M I N U T E S

of the

MEETING OF THE S-9 TECHNICAL COMMITTEE

"NEW PLANTS"

The Introduction, Multiplication, and Evaluation of New Plants for Agricultural and Industrial Used and the Preservation of Valuable Germ Plasm

Plant Industry Station
ARS - USDA
Beltsville, Maryland

July 26-28, 1971

Agenda for Meeting
of the
S-9 Regional Technical Committee

July 26-28, 1971

Place: Conference Room in Building 050, Plant Industry Station, Beltsville, Md.

Time: 8:30 A.M.

1. Call to order and introduction of visitors
2. Welcome to the Plant Industry Station
3. Review and approval of Minutes of 1970 S-9 Meeting
4. Deletions or additions to Agenda
5. Appointment of Committees
    a. Nominations
    b. Resolutions
6. Progress Reports
    a. State Experiment Stations -

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

    b. Federal Agencies - Soil Conservation Service
Northern Utilization Research & Development Division
New Crops Research Branch, PSRD
Cooperative State Research Service
    c. Regional Station
    d. Administrative Advisor

7. Plans for New Crops Research in 1972

8. Preservation of late maturing plant introductions

9. Requests for plant explorations

10. Regional Station budget

11. Regional publication

12. Revision of Project Outline

13. S-9 representation at Meeting of National Coordinating Committee

14. Field trips

Monday P.M.	-	SCS Plant Materials Center Plant Introduction Station at Glenn Dale
Tuesday	-	National Arboretum USDA Plant Inspection Station

Roll call and introductions

The meeting of the S-9 Technical Committee was called to order by J. Velez Fortuno, Chairman, at 8:30 am at the Conference Room in Building 050, Plant Industry Station, Beltsville, Maryland. Those attending the 1971 meeting were as follows:

S-9 Committee Members

C. R. Jackson	Administrative Advisor
W. R. Langford	Regional Coordinator, Georgia
J. L. Bowers	Arkansas
G. B. Killinger	Florida
R. E. Sigafus	Kentucky
R. J. Stadtherr	Louisiana
H. W. Bennett	Mississippi
W. T. Fike	North Carolina
R. S. Matlock	Oklahoma
J. Velez Fortuno	Puerto Rico
J. A. Martin	South Carolina
M. J. Constantin	Tennessee
E. L. Whiteley	Texas
T. M. Starling	Virginia
C. I. Harris	Cooperative State Research Service Washington, D. C.
F. R. Earle	Northern Marketing & Nutrition Research Division, Peoria, Ill.
H. L. Hyland	New Crops Research Branch, ARS Beltsville, Md.
W. C. Young	Soil Conservation Service Fort Worth, Texas

Others in Attendance

James A. Duke	New Crops Research Branch, ARS Beltsville, Md.
H. W. Everett	Soil Conservation Service Beltsville, Md.
C. Galeotti	Oklahoma
W. O. Hawley	U.S. Plant Introduction Station Savannah, Ga.
Quentin Jones	New Crops Research Branch, ARS Beltsville, Md.
A. J. Oakes	New Crops Research Branch, ARS Beltsville, Md.
G. A. White	New Crops Research Branch, ARS Beltsville, Md.
H. F. Winters	New Crops Research Branch, ARS Beltsville, Md.

Additions or corrections of the 1970 Minutes were called for. There were no changes made so the Minutes of the 1970 meeting were approved as written.

Welcome

Quentin Jones of the New Crops Research Branch, ARS, welcomed the committee to the Plant Industry Station.

Appointment of Committees

Nominating Committee	Resolutions Committee
H. G. Bennett	G. B. Killinger
J. L. Bowers	M. J. Constantin
R. S. Matlock	W. C. Young

State and Federal Agency Reports

Committee members and visitors presented their reports on New Crops research. These reports are appended to the Minutes as Appendix B.

