

JAN 20 1953

ANNUAL REPORT - JANUARY 1, 1952 - DECEMBER 31, 1952

SOUTHERN REGIONAL PROJECT S-9

NEW PLANTS

and

PRESERVATION OF GERMPLASM

*About 40 specimens
collected in 1952*

March

COOPERATING AGENCIES AND PRINCIPAL LEADERS

State Agricultural Experiment Stations

Representative

Alabama	P. B. Gibson
Arkansas	R. L. Thurman
Florida	F. H. Hull
Georgia	O. E. Sell
Kentucky	E. M. Fergus
Louisiana	J. C. Miller
Mississippi	H. W. Bennett
North Carolina	F. D. Cochran
Oklahoma	H. F. Murphy
Puerto Rico	J. Velez Fortune
South Carolina	J. A. Martin
Tennessee	J. K. Underwood
Texas	R. G. Reeves
Virginia	J. T. Smith

U. S. Department of Agriculture

Division of Plant Exploration and Introduction
B. P. I. S. & A. E.

C. O. Erlanson
W. H. Hodge

Soil Conservation Service

Grover Brown

Regional Headquarters - Cooperative with B. P. I. S. & A. E. and the Georgia Experiment Station.

Primary Plant Introduction Station
Experiment, Georgia

Edwin James

Office of Experiment Stations - Agricultural Research Administration.

F. D. Fromme
C. L. Lefebvre

Regional Administrative Advisor

R. D. Lewis, Texas

NATURE OF WORK AND PRINCIPAL RESULTS OF THE YEAR

Regional Project S-9 is cooperative between the states of the Southern Region and the Division of Plant Exploration and Introduction, B. P. I. S. & A. E.. Under this cooperative arrangement, the Regional Primary Station at Experiment, Georgia, with the assistance of the staff at the Georgia Agricultural Experiment Station, undertakes the increase and evaluation of introductions sent to the Regional Headquarters by the Division of Plant Exploration and Introduction. The Georgia Station also assists the Primary Station by supplying office space, light, water, heat, and gasoline and oil for trucks and tractors. The Georgia Station bears the cost of mimeographing all catalogs issued by the Primary Station and has further assisted by a cash allotment of \$756 in the year of this report.

The state experiment stations of Arkansas, Florida, Georgia, Oklahoma, South Carolina, Texas, and the territory of Puerto Rico assist in the increase and evaluation of introductions adapted to their respective regions. Contract arrangements have been made with Florida, South Carolina, Texas, and Puerto Rico for increases on a per accession basis. The other states increase limited numbers of accessions in return for the opportunity of first hand screening.

The Division of Plant Exploration cooperates by supplying the Region with introductions collected by their plant explorers. The Division also pays 55 percent of the coordinator's salary and provides the office supplies, certain items of office equipment, and technical assistance to the Primary Station and Region.

ACTIVITIES AT THE PRIMARY STATION

Approximately 20 acres are now being used by the Primary Station, a portion of which is allocated to perennial crops and the balance used in a rotation with annual crops. An additional nursery of non-hardy annual legumes has been planted at the Georgia Coastal Plains Station at Tifton.

The facilities of the U. S. Plant Introduction Garden at Savannah, under the direction of the Division of Plant Exploration and Introduction, are being used for the evaluation of cabbage, brussels sprouts, and parsley.

Improvements have been made in the facilities of the Primary Station by the addition of a new truck, and sufficient irrigation pipe to easily reach all land area in the nursery. Seed storage is being improved by transferring all seed to sealed glass containers.

During the past year 712 new accessions have been sent to the Primary Station and increases have been made on 1,890 introductions. The lower number received this year has permitted the increase of a backlog of a large number of accessions received during the first two years of operation. This will permit the bulk of the work at the Station to be on a current basis hereafter.

