. 54670) with umbellate fans of leathery leaves shows promise as a picturesque ornamental. Cryptomeria japonica (P.I. 239481) has excellent foliage on nicely cone-shaped 5-foot trees that have been hardy since planting in May 1959. Eurya ochnacea (P.I. 235502) continues to show some promise as an evergreen shrub with some fall color.

Osmanthus illicifolia 'Gulftide' continues to look good with dark, tight foliage, erect habit and slow growth. Podocarpus nagi (P.I. 235432) shows promise as an excellent foliage plant as does Sarcococca ruscifolia (P.I. 242896).

Twenty-one chrysanthemum accessions were noted in the greenhouse. None

were considered suitable for outdoor culture. P.I. 240386, a showy, white, decorative-double with small dark ash center, even bloom and good stems was considered best in the group as a pot plant. Another white spoon (P.I. 240381) with small flowers, even bloom and strong stems also has good pot characteristics. A light purple spoon (P.I. 236061) was rated as a good cut flower type as was P.I. 235942, a light pink-purple with tubular rays and yellow center. P.I. 235952, a very showy, long-stemmed, white spoon was considered another good mum for cutting.

The A-2 rootstocks from Sweden were killed by fireblight at the Plateau Experiment Station.

Condensed Annual Report - Texas
Prepared by Eli L. Whiteley

Research workers in Texas received about 1700 accessions in the 1960-61 crop year. These accessions were grouped as follows: 65 sorghums, 7 cereals, 17 legumes, 9 corn, 70 grasses, 450 Cucurbitas, 48 Brassicas, 14 castorbeans, 112 tomatoes, 102 peppers, 104 guars, 177 peanuts, 21 sesame, 51 sunflowers, 375 Vignas, 38 Cucumis, and about 130 miscellaneous accessions consisting of mostly ornamentals.

Most of these plants were introduced for use in existing breeding programs or for adaptation studies. Generally the research worker is looking for some specific characteristic which can be used in his breeding program. However, a number of accessions were tested in adaptation and production studies for their possible value for use in industry.

Plants released:

Starr, a cross between Spantex and P.I. 161317, is a new Spanish peanut adapted to all the peanut growing areas of Texas and produced 10 to 20% more peanuts than standard varieties in tests over the State.

Hale is a dwarf-internode castorbean variety developed in the cooperative castorbean program of the USDA and the Texas Agricultural Experiment Station. It is resistant to bacterial leaf spot and Alternaria leaf spot. Hale is a pure line selection from the cross RA 11-15-4 x Cimarron, made in 1953. RA 11-15-4 is a sister selection of the Dawn variety. Dawn was developed from an unnumbered introduction obtained from Brazil through personal contact by Dr. J. C. Miller, Louisiana Agricultural Experiment Station.

Eight Coleus varieties were released to the ornamental horticulture trade and have been well accepted. These varieties are listed below:

Autumn - P.I. 249770	Blackburn - P.I. 249773
Crimson Velvet - P.I. 249777	Freckles - P.I. 249783
Laing's Croton - P.I. 249787	Pineapple Beauty - P.I. 249793
Red Croton - P.I. 249795	Vesuvius - P.I. 249806

Work Planned for Next Year---The work at College Station will be concentrated on oilseed and paper pulping materials. A date of planting, row spacing and exploratory fertilizer tests will be conducted on Crambe abyssinica. Three Brassicas and nine Lesquerellas will be tested as winter annuals. Eight selections of Dimorphotheca aurantiaca have been planted for further testing as winter annuals. Crotalaria juncea, Kenaf and Sesbania spp. will be tested as paper pulping materials. About 116 lines and 212 selections out of these lines of C. juncea will be tested next summer.

A memorandum of agreement has been developed with Anderson Clayton Company and Rio Farms, Inc. to make an economic, production and processing evaluation of Crambe abyssinica. The seed will be produced in the Rio Grande Valley and pilot studies on the oil and meal will be conducted at College Station.

Plans are being formulated for continuing work with Champion Papers, Incorporated on *Crotalaria juncea*. If seed are available and plans can be completed, a large planting of *C. juncea* will be made in the Rio Grande Valley.

This planting will be large enough to procude enough pulp for a trial run on a paper machine.

Work will be continued with other species which show potential value for industrial uses.

Report of Regional Station Activities

W. R. Langford & Grover Sowell, Jr.

The number of introductions received, catalogued, and distributed by the Regional Station between October 1, 1960 and September 30, 1961 is summarized in Table I.

Seed of vegetative stocks or 1133 new accessions were received during the year. These represent a wide assortment of materials. There were no large collections of any single species such as we had with sorghum and peanuts last year. The largest collections received this year were 172 sorghums, 56 Capsicums, 201 Arachis, and 83 watermelons. We anticipate receipt of about 900 accessions of peanuts which were grown under quarantine at Beltsville this year and will be sent to the regionat station this winter.

Table 1. Introductions Processed by the Southern Regional Plant Introduction Station, October 1, 1960 to September 30, 1961

New introductions received	1,156
Number grown at Regional Station	3,003
Number grown under contract	115
Number catalogued	1,329
Seed packets distributed	
(a) within southern region	8,205
(b) outside of region	5,737
S-9 cooperators received from other stations	6,707
Total received since 1949	18,658

The project to collect fruit stocks in Gulf Coast area was continued with four states, Alabama, Mississippi, Louisiana, and Texas, participating. Sixty-five items collected through this project have been assigned P. I. numbers. Dr. Overcash, in Mississippi, has several additional items that he is trying to maintain and propagate for assignment of P. I. numbers. A number of items in southwestern Alabama have been tagged for collection this winter.

Thirty one hundred accessions were grown for seed-increase during 1961. Over half of these were old materials grown for re-increase because they were low in supply or low in viability. The regional station grew 3003 different items and 115 were grown under contracts. We continue to have difficulty increasing many accessions because of their day-length requirement. This year we had over 200 accessions that failed to mature seed before frost. Most of these are tropical legumes and grasses. In horticultural crops we have 125 peppers that failed to flower and set seed before frost at Experiment.

