

Minutes of the Meeting of the Technical Committee

SOUTHERN REGIONAL COOPERATIVE PROJECT S-9, ON "NEW PLANTS"

Southern Regional Research Laboratory
New Orleans, Louisiana

December 12-13, 1955

Members Present:

Administrative Advisor - R. D. Lewis, Director, Texas Agr. Expt. Sta.
College Station, Texas

Regional Coordinator - Edwin James, Experiment, Georgia

U.S.D.A. - H. R. Thomas, State Expt. Stations Division, A.R.S., Washington, D.C.
C. O. Erlanson, Chief, Plant Introduction Section, A.R.S., Beltsville,
Maryland

Alabama - W. R. Langford, Alabama Polytechnic Institute, Auburn, Alabama

Arkansas - R. L. Thurman, University of Arkansas, Fayetteville, Arkansas

Florida - Fred Hull, University of Florida, Gainesville, Florida

Georgia - A. H. Dempsey, Georgia Agr. Expt. Sta., Experiment, Georgia

Kentucky - E. N. Fergus, University of Kentucky, Lexington 29, Kentucky

Louisiana - Julian C. Miller, Louisiana State University, Baton Rouge 3, La.

Mississippi - H. W. Bennett, Miss. Agr. Expt. Sta., State College, Miss.

North Carolina - Paul H. Harvey, North Carolina State College, Raleigh, N.C.

Oklahoma - Ralph S. Matlock, Oklahoma A. & M. College, Stillwater, Oklahoma

Puerto Rico - Roy O. Woodbury, Puerto Rico Agr. Expt. Sta., Rio Piedras,
Puerto Rico

South Carolina - J. A. Martin, Clemson College, Clemson, South Carolina

Tennessee - J. K. Underwood, University of Tennessee, Knoxville 17, Tenn.

Texas - R. G. Reeves, Texas A. & M. College, College Station, Texas

Others Present

Staff Members of Southern Utilization Research Laboratory, New Orleans, La.

C. H. Fisher, Chief - G. E. Goheen, Asst. Chief - R. Hall, Agr. Marketing Serv.
F. G. Dollear, Asst. Head, Oilseed Section - E. A. Gastrock, Head, Engineering
& Development Section - V. H. McFarlane, Head, Fruit & Vegetable Section -
T. H. Hopper, Head, Analytical, Physical-Chemical & Physics Section

Agenda

1. Appointment of chairman, pro-tem by committee.
2. Report of activities of Primary Station during 1954-55--Edwin James.
3. Report of work by states - State representatives.
4. Report of Plant Introduction Section - C. O. Erlanson
5. Recent developments in the industrial utilization of plants and plant materials - Staff of Southern Utilization Research Branch.
6. Some apparent needs of industry for products obtained from plants - Staff of Southern Utilization Research Branch.
7. New plants adapted to some section of the wouth, with meager information as to their utilization - Committee discussion.
8. Report on Domestic exploration - R. G. Reeves.
9. Discussion of previous and future anticipated utilization of plant introductions - (a) Ideas for encouraging use of materials, such as graduate programs, etc.
10. Discussion of continued maintenance, including bulking of similar accessions.
11. Discussion of more extensive specific and thorough evaluations of plant materials. This discussion could be led by regional coordinator.
12. Publications. Release of information to the public concerning the activities of the New Plants Project - Committee discussion.
13. Proposals for new explorations - Discussion leader J. C. Miller or Fred Hull.
14. Financial report and budgetary recommendations - Edwin James
15. Report on National Coordinating Committee - R. D. Lewis.
16. Election of officers for 1955-56.
17. Time and place of next meeting.

Appointment of Chairman

In the absence of the chairman the meeting was called to order by R. D. Lewis who suggested that Edwin James serve as chairman pro-tem.

G. E. Goheen, Assistant Chief, Southern Utilization Branch extended a welcome to the committee.

J. K. Underwood, H. W. Bennett, and E. N. Fergus were appointed as a committee to nominate officers to serve till the next meeting.

Report of the Coordinator

Improvement of Facilities

The seed-storage room planned in 1954-55 was completed. The 16 x 24 feet room in which a temperature of 40° at 75% relative humidity is maintained will meet our needs indefinitely. A seed packaging room adjacent to the seed storage, and three rooms on the second floor of the Horticulture Building now serve as offices for the Introduction Station.

Five filing cases, one table, and a half-interest in a mimeograph machine has been added to office furnishings.

A new thresher and a modified hammer--mill have been built to aid in seed processing. An addition of 200 feet of four-inch aluminum pipe has been added to the irrigation facilities.

With the help of the local Soil Conservation Service men, the nursery areas have been completely re-worked into a model field with broad-based parallel terraces. Through a trade, land has been acquired so that the entire nursery area is in the same general area. The field help is now in the process of clearing about two acres of bush-covered land contiguous

with the areas already in use. An additional acre or more has been chemically treated to kill Bermuda grass. The Horticulture Department is completing the eradication and will use it for one year. Both sections should be available for nursery work in two years.

Work Accomplished

Incoming introductions are still being received at a high rate and distribution of seed has passed the 5,000 mark again this year. All accessions are now being increased during the season they are received and re-increases are being made whenever stocks become depleted or drop in germination. The latter activity will become accentuated as time goes on. The tables which follow present the above in concise form.

Accessions Received in 1955 and Increases Catalogued
During 1954 and 1955

Crop Classes	Forage Grasses & Legumes	Other Field Crops	Vegetable Crops	Misc. Crops	Totals
Received 1955	928 (1)	108	845	65	2246
Catalogued 1954	231	12	149	50	442
Catalogued 1955	1030 (2)	57	153	—	1225

- (1) 628 collections from Texas.
- (2) Includes 566 old numbers from Wyoming.

