

OCT 19 1959

ANNUAL REPORT January 1, 1958 - December 31, 1958

I TITLE

S-9 "New Plants" - The Introduction, Multiplication and Evaluation of New Plants for Industrial and Agricultural Use and the Preservation of Valuable Germplasm.

II COOPERATING AGENCIES AND PRINCIPAL LEADERS

State Agricultural Experiment Stations

| | | | |
|-------------|-------------------|----------------|------------------|
| Alabama | - W. R. Langford* | North Carolina | - P. H. Harvey |
| Arkansas | - A. M. Davis | Oklahoma | - R. S. Matlock |
| Florida | - G. B. Killinger | Puerto Rico | - R. O. Woodbury |
| Georgia | - A. H. Dempsey | South Carolina | - J. A. Martin |
| Kentucky | - E. N. Fergus | Tennessee | - W. E. Roeber |
| Louisiana | - J. C. Miller | Texas | - R. G. Reeves |
| Mississippi | - E. L. Moore | Virginia | - T. J. Smith |

Administrative Adviser

R. D. Lewis, Texas

U. S. Department of Agriculture
New Crops Research Branch

C. O. Erlanson
W. E. Whitehouse
A. D. Stoesz
W. C. Kennard

Soil Conservation Service
State Experiment Stations Division

Southern Regional Plant Introduction Station Edwin James**
W. R. Langford, Coordinator
Grover Sowell, Plant Pathologist
W. L. Corley, Research Assistant

*Assumed duties of Coordinator October 1958.
**Resigned July 1958 to become Director of National Seed Storage.

III PROGRESS OF WORK and PRINCIPAL ACCOMPLISHMENTS

1. Regional Station
(a) Improvement of Facilities

The physical plant of the Introduction Station was improved during the year by installation of new benches in the greenhouse, acquisition of a new germinator for checking the viability of seeds, and conversion of an office in the greenhouse building into a laboratory for pathological studies. The laboratory has been furnished with a microscope, autoclave, hot air sterilizer, and torsion balance. Other equipment needed for culturing plant pathogens such as test tubes, petri dishes and erlenmeyer flasks have been added to the laboratory. A sink for the laboratory has been purchased and this, together with a laboratory cabinet to provide additional working space in the laboratory, will be installed in the near future.

A new cold room is under construction in the greenhouse building to provide storage for a greater number of introductions. The new storage room is near the seed processing room, making it more convenient to process, store, and dispatch seed.

(b) Work Accomplished

During the year 1580 introductions were received and placed in the evaluation and increase program. Catalogues containing 710 accessions not previously listed were distributed. Table 1 shows the number of new accessions received and those evaluated and catalogued within the crop groups.

Table 1 Summary of plant introductions catalogued in 1958

| Crop Group | Introductions Received | Introductions Catalogued |
|---------------|------------------------|--------------------------|
| Winter forage | 398 | 127 |
| Summer forage | 342 | 84 |
| Sorghum | 159 | 30 |
| Peanuts | 54 | 30 |
| Vine Crops | 196 | 294 |
| Okra | 19 | 19 |
| Sesame | 97 | 104 |
| Guar | 18 | 17 |
| Pepper | 50 | 0 |
| Other | 247 | 5 |
| Total | 1580 | 710 |

The number of new accessions evaluated and catalogued does not represent the extent of nursery plantings. Approximately 800 old introductions were grown during the year to provide reincrease of materials that were low in supply or low in viability.

Distribution of introductions remained at a high level with 5015 packets of seed sent out during 1958. Cooperators in the southern region were furnished 3343 packets, and 1672 were supplied to research workers outside the southern region. Table 2 shows the distribution of new plant material from the Southern Regional Plant Introduction Station in 1958.

Table 2 Distribution of Plant Introductions during 1958

| State | Numbers of introductions received | |
|-------------------------|---|--|
| | From Southern Regional Introduction Station | From other Plant Introduction Stations |
| Alabama | 116 | 89 |
| Arkansas | 61 | 64 |
| Florida | 1805 | 913 |
| Georgia | 161 | 82 |
| Kentucky | 12 | 39 |
| Louisiana | 90 | 139 |
| Mississippi | 116 | 104 |
| North Carolina | 38 | 90 |
| Oklahoma | 173 | 255 |
| Puerto Rico | 27 | 33 |
| South Carolina | 79 | 320 |
| Tennessee | 18 | 102 |
| Texas | 635 | 169 |
| Virginia | 12 | 113 |
| Outside Southern Region | 1672 | |

A punch card system using Royal McBee cards was adopted for recording the performance of each plant introduction. All introductions obtained to date have been indexed, and evaluation notes are being punched on these cards. This system saves considerable time in filling requests for seed and in checking the viability of seeds.