A national program was initiated in 1960 to inventory asexually propagated tree fruits and nuts. December 31, 1961 has been set as the deadline for completion of the inventory. Six stations in the southern region have reported 367 items to date.

Further tests were conducted to determine the value of five watermelon introductions that showed considerable tolerance to Mycosphaerella melonis in initial desease screening trials. In a field planting the disease was moderate on the resistant lines while the susceptible standard variety was defoliated early in the season. P.I. 255136 which produces a large melon but with yellow flesh and poor quality appeared to be the most resistant introduction in this test. A relatively large increase of the five resistant introductions was obtained. This will permit their distribution to all interested watermelon breeders. The screening of Cucumis melo introductions for resistance to the same disease was continued with a total of 362 introductions of this species now having been screened. Thirteen of these gave a resistant reaction in the preliminary tests. Replicated tests must be conducted before any reliable conclusions can be drawn regarding their resistance.

At the last S-9 Technical Committee meeting a need was expressed for an introduction of Cyamopsis tetragonoloba resistant to Alternaria leafspot. This disease seemed adaptable to techniques used at our atation in screening for resistance and represents one of the serious disease control problems in the region. Preliminary research indicated that guar seed carries at least three pathogens. These pathogens must be eliminated or reduced to a very low level if reliable results on resistance to a specific disease are to be obtained. In a series of experiments it was found that soaking the seed for one hour in cold water, followed by treating the seed in hot water at 54° C. for one hour made it possible to grow plants which were satisfactory for screening tests. Seed treatment should be investigated as a control of guar diseases in the field. Hot water treatment at a temperature of 55° C. significantly reduces the germination of guar seed. Treatment at 53 or 52° C. may be effective in controlling at least some of the diseases and it would be safe to use on the field scale.

The fungus which causes Alternaria leafspot has been identified as Alternaria cucumerina (Ell. and Ev) Elliott. A. cucumerina attacks many cucurbits and is common in Georgia on cataloupes. Preliminary evidence indicates that special forms of the fungus, not pathogenic on plants of another family, occur on guar and on the cucurbits. This indicates that the fungus is quite variable and may be able to overcome some sources of resistance. Isolates of the fungus from Texas and from Georgia have been obtained. A Texas isolate is being used in the preliminary screening tests. Introductions showing resistance in this test will be placed in replicated tests and evaluated for resistance to Texas and Georgia isolates of the fungus. This research should be completed soon enough to allow the most resistant lines to be tested in the field next summer.

A number of diseases were observed in the Regional Station nursery which had not been observed previously. These diseases have been reported previously

in the United States and do not represent the introduction of new diseases into this country. Studies were continued on the two disease organisms on guar which have not been reported previously in this country. These are Colletotrichum capsici and Xanthomonas sp. (perhaps X. cyamophagus). C. capsici is common on pepper in the United States. Consequently, unless the fungus on guar is a new special form, there is no problem regarding the quarantine of seed which may carry the fungus. Although the pathogenic bacterium has not been reported previously in the United States it is now believed, based on guar sent to our laboratory by Dr. Matlock, that the disease occurs in Oklahoma. It seems likely that both diseases previously unreported on guar have been present for some time and have not been recognized because of the similarity of their symptoms to those of Alternaria leafspot. In field plantings of guar at Experiment, Georgia, it has been impossible to positively distinguish between the three leafspot diseases. Studies of the symptoms caused by the three disease organisms grown in pure culture were undertaken to clarify this confusing situation. The distinguishing characteristics insofar as they have been determined are as follows:

1. Alternaria leafspot, caused by Alternaria cucumerina: Spots have concentric zonation typical of Alternaria leafspots.

2. Bacterial blight, caused by Xanthomonas sp.: Young spots have water-soaked appearance. Older spots uniform, never zonate.

3. Anthracnose, caused by Colletotrichum capsici (Syd.) Butler and Bisby: Symptoms very similar to Alternaria leafspot in early stages but without distinct concentric zonations on older spots. Black pimples (acervuli) barely visible with the naked eye, may form in the spots.

The importance of distinguishing these diseases in the field cannot be over emphasized. It is essential for the effective utilization of any sources of resistance to specific diseases, located as the result of screening tests at the Regional Station.

The compilation of data from other research workers on the resistance of plant introductions to diseases and insects was continued. Dr. Dan A. Wolfenbarger of Texas reported data indicating that P.I. 135826 and possibly other introductions of pepper are resistant to the leafminer (Liriomyza munda). Data of this type will be included in future editions of cummulative catalogues of the Regional Station. Full credit will be given to the research worker who conducts the research.

Major purchases for improvement of Regional Station facilities during the 1960-61 fiscal year include:

1. Addition to machinery shed at nursery.

2. Additional shelving and trays for seed storage.

3. A portable concrete mixer for mixing greenhouse soil.

4. A hygrothermograph for use in seed storage room and disease screening experiments.

5. Seed counting equipment for germination tests.

6. Electric stapling machine for stapling seed lists and reports.

7. Office furniture for the Agronomist.

Funds allocated to the Regional Station last year and those available during fiscal year 1961-62 are summarized in Table 2.

Table 2. Funds available to the Southern Regional Plant Introduction Station and Expenditures during fiscal years 1960-61 and 1961-62

Source of Funds	Amount	
	1960-61	1961-62
Regional Research Funds (Pooled)	$20,000.00	$20,000.00
Regional Research Funds (Allocated to Georgia)	4,000.00	6,000.00
State Appropriations (Georgia)	4,870.00	4,175.00
A.R.S. (New Crops Research Branch, C.R.D.)	21,875.00	21,875.00
TOTAL	50,745.00	52,050.00

Expenditures	Amount	
	1960-61	1961-62 (Proposed)
Salaries - Coordinator, Pathologist, Agronomist, Research Assistant, and Secretary	$30,807.46	$28,475.00
Labor	11,496.91	16,051.00
Travel		
Coordination of S-9 Activities	742.48	800.00
For Collection of Fruit Stocks by State Station Workers (Ala. 181.45; La. 116.35; Miss. 141.75; Texas 31.90)	472.45	500.00
Contracts with State Stations for Seed Increase		
Ga. Coastal Plain Exp. Sta. 628.00		
Puerto Rico Agr. Exp. Sta. 384.00	1,012.00	230.00
Capital Outlay	2,448.71	2,494.00
Supplies and Operating Expenses	3,586.81	3,500.00
TOTAL	$50,566.82	$52,050.00

PROMISING PLANT INTRODUCTIONS UNDER OBSERVATION IN SOUTHEAST

USDA-Soil Conservation Service, Athens, Georgia

A. H. Quintero, Field-Plant Materials Technician

During 1961, the Soil Conservation Service observed plant introductions and other accessions at three plant materials centers in the Southeastern States. These plant materials centers are located at Arcadia, Florida, Coffeeville, Mississippi, and Americus, Georgia.

