

ANNUAL REPORT

January 1, 1959 - December 31, 1959

I TITLE

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

II CO-OPERATING AGENCIES AND PRINCIPAL LEADERS

State Agricultural Experiment Stations

Alabama	- C. S. Hoveland	North Carolina	- W. T. Fike
Arkansas	- A. M. Davis	Oklahoma	- R. S. Matlock
Florida	- G. B. Killinger	Puerto Rico	- R. O. Woodbury
Georgia	- A. H. Dempsey	South Carolina	- J. A. Martin
Kentucky	- E. N. Fergus	Tennessee	- W. E. Roever
Louisiana	- J. C. Miller	Texas	- R. G. Reeves
Mississippi	- H. W. Bennett	Virginia	- T. J. Smith

Administrative Adviser

R. D. Lewis - Texas

U. S. Department of Agriculture
New Crops Research Branch

C. O. Erlanson
W. E. Whitehouse
W. C. Young
W. C. Kennard

Soil Conservation Service
State Experiment Station Division

Southern Regional Plant Introduction Station

W. R. Langford, Coordinator
Grover Sowell, Jr., Plant Pathologist
W. L. Corley, Research Assistant

III PROGRESS OF WORK AND PRINCIPAL ACCOMPLISHMENTS

1. Regional Station

a. Improvement of Facilities

The physical plant of the Introduction Station was improved during the year by acquisition of several new items of equipment. Major items acquired during 1959 are as follows:

- (1) Addition of three bays to the greenhouse.
- (2) An army surplus field type refrigerator which has been equipped with humidity and temperature controls for disease screening work.
- (3) Completion of a new cold room for storing seed.
- (4) Thermo-Fax copying machine.
- (5) A Contaflex camera with set of portra lenses.
- (6) A three foot sickle bar mower.

The addition to the greenhouse provides 575 square feet of space for the pathologist to use in screening introductions for disease resistance. This section of the greenhouse is equipped with an automatic watering system and forced air heat. The army surplus refrigerator, equipped with humidity and temperature controls, is used as a moist chamber for holding plants after they are inoculated with known pathogens. Conditions optimum for development of the pathogen can be maintained so that susceptible introductions are readily attacked.

The new cold room is constructed in headhouse space once used for storing trucks. It has a volume of 2000 cubic feet and will provide storage space for present stocks and incoming seed anticipated for the next 12 to 15 years.

b. Work Accomplished.

The regional station received seed of 1395 new plant introductions during 1959. This was slightly less than the 1580 obtained in 1958. Requests from plant breeders and others for seed rose sharply over that of 1958. Crops research workers in the southern region were supplied with 5390 packets of seed as compared with 3343 packets the previous year. Through co-operation with other regional and federal plant introduction stations, this station was instrumental in obtaining for workers in the southern region 5021 additional packets of seeds and plants from stations outside the region. In return, crops research workers in other regions of the United States were supplied with 3181 packets of seed from this station and 155 packets were sent to the New Crops Research Branch for people outside the United States. A summary of the introductions handled by the Southern Regional Plant Introduction Station in 1959 is shown in Table 1.

Table 1. Introductions Processed by the Southern Regional Plant Introduction Station during 1959.

Number of new introductions received	1395
Number grown at Regional Station	2578
Number grown under contract	333
Number catalogued	701
Seed packets distributed within region	5390
Total received since establishment of Station	16730
Number in storage	10379

Catalogues containing 701 accessions not previously listed as being available were distributed among plant breeders and others interested in obtaining new stocks of germplasm. The number of introductions received and catalogued by crop groups is shown in Table 2. In addition to those catalogued, the Regional Station grew 746 introductions for reincrease of seed that had declined in viability.

Evaluation of introductions at the Regional Station was strengthened by employment of a plant pathologist by the New Crops Research Branch. In addition to identifying and noting the severity of diseases that occurred on nursery plantings, all Capsicum introductions were screened in the greenhouse for resistance to bacterial spot. Those appearing resistant in the greenhouse were further tested in the nursery. From these tests P.I. numbers 163184, 163189, 163193, 164471 and 164677 appear to possess enough resistance to

bacterial spot to justify their use in pepper breeding programs where this disease is a factor.