Alabama (Hoveland absent)	W. R. Langford
Arkansas	J. L. Bowers
Florida	G. B. Killinger

Georgia	W. R. Langford
U.S. Plant Introduction Station, Savannah, Ga.	W. O. Hawley
Kentucky	R. E. Sigafus
Louisiana	R. J. Stadtherr
Mississippi	H. G. Bennett
North Carolina	W. T. Fike
Oklahoma	C. Galeotti
Puerto Rico	J. Velez Fortuno
South Carolina	J. A. Martin
Tennessee	M. J. Constantin
Texas	E. L. Whiteley
Virginia	T. M. Starling
Soil Conservation Service	W. C. Young
Northern Marketing & Nutrition Research Division	F. R. Earle
New Crops Research Branch, PSRD	A. J. Oakes H. F. Winters C. A. White
Regional Station	W. R. Langford
Cooperative State Research Service	C. I. Harris
Administrative Advisor	C. R. Jackson

Alabama

The report sent by C. S. Hoveland and given by W. R. Langford. The screening of cowpeas (Vigna) for protein and amino acid content of the seed is being continued. W. L. Greenleaf has released a new tobacco etch virus resistant tabasco pepper named "Greenleaf". PI's 152225 and 159236 from Peru were used in its development. Pimiento pepper accessions having resistance to Colletotrichum have been found and are being tested. In tomato (L. esculentum) PI 272735 has been found to have several desirable quality factors and PI 273444 has concentrated maturity and dwarf characteristics needed for once-over mechanical harvest.

H. P. Orr reported several woody plant introductions that should be valuable ornamentals in Buxus, Rhododendron, Hedra, Callicarpa, Cunninghamia, Photinia, and Ilex genera.

A. C. Mixon has evaluated 458 peanut accessions for resistance to Aspergillus flavus. W. P. Caldwell of Northrup, King, & Co. has released Millex 23, a new hybrid pearlmillet, and expects to release a heat resistant turf-type ryegrass, both selected from plant introductions supplied by the Alabama station. C. D. Berry has a breeding program with Festuca arundinacea and Phalaris aquatica to improve these species for winter use. Research on management of Yuchi arrowleaf clover is being expanded under the direction of C. S. Hoveland and W. B. Anthony. They have also screened 1200 grain sorghum accessions by use of the in-vivo nylon bag method and have found the dry matter digestibility ranged from 31 to 60%. There appeared to be a good correlation between seed color and digestibility.

Arkansas

J. L. Bowers reported that 519 accessions have been received by workers in Arkansas. A test of the 185 spinach accessions did not provide a good test for white rust (Albugo occidentalis) and will be repeated. The 519 accessions of southern peas, 3 lupines, and 51 rape accessions will be evaluated this season. Of 65 grape accessions received from 1969 through 1971, some have already fruited and PI 203088, a blue fruited strain has been selected for use in the breeding program.

Florida

G. B. Killinger reported poor germination of 37 Brassica campestris and winterkill of all plants by January from a November seeding. Kenaf yielded from 7 to nearly 10 tons of oven-dry stalks per acre. Only six of 100 strains of pigeonpea (Cajanus cajan) from India set seed before frost. A patent has been obtained on the use of Hemarthria as a beverage. Crepis alpina and sunflowers have been grown and seed harvested. Sunflower varieties yielded 1800 to 2200 of seed per acre.

P. L. Pfahler has hybridized Secale montanun and S. cereale and found vegetative vigor of hybrids greater than either parent and will check these for winter forage potential. F. T. Boyd reports sting nematode

(Belonolaimus longicaudatus) in PI 299601 of Digitaria decumbens. He also found it and PI 309975 Chloris uliginosa to be quite frost tolerant. J. M. Crall notes watermelon PI 255137 to be the most resistant of all lines tested to watermelon mosaic virus. Avelar pepper PI 342948 is reported by H. Y. Ozaki to be only mildly infected with virus by tobacco etch and potato virus while standard varieties are severely infected.

A. E. Kretschmer and J. B. Brolmann at Fort Pierce reported on the evaluation of large numbers of winter annual grasses, clovers and alfalfas. Florida 66 outyielded all alfalfas.

Georgia

W. R. Langford reported that J. H. Massey found fall planted Brassica carinata and B. napus produced very poor stands. B. carinata in an April planting did well, with earlier plantings higher yielding than late ones. No effect of row spacing was found. Crambe abyssinica planted in March and April yielded the same but 14-inch rows yielded more than 21-inch rows which outyielded plantings in 28-inch rows. Kenaf and roselle varieties did not differ in yields in experiments testing time of planting and spacings.

W. L. Corley reported continuing work with ornamental peppers to add information to that in Ga. Agr. Expt. Sta. Res. Bul. 83 "Ornamental Peppers for Georgia". He is evaluating 8 wild species of Cucumis for use as ornamental gourds. Over 200 accessions of grasses are being observed as ornamentals.