A total of 4,103 lots of seed was sent out by the Primary Station to cooperating agencies and an additional 1,341 supplied by the North Central Region, making a total 5,444 lots involved. Of the number shipped out by the Primary Station 1,169 were shipped inter-regionally, or in foreign exchange programs, leaving a total of 4,275 used in the Region. A summary of accessions by genera received, increased, and shipped by states is incorporated in an appended table.

Under contractual agreements, arrangements have been made for increasing and evaluating certain crops as follows:

Peppers	South Carolina
Sesame	South Carolina
Okra	South Carolina
Sorghum	Texas
Castor beans	Texas
Non-hardy grasses and legumes	Florida
Sub-tropical grasses and legumes	Puerto Rico
Central American corn	Puerto Rico

REGIONAL ACTIVITIES

Information regarding state activities has been obtained through reports or personal conference with cooperating staff members in the several states.

Alabama. No supporting project. Eighteen accessions requested. White clover introductions used in breeding project; continued screening of earlier okra and pepper introductions. Of particular note two pepper introductions, 152225 and 152233, were found to be highly tolerant to tobacco etch virus and tobacco mosaic. 2

Arkansas. Project: Investigations with New Crops. Received 403 accessions, 386 of which were cowpeas screened for a superior disease resistant, edible type also resistant to nematodes. Ten corn introductions in advanced testing.

Florida. No supporting project. Accessions numbering 333 received including 186 peppers. Increasing 29 peas and 14 corn introductions on a voluntary basis, and 20 sub-tropicals on contract arrangement; very active in tomato screening and evaluation of forage species. Tomato introduction number (129152) found to be immune to gray leafspot, early blight, and phoma rot has been used in crosses in the breeding program at the Gulf Coast Station. Sweet potato numbers (153907) and (153909) were found to form a normal skin over breaks.

Georgia. Project: The Introduction, Testing and Multiplication of New and Useful Plants of Potential Value for Industrial and Other Uses. Used 618 accessions in various testing and breeding programs in the State. Assisted in screening 378 cowpea accessions by testing for reactions to fusarium wilt and mosaic. Tests for downy mildew and powdery mildew have been made and currently are in process on 423 watermelons and cantaloupes. Cantaloupe No. (177334) resistant to downy mildew, has been used in a cross on Georgia 47 for further improvement. *Cantaloupe*

The opening of 3 new State sub-stations has led to more extensive testing of promising grasses and legumes.

Kentucky. No supporting project. Received 27 accessions with most attention on forage legumes.

Louisiana. Project: Introduction and Testing of New Crops. Eighteen accessions received in cooperative program, and in addition the establishment of a private collection of Dioscorea. Further selection on Phaseolus No. 182026, which is near release as Louisiana No. 1. *Bean*

Mississippi. No supporting project. Requested and received 323 accessions; 1256 tomato introductions tested for resistance to southern blight (*Sclerotium rolfsii*).

North Carolina. Project: New Plants Investigations. Of 300 accessions received 117 were cucurbita which are being tested for scab resistance. Of special interest are watermelon numbers (173669) and (173234) which were reported to have "stood up" under downy mildew and anthracnose attacks. Tests completed on 53 alfalfa introductions received in 1950. In testing soybeans received from various sources, No. (166147) has been found to be resistant or immune to bacterial blight and has been used in a number of crosses. *Watermelon*
Soybeans

Oklahoma. Project: Introduction and Evaluation of New Crops for Oklahoma. Agencies in Oklahoma received a total of 905 accessions, 226 of which were used by M. Hardin, a private breeder attempting to breed drought resistant, determinate vegetable crops. A total of 679 accessions was consigned to the Oklahoma

Agricultural Experiment Station, 526 of which were for evaluation at the Station and 153 at the Samuel Roberts Noble Foundation at Ardmore.

The Experiment Station at Stillwater has established during the past 2 years an extensive grass and legume nursery, with particular attention being given to the grasses in the *Andropogon* and related genera, and to the testing of legumes for drought resistance.