Many accessions were put in tests at each of these locations. Approximately 75% of the plants came from the New Crops Branch. The Americus PMC had approximately 446 plant introductinns; Arcadia PMC had 506; and the Coffeeville PMC had 113. Other locations, such as the State Game and Fish Commission nurseries, State schools (other than land grant colleges), etc., were also testing plant introductions as a direct result of Service requests. Of course this total, more than 1,000 entries, does not represent quite that many seperate introductions since many of them were entered at more than one location.

The Service uses a multi-step observation program in evaluating materials. This program begins on the centers and ends on-site in field locations on problem sites in Soil Conservation Districts. It consists of an initial observational step (rod row); an increase step of small blocks or longer rows to secure seed for further testing; evaluation plantings of suitable size to further appraise the plants; areas of some size to produce seed for field testing; and field plantings to appraise the suitability of a plant on-site. Each step succeeds the former, year by year, as plants show promise for the need thay are expected to fill.

In such an evaluation process many accessions are carried in the initial stage of observation, but only a few survive to the final testing stage.

There are 1,000 plant introductions in the initial stage. Of these, 87 have shown some promise; 25 have been advanced to the initial increase stage; and 14 have been increased for field testing, or are being field tested.

Some of the more important and interesting accessions are: Echinochloa crusgalli - Duck millet. Echinochloa crusgalli and E. crusgalli var. frumentacea are planted in the Southeast for feeding wild ducks. Only northern grown seed are commercially available. Observations at all of our centers show that several introduced accessions would be better seed producers than the commercial seed. For example, at Americus this year only 38 pounds per acre of commercial duck millet seed were produced. P.I. 196291 was the top producer - producing 508 pounds per acre. It was followed by P.I. 211025 which produced 449 pounds per acre. Similarly, the newer accessions are producing better at Coffeeville and Arcadia. At Coffeeville, Mississippi in 1961, seed yields of about 2,000 pounds per acre were secured from commercial seed, but 4,000 pounds or more were secured from the new and better introductions.

Glycine ussuriensis - P.I.-163453 - Wild soybean (Glycine ussuriensis)

has proven valuable for its reseeding ability at the Americus PMC. At the North Carolina Wildlife Resources Commission Nursery* it has given satisfactory volunteer stands under a number of conditions of management. It has volunteered in cultivated corn, after disking, and without treatment to the land.

Soybeans are known to be good wildlife food. The seed are particularly attractive to quail. As a volunteering crop, it is one that can be easily managed for wildlife. Seed production has been heavy, but mechanical harvesting has secured only part of the crop due to shattering. However, at least 200 pounds per acre were combined out of corn at Coffeeville in the summer of 1961.

The plant also has potential as a cover crop interplanted with corn and as a hay.

Lespedeza virgata - P.I. 218004 - Lespedeza virgata is similar in many respects to Sericea lespedeza. It is somewhat smaller in overall growth and the stems are decumbent so that the growth produces a matted effect on the soil surface. Production of seed has been good at Americus - equaling Sericea lespedeza and handled in the same way.

The plant has been tested on road-cut banks in several locations in the Southeast. It seems to offer promise. Highway Departments are conscious of a need for protecting the cut slopes but would prefer a plant lower growing than sericea. The habit growth of Lespedeza virgata offers promise of providing the need. It has some shortcomings, however. For example, it lacks seedling vigor which makes establishment slow, and its ability to compete with taller undesirable vegetation is yet undetermined.

Several other Lespedeza species and accessions have low growing growth forms and are under test as ground covers for this type and other uses. (See Table 1 and 2.)

Lotononis bainesii - First planted at Arcadia in 1958. It did not grow well for a year or more. However, it finally became properly inoculated and has done well since. It is a perennial and has survived at both Arcadia and Americus. A flat growing, sod forming legume, it has spread 18 or more inches a season. It blooms profusely and sets good seed crops. Seed do not shatter badly. It is sometimes attacked by Rhizoctonia spp. but is not killed. Work in Australia indicates that close grazing reduces the effect of the disease. It has a potential as a leguminous component in sod grass pastures.

* - Reference: Graetz, Karl E. The Wild Reseeding Soybean. Wildlife in North Carolina. June 1961. PP. 14-15.

Panicum maximum var. trichoglume - P.I. 202497 - The original sample of this accession came from S. Australia and was planted for the first time at Arcadia, Florida, in 1958.

It is an intermediate type guineagrass with fine stems, abundant but moderate size leaves well distributed. At maturity it is about 48 inches tall. Vegetative growth reaches about 32 inches. It is a perennial - tender to frost but has withstood the winters well at Arcadia.

The plant is apparently making many good seed. Tests made in the field, from a counted number of seed, to determine the depth to plant have yielded as high as 50% emergence. Depth of planting has generally been best at 1/2 to 1 inch on the sandy soils at Arcadia. Seed production has not been heavy, but two and sometimes three crops have been produced.

The grass has been one of the top producers at Arcadia. It was given good fertility treatment. P. maximum var. trichoglume produced less than a large leaf strain of Guineagrass called Avon Park when cut on a 3 week interval; however, it produced more than Avon Park when clipped on a 6 week interval. Differences were slight, with dry matter productions running about 2.3 - 2.4 tons per acre. The abundance of leaf material in the P. maximum var. trichoglume should make it a better quality for either hay or grazing than the coarser leaf varieties.

