

ANNUAL REPORT - JANUARY 1, 1954 - DECEMBER 31, 1954

SOUTHERN REGIONAL PROJECT S-9

and

PRESERVATION OF GERMPLASM

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#### NATURE OF WORK AND PRINCIPAL RESULTS OF THE YEAR

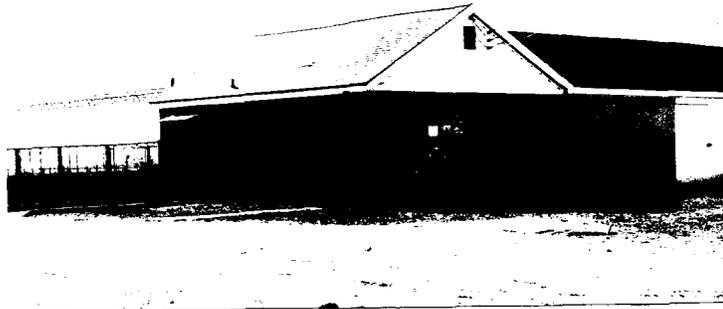
The "New Crops" Project S-9 serves the states in the Southern Region and the Commonwealth of Puerto Rico in the evaluation and distribution of introductions supplied by, and in cooperation with the Section of Plant Introduction, Agricultural Research Service, U. S. D. A. Eleven of the fourteen experiment stations in the Southern Region now have projects in cooperation with S-9 supported entirely by state funds.

The major portion of the work of increases and evaluations is carried out at the Primary Station. Where the adaptation of certain crops is such that they can be grown better at other locations or when crop specialists at other experiment stations wish to assume the responsibility of increasing and evaluating such crops, they are grown at other experiment stations under a contract plan wherein the station is reimbursed on a per accession basis. During the 1954 season contracts of this nature have been in effect with the Florida Experiment Station for the increase and evaluation of crops of sub-tropical origin and with the South Carolina Station for the same work with okra and sesame. The Texas Station cooperates in this respect with grasses adapted to dry land conditions, sorghum, and castor beans. In addition, 471 lots of beans were grown this year at the Ysleta Substation in Texas where seed can be produced under blight-free conditions.

#### Primary Station

During the first five years of operation the Primary Station was handicapped by unsatisfactory seed storage. This has been remedied through the equipping of a new storage room in the Horticulture Building of the Georgia Experiment Station. Adjacent to this storage room, another has been provided for seed inventorying and packaging for shipment. These facilities have been offered to experiment station workers in the Region who wish to preserve germplasm and have no facilities for doing so at their own stations.

Three new pieces of equipment have been added to the facilities for seed processing. Certain grasses and legumes are difficult to thresh and clean by usual methods and to overcome this difficulty a hammer-mill and aspirator have been obtained. The hammer-mill has been modified so that it can be used either for seed threshing or for grinding various materials used in propagation work. A blender has been acquired for separating seed from the pulp of eggplant or other species where the seed is imbedded in pulp. Some of the facilities and work of the station are shown in the photographs which follow.



1. View of Southern Region Primary Station and Greenhouse



2. Stocking New Seed Storage Room



3. Packaging and Germination Room

*Survey. Remains of pipe water*

4. Portion of Summer Grass Nursery

5. Irrigation Pond and Equipment

6. Seed Processing Machines

As indicated in the table below, a total of 1,498 new accessions was received at the Primary Station.

Accessions Received and Increased, 1954

<u>Crop Classes</u>	<u>Field Crops &amp; Grasses number</u>	<u>Legumes number</u>	<u>Vegetables number</u>	<u>Miscel- laneous number</u>	<u>Total number</u>
Received	671	342	408	77	1,498
Increased and Cataloged	184	182	130	40	536
Increased and Not Cataloged	308	30	147	12	497
On Contract & Seed Not Received	571	539	16	44	1,170

It will be noted that the 536 accessions increased represent only those which were cataloged during the 1954 season. An additional 497 were increased at the Primary Station and are now in the process of cataloging for distribution. Until reports are complete, no estimate can be given of the number of accessions increased under contract.

A total of 5,142 seed lots was distributed by the Primary Station during the year. A summary of this distribution follows.