R. O. Hammons is testing peanut introductions for yield and quality, for resistance to larval foliage feeders, and for resistance to nematodes.

Ian Forbes is working with the legumes Dolichos, Lupinus, and Desmodium. G. W. Burton and R. H. Brown have graduate students working on Panicum maximum and wild Arachis species.

T. S. Davis has found promising woody plants among accessions of Quercus acutissima, Q. myrsinaefolia, Pinus thunbergii, Crytomeria japonica, and Ulmus pumila.

Kentucky

R. E. Sigafus reported the continued success R. C. Buckner has had in interspecific hybridization in Fescues. Birdsfoot trefoil strains have been found to contain some resistance to Rhizoctonia solani by L. Henson. Three methods of testing alfalfa weevil feeding have given similar results in tests conducted on species of Medicago, Melilotus, Trifolium and Trigonella by N. L. Taylor et al. He also helped determine the chromosome numbers of 8 additional species of Trifolium.

D. E. Knavel has not found resistance to spider mite in 1500 Phaseolus lines. He did find cantaloupe PI 164320 to be immune or very resistant to powdery mildew in greenhouse checks. In cucumber PI's 197088, 197085 and 279465 were quite resistant to powdery mildew in a greenhouse test.

Louisiana

R. Stadtherr reported that E. P. Barrios would have limited amounts of LP-1 pepper for breeders in the fall of 1971. This plant has been grown in Louisiana home gardens for some time. Mature plants are about 43 cm tall and about 75 cm wide, determinate bearing, and 30 days earlier than 'Tabasco'. Pods are erect about 1.4 cm long and 0.5 to 1.2 cm diameter at base. Immature pods are sulfur-yellow to orange and red when mature. LP-1 is resistant to two races of tobacco etch virus and 4 races of cucumber mosaic virus.

J. F. Fontenot is working on potatoes and with okra. He found pi's 311106, 310477, and 310474 of okra to be resistant to 3 races of Melodogyne incognita in greenhouse tests. R. Stadtherr received several ornamentals in between 1968 and 1971. He reports that the Viburnums appeared to lack cold hardiness and all have died. He will report on performance at a later date. He received Rhododendron, Eurya, Abies, Alnus, Arbutus, Camellia, Cassia, Chamaecyparis, Clematis, Cryptomeria, Gardenias, Hedera, Juniperus, Kirengeshoma, Myrceugenia, Pinus, Prunus, Sycopsis, Virburnum and Cotinus.

Mississippi

H. W. Bennett reported that Tibbee, a new reseeding crimson clover selection from PI 233812 and Dale, a new variety of sweet sorghum containing PI 152857 were released by the Mississippi station in 1970. The Bermudagrass PI 290814 is as high yielding as Coastal at all nitrogen levels. Dwarf Mosaic virus was found to infect six new species of grasses not reported before.

Vigna sinensis and V. cylindrica were tested for tolerance to cowpea weevil. The weevil would reproduce on all of 500 accessions tested but preferred some strains over others.

Tomato lines carrying PI 272636 as a parent showed good resistance to foliage and fruit diseases under field conditions. Three selections are being increased.

Chinese Holly PI's 331203, 331205, and 331306 and Forsythia seiboldii suspensa are in a healthy growing condition and covered with fruit. Several pears and plums from a domestic exploration are producing fruit at State College. Four plums are being evaluated for use as fresh market plums.

North Carolina

W. T. Fike reported that 12 cooperators in North Carolina received a total of 1444 accessions in 29 genera and 52 species. A very large number of

previous accessions are in various stages of advanced testing.

Venus and Saturn are two new tomato varieties released. Foundation seed will be available after November 15, 1971. PI 129080 was used as a source of southern bacterial wilt resistance.

Norman Pigeon Pea from PI 218066, released in 1968 should be available in large quantities in 1972 from African sources.

W. A. Cope is working on crownvetch, Harry Collins and Thad Busbice on alfalfa and Dave Timothy on Pennisetum flaccidum and P. orientale.

Brassica campestris planted in November was killed by cold weather. In March plantings only PI 305275 gave an adequate yield.

Oil crops observed from a November planting included Chamaepeuce, Stokesia, Bifora, Crepis, and Briza.

