ANNUAL REPORT - JANUARY 1, 1956 - DECEMBER 31, 1956

SOUTHERN REGIONAL PROJECT S-9

INTRODUCTION AND EVALUATION OF NEW PLANTS

and

PRESERVATION OF GERMPLASM

COOPERATIVE AGENCIES AND PRINCIPAL LEADERS

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PROGRESS OF WORK AND PRINCIPAL RESULTS OF THE YEAR

Southern Regional Plant Introduction Station
Experiment, Georgia

Improvement of Facilities: Seed storage facilities have been improved by the installation of a dehumidifying unit in the present seed storage cold room. Ideal conditions at 50°F and 50% R.H. are now in effect. A clover huller, a gravity cleaner, and a seed dryer have been acquired to facilitate seed processing.

Work accomplished: The 495 new introductions received this year represents a much lower number than received in previous years. In addition to the new introductions 222 old numbers of peanuts were obtained from the North Carolina Station where they had been maintained over a period of years. Approximately 566 old PI numbers of okra, peppers, cabbage and muskmelons were received from the Cheyenne Horticultural Field Station in 1955 and an attempt is now being made to build up viable stocks of these. Catalogs with 906 accessions not previously available were distributed to the cooperators at State Stations.

Summary of Introductions Received and Cataloged - 1956

Crop Classes	Forage Legumes & Grasses	Other Field Crops	Vegetable Crops	Misc. Crops	Totals
	number	number	number	number	number
Introductions Received	412	15	272 (1)	18	717
Introductions Cataloged	186	173	480	67	906

(1) Includes peanuts from North Carolina.

The numbers of introductions shipped by Southern Regional Plant Introduction Station, (7,425), and the number used in the Southern States, (6,432), represent the largest totals for any one year since the establishment of this Station in 1949. The distribution by crop groups and agencies is summarized in Table 1, appended.

Cooperators in the various states have reported on a fairly large number of introductions having potential value. Others previously reported have either been released or are on the verge of release or being utilized in breeding programs. These promising introductions are listed in the appendix, Table 2.

Activities by States

Alabama: Although Alabama has no project supporting the Regional Plant Introduction Program, a total of 71 new accessions was forwarded during the year to nine people. These included sweet clover, several species of vetch, perennial ryegrass, orchardgrass, smooth bromegrass, bentgrass, corn, tomato, and ornamentals.

Observations made on new accessions of corn during 1956 indicate that some have superior kernel quality and moderate resistance to leaf blight. These will be evaluated further. Accessions of other crops received this year have not completed a full season's growth, and conclusions as to their value in future programs cannot now be made.

Evaluation studies of a few accessions received prior to 1956 are being continued. These indicate Agrostis tennis, which is a promising turf grass in Alabama; certain accessions of Harding grass that appear promising for fall and winter pasture in the South; and Bahiagrass.

Arkansas: Project 323 - Investigations with New Crops.

Only 136 introductions were received in the state in 1956. Of these 136, 76 were evaluated by the Soil Conservation Service. These were evaluated for usefulness in wild life habitat improvement.

A total of 81 forage grasses were received; 22 by the Experiment Station and 59 by the Soil Conservation Service. Eighteen of those received by the Experiment Station are being retained. Fourteen failed to survive the summer or are dead at this time. Of the 59 received by the Soil Conservation Service, 21 are reported as failures as of August 6, 1956.

Forty-seven forage legumes accessions were brought into the state in 1956. Thirteen accessions of lespedeza species are being retained by the Experiment Station. The Soil Conservation Service received 24 accessions, and reports 18 of these as failures.

Among the other agronomic accessions one small grain (oats), six sesame, and fourteen sunflowers were received. The sesame showed no superiority over strains available in the regional testing program. The sunflowers will be dropped and the oats retained.

Five watermelons and six cucumbers were received by the Horticulture Department. These are being retained by the interested people.

Florida: Project 767 - Evaluation of Introduced Plant Species and Varieties.

This state supporting project was approved July 1, 1956 to replace the older project which was terminated on that date. The new project includes testing improved varieties of domestic crops which are not presently grown in the state but show promise. Research in climatology which relates to plant introduction is now carried in a separate project. Testing new introductions of forage, field and horticultural crops was continued on the same or greater scale than formerly. The 1031 introductions received in 1956 were almost evenly divided between agronomic and horticultural crops.

Georgia: Project 74 - The Introduction, Testing, and Multiplication of New and Useful Plants of Potential Value for Industrial and Other Uses.