The distribution of introductions by crop groups and states is presented in table form at the end of the minutes. The financial report as given by the Coordinator is as follows:

Financial Statement 1954-55
Budget

Reg. Research Fund ⁽¹⁾	Sou. Reg. Plant Intro. Sta.	\$20,000.00
U. S. D. A.		4,140.00
State		520.00
		<u>\$24,660.00</u>
Salaries		\$13,640.00
Labor		3,620.00
Capital Outlay		2,650.00
Travel		1,150.00
Operating Expense		3,600.00
		<u>\$24,660.00</u>

Expenditures 1954-55

Salaries	\$13,640.00
Labor	5,680.88
Capital Outlay	3,010.58 (2)
Travel	1,075.45
Operating Expense	1,253.09 (3)
	<u>\$24,660.00</u>

- (1) \$4,000 of Regional Research Funds was allotted to New Crops work by the Director for work in New Plants in Puerto Rico.
- (2) \$2,774.84 for seed storage.
- (3) \$362.50 for contract.

State Reports

Alabama - Received 153 accessions, including corn, ornamentals, grasses and legumes. Work continued on evaluation of accessions of Hardinggrass, Bahiagrass, pepper, and ornamentals received prior to 1955. Two accessions of pepper have shown high resistance to tobacco etch virus. Plans are to use them in the breeding program on improvement of pepper. Some accessions of Hardinggrass appear promising because of their growth at low temperatures in late fall and winter. Magennis grass PI 184339 and Agrostis tenuis PI 172698, are two turf grasses that looked good in the testing program. The latter remains green throughout the year and attempts are being made to increase seed for further testing. Many of the ornamental plants have been disappointing and were discarded. A few are still in evaluation tests.

Arkansas - Arkansas received a total of 1221 accessions during the past years under the New Crops Project. Of these, 992 have been discarded leaving the balance for further evaluation or disposition. Guar has been grown the past two years, but is being discontinued because of poor adaptation. Sesame will be included in tests for 1956. A number of introductions of cucumbers, cowpeas, sorghums and millets are now in active breeding programs. Pennisetum glaucum 182975 was found to be early, drought

resistant, and productive. Seventy-three accessions were received in 1955. Interest on the part of S. C. S. men in forage grasses and legumes accounted for many of these.

Florida - Testing new introductions was continued with 329 new legumes and grasses, many new ornamentals, and 206 vegetables and field crops. Earlier introductions are being used in breeding programs with tobacco, sugarcane, peanuts, corn, oats, sorghums, lupines, crotolaria, grasses for forage and turf, tomatoes, beans, peas, various ornamentals, soybeans, castorbeans, watermelons, and muskmelons. A new peanut, the Florispan, has in its parentage an introduction from Africa. Developmental work with sanseviera, kenaf, ramie, and lychee nuts is in progress. About \$2,000 was expended for punch-card analysis of long time climatological records at three locations in the state and in relating variations to adaptations of introduced plant types.

Georgia - Most of the 219 introductions requested by workers in Georgia during the year consisted of agronomic crops. Participation by the plant materials men in the S. C. S. has been considerably higher than in past years. Both the Experiment and Athens Stations have increased interest in sorghum breeding wherein the yellow endosperm sorghums collected by Webster have played a prominent part. The Georgia Station is continuing the testing of all peanut introductions. During the year single plant selections have been made for further testing from most of the 193 introductions planted during the 1954 season. Particular interest is shown in a Virginia bunch type from Japan, PI 1212232. Experimental crosses have been made with Arachis pusilla 210553 on A. hypogea 212232 and also on A. glabrata 163452. In the horticultural field the station is active in the testing for internal cork, the Ipomoea collection from the Caribbean. A lady-type southern pea selected from a collection maintained by the

Southern Regional Plant Introduction Station is in its advanced stages. Seed stocks are being built up for wide-scale testing. Georgia Red, a 1955 sweet potato introduction by the Georgia Station, has been well received. This variety has as its principal parentage a Puerto Rico introduction.

Kentucky - One hundred forty five accessions from the Regional Station have been or are being studied. Approximately one half are forage legumes. Others are somewhat evenly distributed among the forage grasses, corn and sorghum, and horticultural and ornamental species. The principal effort during the current year was attempted hybridization of Trifolium pratense, with other species of these genus obtained from the Southern Regional Station. These efforts had two objectives. First it was desired to learn which species were compatible with pratense or could be treated to induce compatibility. Second, it is hoped that a better root system and virus resistance may be transferred from another species to pratense. Another effort in the present year under this project has been exploration in the state for superior smooth brome-grass germ plasm. Some promising material was found.

Louisiana - There were 264 accessions sent to Louisiana this past season, going to the Department of Horticulture, Agronomy, and Plant Pathology. Of the previously introduced sweet potato accessions brought in, this station has been helping to evaluate these introductions particularly for soil rot, while other states have been testing for wilt, black rot, and internal cork. We have found 7 sweet potato introductions resistant to soil rot. Other collaborators have found other selections resistant to wilt and black rot. They are also being tested for internal cork, the report on which will be given at the next collaborators' meeting. It was through previous introductions that we brought in varieties that were wilt-re-

sistant. We have used introductions of Irish potatoes in our breeding program and have found one particular selection to be resistant to frost damage. It has withstood outside temperatures as low as 26 degrees without damage. This accession is being used in our breeding program to develop a commercial variety that will be resistant to frost. A number of years ago we obtained okra seed from the Gold Coast, Africa, which was found to be very drought-resistant and to have a short, round pod which we have used in our breeding program. We now have one line that we are about to release of which the introduction was one of the parents. We have been using a sweet corn introduction from Peru, known as Cusco Long Grain, in our breeding program. Crosses with this introduction are now in the F_6 and F_7 generations. The long kernel character is an advantage in a sweet corn breeding program. Other crops which we are testing introductions are sesame, peaches, strawberries, pears, figs, and pigeon peas. As for medicinal plants, the Horticulture Department is testing the tropical yam, and we think we have some good selections from seedlings sent to us by Dr. Correll and others of the Plant Introduction Section. The floriculture section of the department is particularly interested in hardy ornamentals. The Agronomy Department is testing various varieties of grasses, alfalfa, and cotton. The Plant Pathology Department is particularly interested in sugar cane introductions, testing for mosaic and other diseases.

