

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, 1970

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

Alabama
Arkansas
Florida
Georgia
Kentucky
Mississippi
North Carolina
Oklahoma
Puerto Rico
South Carolina
Tennessee
Texas
Virginia

Representatives

*C. S. Hoveland
*J. L. Bowers
*G. B. Killinger
*W. R. Langford
*R. E. Sigafus, Secretary
*H. W. Bennett
*W. T. Fike
*R. S. Matlock
*J. Velez Fortuno, Chairman
*J. A. Martin
*W. E. Roever
*E. L. Whiteley
*T. J. Smith

Administrative Advisor

C. R. Jackson

U. S. Department of Agriculture

New Crops Research Branch, ARS
Plant Introduction Investigations
Plant Materials Investigations
Agronomic Crops
Horticultural Crops
Chemurgic Crop Investigations
Cooperative State Experiment
Stations Service
Utilization Research and
Development Divisions, ARS
Soil Conservation Service

*J. L. Creech
Quentin Jones
H. L. Hyland
A. J. Oakes
H. F. Winters
G. A. White
C. I. Harris
*W. H. Tallent
*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:

Through international exchange of seeds and plant explorations conducted by the New Crops Research Branch 1559 new plant introductions were added to the regional germ plasm collection in 1970, increasing the S-9 inventory of seedstocks to more than 24,000 accessions. Cowpeas constituted 2/3 of the new material, increasing the Vigna collection to 1640 accessions. The other new introductions represent a wide assortment of plant species. Although the collection of plant materials maintained at the regional station represents 240 genera, southern crop species and their wild relatives constitute a high percentage of the collection. Among the crop plants for which a wide range of germ plasm is maintained are peanuts, pepper, sorghum, cantaloupe, watermelon, cowpea, okra, clover spp., and forage grass spp.

The regional station grew 3145 accessions for seed increase and preliminary evaluation. In addition to these, cooperators at the Federal Experiment Station, Mayaguez, Puerto Rico, and Oklahoma State University, increased 1178 accessions of sorghum, chickpea, and mungbean to replenish regional seedstocks. Vegetative stocks of 56 grass and legume introductions that failed to flower in Georgia were transferred to Puerto Rico for seed production. A catalogue of all sorghum introductions was prepared and distributed to plant scientists. S-9 cooperators were supplied with 8470 packets of seed and plants, and through international exchange foreign scientists were supplied 1087 packets from the S-9 collection.

All states in the region participated in the evaluation of agronomic and horticultural plant introductions. The entire collection of Vigna was evaluated at Auburn University for protein and amino acid content, and it was screened in Puerto Rico for types best adapted to tropical conditions. Resistance to powdery mildew, Cercospora leafspot, Anthracnose and Southern Bean Mosaic Virus was observed among the Vigna introductions in Puerto Rico. In forage legume studies in Georgia, Dolichos lablab PI 316899 was used as a source of earliness in crosses aimed at combining earlier flowering and thus reliable seed production with the high forage productivity of the Australian variety 'Rongai'. 451 accessions of Paspalum spp. were evaluated in Mississippi for cold tolerance, and interspecific crosses involving the best introductions were made in attempts to transfer good seed production to the best forage types. The entire collections of pepper and okra were evaluated at Clemson University for plant and fruit characters that lend themselves to mechanical production and harvesting. Some pepper introductions with good abscission of fruits from calyx, making them easier to harvest mechanically, were found. Lupine introductions representing several spp. were screened in Arkansas for resistance to Phytophthora megasperma var. Sohac. Only L. texensis showed resistance. Among 26 sweetpotato introductions screened in North Carolina resistance to scurf, Fusarium wilt, and rootknot nematode was found. Brassica carinata continued to show promise for use as a green vegetable in production and processing trials in Texas. In work with ornamentals in Tennessee 2 introductions of Grysiophila were found to be resistant to Phytophthora parasitica, and a yellow coleus mutant was produced. Twenty-two introductions of grasses and legumes continued to show promise for ground cover and erosion control, wildlife food, or other conservation uses in various parts of the South. Field studies were continued in North Carolina, South Carolina, Georgia, Florida, Alabama, Texas, and Oklahoma to determine the cultural requirements of species that have potential as new chemurgic crops. Major species under study were kenaf, Brassica spp., Crambe, Solanum spp., Briza spicata, and Tephrosia. Several improved varieties developed in part or entirely from introduced breeding stocks were released in 1970. These include (1) 'Tifspan' peanut, selected from a cross involving PI 121070; (2) 'Spancross' peanut, which resulted from an interspecific cross of PI 121070 and PI 210553; (3) 'Tibbee' crimson clover, selected from PI 233812; (4) 'Nova' vetch, containing the hard seed character of PI 121275; and (5) 'Dale' sorgho with germ plasm from PI 152857.

The S-9 Technical Committee met at the Plant Materials Center, Americus, Georgia and the Regional Plant Introduction Station, Experiment, Georgia, July 21-22. Detail reports on the evaluation of 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. The next meeting of the committee will be held at the Plant Industry Station, Beltsville, Md., July 26-28, 1971.

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 New Crops Research Branch will conduct an exploration in South Africa to collect and introduce additional germ plasm of warm season grasses native to that region. 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 new sources of disease and insect resistance. Evaluation of introductions will be continued at state stations and SCS plant material centers.

6. PUBLICATIONS ISSUED OR MANUSCRIPTS APPROVED DURING THE YEAR:

Alabama

Station publications

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.

Journal Series Papers

Hoveland, C. S. 1970. Dormancy and seasonal growth of Phalaris species in Alabama. Proc. XI International Grassland Congress. Surfers Paradise, Queensland, Australia. pp 608-611.

Norton, J. D. 1969. Incorporation of resistance to Meloidogyne incognita acrita into Cucumis melo. Proc. Sou. Agr. Workers Assoc. 66:212.

Georgia

Station publications

Corley, W. L. 1970. Evaluation of Pepper Plant Introductions. Sou. Coop. Ser. Bul. No. 151. 56 pp.

Corley, W. L. and A. H. Dempsey. 1970. Ornamental Peppers for Georgia. Ga. Agr. Exp. Stas. Res. Bul. 83. 14 pp.

Journal Series Papers

Demski, J. W. and Grover Sowell, Jr. 1970. Susceptibility of Cucurbita pepo and Citrullus lanatus introductions to watermelon mosaic virus-2. Pl. Dis. Repr. 54:880-881.

Texas

State publications

Whiteley, E. L. 1970. Kenaf research in Texas. Dept. Information Report No. 31.

Journal Series Papers

Stephens, T. S., G. Saldana, and F. P. Griffiths. 1970. Quality of Brassica carinata as a Green Leafy Vegetable. Jour. Amer. Soc. for Hort. Sci. Vol. 95, No. 1.

7. APPROVED:

Jan. 18, 1971
Date

1/18/71
Date

Walter Fortune
Chairman, Technical Committee
Garrett R. Jackson
Regional Administrative Advisor