

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, 1969

1. PROJECT: SOUTHERN REGIONAL PROJECT S-9, "NEW PLANTS"

The Introduction, Multiplication, Evaluation and Preservation of New Plants for Agricultural, Industrial and Urban-Rural Uses.

2. COOPERATING AGENCIES AND PRINCIPAL LEADERS:

State Experiment Stations

Representatives

Alabama	*C. S. Hoveland
Arkansas	*J. E. Bowers, Chairman
Florida	*G. B. Killinger
Georgia	*W. R. Langford
Kentucky	*N. L. Taylor
Mississippi	*H. W. Bennett
North Carolina	*W. T. Fike
Oklahoma	*R. S. Matlock
Puerto Rico	*J. Velez-Fortuno
South Carolina	*J. H. Martin
Tennessee	*W. E. Roever
Texas	*E. L. Whiteley, Secretary
Virginia	*T. J. Smith

Administrative Advisor

C. R. Jackson

U. S. Department of Agriculture

New Crops Research Branch, ARS	*J. L. Creech
Plant Introduction Investigations	Quentin Jones
Plant Materials Investigations	H. L. Hyland
Agronomic Crops	A. J. Oakes
Horticultural Crops	H. F. Winters
Chemurgic Crop Investigations	G. A. White
Cooperative State Experiment Stations Service	C. I. Harris
Utilization Research and Development Divisions, ARS	*W. H. Tallent
Soil Conservation Service	*W. C. Young

Southern Regional Plant Introduction Station, Experiment, Georgia	
Regional Coordinator	W. R. Langford
Plant Pathologist	Grover Sowell, Jr.
Assistant Agronomist	J. H. Massey
Assistant Horticulturist	W. L. Corley

* Voting Members of the S-9 Technical Committee

3. PROGRESS OF WORK AND PRINCIPAL ACCOMPLISHMENTS

Propagating stocks of 2479 new plant introductions were added to the regional germ plasm collection in 1969, increasing the S-9 inventory of seedstocks to more than 23,000 accessions. The new introductions represent 57 genera, but a collection of Ethiopian sorghum constitutes 51 percent of the new material. Other genera well represented by the new material are Cajanus, Capsicum, Cicer, Cyamopsis, Dolichos and Vigna.

The regional station grew 4680 accessions for seed increase and preliminary evaluation. In addition to these the Oklahoma and Georgia Experiment Stations replenished the regional station with new seed of 1040 peanut introductions. Sixty-four clones of wild Arachis spp. collected in South America during 1969 were propagated by the Oilseeds and Industrial Crops Research Branch, ARS, and plants were distributed for evaluation at six stations in Georgia, Florida, Texas and Oklahoma. Commercial type peanuts introduced from South America in 1968 were increased at Mayaguez, Puerto Rico during the winter and distributed to peanut breeders for evaluation in 1969. Research workers in the South were supplied with 15,939 packets of seeds and plants for evaluation and use as plant breeding stocks and in new crop development programs. Through international exchange of plant germ plasm foreign scientists were supplied with 1565 packets of seed.

All states in the region participated in the evaluation of agronomic and horticultural plant introductions. In Alabama Phalaris aquatica P.I.'s 240261, 240280 and 240282 were found to be especially productive of high quality forage during the winter, exceeding the yield of tall fescue by 50 percent. Southern pea progenies characterized by dwarf bush type plants with concentrated pod set for once-over harvest were selected in Arkansas from a cross involving Vigna P.I. 221731. A number of grass introductions that appeared highly productive in small plots in Florida were selected for further evaluation, some of which will be subjected to grazing. These include Vetivera zizanioides P.I. 302300; Hemarthria altissima P.I.'s 299993, 299994, and 299995; Brachiaria humidicola P.I. 257678; and Digitaria decumbens P.I. 279651. Resistance to both downy and powdery mildew was found in a segregate of Cucumis melo P.I. 300954 at the University of Florida. High resistance to anthracnose was discovered in Sorghum bicolor P.I.'s 248309, 250750 and 267367 in Georgia, and an acceptable level of resistance was found in a number of other grain type sorghum introductions. Pennisetum flaccidum P.I.'s 220606, 338714, 338715, and 338716 and P. orientale P.I.'s 271595, 271596, and 215600 were selected for further evaluation for forage production in North Carolina. Thirteen elite clones representing 4 spp. of Cynodon were selected in Oklahoma for breeding lines in the development of superior varieties of bermudagrass. The entire collection of Cynodon totaling more than 400 accessions were evaluated for winterhardiness in Tennessee, and several high yielding, winter-hardy accessions were selected for more intensive evaluation. Early maturing pigeonpea progenies with determinate growth habit suitable for mechanized production were selected in Puerto Rico from crosses of 'Kaki' and P.R.P.I. 5690. Digitaria P.I. 299731 was selected for evaluation under grazing in Puerto Rico on the basis of its performance in small plots.

