

ANNUAL REPORT OF COOPERATIVE REGIONAL PROJECTS
Supported by Allotments of the Regional Research Fund
Hatch Act, as Amended August 11, 1955
January 1 to December 31, 1979

1. PROJECT: S-9 Plant Germplasm - Its Introduction, Maintenance and Evaluation
2. COOPERATING AGENCIES AND PRINCIPAL LEADERS:

State Experiment Stations and Representatives

Ala.	C. S. Hoveland*	N. C.	W. T. Fike*
Ark.	J. L. Bowers*	Okla.	J. S. Kirby*
Fla.	Gordon M. Prine*	P. R.	O. D. Ramirez*
Ga.	G. R. Lovell*	S. C.	D. W. Bradshaw*, Chm.
Ha.	P. J. Ito*	Tenn.	L. N. Skold*
Ky.	R. E. Sigafus*	Tex.	O. F. Smith*
La.	R. J. Stadtherr*	Va.	A. J. Lewis, III*
Miss.	C. E. Watson*		

Administrative Advisor C. R. Jackson

U. S. Department of Agriculture

Co-Administrative Advisor, SEA,AR D. E. Zimmer

National Program Staff, SEA,AR	Quentin Jones
Germplasm Resources Laboratory, SEA,AR	G. A. White*

National Seed Storage Laboratory, SEA,AR	A. J. Oakes
Subtropical Hort. Res. Stn., SEA,AR	H. F. Winters
	L. N. Bass
	R. J. Knight
	P. K. Soderholm

Mayaguez Institute of Trop. Agric., SEA,AR	F. W. Martin
Northern Regional Research Center, SEA,AR	L. H. Princen
Cooperative Research, SEA	C. O. Grogan
Soil Conservation Service	Arnold Davis*

Southern Regional Plant Introduction Station, Cooperative SEA,AR and SAES.

Regional Coordinator	W. R. Langford (Retired 1-13-79)
	G. R. Lovell (10-22-79)
Plant Pathologist	Grover Sowell, Jr.
Entomologist	R. V. Connin (Retired 2-24-79)
Research Geneticist	W. C. Adamson (8-12-79)

3. PROGRESS OF WORK AND PRINCIPAL ACCOMPLISHMENTS:

Germplasm of 319 new introductions was added to the regional germplasm collection. Of special interest are the 78 introductions from the Peoples Republic of China. There are 18 genera and 23 species ranging from cowpeas to melons and peanuts.

*Indicates voting members of the Technical Committee

Over 8,000 introductions were grown at the regional station and in Florida, Alabama, and Puerto Rico for seed increase and evaluation. The University of Florida at Gainesville under a Broad Form Cooperative Agreement increased 1,000 peanut accessions to replace aged material in inventories at the regional station and the National Seed Storage Laboratory. Under the same cooperative agreement the university's Agricultural Research Center, Ft. Pierce has increased 35 genera (506 accessions) of tropical legumes. The largest single genera is Leucaena (120 accessions) which is currently in demand by researchers in many of the developing countries.

Distribution of 12,689 seed packets were in three major categories: S-9 Regional Project - 7,406; other domestic requests - 2,774; foreign - 2,509 to 55 countries.

Financial support has continued for the preservation of Trifolium in Kentucky and Tripsacum in North Carolina.

The screening of the watermelon introductions (Citrullus lanatus, 880 PI's) in the field resulted in the identification of six new sources of resistance to anthracnose: PI's 244019, 255136, 255137, 266015, 270563, 295842. The muskmelon (Cucumis melo) selection PI 436533 was found equal to the previously recognized PI 14071 in resistance to gummy stem blight when grown in the field.

An 84 page catalog on the Sorghum inventory was completed and received from the printers for distribution. Also, catalogs on the peanuts and eggplant species were completed and placed with the printers.

Prototype computer programs have been completed for 3 crops: Cicer, Brassica and Solanum. Computerization efforts are now concentrating on completing the germplasm inventory.

The S-9 Technical Committee met August 2-3 at Colorado State University, Ft. Collins, Colorado. Progress reports presented by each participant are recorded in the minutes of the meeting.