Stylosanthes sundaica - P.I. 187098 - Introductions of several species of Stylosanthes have promise as leguminous components of pastures. The most outstanding species are perennials, but they have failed to make sufficient seed at Arcadia to warrent further treatment. However, an annual, Stylosanthes sundaica, has given outstanding performance. Testing of it bagan in 1958. It is a densely growing, herbaceous legume reaching about 2 feet under optimum conditions. It withstands mowing and trampling, grows well in other sod forming crops, and has volunteered well. It is best adapted to dry sites. Flowering occurs in September and October at Arcadia. The seed are produced in abundance and may be combined with little difficulty. Production of unhulled seed has been about 550 pounds per acre. The plant appears to be free of disease. - It is a recognized forage plant in Australia.

Trifolium vesiculosum - P.I. 234310 (Early), P.I. 233382 (Medium), P.I. 233816 (Late). The three accessions shown above are by far the most outstanding performers of the annual reseeding clovers that we have tested. They have done well in locations all over the South: Chapel Hill, North Carolina; Little Rock, Arkansas; Amite, Louisiana; Americus, Georgia; and near Charleston, South Carolina.

Rod rows were first planted at Americus in 1958. Since that time volunteer stands and growth have been good each year. Some difficulty has been encountered in securing early inoculation on this clover, but the plant has grown off well in the spring (even where inoculation was late taking effect). The clover is well adapted to upland, well drained sites in the Southeast, and is apparently adapted to the entire climatic range. It has

not been tolerant of poorly drained soils.

One accession is early, one medium or midseason, and the other late in maturity.

Tests at Americus in 1960 comparing dry weight yield of herbage clipped at the full bloom stage were as follows:

Strain		Lbs. Per Acre Dry Wt.
Trifolium vesiculosum	- Early - - - - - -	10,888
	- Midseason - - -	5,431
	- Late - - - - - -	6,902
" incarnatum	- Dixie Crimson -	1,866

TABLE 1. PLANT INTRODUCTIONS PROMISING IN INITIAL OBSERVATIONS IN SCS PLANT MATERIALS CENTERS IN SOUTHEASTERN STATES IN 1961.

PI No.	Name	Potential Use	Important Characteristics
209168	Andropogon glabra	Range forage	Vigorous grower.
216751	" scoparius	" "	Good growth and seeding habits.
216752	" "	" "	Superior growth - good vigor.
216759	" "	" "	Good growth and vigor.
263393	Arachis sp.	Leguminous forage	Excellent growth, vigor, and seed productivity.
237128	Axonopus compressus	Forage and waterway protection	Makes good cover, spreading growth habit.
257678	Brachiaria humidicola	Cool season forage	
185135	Brachypodium pinnatum	" " "	Good spring growth - summer survival - satisfactory seeder.
206545	" "	" " "	" " " " " " " "
89817	" mucronatum	" " "	Good cool season growth.
186288	" phoenicoides	" " "	Hardiness and cool season growth.
206546	" sylvaticum	" " "	" " " " "
189612	Bromus catharticus	" " "	Very vigorous.
218066	Cajanus indicus	Wildlife food	Heavy production - seed at one season.
204368	Centrosema pubescens	Leguminous forage	Vigorous - strong growing.
212980	" "	" "	" " "
219833	" "	" "	" " "
257692	Chloris ventricosa	Summer forage on wet sites.	Highly productive - spreading - quick cover.
213855	Chrysopogon montanus	Range forage	Heavy production @ low fertility.
212225	Desmodium uncinatum	Leguminous forage	Good seed producer - spreads by rooting. stolons.
219606	Echinochloa crusgalli	Wildlife food plant and possible hay on Class II and IIw lands.	Heavy seed production - Arcadia.
196291	" "	" " " " " "	Heavy seed production - Arcadia & Americus.
256044	" "	" " " " " "	" " " - Coffeeville.
183332	" " var. frumentacea	" " " " "	" " " - Americus.

TABLE 1 (Continued).

PI NO.		Potential Use	Important Characteristics
203728	Festuca arundinacea	Cool season forage	Good cool season growth.
170410	Helianthus annuus	Wildlife food plant	Good vigor with high seed production - Americus
170411	" "	" " "	" " " " " "
175730	" "	" " "	" " " " " "
181769	" "	" " "	" " " " " "
182778	" "	" " "	" " " " " "
175726	" "	" " "	" " " " " "
250019	" "	" " "	" " " " " "
170430	" "	" " "	" " " " " "
184049	" "	" " "	" " " " " " - Americus and Coffeeville
170392	" "	" " "	Good vigor with high seed production - Americus.
175723	" "	" " "	(Same as above) - Coffeeville
170393	" "	" " "	" " " " " "
257752	Indigofera neglecta	Ground cover	Dense mat - heavy seed production - low growing.
199075	" pseudotinctoria	Beach protection	A prostrate form.
207718	Lespedeza bicolor	Wildlife food crop	Vigorous grower - good seed producer.
179699	" cuneata	Ground cover	" " " " "
246769	" "	" "	Partly prostrate habit of growth.
246771	" pilosa	" "	Dense flat growth form.
240731	Lolium multiflorum	Cool season forage	Tall, vigorous, grasses
241912	" "	" " "	" " "
241913	" "	" " "	" " "
234807	Lotus corniculatus	Cool season leguminous forage.	Good growth - good reseeding.
206572	Medicago sativa	" " " "	Slightly rhizomatous at Americus.
99907	Malus baccata	Wildlife food crop.	Early production of abundant fruit.
122586	Malus hupehensis	" " "	" " " " "
208397	Panicum maximum	Warm season forage	Some cold tolerance at Americus.