Particular emphasis is being given to the testing of tomato introductions for nematode resistance. Further work at the Station involves the testing of cowpea, peanut, castor bean and other miscellaneous introductions. The Station reports definite possibilities for further development of sesbania No. 189536, having high cold resistance but very late, and cowpea numbers 181585 and 189096, wilt resistant but susceptible to bacterial canker. M. Hardin of Geary, Oklahoma noted definite drought resistance in 22 of 61 cantaloupe introductions having 3 inches of rainfall from June to October and cucumber beetle resistance in numbers 164617, 164723, 164756, 172831. *Cantaloupe*

Puerto Rico. Project: Introduction and Evaluation of New Plants for Industrial and Other Purposes and the Preservation of Germ Plasm of Economic Plants. Increases sub-tropical species under contract per accession. Received 128 species, 11 for increase with considerable carry-over from 1951 in the process of increase. Active in testing forage types. One *Stizolobium* No. 197052 appears exceptionally promising owing to its vigorous growth and absence of damage from insects and diseases. *Veratrum*

South Carolina. Project. Breeding of Disease Resistant Sesame Adapted to Mechanical Production. Increases and evaluates all sesame introductions in conjunction with project by per accession arrangement. The same arrangement is in force for peppers and okra. Increased 54 sesame and 90 pepper introductions the past season. Other accessions, totaling 242, consist mainly of forage crops and vegetables. One new lettuce variety has been released, having as one parent P. I. No. 120695. Chuffa No. 184949 has been found to be considerably more productive than the commercial types and is being increased for a source of feed for wild life. One other accession of major importance is cucumber No. 197087 which has been found to be immune to anthracnose and has been used in crosses directed toward an anthracnose resistant or immune commercial type. Seven additional cucumber numbers being used in breeding program. *Lettuce*
Cucumber

Superior characteristics have led to the use of a number of other introductions in breeding programs. Twelve sesame accessions are being used, with No. 158071 being a good, low combine, 3-capsule type used in crosses on indehiscent strains; in addition 15 other lots have been found to be resistant to fusarium wilt. Two recent pepper introductions 194879 and 194881 are being selected for crosses; twenty-one numbers show nematode resistance, both in the field and greenhouse; seven others are considered valuable as ornamentals. *Pepper*
lawn grass
Cynodon magennisii 184339 is reported as a highly valuable lawn grass requiring no mowing.

Tennessee. Project: Evaluation of New Plants. Only 7 accessions received, but special attention should be called to a Rubus ludwigii No. 197477 which has been used in a cross with the native blackberry species, which has proved superior to the common cultivated blackberry. "These hybrids are just a little bit better than the common cultivated blackberry, not in one respect, but many. In addition the half-bloods have hybrid vigor." Increasing Ilex cornuta rotunda No. 143795 for further distribution in Tennessee.

Rubus
Ilex

Texas. Project: Introduction, Multiplication, Preservation, and Determination of Potential Value of New Plants for Industrial and Other Purposes and for the Preservation of Valuable Germ Plasm of Economic Value. Texas received 725 accessions during the past year including 91 castor beans and 72 sorghum introductions for increase and evaluation. Through the extensive cooperation of several departments and substations the testing program has indicated a fairly large number of accessions as having outstanding value. Three ornamentals, Ficus macrophylla No. 183874, Hoya sp. No. 190391 and Ilex cornuta, var. rotunda have been found to be superior, the first two having been accepted in commercial floriculture.

Ficus
Hoya
Ilex

At Chillicothe 6 castor bean introductions are promising, with No. 179731 acceptable as a commercial variety without modification.