Tephrosia vogelii was planted in 10, 20 and 30-inch rows. Total dry matter yields ranged from 3.1 to 4.8 tons per acre with 0.62 to 0.94 tons of leaves. Highest yields were from the closer row spacing.

Kenaf was studied in a time of planting and row spacing trial. May plantings gave yields double the July planting and 7-inch row spacings were better than 14 inch. Alachlor, propachlor, and trifluralin gave good weed control with no noticeable reduction in crop stand or yield. Dichlobenil, amiben, metobromuran, atrazine, and linuron reduced stand and yields.

Sugarbeets yielded 19 to 24 tons per acre compared to corn at 165 bushels and soybeans at 43 bushels per acre.

A yield trial of sunflowers in 1970 showed yields from 1100 to 2331 pounds per acre with birdfood varieties higher yielding than oilseed. A 24 entry test is being grown at two locations in 1971.

There is a limited market for catnip but 40 acres are being grown under contract in 1971. A drug company will buy dried leaves of Digitalis lanata. There is also some demand for herbage of Lespedeza capitata for export.

The domestic collection of Eastern Vaccinium species is being evaluated by Dr. Galletta and selections are being made of more promising material.

Oklahoma

Ligon Blackeye cowpea is a new variety released July 1971 by the Oklahoma Agr. Expt. Station. It is semi-upright, a good yielder, and has moderate fusarium wilt resistance. Charles Galeotti also reported that 426 varieties and accessions of cowpeas and 40 accessions of mungbeans have been seeded in 1971. Robert Adcock is screening the mungbean germ plasm for root nematode resistance. Chickpea (Cicer arietinum) was seeded in April and 100 of 150 accessions survived and some were ready to harvest in July. Dolichos biflorus and D. lablab were observed in two locations.

Sunflower variety tests averaged 627 to 1294 pounds per acre by location in 1970. Regional tests were put out again in 1971 at three locations. Brassica campestris, B. juncea, and Briza spicata are other oil crops being observed in 1971. The mucilage crop Guar (Cyamopsis tetragonoloba) was seeded at four locations with 24 entries per test. In addition several hundred accessions were seeded for observation and seed increase.

Morpa weeping lovegrass was released by the Oklahoma Agr. Expt. Station and Crops Research Division, ARS, U.S. Department of Agriculture in 1970. It came from PI 208994. P. W. Voigt is responsible for Morpa and is continuing to observe other sources of this grass as well as Digitaria. All D. smutsii accessions were winterkilled or very severely injured. Ornamentals tested long enough to assure that they are well adapted to Oklahoma conditions include: Zelkova serrata, Cotoneaster (PI 113092), Rosa rugosa (PI 227432), Lagerstromea indica (PI 316672), and Malus sieboldii (PI 316711).

Puerto Rico

A total of 132 accessions were received for the research program in 1970-71. There were 27 fruits, 4 vegetables, 14 root crops, 8 bananas, 7 grains, 2 forage and 66 sod grasses and 4 ornamentals.

J. Velez Fortuno reported on rather extensive yield trials of the fruit Sapodilla and of Annona diversifolia. The Macadamia nut is being tried in coffee tree areas. Mangosteen trees bore an average of 42 fruits per tree at the age of 16 years.

Variety trials have been conducted of the starchy root crops, Tanier (tannia or taro) Colocasia spp. and Cassave (manioc) Manihot uitlissima. Coffee trees claimed resistant to rust are being increased.

Pepper PI 174810 appears to be resistant to local virus strains. Pigeon peas introduced seem to have seed too small for the fresh market and canning but are being screened for protein content and quality.

Accessions of Bermuda, Centipede, Zoysia and St. Augustine are being evaluated for turf.

South Carolina

J. A. Martin saved 250 pepper selections from over 1600 grown in 1970. He is looking for those which can be harvested mechanically. Likewise selections from the 221 okra accessions grown in 1970 are being grown for actual field testing for adaptation to mechanical harvesting.

The U.S. Regional Sunflower Yield test is being grown. Yields in a 16-entry test of Brassica ranged from 387 to 879 lbs/A.

In 1970 Kenaf yielded about 3 tons of dry stalks per acre in 42-inch rows with 4 plants per foot of row. Fertilizer at 1000 pounds of 5-10-10 per acre gave yields about as good as treatments with 200 or 400 extra pounds of nitrogen.