Mississippi - Workers in Mississippi are now concentrating in an endeavor to incorporate characteristics sought and found in plant introductions into breeding material and superior strains. Of particular interest are the following activities and accomplishments:

- Breeding for resistance to races of wilt in Southern or cowpeas.
- Breeding for heat and drought tolerance in raspberries.
- Breeding for fruiting and growth characteristics plus disease resistance in beans, tomatoes, pepper, and cabbage.

Screening genus Pisum for ascochyta resistance.
Screening okra for desirable characteristics.
Doubling rust resistance in five ryegrass introductions.
Selected superior strains of Sanyo millet.
Screening orchard grass introductions for rust resistance.
Finding of smut resistance in rescuegrass.

New varieties to be released which have used introductions are: crimson clover, ryegrass, and southern pea.

North Carolina - During the 1955 season, work at this station continued along much the same lines as in previous years. Drs. Cochran and Winstead included 989 phaseolus species, primarily P. vulgaris, in a planting to check for resistance to cyst nematode. The unfavorable weather conditions following the hurricanes resulted in the failure of this test. It is to be repeated in 1956. No new PI accessions have been screened by this institution for resistance to bacterial wilt of tomatoes. Dr. Gregory has a fairly large number of PI numbers in peanuts and a rather good collection of the wild species. The latter have been maintained in the greenhouse, but it has been impossible as yet to hybridize the wild species with the cultivated. Stylosanthes bojeri, PI 219853 and Stylosanthes gracilis, PI 219854 are very similar. Both come to flower December 1; therefore, have not set seed as yet. They have made very good vegetative growth in clay loam and from external appearances may be worth looking into along the Gulf States' southern margin. They are believed to be perennial, but this should be confirmed. Dr. Gregory plans to maintain them for a while yet. No new PI numbers have been received in the corn project, although some material received several years ago has been outcrossed and is now in the process of being inbred. Of particular interest are low-eared plants with relatively late maturity. This station has maintained a good collection of cotton species and a rather active program in cytogenetics is underway, particularly studying the mode of inheritance in inter-specific hybrids. During the present year plans have

been formulated for maintaining a rather large collection of tobaccos, particularly the wild species of Nicotiana which have been collected at the University of California.

Oklahoma - The Oklahoma station personnel extends appreciation to the various agencies involved in making new germ plasm available. This meeting is too early for a complete report on the 368 accessions received during 1955. Screening of a large number of forage accessions by Mr. Harlan showed 51 accessions (6 genera & 15 species) with real promise for Oklahoma. These were equal to or superior to standard checks. Specific reference to promising introductions was summarized in the 1954 Annual Report of Progress. The results of studies on old world bluestems has just been published (Okla. Agr. Sta. Tech. Bul. 58---Studies on Old World Bluestems). The Bothriochloa-Dicanthium complex contains introductions which are superior to American forms in quality, production, persistence under grazing, and ability to respond to high fertility levels. A total of 551 domestic and foreign introductions of miscellaneous crops were grown in 1954. A few brief comments regarding these follows:

Cowpea: Several of the 237 new and old accessions were continued this year. Paraguay No. 1 appeared to have good drought resistance in 1954 and showed good hay and forage characteristics this year.

Peanuts: Sufficient seed was on hand to evaluate 35 introductions in replicated plots at two locations this year. At the Stratford location where moisture was ample, 15 accessions were superior to the mean of three checks. PI 185632 appeared to be highly resistant or immune to leaf-spot disease. At Perkins where moisture was limited, 17 accessions produced higher yields than the checks. Material is needed with resistance to southern blight and root-knot nematode. Of the 13 new introductions in tests this year, four PIs: 210320, 210325-26, and 215696, will

be advanced to replicated tests next year.

Mungbeans: Of 125 green mungbeans grown in observation plots this year, 28 were more productive than the one commonly grown over the state. Those showing promise include the following PIs: 164301, 164301-3, 164436, 164436-1, 164436-3, 164436-4, 164427, 164720, 164778, 179960-1, 183065.

Guar: Guar appears very promising for Oklahoma. The 53 strains grown this year were variable in plant type. Several different types are being continued, since the breeder must know more regarding utilization before a definite type is selected.

Castor beans and Sesame: Most of the 27 introductions showed good drought tolerance in 1954. The breeding work of both these crops is now being done by Dr. Wade Parkey.

Safflower and Sunflowers: Work on both of these crops is now retarded because of low yields and lack of farmer interest.

Sesbania and Crotonaria: Promising types of these plants are available. It is difficult to advocate their planting until more work is done on utilization. C. spectabilis may have a place in peanut rotations in the irrigated sections of Oklahoma where a population of root-knot nematode has been built up.

Horticulture Work: The Horticulture Department has an active program with Rubus and Fragaria species. Work has not progressed to the extent that a full report can be made on introductions of these. The department is also very active in the screening of the Caribbean collection of Ipomoea species.