In addition to visiting several state experiment stations within the region, the coordinator participated in meetings of the Association of Southern Agricultural Workers, The Southern Pasture and Forage Crop Improvement Conference, Southern Corn Improvement Conference, and Southeastern Vegetable Breeders Conference. Plans of the coordinator to visit all of the experiment stations cooperating on this project were not fulfilled because of a change in personnel and lack of a coordinator from July 1 until late Oct.

A meeting of the S-9 technical committee was held at the Regional Station, Experiment, Georgia, July 11-12, 1958. Considerable time was used in the discussion of new crops for industrial use. The S-9 committee approved a motion that the National Coordinating Committee be asked to determine procedure for most effective exchange of information, including reports and minutes of the four regional technical committees.

2. State Activities

State Experiment Stations cooperating on this project made considerable progress in evaluation of plant introductions and incorporation of new germplasm into existing varieties. Accessions evaluated by various states in 1958 and reported to possess genes suitable for improving present varieties are listed in Table 3 of the appendix. Some states made domestic explorations to collect new germ plasm for crop improvement programs. Among these was an exploration made by the Kentucky Experiment Station to collect new genotypes of Kentucky Bluegrass.

The South Carolina Experiment Station has supplied the Northern Utilization Research Laboratory with samples of dried sesame and okra plants to be evaluated for possible use in making paper. Other states have agreed to furnish material that will be screened for possible industrial uses upon request from the laboratory.

IV USEFULNESS OF FINDINGS

A number of plant introductions have shown equal or superior performance when compared to standard varieties in this country. As a result of these findings, new varieties may be named and put into agricultural use after little or no modification, and stocks possessing useful characters, seldom or never seen in existing varieties, may be used as parents in crosses.

Sunturf Bermuda (P.I.184339) which has been released in a number of states has performed well and, since its introduction, the desire for better lawn grasses has been on the increase. Thus, the evaluations of new types and strains has the potential of developing into a major segment of the nursery trade. The public will use these as lawn grasses.

Canbake, the new sweet potato variety, is resistant to black-rot and it has tolerance to fusarium wilt. The variety has outstanding baking and canning qualities.

The Blanco variety of lupine, a recent release with F.I. 189191 as one of its parents, offers resistance to grey leafspot disease. It is a white-seeded sweet lupine and appears superior in many characteristics to the standard variety.

Two introductions have been released as new varieties by the Texas Agricultural Experiment Station. These are Gulf ryegrass, P.I. 193145, which is more resistant to rust than other varieties of ryegrass, and Israel sweetclover, P.I. 200355.

The recent findings of nematode and disease resistance in a number of plant introductions will contribute greatly to plant breeders, processors, growers, and consumers.

V WORK PLANNED FOR NEXT YEAR

The Regional station will continue to increase, evaluate, and maintain plant introductions. Some accessions will be increased by contract or in cooperation with other Experiment Stations. A plant pathologist has been employed to screen plant introductions for disease resistance, and to identify diseases which may occur on new introductions. The greenhouse will be extended 26 ft. to provide space for screening plant introductions for disease resistance.

Many of the states plan to expand their work in testing and evaluating plant introductions with the hope of utilizing any superior germ-plasm found for developing new crops - either in its present form or through breeding methods. More and more emphasis is being placed on efforts to develop new crops for industrial use. Screening for disease and nematode resistance will continue as needed by several states.

Some states have recently added staff members to work on new plants on a full time basis. It is anticipated that the work under these staff members will be expanded into other areas.

Some plants will be subject to chemical screening for industrial use as well as for better color, tenderness, pungency, and other desirable characters.

VI PUBLICATIONS ISSUED OR MANUSCRIPTS PREPARED DURING THE YEAR

Davis, A. M. Sesame as a crop for Arkansas, Arkansas Farm Research, Vol. VII, No. 1, Jan. Feb. 1958.

Dempsey, A. H. Canbake Sweet Potato. Georgia Experiment Station Leaflet No. 18, January 1958.

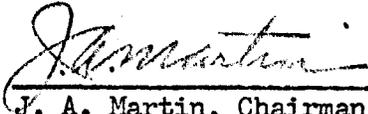
Miller, J. C. et. al. Mimeographed Circular 39. Summary Report Sweet Potato Breeding and Yield Studies for 1957. Hort. Res. La. Agri. Exp. Sta., Baton Rouge, La.

_____. Mimeographed Circular 40. Summary Report Irish Potato Breeding and Development Project for 1957. Hort. Res. La. Agri. Exp. Sta., Baton Rouge, La.