Private breeders and the S. C. S. accounted for approximately 375 introductions of the 639 distributed in the State, Fifty-two others were acquired for genetic studies. Personnel at the Georgia Coastal Plains Station have assumed the responsibility of increasing peanuts for the Introduction Station, free gratis, with 72 lots being grown this year.

Kentucky: Project 59 - 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.

Most of the 44 accessions received by Kentucky were Trifolium species with which attempts were made to hybridize the following listed species with Trifolium pratense, red clover, using the latter as the female parent: T. pallidum, P.I. 201213; T. cherleri, P.I. 200369; T. spumosum, P.I. 180896; T. subrotundum, P.I. 196895; T. alexandrinum, P.I. 180490; T. nigrescens, P.I. 206769; T. tomentosum, P.I. 180492; T. alexandrinum, P.I. 179510; T. squarrosum, P.I. 181813; and T. pratense, P.I. 206766. No hybrid plants were produced, but some shriveled seed was produced in the cross of T. pratense x T. pallidum. The species listed as T. pratense, P.I. 206766 was white flowered and would not cross with Kenland red clover. In appearance, this species resembled T. pallidum, P.I. 201213. No agronomic evaluations were made of these species.

Louisiana: Project 687 - Introduction and Testing of New Crops.

The 328 introductions received by Louisiana in 1956 were mostly vegetable crops. Of these 12 peppers have been selected for further study. Work is continuing with Dioscorea and disease screening work with sweet potatoes. Seed stocks are being built up for the release of a new okra variety having as one of its parents an introduction from the Gold Coast of Africa. Forty red clover introductions were tested for powdery mildew and all were found to be susceptible.

Mississippi: No contributing project.

Increased activity is noted in the screening of a variety of legumes for diseases. In this respect the screening of all introductions of peas, Pisum sativum for Ascochyta reaction has been completed. None were found to be resistant. Even though the Sugar Field Station does not actively participate in the Regional Project it may be noted that two PIs, 152694 and 155819, both from Africa, gave rise to the new Wiley sweet sorghum variety.

North Carolina: Project 116 - New Plants Investigations.

During the calendar year 1956, some 2000 introductions were requested by research workers in North Carolina. These materials were ordered through the Primary Station at Experiment, Georgia, but were, in some cases, filled by stations outside of the regional boundaries. This flexibility is not only necessary but, as is indicated by the magnitude of the program, is considered of great value by the local personnel involved. The introductions entering our state were used in large part by State College and USDA personnel. However, commercial research men have also taken advantage of this facility.

The present position of materials secured under this program ranges from preliminary screening for desirable characteristics to incorporation in varieties expected to be released to commercial channels next year. The crops screened vary from those with the long-range potential of wildlife cover and feed crops to sundry vegetable crops of relatively high immediate cash value.

A newly-initiated grass breeding project has made use of a large number of Festuca and Dactylis species and ecotypes. These have been planted in observational nurseries under the extremes of environmental conditions that are present in North Carolina.

Several genera of horticultural crops: Rubus, Fragaria and Abelmoschus, in particular, are in similar stages of testing.

Various Citrullus, and Cucumis introductions have been tested for one or more seasons. Within these genera, some introductions show considerable promise, particularly as regards resistance to such diseases as downy mildew of watermelon, and anthracnose (several races) of watermelon and cucumber. These are listed in the appendix, Table 2.

Conversely, the introductions of Cucurbita tested thus far have shown little tendency toward resistance to scab.

Numerous bean Phaseolus vulgaris introductions under test for cyst nematode (Heterodera glycines) resistance have proven susceptible with 6 possible exceptions, which are listed in Table 2 in the appendix. Phaseolus lunatus lines under observations had no cysts under the test conditions.

Several Zea lines have been incorporated into the breeding program at the station. These materials are being used in an attempt to increase both ear and kernel size.

Materials introduced during the previous years include several Medicago sativa lines now being evaluated for winter hardiness and vigor. Natural disease infestations have not been severe enough during the two test seasons to provide screening on that basis, but to date, none of the introductions have shown more desirable agronomic characteristics than the presently recommended varieties.

Several peanut introduction have been used as an integral part of the peanut breeding program. One or more varieties, of great commercial promise, are now coming out of this program and trace part of their parentage directly to materials acquired through the Plant Introduction Program.

Oklahoma: Project 732 - Introduction and Evaluation of New Crops for Oklahoma.