Jerusalem Artichokes are being investigated for use as human food, inulin, fructose and levulose. Dahlias may be a better source of carbohydrates than the Artichoke. R. B. Killingsworth is working with J. A. Martin on these plants.

Observations have been made of plantings of Tephrosia, Stokesia, Briza, Crepis and Limnanthes spp. Only the Tephrosia was planted in replicated plots with row spacing, plant spacing, and location variables.

P. B. Gibson is working with Trifolium repens to select strains tolerant to root-knot nematode. T. uniflorum and T. occidentale are being used in species hybridization studies.

Clemson Forestry Bulletin No. 6 describes a plant introduction PI 168939, Sawtooth oak (Quercus acutissima). This tree is being recommended for consideration as a food tree for wildlife. The Forestry Bulletin was written by R. E. Schoenike.

Downy mildew resistant cabbage and broccoli lines have been turned over to seed companies for use in hybrid production. Resistant parents are PI 261774 in cabbage and PI 189028 in broccoli.

R. B. Taylor of Greer Nursery obtained a Chinese Chestnut in 1926, Chinese Frienge in 1938, Laurel Leaf Holly in 1934. He also noted the receipt of shore juniper (Junipers conferta) and Dwarf Variegated Osmanthus.

N. B. Hughes is using several cantaloupe lines for Alternaria resistance. Powdery mildew resistance is good in PI 124111 and is simply inherited.

Tennessee

Fifty-three new accessions were received in Tennessee according to M. J. Constantin. Previous accessions are still being evaluated as with 130 forage type Bermudagrass selections and 80 turf types from 600 previous accessions. Winter hardiness is a main factor being evaluated. W. D. Barber has an alfalfa breeding program for weevil resistance.

Rosa rugosa PI 227432 is growing well but has not been fully evaluated. Sawtooth oak (Quercus acutissima) as reported by South Carolina, looks good for wildlife food.

The German strawberry Senga sengana PI 274680, has been used as a male parent and will be evaluated in the spring of 1972.

Texas

Eli L. Whiteley tested kenaf in a spacing study, a variety test and a fertilizer trial. Yields in the spacing trial were about 3 tons per acre and no differences were found between spacings. Yields of the varieties ranged from 3 to about 4.5 tons per acre with no difference between means. In the fertilizer trial the check plot yielded 5 tons per acre and the highest fertilizer treatment about 50% more. There was evidence that high rates of fertilizer reduced yields.

Phymatotrichum root rot observations of soybeans in 1970 showed no differences. There appears to be differences among 56 lines and varieties planted in 1971. R. D. Brigham is using PI 200503 and PI 227555 as a source of resistance to soybean mosaic virus. He is also using D65-3168, a resistant selection from Hill x 96983 in the study.

Male-sterile sunflower plant introductions are being used by M. L. Kinman to convert Texas-USDA inbreds to male-sterile cytoplasm for use in producing commercial hybrids. The first useable source of restoration of this cytoplasmic male sterility was discovered at College Station, Texas in 1969. Two R lines resistant to rust and producing high oil content seed are being increased in 1971.

Peanut PI's 196602, 196625, 196627, and 196666 have been used to develop resistant lines to Cercospora leaf spot.

Work is continuing with sweet sorghum and some of the quality test results were given in the report on a large number of lines from Meridian, Mississippi and on standard varieties. J. W. Johnson reported seven accessions in 5 species of sorghum as being resistant to aphid Schizaphis graminum. Roma sweet sorghum was released by the Plant Science Research Division, USDA and the Texas Station. It is resistant to downy mildew, leaf anthracnose, red rot, and rust, but is susceptible to cotton insecticides.

Virginia

In the absence of Dr. T. Jackson Smith, Dr. T. M. Starling reported that Virginia has no active project on new plants but that plant introductions are being used as a source of germ plasm in several plant breeding projects in his state.

Soil Conservation Service

W. C. Young presented the SCS report which was mainly a tabulation of the status of plant materials being handled by the managers of Plant Materials Centers and plant materials specialists in Georgia, Florida, Mississippi, and Texas. The tables identify the plants by SCS and PI numbers and the status report indicates the progress of observations from initial evaluations through field testing and seed increase if plants are found useful. Further information on any accession can be obtained from annual reports of the centers or by writing directly to center managers.