Table 2. Number and Kind of Plant Introductions Received and Catalogued During 1959

Crop group	Number received	Number catalogued
Winter forage	136	79
Summer forage	235	112
Peanuts	335	19
Vine crops	52	338
Sorghum	60	0
Sesame	31	28
Ricinus	0	29
Pepper	355	29
Voandzeia	0	42
Other	191	25
Total	1395	701

The regional coordinator visited twelve of the state experiment stations in the region and attended the following meetings during the year:

- January 13, Georgia Division of Agronomy; Athens, Ga.
- January 14, Georgia Section American Soc. of Agron; Athens, Ga.
- February 2-5, Ass'n. Southern Agric. Workers; Memphis, Tenn.
- April 9-10, New Crops National Coordinating Committee; Atlanta and Experiment, Georgia
- June 9-11, Southern Pasture and Forage Crops Improvement Conference; State College, Miss.
- November 18-19, Vegetable Breeders Conference; Charleston, S.C.

The regional station was host to the New Crops National Coordinating Committee which met in Atlanta and Experiment April 9-10. Other visitors to the station in 1959 included 120 high school students from neighboring counties during May, approximately 600 Georgia farmers and county agents during July, and 27 plant breeders and SCS plant materials specialists who came singly or in groups of 2 or 3 for personal tours of the nursery during the growing season.

2. State Activities

Although some states do not have projects contributing to S-9, all states in the region participated in the evaluation and use of new plant material available through the Regional Station. Table 3 shows the distribution of introductions to each state.

Three states - Texas, Oklahoma, and North Carolina - initiated projects to determine the cultural requirements and adaptation of potential new crops for industrial uses.

The New Crops Research Branch provided \$500 for collection of domestic fruits near the Gulf Coast. States participating in this exploration are Louisiana, Alabama, Georgia, Florida, Mississippi, South Carolina, and Texas.

Table 3. Distribution of Plant Introductions During 1959

State	Number of Introductions Received	
	From Southern Regional Introduction Station	From Other Plant Introduction Stations
Alabama	132	396
Arkansas	63	19
Florida	2074	1341
Georgia	716	420
Kentucky	303	52
Louisiana	8	372
Mississippi	18	262
North Carolina	23	342
Oklahoma	242	263
Puerto Rico	15	-
South Carolina	228	259
Tennessee	4	175
Texas	1557	760
Virginia	7	360
Total	5390	5021

The S-9 technical committee met at the National Seed Storage Laboratory August 3-4. Each committee member gave a detailed report on the progress of new crops research in his state. These reports appear in the minutes of the meeting, copies of which can be obtained from the coordinator. Highlights of the findings reported at the August meeting and in supplementary reports covering the period August through December are listed in Appendix A of this report.

IV USEFULNESS OF FINDINGS

Increase of new plant material at the regional station in 1959 will provide plant breeders with 701 new introductions for further evaluation and use in plant breeding programs. Pepper breeders now have a readily available source of bacterial spot resistance as a result of screening Capsicum introductions for disease resistance at the regional station.

In addition to finding valuable new genes for improving present varieties, a selection from P.I. 121070, Arachis hypogaea, was released as a new variety in Georgia. This new variety is reported to be the most productive Spanish-type peanut tested in Georgia. Gold Coast, a new variety of okra resulting from a cross between P.I. 186972 and the Louisiana Market variety, was released for commercial production in Louisiana. It is an excellent variety for canning and freezing. Development of a male sterile line of Sorghum in Georgia by crossing P.I. 156549, Sorghum arundinaceum, with combine Kafir 60 should enable sorghum breeders to develop F₁ hybrid varieties of Sudangrass.

Other introductions listed in the appendix and reported to possess valuable characteristics will be available for improving present crop varieties. Many of these will be used as sources of resistance to diseases.