Puerto Rico - The cooperative project on "New Crops" sponsored by the Agricultural Experiment Station of the University of Puerto Rico, is known as C- 145, its title being "Introduction and Evaluation of New Plants for Industrial and Other Purposes, and the Preservation of Valuable Germ

plasm of Economic Plants". As the Commonwealth of Puerto Rico has embarked in a wide program of industrialization and crop diversification, the introduction and evaluation of plants gains considerable interest and importance. The main source of introduction has been the Southern Regional Plant Introduction Station. However, we have also made many introductions from other sources. Among these could be cited the U. S. D. A. at Beltsville, countries of the eastern tropics, especially India, and countries of the American tropics. I might add that a few native accessions are now being tested, and many more native plants, especially legumes and exotics, are expected to be tested in the near future. During the past year, the New Crops project has received a total of 221 accessions from the above mentioned places. However, this does not include numbers of accessions obtained by our cooperators in sugar cane, coffee, and vegetable crops. As our government is greatly interested in coffee, our coffee breeder at Castaner, a substation in the mountainous central part of the Island, has in the past two years introduced 123 new varieties of coffee, including varieties of Coffea arabica, C. canephora, C. congensis, C. demerei, C. excelsa, C. eugenioides, C. kivuensis, C. liberica, C. purpurascense, and a near relative of Coffea, Psilanthopsis Kapakata. Two varieties of these accessions show promise in resistance to the disease of "Coffee rust". It is rather premature to test the complete performances of these young plants. We are also in the process of testing for "Sun grown" varieties.

Because of the recent interest in the high vitamin C content of the Acerola (Malpighia sp.), the horticulturists are making efforts of securing high yielding varieties and also in trying to secure a root-stock resistant to nematodes for grafting purposes. There are also many species of ornamentals and other tropical fruits in different degrees of testing. Our

grass program is at the present at a standstill due to the transfer of our regular grass breeder to another department. Nevertheless, the grass plots are being preserved at the present by our corn breeder. As to our corn program, a large number of accessions of sweet corn have been on trial in Puerto Rico for several years; but none have come up to expectations. Most of our accessions are from temperate climates. We are now trying to get some accessions of tropical sweet corn for trial. In regards to the sweet potato, considerable testing of seedlings is being conducted. Out of 1800 seedlings tested our sweet potato breeder has selected 28 for further study. One of these is the bush type with white potatoes. These 28 seedlings are now in the second planting for further screening. He would like to develop an all-purpose potato that can be used in all areas of the Island. In papayas, our breeder is attempting to obtain a variety that is resistant to "Bunchy top". Out of the many varieties tested only one plant(a Solo Line 8 from Hawaii) showed any resistance to the disease. Sixteen varieties were tested for desirable fruit characters and height of plant at harvesting time. These varieties were from Mexico, Peru, and the Fiji Islands. All were discarded for one reason or another. He is now undertaking a program of breeding and selection whereby he might obtain a variety which will set and ripen fruit in a shorter period of time. The bean breeder is interested in obtaining a good summer variety of bush bean, but has met with no success from 130 accessions from tropical countries. He still has 74 accessions under trial. He is also trying to combine in his breeding work the vigor of the native bean with the high yielding quality of introduced varieties. At the present we are conducting preliminary trials of several oil producing plants, namely castor bean, sesame, and aceituno, a tropical tree with a very high percentage of oil.

South Carolina - Peppers: Fifty one pepper accessions were received for the 1955 growing season for seed increase and evaluating. A total of 245 old accessions which were tested in 1954 during a very dry year were tested again in 1955. Four hot pepper accessions; PI 155349, 169121, 194260, and 213918 may be adapted to mechanized harvesting due to the deciduous calyx which is responsible for ease of abscission. Work will be continued along this line as a means of reducing labor requirements in the production of hot peppers. Six paprika accessions; PI 219869, 222133, 222134, 222135, 222136, and 223551; may possess characters which may be useful in paprika breeding, especially for good color retention. Accession, PI 149242, which is a hot type possesses the largest placenta found to date in any pepper of this type. Accession, PI 215740, possesses purple flowers and has attracted much attention in the nursery as being strikingly different from all other pepper accessions. Its characters may be of some genetic value. Twenty-five accessions showed promise as ornamental types which could be used by florists. These accessions will be studied more closely for making a release of several of the best types to the trade. An attempt was made in 1955 to evaluate all the pepper accessions for as many characteristics as possible. For some time it was evident that many of the pepper accessions possessed characteristics which indicated that they should be classified as specific groups or species. Dr. Paul G. Smith, (and with Charles B. Heiser, Jr.), Associate Professor, Department of Vegetable Crops, University of California, Davis, has recently published a paper: Taxonomic and genetic studies on the cultivated peppers, Capsicum annum L. and C. frutescens L., American Journal of Botany, Vol. 38, No. 5, 362-368, May 1951. From this work we have grouped all PI pepper accessions accordingly on the basis of the differences between these species as we now understand them. These species are listed

as follows: Capsicum frutescens L., C. annum L., C. pubescens R. and P., and C. pendulum Willd. There was some doubt in the proper classification of a few accessions, but we hope to complete the work during the next few years. It has been observed that the pungency substance, capsaicin, may vary in chemical structure among the various species of the hot or pungent types. We hope to have some work conducted as to any variation or differences as soon as possible.

Sesame: Twenty-three new sesame accessions were increased and evaluated. Four hundred and thirty old sesame accessions were rechecked. Fourteen accessions showed promise as good breeding material. In April 1955 the first indehiscent sesame varieties, Palmetto and Rio, were released by South Carolina Agricultural Experiment Station and Texas Agricultural Experiment Station, respectively. These varieties were developed from foreign germplasm. Sesame has created a great deal of interest in past few years as a result of the development of indehiscent varieties for oil crushing, confectionery trade, and other uses. Recently, the discovery of sesamol, an excellent synergist, in sesame oil has opened a new field in the insecticide industry. It has been found that sesamol has a methylenedioxyphenoxy molecular group, so is just slightly different from present commercial boosters, which contain a methylene dioxyphenyl group. That small difference has a big effect. It takes 5 times as much of the best commercial synergists for a 12-fold boost as the amount of sesamol that will boost pyrethrum's effectiveness 30-fold. Sesame growing, just starting in the South, picked up when cooperating State-U. S. D. A. researchers created new non-shattering varieties that could be harvested mechanically. Twelve-thousand to 15,000 acres were planted in 1955. Demand for sesamol, oil, protein, and confectionery uses may further stimulate production.