Field studies of kenaf were conducted in North Carolina, South Carolina, Georgia, Florida, Alabama, and Texas. Susceptibility to nematodes is the major deterrent to further development of this species into a pulp crop. Regional field trials of potential new crops for the south also included Tephrosia, sunflower, Brassica spp., and Briza.

A number of improved varieties developed in part or entirely from introduced breeding stocks were released in 1969. These include (1) 'Walter' tomato which contains *Fusarium* race-2 resistance from P.I. 126915, (2) 'Frost' blue lupine with winterhardiness from P.I. 168535, (3) 'Tiftlate' pearl millet developed from several photoperiod-sensitive introductions, (4) 'Spanhoma' peanut with high yield from P.I. 121070, and (5) 'Slenderstem' digitgrass, a vegetative increase of P.I. 300935.

The S-9 Technical Committee met at the Puerto Rico Experiment Station July 9-11. Detail progress reports of the evaluation of the plants mentioned above and numerous other introductions that merit further evaluation were presented by each participant.

The progress reports are recorded in the Minutes of the meeting, copies of which are available from the Coordinator. The next meeting of the S-9 committee is tentatively scheduled during the 3rd week of July 1970 at the Plant Materials Center, Americus, Georgia and the Regional Plant Introduction Station, Experiment, Georgia.

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 with resistance to diseases and insects, thereby increasing 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 chemurgic crops will aid in the development of new crops and diversification of agriculture.

5. WORK PLANNED FOR NEXT YEAR:

The regional station will continue to receive, propagate, evaluate, and catalogue new plant materials. Screening studies will be continued to locate new sources of disease and insect resistance. Evaluation of promising introductions will be continued at state experiment stations and SCS plant material centers.

6. PUBLICATIONS ISSUED OR MANUSCRIPTS APPROVED DURING THE YEAR:

Alabama

Station publications

Hoveland, C.S., E.L. Carden, G.A. Buchanan, E.M. Evans, W.B. Anthony, E.L. Mayton, and H.E. Burgess. 1969. Yuchi Arrowleaf Clover. Agr. Exp. Sta. Bul. 396.

Hoveland, C.S., E.L. Carden, W.B. Anthony, and J.P. Cunningham. 1969. Phalaris aquatica - promising cool season grass for Alabama. Auburn Univ. Agr. Exp. Sta. Highlights of Agr. Res. Vol. 16, No. 4.

Georgia

Station publications

Burns, Robert E., and John H. Massey. 1969. Sunflowers for Georgia. Ga. Agr. Res. 10(3): 9-10.

Journal Series Papers

Massey, John H. 1969. Fruiting pattern of Vernonia anthelmintica (L.) Willd. Agron.J. 61:651-652.

Massey, John H., and Grover Sowell, Jr. 1969. Effects of spacing and anthracnose on Cassia occidentalis L., Agron. J. Vol. 61:749-750.

Sowell, Grover Jr., and H.B. Harris. 1969. Downy mildew of sorghum in Georgia. Pl. Dis. Repr. 53:4.

Sowell, Grover Jr., and James W. Demski. 1969. Susceptibility of watermelon cultivars to watermelon mosaic virus-2. Pl. Dis. Repr. 53:209.

Sowell, Grover Jr., and W.L. Corley. 1969. Screening cucurbits for resistance to powdery mildew. Ga. Acad. Sci. Vol. 27:82.

7. APPROVED:

1-9-70
Date

1/9/70
Date

John L. Bowers
Chairman, Technical Committee

G. R. Jackson
Regional Administrative Advisor