Activity has continued in the screening of miscellaneous crops such as gaur, mungbeans and several oil producing crops. Several promising peanut introductions listed in the 1955 report were in advanced testing. Prolonged drought led to inconclusive results as yet. A large number of legumes were tested at the Samuel Roberts Noble Foundation at Ardmore including all the cowpea Vigna sinensis available at the Southern Regional Plant Introduction Station. Some of the legumes appeared to have promise but at least one more year will be required to determine their real potentials.

Puerto Rico: Project 145 - Introduction and Evaluation of New Plants for Industrial and Other Purposes, and the Preservation of Valuable Germplasm of Economic Plants.

The Puerto Rico project was revised in 1956. Particular attention is being given to the collection of tropical fruits and coffee for future evaluation. The Southern Regional Plant Introduction Station provided 283 introductions, mostly grasses and legumes. These are now in the process of evaluation.

South Carolina: Project 88 - Investigations of New or Special Crops.

The South Carolina project outline was revised to include a large number of new crops including bamboo and tea in addition to the evaluation of standard horticultural and agronomic crops.

In the horticultural group 153 new pepper, and 304 new okra introductions were screened. Fifty-nine pepper introductions were selected for further observation in 1957. Unusually dark green pods were observed in okra introductions, PIs 140318, 142784 and 142785, and these will be crossed on commercial varieties in an attempt to transfer this property to the commercial types. All okra introductions are to be tested in the greenhouse for nematode resistance. Unsatisfactory evaluations were obtained on eighty new sesame introductions. These will be re-evaluated in 1957.

Selection work has continued with Chufas, P.I. 184949 and plans are underway to encourage the use of this introduction for hog grazing in the coastal plains.

Agrostis tennis P.I. 171470 appears to have promise as a 12-month lawn grass. It remained green during the dry summer and has not been affected by the cold through December.

At the Pee Dee Station 326 lots of cowpeas were screened to find a hay type with the ability to inhibit the reproduction of sting and root-knot nematode. Eleven of these were selected for further study.

All the orchard grass introductions at the S-9 and N.C. 7 Stations have been obtained to find one with possible adaptation to climate conditions in South Carolina.

Tennessee: Project 57 - Evaluation of New Plants.

The 24 introductions received by Tennessee in 1956 were either fruits or ornamentals, and considerable time will be required to complete their evaluations. Tests of 22 Rumex showed them to be resistant to rhubarb crown rot. Crosses of the best of these on rhubarb will be attempted. Ilex cornuta rotundifolia PI 143795 has been increased and some distribution made. Other ornamentals received in previous years are in various stages of the testing program.

Texas: Project 717 - Introduction, Multiplication, Preservation, and Determination of Potential Value of New Plants for Industrial and Other Purposes, and for Preservation of Valuable Germplasm of Economic Value.

Screening of the southwestern grass collection is continuing. In addition there were 1066 new introductions received by various agencies in the state. Most of these were agronomic crops.

The following accessions have been recommended for release but have not yet approved by the Texas Seed Release Committee.

Lolium multiflorum, 193145
Melilotus alba annua, 200355

The following is a condensed statement of accessions showing promise but needing further evaluation. The list merely gives the total number of promising accessions of each botanical group. P.I. numbers are shown in Table 1, in the appendix.

Cyamopsis tetragonoloba,	3	Andropogon aristatus,	1	Bouteloua gracilis,	5
Setaria macrostachya,	5	" sericeus,	1	Leptochloa dubia,	3
" (other spp.),	6	" barbinodes	14	Pappophorum bicolor,	3
Andropogon annulatus,	4	" saccharoides	6	Pappophorum	
" insculptus,	1	Bouteloua curtipendula,	29	mucronulatum,	4
Trichloris mendocina,	1	Trifolium spp.,	4	Trichloria crinita,	2
Sorghum sp.,	3	Cynodon spp.,	5	Panicum deustum,	2
Urochloa mosambicensis,	3	Chloris gayana,	3	" laevifolium,	1
Carica papaya,	2	Digitaria valida,	1	" makarikariense,	4
Sesamum indicum,	4	Panicum coloratum,	5	" stapfianum,	8
				" virgatum,	2
				Total no. promising	131

Virginia: No contributing project

The alfalfa breeding project has been expanded and half of the 345 accessions received were alfalfas. They will be tested for hardiness, recovery, and disease resistance.

Usefulness of Findings:

One introduction Cynodon magennisii PI 184339 has been released as a turf grass under the name Sunturf by Alabama, Arkansas, Oklahoma, and South Carolina. It has been found to be superior to any other lawn type bermudagrass for those states.