TABLE 1 (Continued)

PI No.	Name	Potential Use	Important Characteristics
185457	Panicum sp.	High yielding potential	Rank vigorous grower.
163300	Panicum miliaceum	Wildlife food plant	Highest seed producers out of 35 tested at Americus.
179389	" "	" " "	" " " " " " "
198154	" "	" " "	" " " " " " "
251389	" "	" " "	" " " " " " "
178992	" "	" " "	" " " " " " "
202292	" "	" " "	" " " " " " "
251404	" "	" " "	" " " " " " "
179385	" "	" " "	" " " " " " "
198153	" "	" " "	" " " " " " "
202295	" "	" " "	" " " " " " " - Americus and Coffeeville.
251405	" "	" " "	Highest seed producers out of 35 tested - Americus.
202815	" "	" " "	(same as above) - Coffeeville.
202294	" "	" " "	" " " " "
233707	Phalaris arundinacea	Cool season forage	Vigorous, cool season growth - tolerates the summer.
207962	" "	" " "	Excellent cool season growth - tolerates the summer.
207966	" "	" " "	" " " " "
207968	" "	" " "	" " " " "
202480	" "var. stenoptera	" " "	Tall - vigorous - cool season growth - tolerates the summer.
14350	Phyllostachys sp.	Erosion control - water and wind	Hardy - vigorous.
116768	" meyerii	" " " "	" "
40842	" bambusoides	" " " "	" "

TABLE 1 (Continued)

PI No.	Name	Potential Use	Important Characteristics
186346	Setaris argentina	Warm season forage	Hardy - vigorous - perennial.
208299	" flabellata	" " "	Vigorous - drouth resistant.
153695	" sphacelata	" " "	" " "
198597	Sporobolus fimbriatus	Range forage	Good production - herbage.
147821	Stipa splendens	Cool season forage	Hardy - good cool season producer.
219853	Stylosanthes fruticosa	Leguminous forage	Compatible with grasses - good vegetative production.
219854	" guyanensis	" "	" " " " "
270390	Tephrosia noctiflora	Wildlife food plant	Heavy growth - dominates weeds.
238362	Trifolium diffusum	Leguminous forage and cover crop.	Good production - reseeding - cool season annual.
244678	" globosum	" " " "	" " " "
235521	" meneghinianum	" " " "	" " " "
206926	" nigrescens	" " " "	" " " "
206769	" "	" " " "	" " " "
249880	Vicia lutea	" " " "	Good producer - does not shatter seed.

TABLE 2. PLANT INTRODUCTIONS IN INITIAL SEED INCREASE STAGE IN SCS PLANT MATERIALS CENTERS IN SOUTHEAST IN 1961.

PI No.	Name	Potential Use	Important Characteristics
190302	Andropogon nodosus	Forage	Rapid cover - heavy yield.
172223	Arachis sp.	Summer leguminous forage in mixture with grass.	Perennial
162801	" "	" " " " "	"
172224	" "	" " " " "	"
151982	" "	" " " " "	"
58602	Castanea mollissima	Wildlife food	Disease free - early production of nuts.
250357	Cyamopsis tetragonolobus	Cover crop	Vigorous - disease free (so far).
224152	Cynodon dactylon	Forage	Vigorous growth
224693	" "	Forage	" "
237955	Desmodium ovalifolium	Forage and ground cover	Spreading habits - good production.
197975	Indigofera hirsuta	Cover crop	Early, heavy production.
186171	Lespedeza cuneata	Ground cover	Prostrate growth form.
234409	Lotononis bainesii	Forage legume	Cool season growth - rapid spread.
260012	Lotus corniculatus	" "	Good production - Arcadia.
185099	Lupinus elegans	Cover crop	Good production - Arcadia.
184776	Panicum coloratum	Warm season forage	Drouth resistant - productive.
210692	" makirikariense	" " "	" " "
196292	" miliaceum	Wildlife food	Good seed production - Americus.
185642	Pennisetum ciliare	Warm season forage	Hardy at Americus.
202480	Selection of Phalaris tuberosa var. stenoptera	Warm season forage	Vigorous and productive.
203240	Pyracantha coccinea	Wildlife food	Early berry production.
52674	Sasa pygmaea	Ground cover	Heavy coarse protection.
197675	Stipa hyalina	Cool season forage	Hardy - good production at Americus.
187098	Stylosanthes sundaica	Warm season forage	Reseeding annual
244288	Trigonella caerules	Cool season forage legume	Hardy and productive.

TABLE 3. PLANT INTRODUCTIONS BEING INCREASED FOR FIELD PLANTINGS IN SCS PLANT MATERIALS CENTERS IN SOUTHEAST IN 1961.

PI No.	Name	Potential Use	Important Characteristics
195476	Bromus catharticus	Cool season forage	High production - good reseeding.
162637	Chloris distichophylla	Warm season forage	Heavy growth and ground cover.
163453	Glycine ussuriensis	Warm season forage and wildlife food	Volunteering ability - N.C. & Americus.
246770	Lespediza intermixta	Ground cover	Dense flat cover - good vigor.
218004	Lespedeza virgata	" "	Dense procumbent cover - fair vigor.
240731	Lolium multiflorum	Cool season forage	Vigorous - big and robust - high production
241912	" "	" " "	" " " " " " "
241913	" "	" " "	" " " " " " "
202497	Panicum maximum	Warm season perennial forage	Drouth resistant - high production - perennial - Arcadia.
178257	" stapfianum	" " " "	Drouth resistant - high production - perennial - Americus.
206758	Trifolium angustifolium	Cool Season forage	Reseeding annual - good production.
234310	" vesiculosum	" " "	" " - early maturing.
233816	" "	" " "	" " - medium maturity.
233782	" "	" " "	" " - late maturity.

REPORT OF THE NEW CROPS RESEARCH BRANCH -- W. E. Whitehouse

The work of the New Crops Research Branch is now conducted under four investigations groups and the National Seed Storage Laboratory as follows:

Plant Introduction Investigations - H. L. Hyland
Crop Breeding Stock Investigations - W. E. Whitehouse
Chemurgic Crop Investigations - J. R. Haun
PLant Resources Investigations - Quentin Jones
National Seed Storage Laboratory - Edwin James

The S-9 Regional Program is at present actively engaged in the evaluation and use, either directly or as breeding stocks, of fruit and tree nuts; vegetables; forage and range material; and new and little known introduced ornamental plants.

PLANT INTRODUCTION INVESTIGATIONS CR il-11, CR il-12, CR il-13

Information most pertinent to this committee was presented in the Minutes of the 1961 National Coordinating Committee Meeting. A review has also been made of the latest Technical Committee meetings and the following specific points related to exploration activity are presented for your consideration.