Distribution of Introductions in 1954

<u>Distribution</u>	<u>Introductions sent number</u>
<u>Southern Region:</u>	
Alabama	12
Arkansas	6
Florida	889
Georgia	130
Kentucky	86
Louisiana	121
Mississippi	245
North Carolina	359
Oklahoma	416
Puerto Rico	274
South Carolina	233
Tennessee	210
Texas	1,621
Virginia	51
<u>TOTAL USED IN SOUTHERN REGION</u>	<u>4,653</u>
<u>Outside Southern Region</u>	<u>1,133</u>
<u>Total Distributed, 1954</u>	<u>5,786</u>
<u>Supplied by Other Regions &amp; U. S. D. A.:</u>	
North Central Region	345
Western Region	175
Direct to Cooperators by Plant Introduction Section, Beltsville, Maryland	124
<u>Total Supplied by Other Regions &amp; U. S. D. A.</u>	<u>644</u>
<u>Total Distribution by Southern Primary Station</u>	<u>5,142</u>

Activities by States

Alabama. No supporting project.  
Of 12 introductions sent, three were requested by the Experiment Station.  
No report.

Arkansas. Project - Investigations with New Crops.  
Six new accessions received in 1954. Work is being continued with earlier disease resistant cowpeas, Magennis grass, sorghum, guar, forage legumes and corn. Work with castor beans is being discontinued and a bulletin is being published on the results. Guar shows much promise and work on the crop is to be expanded in 1955.

Florida. Project - Screening Forage and Cover Crop Introductions for Ecological Adaptation and Use in Florida.

During the past year Florida received 889 accessions, 479 of which entered into the supporting project. An additional 320 forage grasses and legumes were placed in tests at various points in the state. Of the forage crop accessions received, 469 were under increase and evaluation contract as were 41 accessions of corn and 49 of cowpeas, both of subtropical origin. The remaining 116 introductions were mostly vegetable crops with a few fruits and miscellaneous crops. Of particular note is the release of the Mysore raspberry at the Subtropical Station at Homestead.

Georgia. Project - The Introduction, Testing and Multiplication of New and Useful Plants of Potential Value for Industrial and Other Uses.

Of the 130 accessions distributed, 113 were forage crops, grasses, and legumes under tests at several locations in the state. Several peanut introductions have entered the breeding program at Experiment; they are as follows: 163278-79, being line selected and in tests; and 210553, 212232 and 219824, in crosses.

Kentucky. Project - Introduction, Multiplication, Preservation, and Determination of Potential Value of New Plants and Plant Species for Industrial and Other Purposes, and for the Preservation of Valuable Germplasm of Economic Plants.

Received 130 accessions, mainly forage crops under test for possible adaptation to Kentucky conditions, or as breeding material. No accessions reported to have value for Kentucky conditions. Seed of three naturalized varieties of tall fescue and of one variety of smooth bromegrass were collected from their original stands. Part of this was planted in isolated nurseries for multiplication and the remainder in plots for natural selection under different management practices as a screening procedure for obtaining breeding stock.

Louisiana. Project - Introduction and Testing of New Crops.

Selection work is continuing with "Gold Coast" okra with early release of a new variety anticipated. Screening work with sweet potatoes indicates that nine new introductions are resistant to soil rot. These are listed in the appended table. Increased interest is being shown in forage crops which constitute 47 of the 121 introductions received. The balance are mostly vegetable crops, including Allium species which are being screened for downy mildew resistance.

Mississippi. No supporting project.

Breeding work with rust-resistant ryegrass introductions continuing at two locations with the possibility of a varietal release in one or two years. Selection work is in progress with Sanyo millet, PI 168488. Attention is called to the sweet sorghum variety, Sart, from PI 152945, not previously mentioned in earlier reports. Of 245 accessions received, 180 were peas screened for resistance to Aschochyta disease.

North Carolina. Project - New Plants Investigations.  
Received 359 accessions in 1954 with 296 watermelons constituting the largest group. In screening these for downy mildew reaction it was found that eight were highly or moderately resistant and are to be used in crosses. Participation is continuing in the screening of alfalfa introductions and other forage species. Nineteen Phaseolus introductions from Turkey, Mexico, and Guatemala show promise as sources of root rot resistance. One cucumber accession is being used for resistance to scab.

Oklahoma. Project - Introduction and Evaluation of New Crops for Oklahoma.  
The major portion of the 416 accessions received in 1954 indicate continued concentration on screening forage species for Oklahoma conditions. Several introductions, each of bromegrass, crested wheatgrass and alfalfa are in multiple crosses for further selection. A breeding program with guar is being initiated.

Puerto Rico. Project - The Introduction and Evaluation of New Plants for Industrial and Other Purposes, and the Preservation of Valuable Germplasm of Economic Plants.

A 9b3 allocation of \$4,000 is permitting expanded work with new plants under a project revised during 1954. Crops under test include subtropical species such as coffee, avocados, citrus crops, guavas, and papayas. The federal station also received a large number of introductions including 152 sorghums with a number of yellow endosperm types. These are being increased by the station for the Southern and North Central Regions.