V WORK PLANNED FOR NEXT YEAR

The regional station will increase and evaluate introductions that were received too late to be included in the nursery plantings made last spring or fall. Seed of approximately 800 old introductions now in storage but low in viability or low in supply will be reincreased. Introductions of peanuts, sesame, sorghum, okra and Trifolium will be increased under contract by various cooperators in the Southern Region. Introductions of cucurbits will be screened at the regional station for resistance to gummy stem blight.

A bulletin reporting the 10-year accomplishments of the project will be completed by the regional station and S-9 technical committee. The domestic exploration initiated late in 1959 will be continued.

VI PUBLICATIONS ISSUED OR MANUSCRIPTS PREPARED DURING THE YEAR

Alabama

Greenleaf, W. H. Basic Research in Pepper Breeding Gives Promise of Saving Important Industry. Highlights of Agricultural Research, Ala. Agric. Expt. Stat., Vol. 6, No. 1, 1959.

Georgia

Hammons, R. O., Bailey, W. K., Parham, S. A., and Harrison, H. F. Comparative Performance of the Spanish Peanut Argentine in Co-operative Tests in Georgia, Georgia Agric. Expt. Stations Mimeograph Series NS 72. May 1959.

Sowell, Grover Jr. Bacterial Spot Resistance of Introduced Peppers. Phytopathology 50: 1960 (in press)

Forbes, Ian Jr. Blanco Blue Lupine. Georgia Crop Improvement News. Vol.12, No. 65. 1959.

Louisiana

Miller, J. C., Jones, L. G., and Wilson, W. F. Jr., Gold Coast, A New Variety of Okra. La. Agric. Expt. Stat. Circular 57. June 1959

W. R. Langford
W. R. Langford, Coordinator

G. B. Killinger
G. B. Killinger, Chairman
S-9 Technical Committee

R. D. Lewis
R. D. Lewis
Administrative Adviser

Appendix A

Plant Introductions of Value Reported During 1959 in the Co-operative New Plants Project S-9

FIELD CROPS

<u>Plant Name</u>	<u>P.I. Number</u>	<u>State Reported</u>	<u>Apparent Value</u>
Andropogon annulatus	219976	Oklahoma	Semi-hardy and productive
" intermedius	173638	"	Winter-hardy
" intermedius	174042	"	Ditto
" intermedius	176409	"	"
" ischaemum	171197	"	"
" ischaemum	172372	"	"
" ischaemum	172373	Arkansas	Various leaf types and textures
" ischaemum	172720	Oklahoma	Very promising grazing plant
" ischaemum	199861	"	Partly sexual; used in hybridization
" ischaemum	213860	Ark. and Okla.	Cold tolerance and leafiness
" ischaemum	213861	Oklahoma	Winter hardy
" ischaemum	220570	"	Ditto
" ischaemum	223024	Ark. and Okla.	Various leaf types and textures, winter hardy
" sp.	229483	Oklahoma	Winter hardy
" sp.	229746	"	Ditto
Bothriochloa pertusa	218060	Ark. and Okla.	Cold tolerance and leafiness
Bouteloua curtipendula	216244	Texas	Superior seed and forage production
Brachiaria decumbens	210724	SCS	Aggressive and spreading perennial grass
" lata	238236	SCS	Forage and feed for wildlife
" ruziziensis	247404	SCS	Forage and silage
Bromus catharticus	195476	SCS	Grows well and relatively disease free
" inermis	206678	Oklahoma	Drought and heat tolerance
Camelina sativa	195743-49	Texas	Possible oil crop
Carthamus	202728	Texas	Apparently immune to leafspot, but susceptible
"	235658	"	to red spider
"	235668	"	Ditto
"	244354	"	"
Cassia le shenaultiana	204365	SCS	Wildlife food
Centrosema pubescens	199739	SCS	Shows promise for use in grass-legume mixtures
Chloris gayana	203851	SCS and Georgia	Aggressive; good winter survival at Americus
Chrysopogon montanus	213885	"	Aggressive; winter hardy

Appendix A (continued)