Reeves, R. G. 1958. New plants for Texas. Texas Agr. Progress 4:5-6, 18.



W. R. Langford, Coordinator



J. A. Martin, Chairman
S-9 Technical Committee



R. D. Lewis
Administrative Adviser

Appendix

Table 3

Promising Introductions Reported During 1958 in the cooperative New Plants Project in the Southern Region (S-9)

| Name and PI Number | | State Station Reporting | Apparent Value and Use |
|--------------------------------|--------|-------------------------|---|
| <i>Arachis hypogaea</i> | 110751 | Fla. | Large seed; runner type |
| <i>Bothriochloa intermedia</i> | 119861 | Okla. | Useful as female parent |
| " " | 209355 | " | " " " " |
| " " | 213858 | ") | |
| " " | 218060 | ") | Overwintered; |
| " " | 219976 | ") | productive |
| <i>Cajanus cajan</i> | 218066 | " | High seed production |
| <i>Capsicum frutescens</i> | 163190 | S. C. | Ornamental |
| | 176470 | " | Early yellow bell type |
| | 188478 | " | Ornamental |
| <i>Chloris gayana</i> | 208285 | Fla. | High forage production |
| " " | 212063 | " | " " " |
| " <i>pycnothrix</i> | 217645 | " | " " " |
| " sp | 225880 | " | " " " |
| <i>Chrysopogon montonus</i> | 217906 | " | Cold resistant |
| | 219579 | " | " " |
| <i>Citrullus vulgaris</i> | 211852 | Okla. | Good quality; keeps well |
| <i>Crotalaria grantiana</i> | 68849 | S. C. | Low growing; vigorous; excellent seed prod. |
| <i>Cucurbita moschata</i> | 162889 | Okla. | Hardy; keeps well |
| | 169444 | " | Butternut fruit type; fine texture |
| | 195311 | " | Hardy; no diseases |
| <i>Cucumis melo</i> | 164974 | " | High quality |
| " <i>sativus</i> | 197087 | Miss. | Vigorous; resistant to downy mildew |

Table 3 (cont'd)

| Name and PI Number | | State Station Reporting | Apparent Value and Use |
|----------------------|--------|----------------------------|---|
| Cynodon dactylon | 224141 | Ark.) | Fine texture; disease resistant; excellent vigor; good color |
| " " | 224145 | ") | |
| " " | 224145 | ") | |
| Dicanthium annulatum | 188926 | Okla. | Productive and winter hardy |
| " " | 210343 | " | " " " " |
| Digitaria natalensis | 208287 | Fla. | High forage production. |
| " valida | 203345 | " | Vigorous; leafy; long season |
| " " | 209175 | " | " " " " |
| Hibiscus esculentus | 217511 | Okla. | Early; prolific; spineless |
| Lolium multiflorum | 238937 | Fla. | High forage production |
| " sp | 238939 | " | " " " |
| Lycopersicon | | N. C. | Resistant to mosaic |
| Panicum antidotale | 235119 | Fla. | Heavy forage production |
| " coloratum | 207996 | " | " " " |
| " laevifolium | 213720 | " | " " " |
| " maximum | 209199 | " | " " " |
| " sp | 185457 | " | " " " |
| Pennisetum spicatum | 185462 | " | " " " |
| " " | 217952 | " | " " " |
| " " | 218100 | " | " " " |
| " sp | 224998 | " | " " " |
| Phaseolus vulgaris | 136680 | Miss. | Good resistance to disease |
| " " | 179418 | " | Small white seed; high quality pods |
| " " | 179425 | " | Very early; concentrated pod set |

Table 3 (cont'd)

| Name and PI Number | | State Station Reporting | Apparent Value and Use |
|---|--------|-------------------------|--------------------------------|
| Sesamum indicum | 158062 | Texas | Resistant to bacteria leafspot |
| " " | 159801 | Ark. | Semi-determinate growth |
| " " | 234424 | Texas | Resistant to alternaria |
| Sorghum vulgare | 195755 | Fla. | Excellent forage production. |
| " " | 221627 | " | " " " |
| " sp | 236297 | Texas | Male sterile |
| " sp | 246693 | " | Twin-seeded |
| " sp | 246697 | " | Seed corneous |
| Trifolium pratense ^{pallidum} | 206766 | Fla. | Mildew resistant |
| " vesiculosum | 233782 | " | Very vigorous |
| Vigna sp | 170848 | Texas | Drought resistant |
| " sp | 189099 | " | Non-shattering |
| " sp | 190191 | " | Possible nematode resistance |
| " sp | 194202 | " | " " " |