Foreign Exploration: There have been no specific proposals submitted by S-9 although there are a few requests pending that have been submitted by individual research workers. These will be handled in normal fashion as rapidly as possible through correspondence or exchange.

Two explorations have been completed. Dr. Jack Harlan finished his assignment in the Near East and Ethiopia with a total of 1,650 collections. The largest segments included 505 vegetables, 453 forage legumes and grasses, 407 cereal grains and 106 fruits. Dr. John Creech has just completed a third phase of collecting ornamentals in Japan as part of the New Crops - Longwood Cooperative program. Emphasis was placed on biotypes of woody and herbaceous plants and specifically broadleaved evergreens from the northern limits of distributions. Around 350 collections have been placed under inventory. Dr. Fred Meyer is presently collecting in Ethiopia and adjoining areas specifically to get plant materials for chemical screening programs. The usual practice of notifying the regional cooperators in advance was not followed in this instance since there will be little time available to collect other than for the main objective.

Domestic Exploration: Only one proposal has been submitted by S-9 and this covers collecting native fruits along the Gulf Coast Region. The Coodinator, in cooperation with Louisiana State personnel, has made good progress on this project to date. However, it is being supported for the third season and a progress report is in order before additional funds for this or other projects will be considered at Branch Headquarters. In this respect, we wish to emphasize that future proposals for domestic exploration must be prepared in advance and have the Technical Committee approval before submitting to the Branch for consideration.

Progress made in obtaining an inventory of clonally propagated deciduous fruits and nuts being maintained in collections throughout the nation has been reported in the Minutes of the 1961 National Coordinating Committee Meeting. A deadline of December 31, 1961, has been set for the completion of this inventory. The report given at the May 18th National Coordinating Committee Meeting carries all facts of pertinent and current interest to this group.

Crop Breeding Stock Investigations

Fruit and Tree Nut Evaluations: CR i2-1

Drupaceous Fruits - Two European cherry varieties, Early Burlat and Moreau, outstanding for early maturity, large size, and suitability for shipping, have been released for propagation by the U.S. Department of Agriculture. The first commercial shipments of these varieties were made four to seven days before Black Tartarian from Stockton, California, to Chicago with excellent market acceptance. Some 250 other foreign cherry varieties are under test at the Chico Plant Introduction Station and there are several hundred more at the Glenn Dale, Maryland, Station awaiting virus indexing.

Pomaceous Fruits - There is little, if any, interest in the introductinn of foreign apple and pear varieties. In the past an occasional introduction has provided fruit or tree characteristics of value. In New York and Connecticut, where Golden Delicious apples tend to russet and later shrivel somewhat in storage, the Mutzu tree from Japan produces good crops of large-sized, smooth-skinned non-russetting apples which store well. In Connecticut processors have found Mutzu makes a quality sauce which does not contain dark flecks. Another example is the use of the 1933 introduction of the Re Carlo di Wurtemberg pear from Italy (P.I. 102449) as a parent in developing the highly blight-tolerant Moonglow pear which was recently released for trial by the U.S. Department of Agriculture.

In 1955, the Branch agreed to initiate a drupaceous fruit virus-indexing program at Glenn Dale based on procedures set up by western state pathologists. It took five years to get the program into workable shape and in the meantime a backlog of some 350 drupaceous fruit introductions has built up at Glenn Dale.

Briefly described, the test is set up by propagating eight virus-free indicator varieties on virus-free rootstocks; then inserting a bud of the introduced variety into the indicator. In 1960, it became possible to purchase "indicator variety propagated on rootstock" from western nurserymen. It is now possible to index an introduction in two growing seasons and release it, if it is virus free. It is anticipated that some 83 varieties will be released in the fall of 1962 and about the same number each succeeding year.

Dr. Robert Kahn, a member of the Plant Quarantine Division presently in charge of the virus-indexing program at Glenn Dale, is in close touch with similar programs underway in some states. A paper entitled "Detection of Viruses in Foreign Plant Introductions under Quarantine in the United States" by Dr. Kahn, et al., will be available in the near future.

Vegetable Introductions: CR i2-5

Vegetable introductions are screened through the Regional programs in the New Crops Research Branch.

It is noteworthy that the commercial spinach industry in the United States owes its existance to introductions from the world areas of origin. A single gene for resistance to blight was found in a 1906 introduction from northern Manchuria, P.I. 200026, and was bred into Virginia Savoy. The wilt resistance selected out of the blight resistant Virginia Savoy probably came from the Manchurian introduction. The downy mildew resistance of Dixie Market; Califlay; Early Hybrid 7, 10, 424, and 425, was found in the Iranian spinach collections P.I. 140464 and 140467. Resistance to a second race of downy mildew which showed up on California's Califlay variety was also derived from these Iranian introductions. Curly-top resistance was found in introductions from India, Turkey, and Belgium; white rust resistance from P.I. 165560.

The pedigrees of nine of the 17 lettuce varieties[1] developed and released by the Crops Research Division over a 30 year period, as a result of the late Ross C. Thompson's research efforts, are sprinkled with P.I. numbers. It is of interest to note that the Vegetables and Ornamentlas Research Branch has made considerable progress in the attainment of their long-term objective -- that of developing and distributing desirable vegetable breeding lines to breeders.

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1 Thompson, Ross C. and Edward J. Ryder. Description and Pedigrees of Nine Varieties of Lettuce. USDA Agricultural Research Service Technical Bulletin No. 1244. 1961

Forage and Range Evaluations: CR i2-7

The screening of field crop introductions in the New Crops Research Branch is done through the Regional programs. Dr. Max Hoover has recently published a study of Regional evaluation and research workers' utilization of field crop introductions during the past 13 years. This survey, participated in by a broad representation of research workers, makes possible the planning of future field crop introduction programs in a manner to more closely represent the needs of research workers. It also provides a basis for a decision as to how many, if any, of the present stocks that appear to be in excess of research needs should be retained.

For example, the majority of the 17,559 accessions representing 300 genera and 1,700 species of field crops, introduced during the past 13 years, have been evaluated and made available to research workers. Fifty-two percent of the genera and nearly 40 percent of the species presently held are of no interest to 98 percent of the research workers. One hundred eighty-six grass and 72 legume genera have entered the S-9 Regional Program during the past 13 years. Research workers have specifically requested the introduction of 85 grass and 43 legume genera. The record shows 46 percent utilization of grass and 60 percent of legume introductions by S-9 research workers.