South Carolina. Project - Breeding of Disease Resistant Sesame Adapted to Mechanical Production.

Sesame breeding lines R44 and C329 are now being increased and will enter statewide tests in 1955. Selection work and tests are also being continued with chufas. A new project with sunflowers accounts for 130 of the 233 accessions received. Carolina cucumber S50 developed from Anthracnose immune PI 197087 to be increased for early release.

Tennessee. Project - Evaluation of New Plants.  
Received 210 accessions during the year. Screening work with forage crops accounts for about half of this number. Crosses with Lycopersicon species and related genera have been made to find a source of resistance to buck-eye rot of tomatoes.

Texas. Project - Introduction, Multiplication, Preservation, and Determination of Potential Value of New Plants for Industrial and Other Purposes and for the Preservation of Valuable Germplasm of Economic Value.  
The Texas Station received a total of 1,621 accessions in 1954. This number includes 472 accessions of beans and 1,333 of range plants, grown primarily for seed increase.

The range plant accessions were collected by Texas Station personnel during 1953. Many of them will be tested under range conditions in 1955.

A number of accessions showed enough promise to justify their being placed in replicated trials or breeding programs. Those given this rating are grape accessions for table use, TS 34125, TS 34126, PI 157521, PI 157531, PI 163503, PI 181634; castor bean PI 204322, an early type with large spikes, and PI 215770, PI 215771, PI 215768 which appear to have very little bacterial leafspot.

Many additional accessions showed some promise but need further preliminary evaluation.

In cooperation with the Plant Introduction Station about 750 accessions of range plants were collected in 1954 in New Mexico, Arizona, Sonora, Sinaloa, Durango, Zacatecas, and Coahuila.

Virginia. No supporting project. Received 51 accessions, most of which still are to be planted. No further report.

#### Technical Committee

The S-9 Technical Committee met at the Georgia Experiment Station on May 7-8. Reports were given by the members present on the introduction activities in their respective states, and suggestions submitted pertaining to new or continued explorations. A budget was approved for the next fiscal year. This meeting was the first to be held at the Primary Station since 1950. An inspection of the facilities and nurseries concluded the meeting.

#### Application of Benefits

Each year an effort is made to obtain information from cooperators on introductions which show enough promise for further testing, or with one or two characters which make them valuable as breeding lines. In the table attached are listed such introductions which have not been incorporated in previous reports.

#### Work Planned for Next Year

Increase and evaluation work will be continued on a current basis either at the Primary Station or under contract with other experiment stations. Reincreases of introductions dropping in viability in storage will continue. With the large number of introductions on hand it appears that the major proportion of nursery land will be used for this purpose, in which case contract work with new introductions will be expanded.

Up to the present it has not been possible to obtain sibbed seed of the numerous alfalfa introductions on hand. An effort will be made this year to accomplish a portion of this work with cages and bees.

Certain items of equipment are still needed by the Station, mainly pollination cages and power spraying equipment. As funds permit, these facilities will be added.

Publications

Nine catalogs, representing new introductions, have been compiled and distributed to the states.

Southern Cooperative Series Bulletin 27, "The Progress and Potentials in Plant Introduction for the South," has been written and the manuscript is now in the hands of the printers. It is to be published by the Georgia Station and will contain the results of a survey in the Southern Region on the contributions of plant introductions to breeding programs in agronomic and horticultural crops distributed through the facilities of the Southern Region Primary Station. Three hundred introductions and varietal releases are cited, many of which are making major contributions to our agricultural economy.

The Regional Research Project S-9 was revised in December of 1954 and a copy of the revised outline is now in the process of being approved.

*Fred D. Cochran*

Chairman, Technical Committee

*R. D. Lewis*

Regional Administrative Advisor

PROMISING INTRODUCTIONS REPORTED IN 1954

<u>SPECIES</u>	<u>P. I. NUMBER</u>	<u>STATE REPORTING</u>	<u>CHARACTERISTICS AND USE</u>
<u>Agropyron cristatum</u>	172690	Oklahoma	Apparently adapted to the climatic conditions of the Southern Great Plains and have entered breeding program.
<u>Agropyron cristatum</u>	172691	Oklahoma	
<u>Agropyron cristatum</u>	172694	Oklahoma	
<u>Agropyron cristatum</u>	173622	Oklahoma	
<u>Agropyron cristatum</u>	180794	Oklahoma	
<u>Arachis glabrata</u>	Unknown	N. Carolina & Georgia	Resistant to leafspot and in trials as possible pasture legume.
<u>Arachis hypogea</u>	121067	N. Carolina	Resistant to leafspot. In advanced crosses and selection.
<u>Bromus inermis</u>	173646	Oklahoma	Apparently adapted to the climatic conditions of the Southern Great Plains and have entered breeding program.
<u>Bromus inermis</u>	173647	Oklahoma	
<u>Bromus inermis</u>	178843	Oklahoma	
<u>Bromus inermis</u>	178844	Oklahoma	
<u>Citrullus vulgaris</u>	164460	N. Carolina	All resistant to downy mildew and entering crosses to transfer resistance to commercial types.
<u>Citrullus vulgaris</u>	169289	N. Carolina	
<u>Citrullus vulgaris</u>	169290	N. Carolina	
<u>Citrullus vulgaris</u>	171392	N. Carolina	
<u>Citrullus vulgaris</u>	179660	N. Carolina	
<u>Citrullus vulgaris</u>	179875	N. Carolina	