Plant Name	P.I. Number	State Reported	Apparent Value
<i>Cicer arietinum</i>	257583	Oklahoma	Good seed production
Do.	257584	"	"
"	257586	"	"
<i>Crotalaria intermedia</i>	239485	Alabama	High yielding
"	189044	Oklahoma	"
<i>Cyamopsis tetragonolobus</i>	116034	Oklahoma	Early and prolific
Do.	158116	"	"
"	158126	"	"
"	158129	"	"
"	163103	"	"
"	164801	"	"
"	179928	"	"
"	186477	"	"
"	212987	"	"
<i>Cymbopogon</i> sp.	189302	"	Winter hardy
<i>Cynodon dactylon</i>	213387	Texas	Retains color well
Do.	213388	"	Very vigorous
<i>Cynodon magennisii</i>	184339	Ga., Ark., Va.	Very good lawn grass
Do.	213390	Texas	Extensive root system
<i>Cynodon</i> sp.	224139	Tenn.	Very desirable Bermuda
Do.	224140	Tenn., Ark., Texas	Very hardy
"	224143	Tenn.	"
"	224145	Ark., Tenn.	"
"	224146	Ark., Tenn.	"
"	224149	Ark., Tenn.	Good sod; not winter hardy
"	224151	Tenn.	Very hardy
"	224153	Ga.	Good forage producer
"	224693	Ga.	"
"	225809	Ark., Tenn.	Very hardy
<i>Cyperus esculentus</i>	184949	S.C.	High oil and protein
<i>Dactylis glomerata</i>	225822	Ark.	Source of superior selections
Do.	229446	"	"
"	230116	"	"
"	230117	"	"

Appendix A (continued)

Plant Name	P.I. Number	State Reported	Apparent Value
<i>Desmodium distortum</i>	219840	SCS	Feed for wildlife
" <i>ovalifolium</i>	227477	SCS	Perennial for use as forage in legume-grass complex
" <i>tortuosum</i>	214158	Ala.	Possibilities for paper pulp
" sp.	225890	"	"
<i>Dichanthium annulatum</i>	199240	Oklahoma	Partial sexuality
Do.	210343	"	Productive; semi-hardy
<i>Digitaria eriantha</i>	-	SCS	Rank growth
" sp.	196342	SCS	Early; abundant forage
<i>Eleusine coracana</i>	217608	SCS	Early growth; bird food
<i>Eragrostis chloromelas</i>	208225	Oklahoma	Palatable; hardy
" <i>curvula</i>	164253	"	High palatability
Do.	202420	"	"
"	206072	Arkansas	Assorted leaf types and textures
"	206673	Oklahoma	High palatability
"	208389	"	"
"	208992	"	"
"	208994	"	"
"	232813	"	"
"	236620	"	"
<i>Erucastrum abyssinica</i>	243913	Alabama	Possible temporary grazing crop
<i>Festuca arundinacea</i>	199249	Oklahoma	Drought tolerant and vigorous
<i>Glycine</i>	84751	Tenn.	Resistant to soybean cyst nematode
Do.	88788	"	"
"	89772	"	"
"	90763	"	"
"	92590-B	"	"
<i>Lolium multiflorum</i>	240731	SCS	Very productive
Do.	241912	"	"
"	241913	"	"
<i>Medicago falcata</i>	14488	"	Good ground cover
Do.	163394	"	Superior <u>falcata</u>
"	231713	"	"
<i>Medicago hispida</i>	246740	"	Looks very good
" <i>truncatula</i>	244285	"	Heavy seeder; good growth
" <i>sativa</i>	199280	Virginia	Highly resistant to <i>Pseudoplea</i>
" "	206572	"	"

Appendix A (continued)