The limited interest in more than half of all genera introduced hardly justifies making additional introductions of these genera. Furthermore, using research worker interest as a criterion for making additional introductions, we must conclude that in the future only those field crop genera and species of genuine interest to research workers should enter the Regional Program. Coordinators have approved the sending of species of limited interest directly to the one or two research workers requesting them, providing a copy of the order is sent to the Coordinator.

The number of new lines that the Regional Station receives varies from year to year but on the average has amounted to some 1,000 annually. Consequently, as the cumulative number of introductions grow, storage and increase of old lines before the seed supply is exhausted or loses viability becomes a formidable task.

The matter of preservation of germ plasm is the joint responsibility of the New Crops Research Branch and the Regional Projects. Accessions may be discarded by the primary station provided such action is cleared with the New Crops Research Branch. It would thus appear, that provided there is sufficient reason, an introduction held at a Regional Station may be discarded.

Ornamental Plant Evaluations: CR i2-15

Recent ornamental explorations by the Branch have been made possible through a cooperative arrangement with the Longwood Gardens. A share of all materials collected is sent to them for their use. The remaining share is utilized in the work of three U.S. Department of Agriculture investigations groups: namely, Dr. Emsweller's ornamental breeding programs at Beltsville, the National Arboretum, and our Branch. The U.S. National Arboretum is interested in and evaluates woody ornamental introductions and undertakes to propagate and distribute to botanic gardens and arboreta those of promise which are climatically adapted.

In the past the New Crops Research Branch has propagated and offered to Agricultural Experiment Stations, private breeders and commercial nurserymen those introductions considered worthy of wide test with the stipulation that we be given records of their adaptation and plant performance. Returns from this program have not been up to expectations. Therefore, we have revised our ornamental program. Future explorations will be based largely on collecting biotypes of some of our more prominent American garden ornamentals which will represent their range of distribution in world areas of origin. This approach was followed by Dr. Creech in planning his recent Japanese explorations. He made collections of the best of so-called Hirado azaleas while they were in flower on the Island of Hirado. The Hirado azalea race is the result of breeding that involved Chinese azaleas brought to the Island in the 17th Century. The flowers are said to be larger than those of any known race. Lily species native to this area were collected for Dr. Emsweller's work and collections were made of seedling progenies of biotypes of some 18 genera over their range of distribution.

Rhododendron kaempferi, evergreen hollies, Ilex crenata, and Hemerocallis were found growing in extensive colonies covering the entire island chain of Japan. A new collection of cold-resistant camellias (Camellis rusticana) was collected on the Japanese side of Honshu, where the Snow Camellia is native. Dr. Creech has pointed out that new concepts on the manner in which broadleaf evergreen shrubs extend their range of natural distribution northward may be developed as a result of this exploration. For example, the scope of natural species hybridization of Rhododendron kaempferi, the common parent of four interspecific crosses, was observed.

An evaluation program for each genera collected will be worked out on the basis of its developmental needs. For example, camellia breeders have produced some 3,000 cultivars during the last 200 years, these selections coming from garden types which were derived from a collection of wild material made in a limited area. Collections from the entire range of their natural distribution are now available. A portion of these accessions will be retained at the Branch's Glenn Dale Station for cold-hardiness studies, a portion will be sent to the National Arboretum for use in their camellia research work, and a portion will be sent to the Camellia Research Advisory Committee for distribution to camellia breeders.

On the other hand, the Rhododendron kaempferi collection will be studied at the Glenn Dale Station. In the future, collection of seed when possible will satisfy most of our needs.

Named varieties developed by breeders in other countries and selections resulting from seedling progeny evaluations at our Federal Stations will be widely tested through our Federal and Regional programs. Several years ago, for example, we made a general distributation of Japanese chrysanthemum varieties from Glenn Dale. Today they would be sent to the Regional Plant Introduction Stations for evaluation presumably based on trials similar to those with woody ornamentals now underway in NC-7.

Chemurgic Crop Investigations

A detailed account of new crop development programs was presented at the National Coordinating Committee Meeting, May 18-19, and appeared in the minutes of that meeting.

Since the last meeting of the S-9 Technical Committee, further emphasis has been placed on the agronomic development of new crops in the activities of a newly constituted group called Chemurgic Crop Investigations which is one of four investigations groups of the New Crops Research Branch. Research line projects of this group include the line projects formerly involving specialty crops. As new leads from the screening program of the Northern Utilization Division are developed and become sufficiently promising, additional line projects will be written.

Summaries of results on each potential new crop in advance stages of study will be made each year as soon as the data are assembled from all locations in the country. These summaries should be useful to cooperators and others interested in the performance, problems, yield, etc., of species under study in various states and regions of the country.

Plant Resources Investigations

A comprehensive report of Plant Resources Investigations in the New Crops Research Branch was presented to this committee at its last meeting. Dr. Jones' report on the progress of the work during the past year has been published in the Minutes of the National Coordinating Committee Meeting, May 18-19, 1961.

11/1/61 - I. A. Wolff
Prepared for 12/13-15/61
Meeting of S-9 Committee

NORTHERN UTILIZATION RESEARCH AND DEVELOPMENT DIVISION

I. Development Program Assignments in UR

The committee will recall that new crops chemical screening research for the ARS is centralized at our Peoria Laboratory. On the basis of screening results and advice from CR, developmental chemical research on specific species or topics is assigned administratively to each of our four regional utilization laboratories. Assignments made to date are the following:

EU, Philadelphia--Vernonia anthelmintica, oilseed containing epoxy fatty acids.
SU, New Orleans--Cuphea,* oilseed having mostly short-chain (10-carbon) acids.
Limnanthes,* oilseed having long-chain (20- and 22-carbon) acids with unusual carbon-carbon unsaturation.
Umbelliferae,** oilseeds containing petroselinic acid.