Northern Marketing and Nutrition Research Division, Peoria

F. R. Earle reporting for W. H. Tallent indicated that their efforts would be largely concentrated in six areas to include work on kenaf,

Crambe, Limnanthes, Lesquerella, sources of epoxy oils and the screening program.

Kenaf storage studies will continue in Georgia and chemical and physical factors of pulping will be studied at Peoria. Crambe production would be stimulated if a proposed 50-ton per day extraction plant is built in Indiana. Restriction on use of sperm oil makes Limnanthes studies more appropriate. Lesquerella as a source of a new hydroxy-acid oilseed and the epoxy acids in Vernonia, Stokesia, and Erlangea justify further studies with these plants. Brassica, Linum, Trigonella, Mucona are a few of the plants being screened for potentially useful commercial products.

New Crops Research Branch

In the absence of H. L. Hyland, A. J. Oakes reported for NCRB. The 20-year report entitled "The National Program for Conservation of Germ Plasm (A Progress Report on Federal-State Cooperation)" is being published by the Georgia AES Editor.

Plant Introduction - A total of 9,103 accessions were received during the year. Several explorations were made and it may be of interest to note special accessions such as the several new species of ornamentals from the Winters-Higgins trip to New Guinea. The wild peas from the Ethiopian highlands by H. S. Gentry included 110 samples. From Bolivia, Ecuador, Peru, and the Galapagos C. M. Rick collected 200 samples of tomatoes as well as many not-tuber producing Solanums. Forage grasses from South Africa collected by A. J. Oakes numbered 940. Domestic explorations include one on big bluestem, Indiangrass, and switchgrass and a completed one on Vacciniums. The National Seed Storage Laboratory added 4,608 seed lots to make a total of 78,602 in permanent storage.

Plant Resources Investigations - Screening of plants for L-dopa, special mucilages, and anti-cancer agents were main activities. The only good source of L-dopa was in the legume, Mucuna. Cassia and Sesbania were among the best sources of mucilage. Anti-cancer screening yielded 100 new active plants including three new anti-cancer alkaloids isolated from Cephalotaxus. Future plans call for a guide for use of scientific names in manuscripts for the benefit of authors of scientific papers.

Horticultural Crops - H. F. Winters reporting on horticultural crops noted the Rhododendron, Impatiens, and Hoya obtained in New Guinea. Work with fruits in California and Florida was discussed. A cold hardy selection of Camellia named 'Frost Queen' has been released from Glenn Dale to growers. Dombeya cultivars 'Perrine', 'Deep Pink', and 'Pink Clouds' were also released.

Agronomic and Chemurgic Crops - G. A. White reported on the increased use of automated procedures in information retrieval. Regional Plant Introduction Stations cited significant projects. NE-9 is screening red clover collections for resistance to powdery mildew and yellow bean

mosaic and Lotus for host range of Myrothecium leafspot. Oil content of corn has been a major screening project of NC-7. Cold tolerant clones of Cynodon, Digitaria, and Paspalum and high yielding introductions of guineagrass, rhodesgrass, and Brachiaria species has been a major enterprise in S-9, while W-6 workers are looking for vetch brucid resistance in Vicia.

Root-knot nematode resistance in kenaf is needed. There is promise on resistance in some accessions. Paper making studies from kenaf are being intensified. For Crambe screening for Alternaria resistance is being done at Ames. New varieties show promise and some may be far enough along to be released in 1972. Strains with good seed retention are still being sought in Limnanthes and Vernonia. Future plans call for some curtailment of efforts on Tephrosia, Briza, Crepis, and Bifora but some increase in work on Stokesia laevis and Erlangea tomentosa.

Regional Station

W. R. Langford reported that 1531 new introductions were received last year. Two-thirds of them are Vigna spp.

3145 accessions were grown for seed increase, but many sorghums from Ethiopia and other tropical grass and legume introductions failed to flower in the field at Experiment, Georgia. Some of these were increased in the greenhouse during the winter.

Screening studies were continued to locate resistance to peanut stunt virus, Rhizoctonia on peanut and leafspot of peanut. No resistance to PSV or Rhizoctonia was found, but PI 109839 showed promise of having resistance to peanut leafspot.

17984 samples of seeds and plants were supplied from stocks held at the regional station to plant scientists. Approximately 1/2 of these went to research workers in the South. 5378 samples were sent overseas.