Israel sweet clover Melilotus alba annua PI 200355 and Lolium mulfiflorium PI 193145 a rust-resistant ryegrass from Uruguay, have been recommended for release by the Texas Station. Approval by the Texas Seed Release Committee is pending. The release of Wiley sweet sorghum has previously been mentioned in the Mississippi report.

Work Planned for Next Year:

An addition will be made to the present Plant Introduction Building at the Georgia Experiment Station. This addition should provide ample room for seed processing and remove this activity from the office space. Improvements in the office rooms will also be made.

Funds have been made available by the Plant Introduction Section, A.R.S. to permit the addition of a plant pathologist to the staff. This addition will be made as soon as a prospect can be found.

In addition to the usual work of increase and evaluation a program of testing the adaptability of the tropical yam Dioscorea sp. will be carried out in several locations in the southern states.

Work with timber bamboo as a source of paper pulp has been initiated in South Carolina. An attempt will be made to place other such plantings in other southern Experiment Stations.

Greater emphasis on evaluation of crops for industrial use will be sought.

Publications:

In addition to the distribution of nine mimeographed catalogs by the Southern Regional Plant Introduction Station covering 906 new introductions, attention is called to South Carolina Circular 103 "Sunturf Bermuda".

Chairman, Technical Committee

Regional Administrative Advisor

Appendix

Table I - DISTRIBUTION OF INTRODUCTIONS Jan. 1, --- Dec.31, 1956

State	Grasses & Legumes: By S. Reg.	Grasses & Legumes: By Others	Other Field Crops: By S. Reg.	Other Field Crops: By Others	Vegetable Crops: By S. Reg.	Vegetable Crops: By Others	Misc. Crops: By S. Reg.	Misc. Crops: By Others	Totals
Alabama	23	4	38		2	1	3		71
Arkansas	114				6		14		134
Florida	332	9	47	113	474		56		1031
Georgia	100	5		326	115	6	4		639
Kentucky	5	25		7		5	2		44
Louisiana	31	3			244	44	6		328
Mississippi	84	77			87	33	2		2283
North Carolina	45	196	8		355	274	4		882
Oklahoma	76	93	14		565	57	1		806
Puerto Rico	277		6						283
South Carolina	18	43			390	25	20		496
Tennessee					20		4		24
Texas	471	91	317	139	27		21		1066
Virginia	2	279	5		57		2		345
Totals by S. Reg.	1578		518		2342		139		4577
Totals by Others		825		585		445			1855
Totals by Crops	2403		1103		2877		139		6432

Shipped outside Southern Region	
Northeast Region (1)	356
North Central Region (2)	925
Western Region (3)	1140
Beltsville & Foreign	427
Total	2848
Total by S. Reg. Plant Intro. Sta.	7425

(1) Includes 221 transfers to Northeast Station.
(2) Includes 89 transfers to North Central Station.
(3) Includes 222 transfers to Western Station.

Table 2

PROMISING INTRODUCTIONS REPORTED IN 1956 *

Species	P. I. number	State reporting	Characteristics & Use
Agrostis tenuis	171470	S. Carolina	Remain green year round. Promise for lawns.
	172698	Alabama	
Andropogon barbinodes	216053	Texas	All drought resistant, good forage quality and production, high seed yields.
	216055	Texas	
	216059	Texas	
	216068-69	Texas	
	216073	Texas	
	216079	Texas	
	216086-88	Texas	
	216092	Texas	
	216094	Texas	
	216099	Texas	
	216101	Texas	
A. saccharoides	216128-29	Texas	Good forage qualities Drought resistant good forage, drought resistant
	216131-32	Texas	
	216134-35	Texas	
Bouteloua curtipendula	216216	Texas	All drought resistant with good forage production and quality, and mostly good seed producers.
	216218	Texas	
	216221	Texas	
	216228	Texas	
	216231-32	Texas	

* At the end of each year a report form (sample attached is sent to every individual receiving introductions during the year. The listing of promising introductions is tabulated from these reports. Some immediately enter breeding programs, other when thoroughly evaluated may be discarded.