Sunflowers numbering 12 accessions and 16 sesame introductions have a sufficient value to be used in breeding programs. Two additional sunflower accessions, 201814 and 201816 show promise for hot, dry areas. Four ryegrass accessions, numbers 162678, 187220, 189150, and 196538 have been selected for a breeding program for better varieties and Cynodon magennisii No. 184339 is showing considerable promise as a turf grass. A selection of Buffel grass T 4464 has been made from P. I. No. 153671. Number T. S. 134126 is especially promising as a table grape. One cantaloupe, No. 182959 has been noted as being drought resistant and appears also to carry resistance to downy mildew. Eighteen forage grasses and legumes at Beaumont show sufficient promise to be put in replicated tests. At McGregor, Lotus 180171 appears promising as a summer growing perennial under severe drought and cotton root rot conditions to which it seems resistant.

Virginia. No supporting project. Received 84 accessions large forage grasses. Cynodon magennisii reported as being a superior hardy turf grass.

Application of Benefits: The benefits and findings listed above in state reports are reiterated below for a summary.

Alabama

Pepper introductions numbers 152225 and 152233, tolerant to tobacco etch and tobacco mosaic.

Florida

Tomato introduction No. 129152 being used in breeding program because of immunity to gray leafspot, early blight, and phoma rot. Sweet potato numbers 153907 and 153909 form normal skin over break.

Georgia

Cantaloupe No. 177334, resistant to downy mildew, being used in crosses on Georgia 47.

North Carolina

Watermelon accessions numbers 173234 and 173667 apparently resistant to downy mildew and anthracnose. Soybean No. 166147 resistant or immune to bacterial blight.

Oklahoma

Cowpea introductions 181585 and 189556 appear resistant to fusarium wilt.

South Carolina

Introductions of Parris Island Romaine lettuce with P. I. No. 120695 as a parent. Chuffa No. 184939 being increased because of its superiority over commercial types. Cucumber No. 197087 immune to anthracnose; this and 7 others are being used in the breeding project.

Tennessee

Development of new blackberry derived from a cross of *R. ludwigii* No. 197477 on native species.

Increasing Holly No. 143795 for distribution in commercial channels.

Texas

Twelve sunflower and 16 sesame introductions entering into the breeding program. Four ryegrasses acceptable for the breeding of superior varieties and one cynodon considered a superior turf type. Buffel grass T 4464 selected from P. I. No. 153671. Three ornamentals of probable commercial value ready to enter commercial trade. One cantaloupe No. 182959 found to be drought and downy mildew resistant.

WORK PLANNED FOR THE COMING YEAR

Particular attention will be directed to completing the increase and evaluation of earlier accessions which the Primary Station has not been able to increase up to the present time, owing to the small amount of seed received, lack of adaptability and disease susceptibility. The adaptation problem is most acute in the case of sorghum and castor beans, a large percentage of which fail to reproduce owing to a photoperiod longer than that necessary to induce flowering in tropical or sub-tropical species. A similar problem exists in the case

of tropical or sub-tropical bean introductions which do not mature early enough to escape the various diseases to which they are susceptible. The attention of the Regional Committee will be directed toward these problems with the possibility of arriving at a satisfactory solution.

Seed stocks which are in excess of present needs for distribution are to be reduced in quantity and a sufficient amount saved in sealed containers for maintenance purposes. This is necessary because of limited facilities for storing large stocks.

Most outstanding introductions enter quickly into breeding programs in the various states but certain forage grasses and legumes, which appear superior at the Primary Station need further testing under a diversity of conditions. Plans are being made to put such accessions in the hands of the cooperators in the Regional Pasture and Forage Crops Project S-12 for uniform testing in the Region.

The Primary Station is still limited in the matter of adaptable field equipment and seed processing facilities. Plans are being made for improvements in at least one of these.

Publications. New, or supplementary seed catalogs have been distributed in the Region for 7 crops on which initial or additional increases have been obtained.