<u>SPECIES</u>	<u>P. I. NUMBER</u>	<u>STATE REPORTING</u>	<u>CHARACTERISTICS AND USE</u>
<u>Citrullus vulgaris</u>	183399	N. Carolina	All resistant to downy mildew and entering crosses to transfer resistance to commercial types.
<u>Citrullus vulgaris</u>	189225	N. Carolina	
<u>Ipomaea batatas</u>	208792	Louisiana	High resistance to soil rot disease.           Good resistance to soil rot disease.
<u>Ipomaea batatas</u>	208796	Louisiana	
<u>Ipomaea batatas</u>	208804	Louisiana	
<u>Ipomaea batatas</u>	207691	Louisiana	
<u>Ipomaea batatas</u>	207700	Louisiana	
<u>Ipomaea batatas</u>	208314	Louisiana	
<u>Ipomaea batatas</u>	208645	Louisiana	
<u>Ipomaea batatas</u>	208816	Louisiana	
<u>Ipomaea batatas</u>	209555	Louisiana	
<u>Lolium multiflorum</u>	194394	Florida	
<u>Lolium multiflorum</u>	194395	Florida	
<u>Lupinus alba</u>	177456	Georgia	Cold hardy. In crosses.
<u>Lupinus alba</u>	168891	Mississippi	Cold hardy. Being increased for release.
<u>Lupinus alba</u>	202527	Florida	High seed yields. Being increased for release.
<u>Lupinus angustifolius</u>	189191	Georgia	Sweet blue. Approved for certification.
<u>Lycopersicon peruvianum</u>	126928	N. Carolina	Resistant to root-knot nematode.

<u>SPECIES</u>	<u>P. I. NUMBER</u>	<u>STATE REPORTING</u>	<u>CHARACTERISTICS AND USE</u>
<u>Lycopersicon peruvianum</u>	126929	N. Carolina	Resistant to root-knot nematode.
<u>Lycopersicon peruvianum</u>	126944	N. Carolina	
<u>Lycopersicon esculentum</u>	92863	Mississippi	Apparent resistance to southern blight.
<u>Lycopersicon esculentum</u>	95588	Mississippi	
<u>Lycopersicon esculentum</u>	185685	Mississippi	
<u>Lycopersicon esculentum</u>	185686	Mississippi	
<u>Lycopersicon esculentum</u>	126425	Texas	
<u>Lycopersicon esculentum</u>	126429	Texas	Resistant to cracking and in breeding program.
<u>Lycopersicon esculentum</u>	134208	Texas	
<u>Medicago hispida</u> var. <u>reticulata</u>	197341	Texas	Early and productive. Being increased for further tests.
<u>Medicago hispida</u> var. <u>terebellum</u>	197343	Texas	
<u>Medicago sativa</u>	173730	Oklahoma	
<u>Medicago sativa</u>	173735	Oklahoma	Adapted to Southern Great Plains. In multiple crosses.
<u>Medicago sativa</u>	174273	Oklahoma	
<u>Medicago sativa</u>	174274	Oklahoma	
<u>Sorghum vulgare</u>	152945	Mississippi	Released as Sart sweet sorghum.
<u>Spinacia deracea</u>	140467	Texas	Immune to downy mildew. In crosses.
<u>Rubus albescens</u>	194478	Florida	Released as Mysore black raspberry.

<u>SPECIES</u>	<u>P. I. NUMBER</u>	<u>STATE REPORTING</u>	<u>CHARACTERISTICS AND USE</u>
<u>Vigna sinensis</u>	189416	Florida	Parent in high yielding breeding line.
<u>Ricinus communis</u>	204322	Texas	Early and large spikes.
<u>Ricinus communis</u>	215768	Texas	} Apparent resistance to bacterial leafspot.
<u>Ricinus communis</u>	215770	Texas	
<u>Ricinus communis</u>	215771	Texas	