Species	P.I. number	State reporting	Characteristics & Use
Bouteloua curtipendula	216241-43	Texas	Drought resistant with good forage production and quality and mostly good seed producers.
	216245	Texas	
	216253	Texas	
	216268	Texas	
	216284	Texas	
	216286	Texas	
	216290	Texas	
	216295	Texas	
	216815	Texas	
	216824-25	Texas	
	216830	Texas	
	216832-33	Texas	
	216853	Texas	
	216894	Texas	
B. gracilis	216238	Texas	All outstanding drought resistant forage quality and production, very cold tolerant.
	216330	Texas	
	216332	Texas	
	216334	Texas	
	216336	Texas	
Carica papaya	226028-29	Louisiana	Vigorous & productive
Citrullus vulgaris	162296	N. Carolina	All through 222714 appear resistant to anthracnose, Race 3.
	163572	N. Carolina	
	164977	N. Carolina	
	165448	N. Carolina	
	165451	N. Carolina	
	169258	N. Carolina	

Species	P. I. number	States reporting	Characteristics & Use
Citrullus vulgaris	169297	N. Carolina	
C. Vulgaris	172789	N. Carolina	
	175660	N. Carolina	
	175664	N. Carolina	
	176488	N. Carolina	
	176909	N. Carolina	
	176917	N. Carolina	All through 222714 appear resistant to anthracnose, Race 3.
	180427	N. Carolina	
	183123	N. Carolina	
	183673	N. Carolina	
	186490	N. Carolina	
	211851	N. Carolina	
	212287	N. Carolina	
	222714	N. Carolina	
	169289-90	N. Carolina	
	171392	N. Carolina	Resistant to downy mildew
	179660	N. Carolina	
	179875	N. Carolina	
Cucumis melo	179913	Virginia	
	182953	Virginia	Resistant to powdery mildew
	182959	Virginia	
Cucumis sativus	162889	Oklahoma	Hardy miniature plants
	163217	N. Carolina	Resistant to anthracnose, Race 3
	175111	N. Carolina	Resistant to 3 races of anthracnose

Species	P. I. number	State reporting	Characteristics & Use
Cyamopsis tetragonolobus	164477	Texas	Early, branched, good seed prod.
	180287	Texas	Early, branched, good seed and forage prod.
	180288	Texas	Deep rooted, branched, long season
Cynodon dactylon	213385	Georgia	Good turf quality
Leptochloa dubis	216417	Texas	Drought resistant, high seed and forage prod.
	216468	Texas	" " "
	216473	Texas	Drought resistant, high seed prod.
Medicago truncatula	190089	Texas	Tolerates adverse conditions
Pappophorum bicolor	216526	Texas	Drought resistant & high seed prod.
	216528	Texas	" " "
	216531	Texas	" " "
P. mucronulatum	216532-33	Texas	" " "
	216535-36	Texas	" " "
Panicum virgatum	216518	Texas	Drought resistant good forage & seed prod.
	217212	Texas	Same as 216518 with extensive rhizomes
Phaseolus vulgaris	182281	Oklahoma	Disease free through 1956
	163118	N. Carolina	All appear to have some resistance to cyst nematode, need further tests
	165462	N. Carolina	" " " " " " "
	169760	N. Carolina	" " " " " " "
	169864	N. Carolina	" " " " " " "
	169779	N. Carolina	" " " " " " "
	179416	N. Carolina	" " " " " " "

Species	P. I. number	State reporting	Characteristics & Use
Paspalum notatum	162791	Georgia	Long season & frost resistant
Setaria macrostachya	216548	Texas	Drought resistant
	216560	Texas	Drought resistant
	216549	Texas	Drought resistant, good seed prod.
	216555	Texas	Drought resistant, good forage quality and Prod. , good seedling vigor
	216557	Texas	
Sorghum vulgare,	152694	Mississippi	Parents of Wiley
	155819	Mississippi	Parents of Wiley
	180008	Texas	Adapted to mechanical harvesting
	186232	Texas	Short, good forage Prod.
	192979	Texas	Early grain prod.
Trifolium angustifolium	206758	Texas	Good winter growth
T. isthmocarpum	202517	Texas	Good winter growth
	203664	Texas	Good winter growth
T. nigresicens	206926	Texas & Ga.	Very vigorous growth, Being increased by SCS in Ga.
Trichloris crinata	216653-54	Texas	Drought resistant
T. mendocina	216655	Texas	Drought resistant
Vigna sinensis	115879	S. Carolina	Very good hay prod. on soils infested with sting nematode and tolerant to mosaic
	170868	S. Carolina	
Zea Mays	216825	Alabama	All have lodging resistance with Good kernel quality and leaf blight resistance
	216827	Alabama	
	216831-32	Alabama	
	216840-42	Alabama	
	216852	Alabama	

Species	P. I. number	States reporting	Characteristics & Use
Zea Mays	216829-31	N. Carolina	) In crosses for large kernel size
	216838	N. Carolina	) In crosses for large)=ears and kernel
	216841-44	N. Carolina	) size