Approved:

O. E. Sell

Chairman, Technical Committee

R. D. Lewis

Regional Administrative Adviser

Accessions Received, Increased
and
Numbers Sent by States

Name	No. Received	No. Increased	Accessions Received, Increased and Numbers Sent by States														Interregional	Genera Sent Totals
			Ala.	Ark.	Fla.	Ga.	Ky.	La.	Miss.	N.C.	Okla.	P.R.	S.C.	Tenn.	Tex.	Va.		
<u>Field Crops and Grasses</u>																		
Aeschenoma	0	1																0
Agropyron	0	0											1					1
Agrostis	1	1			1	2					1	1				1	1	7
Alopecurus	1	0									1							1
Aleuropus	0	1																0
Andropogon	15	8								1	43	1			6			51
Antho- schmidtia	1	0									1							1
Arrhenathe- rum	0	1									1							1
Arrundinella	0	1																0
Aristida	2	0									3							3
Astrebla	0	1										1			3			4
Avena	2	0									1							1
Beckeropsis	0	1																0
Bothriochloa	2	1									1							1
Bouteloua	1	0										1			1			2
Brachypodium	1	0									1							1
Briza	2	0									2							2
Bromus	4	2			13	3	1				1		21		6			45
Cenchrus	1	0													2			2
Chloris	2	7				2						2			13			17
Chrysopogon	2	1									2							2
Coelachrym	0	0			1													1
Coix	3	0			2								4					6
Cymbopogon	1	0									2							2
Cynodon	0	3				2												2
Dactylis	1	4				1			5		5	1	43			43		98
Dactylocten-																		
	1	2																0
	2	0									3							3

Accessions Received, Increased
and
Numbers Sent by States

Name	No. Received	No. Increased	Ala.	Ark.	Fla.	Ga.	Ky.	La.	Miss.	N.C.	Okla.	P.R.	S.C.	Tenn.	Tex.	Va.	Inter- regional	Genera Sent	Totals
<u>Field Crops</u> <u>and Grasses</u>																			
Digitaria	1	2										3			1				4
Dinebra	0	1																	0
Eleusine	0	0													2				2
Eragrostis	4	31									2	1			3		23		29
Erianthus	0	0									2								2
Ehberta	2	1									1								1
Euchlaena	0	1																	0
Festuca	3	5							2		9	1	4		4				20
Gaudinia	1	0																	0
Haynaldia	2	0																	0
Heterpogon	2	0									2				1				3
Holcus	4	0																	0
Hordeum	3	0									2								2
Hyparrhenia	3	0																	0
Imperata	0	0									1								1
Iseilema	1	0									1								1
Leptachloa	0	1													1				1
Lolium	6	6			2	3			5		4	2	2		1				19
Oryzopsis	4	1									3								3
Panicum	8	11			1						3	23	4		1				32
Pappophorum	0	0													2				2
Paspalum	4	14										2		1	2				5
Pennisetum	4	6			3	19					2	11							35
Phalaris	6	5			13						16		5		16				50
Phleum	1	0									1								1
Poa	0	0									1			1					2
Pseudopogon- atherum	1	0									1								1
Setaria	2	3									1				2				3
Sorghastrum	0	0									2								2
Sorghum	27	11							1		8				111		189		309

Accessions Received, Increased
and
Numbers Sent by States

Name	No. Received	No. Increased														Interregional	Genera Sent Totals	
			Ala.	Ark.	Fla.	Ga.	Ky.	La.	Miss.	N.C.	Okla.	P.R.	S.C.	Tenn.	Tex.			Va.
<u>Legumes</u>																		
Lotus	2	4				2	2			2	10			4		20		
Lupinus	1	6								1					26	27		
Lygeum	0	0													1	1		
Medicago	42	85			12	2	7			92	160			154	23	450		
Melilotus	4	3									11					11		
Milletia	1	0														0		
Onobrychis	5	0								1						1		
Ornithopus	0	0								2				2		4		
Pachyrrhizus	1	0														0		
Phaseolus	135	282							166		30				125	321		
Psoralea	1	0									1					1		
Pueraria	0	0			2											2		
Rhynchosia	3	0														0		
Securigera	0	0								1						1		
Sesbania	0	0								6						6		
Spartium	2	0														0		
Stizolobium	0	3										2				2		
Tetragono- lobus	1	0									1					1		
Teramnus	1	0														0		
Trifolium	24	29	2		12	2	11			47	17		1	30		122		
Vicia	0	42	3				3			29		59	1	8		103		
Total	277	590	5	17	53	6	23	11	168	94	450	55	72	2	236	0	177	1053
<u>Fruits and Vegetables</u>																		
Abelmoschus	0	5														30	35	
Alium	0	0								1							1	
Arachis	12	232								32				179		1	212	
Beta	0	0								1							1	
Brassica	12	120											6			9	15	