There were major changes in the staffing of the Regional Plant Introduction Station. Dr. W. D. 'Bob' Langford retired as Coordinator on January 13, 1979, and Dr. R. V. Connin, Entomologist, retired February 24, 1979. On August 12, 1979 Dr. W. C. Adamson, Research Geneticist, transferred from the Savannah Plant Introduction Station. Gilbert R. Lovell reported on October 22, 1979, filling the vacancy of Coordinator and Research Leader.

The new seed processing building, equipped for cleaning, drying, and fumigating seed, was completed and in use by early December.

4. USEFULNESS OF FINDINGS:

Results obtained through this project at the regional station, at state experiment stations, by federal agencies, and by private enterprise are mutually beneficial to plant breeders and other plant scientists, and through them ultimately to the public. Desirable traits found in plant introductions can be used to develop superior varieties thereby increasing the efficiency of production and reducing the need for pesticides. Through work at the regional station seed of world collections of economic crops is maintained for future use. New information gained from cultural studies of potential crops may lead to greater diversification of agriculture.

5. WORK PLANNED FOR NEXT YEAR:

The regional station will continue to receive, propagate, and catalogue plants for distribution to plant breeders and other cooperators. Screening studies will be continued to locate resistance to insects and disease. A basic evaluation study of 12 species of tuberous legumes will be initiated. The legumes will be analyzed for protein levels and evaluated for human consumption. As part of SFA-AR Regional Agricultural Energy Centers, the regional station will collect and evaluate various grasses, Compositae, and other herbaceous perennials to determine potentials as a biomass source for hydrocarbons. This project will be funded by special allocations from the Department of Energy. Computerization of germplasm inventories will be completed and a maintenance program will be developed. The plant exploration for Festuca, Dactylis, Trifolium, and Lotus species in Yugoslavia will be scheduled for June, July, and August.

6. PUBLICATIONS ISSUED OR MANUSCRIPTS APPROVED DURING THE YEAR:

A partial list of publications related to evaluation and use of plant germplasm in the Southern Region during 1979 are listed in Supplement II of this report.

7. APPROVED:

2-19-80
Date

David W. Bradshaw
D. W. Bradshaw, Chairman, Technical Committee

2/26/80
Date

C. R. Jackson
C. R. Jackson, Administrative Advisor

Supplement I
to
1979 ANNUAL REPORT FOR REGIONAL PROJECT S-9

Plant introductions that exhibited desirable characteristics in S-9 Regional evaluation tests. 1979

Name & P.I. No.	State reporting	Reported value
<u>VEGETABLE PLANTS</u>		
<u>Brassica oleracea (capitata group)</u>		
324069	VA.	)Resistance to looper and
343488	VA.	)imported cabbage worm
<u>Citrullus lanatus</u>		
189225	ALA.	)GSP and Anthracnose
271778	ALA.	)resistance
203551	ALA.)
271775	ALA.	)Anthracnose resistance
299379	ALA.)
326515	ALA.)
<u>Cucumis melo</u>		
266935	GA.)
296345	GA.	)GSB resistance
436533	GA.)
<u>Lycopersicon cheesemonii</u>		
379039	ALA.	)Heat tolerance
<u>Lycopersicon hirsutum</u>		
134417	N.C.	)Hornworm resistance
205601	N.C.)
272636	N.C.	)Fruit rot resistance
<u>Lycopersicon esculentum</u>		
272735	ALA.	)Heat tolerance

Name & P.I. No.	State reporting	Reported value
<u>Phaseolus vulgaris</u>		
165426	ARK. & HAW.)
203598	ARK.	)<u>Rhizoctonia solani</u>
226895	HAW.	)resistnace
307760	ARK.)
169778	VA.	)Ozone resistance
<u>ORNAMENTAL PLANTS</u>		
<u>Betula platyphylla</u> var. <u>japonica</u>		
235128	GA.	)fast growing, pest)resistant
<u>Photinia</u> sp.		
325010	LA.	)Disease tolerant
<u>Quercus chenii</u>		
102653	GA.	)Good border type,)large, full spreading
<u>AGRONOMIC PLANTS</u>		
<u>Arachis hypogaea</u>		
109839	GA.	)leafspot resistance
268661	OKLA.	)earliness, good yield,)large pod & seed size
288160	GA.	)white testa color, possible)food supplement
<u>Arachis</u> sp.		
338279	GA.	)Roadside stabilization &
338280	GA.	)beautification
<u>Cynodon aethiopicus</u>		
225957	FLA.	)high dry matter yield,)high % <u>in vitro</u> digestion