Okra: A total of 141 okra accessions were evaluated. It appeared that PI accessions 171659, 177240, 179158, and 183286 possessed some resistance to root-knot nematodes. These accessions will be tested again with hopes that we can subject them to the various types of root-knot nematodes for determining degrees of resistance, if any.

Tephrosia Vogellii: Tephrosia has been tested at Clemson, Pontiac, Blackville, and Florence in 1954 and 55. It shows promise as a source of rotenone. The crop appears to grow well at all locations in South Carolina. Work is to be continued in cooperation with the U. S. D. A.

Tennessee - Fifty PI accessions received during 1954, 12 of which were forage crops and the remainder horticultural material. Fragaria viridis, PI 202740 from France is not promising as a source of root rot resistance in strawberry breeding. Out of 24 ornamental PI accessions, 5 have failed, namely Betula davurica--73057 no germination, Dianthus superba--162481, Buddleia salvifolia--209243, Melicope awaden--223320, Nothophagus procera--210766. Progeny data of Rubus, PI numbers 194478 and 164571, a rogue selection from PI 194477, and Rubus crataegifolius are to be presented at the Southern Agricultural Workers Meeting in February, 1956 and a manuscript is to be in the Proceedings of the American Society for Horticulture Science. Twenty-two PI Rubus numbers died from the low temperatures of last March. Dr. L. M. Josephson increased and evaluated 30 corn introductions he obtained in South Africa. These are to be cataloged by the Southern Regional Plant Introduction Station and made available to other corn breeders.

Texas - Forage and Range Plants: Good forage production is indicated for the following introductions:

Bouteloua	curtipendula	216221
"	"	216244
"	"	216284

Bouteloua curtipendula.....	216253
" "	216273
Hilaria sp. (near berlangeri).....	216444
" " "	216446
Andropogon gerardii.....	216695
" intermedius.....	216701
Panicum antidotale.....	217151
" coloratum.....	193363
Sorghastrum nutans.....	217249
Sporobolus asper.....	217306
Trifolium angustifolium.....	206758
" echinatum.....	170830
" isthmocarpum.....	202517
" ".....	203664
" nigrescens.....	206926
" pallidum.....	201213
" pratense.....	204926
" resupinatum.....	204932
" resupinatum.....	208117

Panicum coloratum 193363 is being increased for yield tests on the basis of past performance. Lolium multiflorum 193145 and 225726, show promise in their resistance to rust, 193145 being superior also in winter forage production. Trifolium resupinatum, PIs 141500-02, 143496-99, 173974, and 180492 are in the breeding program to develop hard-seeded strains of this species. Melilotus alba annua, PI 200355, shows unusual promise and has been increased for testing in several locations.

Horticultural Crops: About 10 avocados of the Mexican type showed promise at the Weslaco station as having ability to withstand cold. (PIs not available). Several accessions of Vigna spp. from South Africa are now being used in a breeding program. They show extreme vigor and tolerance to drought.

Virginia -- Not represented and no report.

REPORT ON COOPERATIVE ACTIVITIES OF THE
PLANT INTRODUCTION SECTION

ARS, USDA-----C. O. Erlanson

1955 Meeting of the National Coordinating Committee

Of interest to this group was the convening during March 25 and 26 of

1955 of the National Coordinating Committee in Washington. This national group is the one which coordinates the activities of the several New Crops or Plant Introduction Projects. The Committee itself is comprised of representatives from the various projects, including NC-7, NE-9, S--9, W-6, IR-1, and HCG5, which is the Federal Plant Introduction work project cooperating. The functions of the National Coordinating Committee, as well as those of the individual "New Crops" projects, have been outlined in several places, the most recent being in the Minutes of the National Coordinating Committee for 1953. The functions of this National Committee are spelled out in these Minutes which should be available in the Director's office of each State Experiment Station.

The meeting of the National Committee last March included the usual reports from each of the cooperating projects. There was a review also of the project outlines and a discussion of the inter-relations of the Plant Introduction Section in regard to a statement of how operational leadership is given and in respect to financing. Other items which came up included the extent to which introduction, evaluation, and cataloging should be carried out under this program, a definition of secondary stations and state contributing projects, an explanation of the inter-regional new project, IR-2, concerned with the maintenance of virus-free stocks of deciduous fruits, a report of sub-committees on a National Seed Storage Facility, and on publicity and publications.

At the conclusion plant exploration proposals were presented. The National Committee reviews such proposals and sets them up on a priority basis if necessary before recommending them to the Plant Introduction Section for action.

Preceding the National Committee Meeting a meeting of Regional Coordinators was also held at Beltsville.

Plant Exploration

Exploration, particularly in the foreign field, is limited by the funds made available annually to the Plant Introduction Section. As stated at previous

meetings of this Committee the Section has received no increment in its funds since the establishment of the National Cooperative Program. On the other hand the budgets of the several cooperating new crops projects have steadily increased. Again there is no sign that our next budget allotment will be increased. Automatic Civil Service salary increases each year take more and more of the liquid balance allocated by the Section to exploration yet at headquarters we are already understaffed and personnel cannot be reduced further without seriously affecting operational efficiency. This is a serious problem which is now affecting directly the amount of exploration that can be undertaken in any year. Up to now we have been able to place one man (presently Dr. Gentry) in the foreign field each year on exploration work for the National Cooperative Program. Because of lack of funds we will not be able to send Dr. Gentry to the field in the calendar year 1956, even though there are definite proposals still pending from 1953 for foreign exploration. It appears that strong supporting pressure for funds is needed immediately from the States through the New Crops Committees to insure that the Plant Introduction Section carry out its part in the exploration phases of this National Program.

Foreign exploration conducted in India, West Pakistan, and Afghanistan has been completed since the last meeting of this Committee. Although the primary objectives of these explorations were forage grasses and legumes of dryland and range areas, a large series of other agricultural items, including citrus and deciduous fruits, vegetables, black pepper, and miscellaneous oil seeds, were also collected. Accessions totaled 3,021 items.