WU, Albany, California--Dimorphotheca, oilseed having hydroxy-dienoic acid.
Lesquerella,* oilseed having 14-hydroxyeicos-11-enoic acid.
NU, Peoria--Erucic acid-containing oilseeds; pulp fiber crops; Crotalaria intermedia seed mucilage.

*New assignments, spring 1961.
**Withdrawn spring 1961 on advice of Crops Research Division.

II. The NU Screening Program

A. Seed screening for major constituents.

Samples received: 3249, in 149 families, 891 genera, 1827 species.

Samples analyzed: 2982.

$\geq$ 20% oil: 1260.

$\geq$ 60% oil plus protein: 469.

$\leq$ 35% oil plus protein, no starch: 544.

Oil samples analyzed for fatty acid composition: 630.

B. New fatty acids in seed oils.

Organic chemical structural characterization continues to reveal presence of acids, never before known to occur naturally, which

may have considerable commercial value; e.g., a new trienoid acid in Thalictrum seed oil has just been discovered.

C. Screening of Cruciferae, especially Brassicas, for seed oils of high erucic acid content.

Contract research at Montana State College. 225 samples of collections, introductions and breeding stock analyzed.

D. Over 250 solvent-extracted seed meals analyzed for amino acid composition of the proteins.

E. Pulp fiber plant screening.

Samples received: 893 (409 species).

Samples screened analytically: 674 (331 species).

Samples screened by preliminary pulping: 199 (81 species).

III. The NU Development Program

A. Erucic acid-containing oilseeds. Studies include:

1. Processing studies in the pilot plant to obtain oil and coproduct meal.
2. Compositional studies of the meal, with present emphasis on nature and amount of sulfur- and nitrogen-containing glucosides.
3. Preparation of chemical derivatives of the oils, or of erucic acid, which may have industrial utility.
4. Surveying economics of erucic acid utiliaztion in selected end uses.

B. Pulp-fiber crops.

Emphasis is on kenaf, okra, Crotalaria juncea, Sorghum almum, and a few other selected species. The laboratory and pilot-plant research includes study of optimum pulping procedures, behavior of blends with fibers from other sources, and especially attempt to find unique characteristics which may lead to preferred end uses. To be of economic value, the crop should produce 5 tons dry matter per acre.

C. Seed polysaccharides.

Crotalaria intermedia seed has been found to contain a high quality galactomannan mucilage. Processing studies have revealed procedures for obtaining the mucilage in good yield and adequate purity. Laboratory evaluations have shown desirable viscosity characteristics and utility as a paper additive. Samples have been submitted to a number of industrial companies together with an appropriate data sheet. Whether commercialization occurs will be dependent upon (1) agronomic factors including seed yield per acre, and (2) whether the toxicity known to be in Crotalarias, which can carry over into selected milling fractions, will be a factor with C. intermedia.

General Comments and Report on Activities of the W-6, NE-9 and NC-7 Technical Committees

William C. Kennard

During the past year the following actions were taken by your companion "new crops" committes which will be of interest to this group.

NE-9 (August 15 and 16, 1961)

1. Director D. W. Barton of Geneva, New York, attended his first meeting as the official Administrative Advisor of NE-9.

2. The group felt that physiologists, pathologists, etc, should be contacted regarding lines for inclusion in the National Seed Storage Laboratory.

3. Monthly reminders will be sent to each station representative so that the clonal inventory of tree fruits and nuts will be completed by December 31, 1961, deadline.

4. A subcommittee was formed to investigate the possibility of using IBM cards to store plant accession information.

NC-7 (September 7 and 8, 1961)

1. The Fruit Crops Subcommittee met just preceding the full technical committee meeting.

2. A publication on stone fruits is planned to be completed by December, 1961.

3. The regional project outline was revised.

4. An official representative to NC-7 from the Northern Utilization Research and Development Division, Peoria, Illinois, was requested.

5. A special allotment of $10,500 was given to the project toward cost of constructing the greenhouse at Ames. An additional $7,500 was earmarked for this purpose by the committee. Total construction cost will be approximately $60,000.

W-6 (October 25-27, 1961)

1. The regional project outline was revised.

2. All present contributing projects were accepted by the committee.

3. A proposed new contributing project on the evaluation of new crops for industrial utilization was accepted but not funded.

4. Representation on the committee from the U. S. Forest Service will be requested.

5. The financial situation of the Regional Station will be improved in fiscal 1963 by transfer of funds to it from one of the contributing projects and by a planned increase in regional funds to the project.

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

1. At the April 10-11, 1961, meeting of the Committee of Nine, the project review subcommittee made the following recommendation: "A number of regional research projects were noted as having problems of apparent inadequate funding (including NC-7, NE-9, and W-6). The committee of Nine should restate the philosophy of adequate funding to discourage starting regional projects when funds are not sufficient to carry out the procedure in an adequate manner."

2. 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.

3. 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.

4. Effective September 1, 1961, the State Experiment Stations Division (SESD) was taken out of ARS and designated as a seperate Service in the Department of Agriculture with the title of Cooperative State Experiment Statiom Service (CSESS). It is responsible directly to the Assistant Secretary for Federal-States Relations and will represent the Secretary of Agriculture in administration of the Hatch Act. The CSESS now is authorized to establish, on behalf of the agricultural experiment stations, direct liaison with all Federal agencies such as the National Science Foundation, the Atomic Energy Commission, the Weather Bureau, and others. Budget presentations will be made directly in the name of the state stations rather than through another Service in the Department which itself has research and other functions. The establishment of the new Service will help facilitate the process of research coordination and cooperation.

5. In the spring of 1961 a new cover-abstract-signature page (SES Form 20) was prepared for each Hatch project. Each leader was asked to fill in the section entitled "Description of Work." These completed forms have been duplicated and a set of all Hatch projects (approximately 6,500) in the country has been sent to each agricultural experiment station. The projects are arranged according to the classification system used in CSESS, a copy of which also has been sent to each station. Periodic mailings of new and revised projects and of project terminations will be made from CSESS. Thus scientists at all stations will have a continuously up-to-date reference to Federal-grant research in their area of interest. During the coming year most stations plan to prepare similar forms for projects which are supported by funds from non-Federal sources. These will be mailed to each station as they become available, forming a complete file of all state station research regardless of the fund source used to support the work.