Name & P.I. No.	State reporting	Reported value
<u>Desmodium hetercarpon</u>		
217910	FLA.	)released as 'Florida')cultivar
<u>Digitaria valida</u>		
299877	HAW.	)erosion control
<u>Galactia jussiaena</u>		
522451	S.C.	)good seed production
<u>Helianthus annuus</u>		
175728	TX.	)chaffy head resistance
<u>Hemarthria altissima</u>		
299995	HAW.	)high yield
<u>Panicum maximum</u>		
291047	P.R.	)high yield
340676	P.R.	)high yield
<u>Fraxalis tuberosa</u>		
294268	OKLA.	)winter hardiness
<u>Sorghum bicolor</u>		
152857 (MN1060)	TEX.)
152959 (MN1048)	TEX.	)newly released
152965 (MN1054)	TEX.	)germplasm lines
152967 (MN1056)	TEX.	)with resistance to
152971 (MN1060)	TEX.	)downy mildew, leaf
154244 (MN1500)	TEX.	)anthracnose, and rust
<u>Stylosanthes guianensis</u>		
401504	FLA.	)cold tolerance
401505	FLA.)
<u>Trifolium subterraneum</u>		
168638	MISS.)
311493	MISS.	)well adapted to S.F.
319145	MISS.	)with superior agronomic
319415	MISS.	)traits

Supplement
to
1979 ANNUAL REPORT FOR REGIONAL PROJECT S-9

Publications related to evaluation and use of plant germplasm in the Southern Region, 1979

1. Adamson, W. C., F. L. Long, and M. O. Bagby. 1979. Effect of Nitrogen Fertilization on Yield, Composition, and Quality of Kenaf. Agron. J. 71:11-14.
2. Minton, N. A., and W. C. Adamson. 1979. Response of Tephrosia vogelii to Four Species of Root-Knot Nematodes. Plt. Dis. Reprtr. 63:514.
3. Minton, N. A., and W. C. Adamson. 1979. Control of Meloidogyne javanica and M. arenaria on Kenaf and Roselle With Genetic Resistance and Nematicides. J. Nematol. 11:37-41.
4. Norton, J. D. 1979. Cantaloupe: Breeding for Resistance to Didymella bryoniae. Biennial Report of Veg. Breeding in Southern U. S., HI., and Puerto Rico. 1979:9.
5. Norton, J. D. 1979. Inheritance of Resistance to Gummy Stem Blight in Watermelon. Hort. Science 14(5):630-632.
6. Sotomayor-Rios, A. 1979. Potential of Stylosanthes guianensis as a Forage Crop in the Humid Mountain Region of Puerto Rico. J. Agr., U. Puerto Rico.
7. Sowell, G. Jr., B. B. Rhodes and J. D. Norton. 1980. New Sources of resistance to watermelon anthracnose. Jour. Amer. Soc. Hort. Sci. 105(2).
8. Sowell, G. Jr., N. W. Schaad. 1979. Pseudomonas pseudoalcalignes subsp. citrulli on watermelon: seed transmission and resistance of plant introductions. Plant Disease Reporter 63:437-441.
9. Telek, L. and A. Santiago. 1979. Leaf Protein Concentrate From Leucaena leucocephala, a Potential Feed Supplement in the tropics. J. Agr., U. Puerto Rico.
10. Walker, J. T., W. C. Adamson, and J. Melin. 1979. Ring Nematode Populations of Selected Woody Ornamentals Under Natural Field Conditions. Proc. Sna. Res. Conf. 24:156-157.