Dr. Howard Scott Gentry, who initiated the work in Afghanistan and India, returned early this fall from a full season's work in Iran. The exploration in Iran was initiated in late 1954 by Dr. E. E. Smith, when he moved from Afghanistan to Iran for a short six-weeks period and was able to collect around 500 items late in the season. The work and objectives in Iran are the same as those

listed above for Afghanistan and neighboring countries.

During the period, January through June, 1955, James L. Stephens, U. S. D. A. agronomist of the Tifton, Georgia Station, collected clonal material of Bermuda grasses for us from southern Africa northwards to Ethiopia.

Explorations, other than under the Cooperative program, have also continued. Dr. John Creech, in charge of our Glenn Dale Garden and ornamental work for the Section, spent a full season in Japan and Okinawa. Although the main interest was ornamentals(camellias, azaleas, etc.) a good series of agricultural items were also collected. In work sponsored by the National Heart Institute Dr. B. G. Schubert conducted field work in Costa Rica. This was an extension of activities originally started in Cuba and Puerto Rico.

Other Activities of the Section

At the time of the March 1955 meeting of the National Coordinating Committee, members of the Committee, including representatives from the S-9 group, were able to visit the U. S. Plant Introduction Garden at Glenn Dale where quarantine facilities are maintained. During 1954 quarantine programs covering the introduction of citrus and drupaceous fruits were revised and expanded to meet the need for indexing these plants for hidden virus infection. Citrus introduction work stopped ten years ago when Tristeza and quick-decline viruses were discovered and were started again in quarantine procedures revised to include virus indexing. The quarantine procedure covering the introduction of peaches, plums, apricots, almonds, and cherries was also expanded to include indexing for virus diseases. Procedures for the virus indexing programs were recommended by pathologists working with these diseases.

The staff of the Section have recently prepared several articles of value as references since they outline the general activities and functions of the Plant Introduction Section. One of these entitled, "Plant Introduction as a Federal Service to Agriculture", has just appeared in Volume 7 of "Advances in

Agronomy". Another on "Federal Plant Introduction Gardens and their Contributions to American Horticulture" will appear in an early issue of the "National Horticultural Magazine". An illustrated historical account of the Section and its activities has also been completed and will be published in the journal, "Economic Botany".

News Items from the New Crops Projects

In its first year of operation the Regional Plant Introduction Station at Geneva, New York (NE-9), grew and took preliminary descriptive notes on 849 plant introductions. From this Region have come a number of valuable plant introductions such as the following: The Sunapee peach, an extremely hardy, yellow, oval, free-stone peach ripening in late August, was named and distributed by the New Hampshire Experiment Station. This peach produces a good crop when the commercial varieties are a total failure due to low winter temperatures. This is the end result of a search for a cold-resistant peaches which has been carried on by the Section of Plant Introduction since 1929. The Sunapee peach has been developed from north Caucasus peach clones which were shown to survive -17° F. at the Glenn Dale, Maryland, Plant Introduction Garden. The same station recently released a large fruited tomato variety, Double Rich, notable for its high vitamin C content which was obtained from a small fruited wild tomato introduced from Peru.

During the past year the Regional Plant Introduction Station at Pullman, Washington (W-6) got into field production for the first time. At the last meeting of the Technical Committee two State contributing projects were approved: One with Arizona provides for the preliminary evaluation and seed increase of introductions adapted to the Southwest; the other with Oregon sets up a pear germ plasm repository at Medford.

The fine germ plasm collection of tuber-bearing potatoes established at the IR-1 headquarters at Sturgeon Bay, Wisconsin, continues to attract a number

of students interested primarily in genetical and breeding problems. This past summer there have been two post-doctorate workers as well as six post-graduate student workers representing as widely different areas as Korea, India, Switzerland, and Chile. Dr. D. S. Correll of our Section headquarters staff is now spending a considerable part of his time on a taxonomic study of the South American tuber-bearing species in anticipation of continuing publication of a revision of this group. It should be pointed out that at many of the other Regional Plant Introduction Stations there are large germ plasm collections of economic genera which must have abundant problems of interest to workers in not only the Region but also nationally. Representatives on all the Technical Committees should call these collections to the attention of fellow workers or students.

Preservation of Aboriginal Races of Maize

This Committee may be familiar with the recent work of the Rockefeller Foundation in collaboration with the National Research Council in bringing together and preserving the indigenous races of maize of the New World. The collection of United States and Canadian races is held at the NC-7 Regional Station at Ames, Iowa, while the tropical races are preserved at three centers located in Mexico, Colombia, and Brazil.

The International Cooperation Administration (ICA, formerly known as FOA) has now approved and allocated funds for a 3-year project involving a detailed study of the approximately 9,000 maize varieties held at the Latin American centers (ICA funds can only be used abroad and so no study can be made of the maize collection at Ames through this project). Studies undertaken will include description of all materials presently held as well as publication of same in English and Spanish editions.

Eventually complementary studies similar to those now being supported by ICA ought to be made of the aboriginal collection at Ames.

National Seed Storage Facility

Nothing definite can be reported concerning the progress toward setting up a National Seed Storage Facility. It appears, however, that both the Administration and the Federal Budget Bureau are looking favorably upon the allocation of funds to establish such a facility. Presumably the administration of a national seed storage will fall to the Plant Introduction Section. It is not premature to begin thinking about the problems involved in setting such a facility to effective work. It is felt that the new crops committees, such as this one, could initiate advice particularly regarding the procedures by which materials are selected for permanent storage as well as the problems that ought to be investigated by the staff (seed physiologists) of such a National Seed Storage Facility. The Plant Introduction Section will certainly welcome any suggestions that this group may care to make.