Accessions Received, Increased
and
Numbers Sent by States

Name	No. Received	No. Increased	Accessions Received, Increased and Numbers Sent by States													Interregional	Genera Sent Totals		
			Ala.	Ark.	Fla.	Ga.	Ky.	La.	Miss.	N.C.	Okla.	P.R.	S.C.	Tenn.	Tex.			Va.	
<u>Fruits and Vegetables</u>																			
Capsicum	39	90	1		186	12								90				223	512
Cichorium	0	2																0	0
Citrullus	6	32				38		1			59							26	124
Cucumis	27	73				150			11	14	57		5		1	5		17	260
Cucurbita	9	16									117								191
Daucus	0	0												2					2
Frageria	4	1	1					1	4	1	1			1	1	1			11
Ipomea	0	16							1										1
Lepidium	1	0																13	13
Lycopersicon	10	0				1			125	1	12		8		34			45	226
Malus	3	0								2	2		2				2		8
Phaseolus	111	187							188									189	221
Pisum	38	0			29						7								36
Pyrus	0	0													10				10
Raphanus	0	71													5				5
Rubus	13	0	2					2		3	2		3	2	3				17
Solanum	9	10																	0
Spinacea	0	0															2		2
Vigna	17	232	1	386		378					33		17				23	192	1,030
Vitis	0	0											1						1
Total	210	1000	5	386	215	579	3	6	140	137	280	5	133	3	233	32	556	3,034	
<u>Oil, Ornamental and Specialty</u>																			
Anni	2	0									6					2			8
Anethum	0	2									2								2
Bauhinia	0	0											1						1
Carthamus	0	0									16								16
Chenopodium	0	0													1				1

Name	No. Received	No. Increased	Accessions Received, Increased and Numbers Sent by States														Interregional	Genera Sent Totals
			Ala.	Ark.	Fla.	Ga.	Ky.	La.	Miss.	N.C.	Okla.	P.R.	S.C.	Tenn.	Tex.	Va.		
<u>Oil, Ornamentā and Specialty</u>																		
Clappertonia	0	0			2													2
Coriandrum	0	10								13								13
Cryptostegia	0	0			1							1						2
Cuminum	0	0								7							9	16
Cyamopsis	3	0			5													5
Foeniculum	0	4																0
Gladiolus	0	0			6											8		14
Guizotia	0	0												15				15
Helianthus	3	0								8								8
Lebeckii	0	0			1													1
Luffa	2	0																0
Milletia	1	0																0
Nigella	2	13								18								18
Ocimum	0	9								13								13
Perilla	0	0								9								9
Petroselinum	3	0																0
Physalis	1	11									6							6
Pimpinella	0	0															4	4
Plantago	1	0																0
Rapheolepis	0	1	1		1	1		1	1	1			1					7
Ricinus	20	45									4				20		184	208
Sesamum	16	54									10		54		30			94
Tephrosia	0	0													7			7
Trigonella	1	0																0
Total	119	146	1	0	16	1	0	1	1	69	44	2	55	0	75	0	197	470
TOTAL	712	130	18	403	333	618	27	18	323	300	905	128	386	7	725	84	1169	5444