Administrative Advisor

Dr. C. R. Jackson commented on the value of plant introductions. Some states have not been represented at recent S-9 meetings. Dr. Jackson reported on his efforts to have other workers attend meetings if the official committee member does not attend.

An appeal was made for committee members to help the regional coordinator in every way possible.

Attention was called to the many reports on specific plants that are made at the S-9 meetings. It was suggested that it would be desirable if summary reports such as the recent one on kenaf might be made by expanding some of the reports made to S-9. Such reports serve a very useful purpose and would be of credit to the S-9 project.

Dr. Jackson mentioned a very successful meeting on Potatoes at Rhinelander, Wisconsin in 1970. Action of the committee was not called for but a suggestion was made that possibly for the 1972 meeting that some special topic might be selected. This topic could be discussed as a regular

part of the S-9 committee meetings or a separate meeting could be arranged. Ornamental Plant Introduction in the Southeast was mentioned as a topic that might be of common interest to the whole Southeast region.

The national Coordinating meeting for New Crops is to meet in September in Peoria, Illinois. Committee members were asked for ideas that might be proposed at this meeting.

Suggestions were made relative to research proposals which might receive favorable consideration by station directors of research.

Members of the S-9 Committee were asked to comment on promoting S-9 activities with the state experiment station directors. Slides of S-9 activities were called for. There is a need to show that plant introductions are something other than scientific curiosities.

An idea presented many times previously but on which little action has been taken was that of using Puerto Rico for increasing seeds of plants which will not seed in the mainland.

The committee in charge of revision of the S-9 Regional Project outline was reminded that the completed revision should be ready to present to the Director's meeting in April 1972. If ready earlier it could be submitted to the Committee of "9" at the Land Grant meeting in November.

Disposition of vegetative stocks and seed increase of late maturing species in frost-free areas: The problem of maintaining vegetative stocks and obtaining seed from late maturing plant introductions was discussed. It was the consensus of the committee that this was a very important item that had been discussed before but one which should be brought before the National Coordinating Committee Meeting in Peoria in September. In the general discussion it was brought out that a few individual workers, through personal contacts,have made use of facilities in Hawaii and Puerto Rico to maintain certain vegetative stocks and to increase seed supplies of other materials. However, committee members felt that some organized effort should be made to provide such a service for additional workers. W. C. Young mentioned that a SCS technician in Puerto Rico could handle a few items but that limited space, funds, etc. would prevent any sizeable operation. The belief was expressed that the proper development of the service as mentioned was a high priority item and that it would cost money. If followed through properly there would need to be buildings; land; machinery, clerical, technical and field help, etc. It seemed to be implied that those who sent materials would be expected to stand at least the major costs involved.

Regional Station Budget

The Regional Station Budget for 1971-72 was presented by W. R. Langford. The committee approved the budget as presented and as shown in Appendix A.

Requests for new plant explorations

T. P. Hernandez of Louisiana asked for germ plasm of sweet potato resistant to soil insects and sweet potato weevils, and resistant to black rot and scurf diseases.

C. R. Jackson suggested that any future plant explorations, expecially those to temperate regions, make every attempt to bring to the United States introductions of grasses that may be suitable for use in lawns in the temperate areas. Particularly desired are clones and/or varieties of Centipedegrass, St. Augustine grass, and other stoloniferous species which might have superior resistance to diseases, insects, adverse weather and soil conditions.

G. B. Killinger and co-workers made the following requests:

Charles Conover - Apopka, Fla. - All plants with ornamental characteristics capable of surviving low light levels. In particular, small shrubs or trees for office interiors, etc. The plants should also withstand low humidity and be evergreen.

John B. Brolman - Fort Pierce, Fla. - Stylosanthes humilis and guayanensis
Desmodium heterocarpon
Centrosema pubescens and plumerii
Trifolium hybridum

T. A. Zitter - Belle Glade, Fla. - Capsicum annuum and Capsicum spp. for abscission at the ovulary to aid in mechanical harvesting. Same genera and species resistant to virus, to tobacco etch and potato y virus.

A. Norden - Gainesville, Fla. - Peanut germ plasm, see report from Raleigh, N.C., July 1971.

F. T. Boyd - Gainesville, Fla. - Chloris gayana and Chloris spp., preferably from areas above 30° N and S latitudes or from elevations with comparable temperatures.