The Longwood Foundation

Of interest to those concerned with ornamental horticulture is the establishment of a "Longwood Foundation" during the past year under the terms of the will of the late Pierre DuPont. As a living horticultural exhibit, Longwood Gardens, situated at Kennett Square, Pennsylvania (near Wilmington, Delaware), have long been famed. Under the new Foundation the gardens will enter into a new program which promises to include eventually much activity in ornamental horticulture and research similar to what has been carried out by Kew in Great Britain and the Arnold Arboretum in this country. Dr. Russell J. Seibert, a former U. S. D. A. scientist (Rubber Plant Investigations), more recently in charge of the Los Angeles State and County Arboretum, is the new Director of Longwood Gardens. Dr. W. H. Hodge, until recently associated with the Plant Introduction Section, is now at Longwood in charge of their educational and research program. It is hoped that a sustained program of exploration for ornamentals may possibly develop cooperatively between Longwood Gardens and the Plant Introduction Section.

Publications

Dr. Lewis stated that the Southern Region was first with its Southern Cooperative Bul. 27, "Progress and Potentials in Plant Introduction for the South" by Edwin James. Many favorable comments have been received on this publication and the coordinator is to be congratulated on its preparation.

Other ways for publicizing New Plant material:

1. Student publications on college campus - Hull
2. Sub-committee of the Technical Committee on publications.
3. Use of Bul. 27 as basis of newspaper story with local interest included.

Mr. Erlanson stated that a regional publication will be issued describing the Ohio Pear collection at Wooten, Ohio.

Recent Developments in Industrial Uses of Plants and Plant Materials
and
Some Apparent Needs of Industry for Products Obtained from Plants

The program given by the staff of the laboratory was as follows:

Introductory Remarks	C. H. Fisher, Chief, SURB G. E. Goheen, Asst. Chief, SURB
Some comments on the place for new crops or products in the Agricultural Market	R. Hall of Agricultural Marketing Service
Report of some work in Oilseed Section	F. G. Dollear, Asst. Head
Report of work in Engineering and Development Section	E. A. Gastrock, Head
Fruit & Vegetable Utilization Research in Southern Region	V. H. McFarlane, Head, Fruit & Vegetable Section
Comments on Possible Utilization of New Crops	T. H. Hopper, Head, Analytical, Physical-Chemical & Physics Section
Discussion	

Mr. Fisher and Mr. Goheen officially welcomed the committee to the laboratory and introduced the members of the staff present. The general objectives of the laboratory were presented in outline.

Mr. Hall presented justification for new crops as follows:

1. Changes in consumer habits.
2. Acreage controls on present crops.
3. Shifting of production areas.
4. Change in industrial consumption.
5. Surpluses of existing crops.

He also pointed out that if new crops are to have a good distribution and competitive position, they must create a value equal or superior in quality and quantity to those now in production. In many instances, Mr. Hall stated, new crops must also compete with non--agricultural commodities.

Mr. Dollear reviewed much of the work that had been done on the utilization of cottonseed meal and oil with particular emphasis on the modification of these products, adapting them to expanded utilization. He indicated that new crops with a high content of lysine and kamloleic acid may have a place in agriculture and industry.

Methods of processing crops for oil was discussed by Mr. Gastrock. He emphasized that new oil crops must compete with high producers such as cotton and soybeans. As an example he noted that, to be in a good competitive position, sesame would have to average 800 to 1000 pounds and castor beans up to 1800-2000 pounds per acre.

To show the part that utilization research plays in plant products, Mr. McFarlane used the citrus industry as the outstanding example. The increased use of orange concentrates, powders, and other products such as molasses and flavanoids resulted from utilization research. In regards to further utilization of a new crop he discussed the possibility of avocado preservation. The wide array of products from sweet potatoes was also cited.

In a summary he listed a number of problems related to the utilization of new plants. They are as follows:

Determination of:

1. Processing of edible portions
2. Constitution of nutrient value
3. Value of feed constituents
4. Medicinal value
5. Enzyme systems
6. Parts for industrial use
7. Portions for organic synthesis
8. Biochemical properties related to quality.

Mr. Hopper concluded the program briefly by emphasizing that to be acceptable a new crop must be produced cheaply and abundantly. He also stressed the need for further introductions and research on forage crops.

New Plants Adapted to Some Sections of the South with Meager Information as to their Utilization

Following the program presented by the staff as given above, members of the committee mentioned several crops in which utilization problems were existent. No answers to these problems were forthcoming for the moment but many of them served to form a basis for further utilization work provided facilities could be provided to take care of such an expanded program.

Report on Domestic Explorations

Collections have been made for years 1953 and 1954 in Southwest U. S. A. and Mexico by Dr. Reeves and others for grasses and legumes. Most of the material was collected as seeds. Many of the introductions were collected in dry areas that had been without rain for five years.

The collections made in 1953 and 1954 have been planted in a nursery. The best evaluation for drought tolerance can be made during the second year in the nursery. Some data were collected on the 1953 collections during the growing season of 1955. Material will be rated on forage production, size of leaves,

length of leaves, and adaptability.

A total of 3,500 accessions were made. About 1,400 of these were grasses and legumes.

Discussion of Previous and Future Anticipated
Utilization of Plant Introductions

Mr. James Began the discussion by mentioning the action taken in other regions encouraging the use of plant introductions in graduate theses.

Mr. Miller of Louisiana stated that he used the classification of potatoes as M. S. thesis for one of his graduate students. In the North Central Region, potatoes have also been used for a graduate problem.

The following procedure was outlined to encourage use of introduced material:

1. Each state representative on the S-9 New Plants Technical Committee is to send a list of all titles for suggested graduate problems to Mr. James before Feb. 1, 1956.
2. Mr. James will compile a list of all proposed problems and send a list to each state representative.
3. Plan group meetings at the various colleges in the region and regional coordinator could discuss problems with these groups.