Plant Name	P.I. Number	State Reported	Apparent Value
Medicago sativa	209090	Virginia	Highly resistant to Pseudoplea
" "	217419	"	"
Panicum antidotale	220026	Oklahoma	Dense; fine stem
Panicum coloratum	178251	SCS	Rank growth
Ditto	178257	"	"
"	184776	"	"
"	207990	"	"
Panicum makarikariense	210692	"	Vigorous; perennial
" maximum	-	"	Vigorous; good quality
" "	208397	"	Strong perennial
" stapfianum	178257	"	Possible grazing plant
Pennisetum ciliare	141474	"	Best performing buffel grasses
Ditto	203365	"	"
" var. Chipinga	243198	Alabama, Fla.	Very productive; vigorous
" var. Grassland	243199	" "	"
Phalaris arundinacea	207959	SCS	Retains color well
" tuberosa	193056	Oklahoma	Good fall and winter growth
" "	207966	Georgia	Good growth
" "	233707	Ala., Ga., SCS	Excellent growth
" sp.	239707	Arkansas	Good vigor; leafy
Phaseolus aureus	214334	Oklahoma	Good forage producer
Ditto	223711	"	Excellent forage producer
Ricinus communis	195412	Texas	Potential ornamental
Ditto	195638	"	"
"	196883	"	"
"	197048	"	"
"	199979	"	"
"	207870	"	"
"	208696	"	Possibly resistant to fungi which attack capsules
"	240310	"	Source of better seed quality
"	240311	"	"
"	240312	"	"
"	243200	"	"
"	243214	"	"

Appendix A (continued)

Plant Name	P.I. Number	State Reported	Apparent Value
<i>Secale anatolicum</i>	206992	Oklahoma	Disease resistance; late maturing
<i>Sesamum indicum</i>	226971	Arkansas	Excellent yields
<i>Sesbania cannabina</i>	180050	Oklahoma	Good forage and seed yield
<i>Sesbania</i> sp.	167069	"	"
Ditto	167290	"	"
<i>Setaria argentina</i>	186346	SCS	Rank growth
" <i>sphacelata</i>	247411	"	Forage and silage
<i>Sorghum arundinaceum</i>	156549	Georgia	Used in producing male sterile strain of sudan
" <i>almum</i>	190579	Oklahoma	Perennial; good production
" <i>vulgare</i>	170797	Kentucky	Open headed
Ditto	192878	Arkansas	Leaf distribution
<i>Trifolium cheranganiensis</i>	226101	SCS	Abundant forage
" <i>cherleri</i>	200369	Georgia	Good winter annual clover
" <i>globosum</i>	168636	SCS	Dense growth
" <i>hirtum</i>	234050	Georgia	Vigorous; heavy seeder
" <i>incarnatum</i>	232940	"	Branches after stooling
" <i>lappaceum</i>	244323	SCS	Good growth
" <i>meneghinianum</i>	235521	SCS	"
" <i>michaelianum</i>	120136	"	"
" <i>pallidum</i>	201213	Ga., SCS	Good winter annual clover
" <i>resupinatum</i>	205238	SCS	Best Persian clover tried
Ditto	212329	Oklahoma	Some very large plants
"	212865	"	"
"	220202	"	"
"	220553	"	"
"	222085	"	"
"	222121	"	"
<i>Trifolium rupellianum</i>	234411	SCS	Good growth
" <i>strictum</i>	238372	"	Forms dense mat
" <i>vesiculosum</i>	233782	Fla., SCS	Much foliage
Ditto	233816	Ga., Fla., SCS	Rank growth
"	234310	Ga., SCS	Rank growth
<i>Vicia atropurpurea</i>	220880	Oklahoma	Burchid resistant; early growth
<i>V. narbonensis</i>	206927	SCS	Good upright growth
<i>V. sepium</i>	238382	SCS	Good growth
<i>Vigna cylindrica</i>	180494	Oklahoma	Early; prolific; erect

Appendix A (continued)

Plant Name	P.I. Number	State Reported	Apparent value
Vigna cylindrica	205139	Georgia	Mosaic resistant
Vigna sinensis	121433	Oklahoma	Fusarium wilt resistance
Ditto	145198	"	"
"	162925	"	"
"	170869	"	Very large blackeye seed
"	186466	Georgia	Fusarium resistance
"	189378	Oklahoma	Small white seed; fusarium resistance
Vigna sp.	158831	Ga., SCS	Perennial bean for forage and wildlife food
Voandzeia	240867	Oklahoma	Good seed producer
"	244973	"	"
"	245113	"	"
Zea mays	167962	Arkansas	Low ear placement
Do.	221835	Georgia	Used in crosses to study inheritance of
"	221850	"	loose pericarp