Discussion of Continued Maintenance, Including
Bulking of Similar Accessions

Mr. James proposed the bulking of accessions originating in any given area in the world and which to all appearances are identical. Mr. Erlanson stated that the other regions do not favor such a procedure and expressed the possibility that bulking would reduce the requests for introductions from the other three regions. Mr. Woodbury maintained that bulking should be only on the basis of the entire genetic composition, which information is not being available at this time. Mr. Hull suggested the discarding of apparent duplicates. The committee agreed that bulking at the present time would have an adverse effect and should be delayed until the problem of maintenance becomes more critical.

Discussion of More Extensive Specific and Thorough Evaluations of Plant Materials

The need for controlled disease reaction studies on the large number of introductions on hand was discussed by Mr. James. Mr. Erlanson mentioned the progress being made in the nationwide screening of tomatoes for diseases, and added that the thousands of bean introductions have been only partially evaluated. The committee suggested that individuals interested in a crop be encouraged to evaluate introductions and make the information available through catalogs.

Proposals for New Explorations

Mr. Lewis pointed out that the final decision regarding explorations rests with the Plant Introduction Section. Mr. Erlanson called attention to the fact that fund limitations have delayed the completion of earlier exploration proposals and that this year domestic explorations will receive attention. The committee proposed the following:

1. Completion of the exploration of the Caribbean area, including Central America for sweet potato breeding material.
2. Exploration of Australia and New Zealand for forage grasses and legumes.

Budgetary Recommendations

The budget for 1955-56 as shown below was presented by the coordinator and approved by the committee.

Budget 1955-56

Funds:

Regional Research Fund (1)	\$20,000.00
U. S. D. A.	4,800.00
State	1,066.00
Total Funds	<u>\$25,866.00</u>

Personal Services:

Salaries	\$14,886.53
Labor	<u>4,800.00</u>
Total Personal Services	\$19,686.53
Capital Outlay	1,200.00
Travel	900.00
Operating Expense (2)	<u>4,079.47</u>
Total	<u>\$25,866.00</u>

1. Other Regional Research Fund Allocations: by Puerto Rico Agr. Expt. Station \$5,175---by South Carolina \$3,000.00

Figures were presented by Mr. Lewis and Mr. Thomas showing that the Southern Regional Plant Introduction Station received the lowest allocation of Regional Research Funds of any such station in the country. On a comparable basis, the figures presented were as follows:

Regional Research Funds by Regions

<u>Region</u>	<u>For Region</u>	<u>For Introduction Station</u>
North Central	\$51,00.00	\$34,600.00
Northeastern	24,500.00	24,500.00 (1)
Western	36,800.00	27,800.00
Southern	28,175.00 (2)	20,000.00

1. Includes \$1,500.00 travel trust fund.
2. Includes allocations by Puerto Rico and South Carolina Experiment Station, \$3,175.00

Mr. James indicated that expansion has been slow and evaluation work handicapped under the present Regional Research Fund allocation. It was shown that if the Station is to adequately meet the needs and demands of the workers in the region, an increased allocation would be required. The Committee passed a resolution requesting an increase in Regional Research Funds and instructed the Coordinator to prepare an outline of needs and justification for the increase for submission, through the Administrative Advisor, to the Directors of the Experiment Stations in the Southern Region.

Report on the National Coordinating Committee

Mr. Lewis briefly summarized the minutes of the National Coordinating Committee. In reviewing the functions in the cooperative project it was emphasized that responsibility for explorations rests with the Plant Introduction Section and that plant breeding is a function distinct and separate from evaluation and maintenance which is the responsibility of the Regional Introduction Stations.

Attention was called to the dropping of the word "Primary" when designating Regional Plant Introduction Stations. On the basis of this change, the unit at the Georgia Experiment Station would now carry the title "Southern Regional Plant Introduction Station".

The question of contributing project arose and Mr. Lewis outlined the procedure for approval as follows:

1. Project outlines are approved by the S-9 Technical Committee.
2. Approved by the Director of the Experiment Station concerned.
3. Sent to State Experiment Stations Division for recording.
4. Regional Research or state funds may be used to support the project.

Election of Officers

The Nominating Committee composed of J. K. Underwood, H. W. Bennett, and E. N. Fergus nominated J. C. Miller for Chairman and A. H. Dempsey for Secretary. It was moved and passed that nominations be closed and that the Secretary cast a unanimous ballot.

Time and Place of Next Meeting

It was moved and passed that the next meeting of the S-9 Technical Committee be held at Clemson, South Carolina. The initiative for calling another meeting was left to the executive committee.

DISTRIBUTION OF INTRODUCTIONS, Jan. 1---Dec. 1, 1955

State	Grasses & Legumss		Other Field Crops		Vegetable Crops		Misc. Crops		Totals
	By S. Reg.	By Others	By S. Reg.	By Others	By S. Reg.	By Others	By S. Reg.	By Others	
Alabama	7		130		4		12		153
Arkansas	61					12			73
Florida	329		44		9	153	9	980	1524
Georgia	101	3	71	1	1		6	36	219
Kentucky	14								14
Louisiana	75	30			10	132	9	6	262
Mississippi	6		31			7	1	9	54
North Carolina	22		21		22	1020	1	9	1095
Oklahoma	237	11	18	14	40		39	9	368
Puerto Rico	212	7				28	4	14	265
South Carolina	8				650		16		674
Tennessee	117						15		132
Texas	482		129		104	52	84	165	1016
Virginia	37				6				43
Total by S. Reg.	1708		451		846		196		3201
Total by Others		44		15		1404		1228*	2691 5892
Total by Crops	1752			466		2250		1324	5892
To N. E. Reg.									119
To N. C. Reg.									673
To West Reg.									172
Foreign									1134
Storage									46
Total Shipments by S. Reg. Plant Introd. Sta.									5345

* Approximately 1000 ornamentals from Coconut Grove.