VEGETABLE CROPS

Arachis hypogaea	121070	Georgia	Developed into a new high yielding variety
Do.	161317	Texas	Crossed with Spantex to give superior strain
Capsicum frutescens	163184	SRPIS	Resistant to bacterial leaf spot
Ditto	163189	"	"
"	163193	"	"
"	164471	"	"
"	164677	"	"
Cucumis melo	127575	Oklahoma	Very thick flesh
Ditto	140775	"	"
"	164584	"	Netted; copper-red rind
"	169308	"	Casaba; high quality
"	169347	"	Winter melon; pineapple flavor
"	169349	"	"
"	182942	"	Heavy net
"	234607	Texas	High resistance to powdery and downey mildew
"	250109	South Carolina	Honeydew rind; white flesh; casaba flavor
Hibiscus esculentus	186972	Louisiana	Used in parentage of Gold Coast okra
Ipomea	153655	"	Disease resistance
Lactuca sativa	176589	Kentucky	White seed used as gene marker

Appendix A (continued)

Plant Name	P.I. Number	State Reported	Apparent value
<i>Lycopersicon esculentum</i>	129034	Oklahoma	Vigorous; heavy yield
Ditto	196297	South Carolina	Source of curly mottle gene
<i>Lycopersicon pimpinellifolium</i>	126949	Kentucky	Excellent indicator of phosphorous & K deficiency
<i>Vitis vinifera</i>	200633	Oklahoma	Very hardy
Ditto	200656	Virginia	Productive; attractive cluster
"	237626	Oklahoma	Vigorous
<i>Coleus</i> sp.	249795	Texas	Good foliage plant
<i>Ficus mallatocarpa</i>	244611	"	"
" <i>wrightiana</i>	249537	"	"
<i>Lagerstroemia fauriei</i>	237884	Georgia	Good vigor
<i>Pittosporum undulatum</i>	249505	Texas	Good foliage plant

ORNAMENTALS WHICH SHOW PROMISE IN FLORIDA AND ARE BEING TESTED FURTHER:

<i>Aphelandra sinclairiana</i>	222142	<i>Chrysanthemum</i>	235936
<i>Ardisia acuminata</i>	222143	Ditto	235944
<i>Arundinaria longifolia</i>	240702	"	235945
<i>Azalea</i>	226144	"	235946
Ditto	226146	"	235947
"	226148	"	235949
"	227067	"	236043
"	227077	"	236044
"	227084	"	236045
"	227099	"	236046
"	227100	"	236050
"	227107	"	236062
"	227111	"	236127
"	228104	<i>Citropsis dawsoniana</i>	247137
"	228111	<i>Citrus aurantifolia</i>	248413
"	228115	<i>Citrus limon</i>	248414
"	230810	<i>Cordia abyssinica</i>	222152
<i>Bauhinia pruinosa</i>	249291	<i>Cryptostegia</i> sp.	197209
<i>Brachychiton acerifolium</i>	222144	<i>Dalbergia latifolia</i>	222154
<i>Brunfelsia latifolia</i>	222145	<i>Dolichandrene alba</i>	222156

Appendix A (continued)

ORNAMENTALS WHICH SHOW PROMISE IN FLORIDA AND ARE BEING TESTED FURTHER:

Cactus harlowii	255258	Enterlobium	222157
Callistemon salignus	222146	Exanthorrhoea arborea	222176
Cassia	222147	Ficus mallatocarpa	244611
Cassia biflora	240705	Ficus sp.	228251
Chamaedorea erumpens	14920	Ilex cornuta	65860
Chrysanthemum	235913	Ditto	143795
Ditto	235922	Ilex opaca	183818
"	235925	Livistona	97914
"	235929	Ditto	222153
"	235935	"	222163
		"	222167
Markhamia sp.	222164		
Melaleuca linariifolia	212642		
Petrea arborea	222168		
Polyalthia cerasoides	222169		
Quercus acutissima	142294		
Ditto	168939		
Ruttya fruticosa	222171		
Serissa foetida	226298		
Stephegyne parvifolia	222172		
Tromigiun censis	222174		
Zephiranthes citrina	130741		