Gary J. Wilfret - Bradenton, Fla. - Species of Gladiolus (Iridaceae) for breeding and genetic research. Both viable seed and corms will be accepted.

A. H. Krezdorn - Gainesville, Fla. - Prunus spp. budwood of local plum varieties - Taiwan and/or Okinawa. Pyrus malus budwood of unnamed low Chilling apples.

Ein Shemer - contact Dr. Spiegel - Roy at Volcanic Institute, Beit Dagan.

Tom Sheehan - Gainesville, Fla. - Orchids - especially Phalaenopsis from Andaman or Nicobar Islands.

E. S. Horner - Gainesville, Fla. - Corn (Zea mays) resistant to southern corn leaf blight (H. maydis). Lowlands of Mexico, Brazil, Colombia, etc. (warm, humid climate).

G. B. Killinger, Gainesville, Fla. - Hibiscus cannabinus (Kenaf) large diameter stem, nematode resistance, etc. Africa, India, Pakistan, and islands in near and far East. Cajanus cajan (Pigeonpea) with photoperiod to bloom at 12 to 14 hours day length. Mycorrhizae and/or any other symbiotic organisms in addition to the Rhizobium.

Dana Griffin, III, Curator, Bryophyte and Lichen Herbarium, 201 Rolfs Hall, Gainesville, Fla. - Moss material from within the tropical and sub-tropical latitudes.

H. W. Bennett, State College, Miss., cited the need for more cold hardiness in Paspalum, Cynodon, Chloris and Cenchrus ciliare.

W. C. Young, SCS, Fort Worth, Texas cited a need for plants tolerant to brackish water and ones that could be used to stabilize beaches and river channels.

J. A. Duke, NCRB, Beltsville, Md. need low narcotic varieties of poppy and cannabinus.

Report of Nominating Committee

Chairman Velez called for the recommendation of the nominating Committee. The nominating committee suggested the promotion of the secretary, R. E. Sigafus, to Chairman of the S-9 Technical Committee for 1971-72 and W. T. Fike for secretary. Motion was made, seconded and passed.

Time and place of next meeting

An invitation has been received from Auburn and at the 1970 meeting this invitation was accepted. The meeting date will be set by the host station and the Administrative Advisor.

Resolutions Committee Report

Chairman W. C. Young made the following report:

Be it resolved that the S-9 Technical Committee give special thanks to:

Dr. Quentin Jones for providing the facilities and arrangements for this meeting.

A. J. Oakes, G. A. White, and H. H. Fisher for their part in meeting and transporting the members.

W. L. Ackerman, H. E. Waterworth, and J. J. Higgins for taking time to instruct the committee in the special activities at the Glenn Dale Station.

H. W. Everett for his part in explaining the operation and providing a tour of the National Plant Materials Center.

Mrs. Myra Haines and J. E. Mabry of the U.S. Plant Inspection Station and U.S. Plant Quarantine Station for explaining their work in introducing seeds and plants and safeguards used to prevent introduction of diseases and insects.

H. T. Skinner of the National Arboretum and his staff including R. M. Jefferson, Botanist, F. G. Meyer, Curator of the Herbarium, D. R. Egolf in plant breeding, and to A. A. Piringer who coordinated our tour there.

Mrs. Viola Jewell, Mrs. Elizabeth Adkins and Mrs. Georga A. White for preparing and serving refreshments.

Howard Hyland for taking special care of the ladies who accompanied committee members.

It is requested that the coordinator write appropriate letters of appreciation to the leaders of the units who accorded us this most gracious consideration.

It is noted with regret the passing of Julian Miller, a long-time member of this committee, who's work with introductions, plant breeding, and production, especially with sweet potatoes, is serving the country so well and will continue to do so. The committee makes this tribute to his memory.

Respectively,

G. B. Killinger
M. J. Constantin
W. C. Young, Chairman

The meeting was adjourned at 12:00 noon by Chairman Velez.

Appendix A

Regional Station Budget

Fiscal Year 1971

Source of funds

Regional Research Funds (Pooled)		$38,000
Regional Research Funds (Ga. Sta.)		26,048*
Hatch Funds		2,000
State Funds		3,304
USDA, New Crops Research Branch		54,885
	TOTAL	$124,237

Expenditures

Salaries and labor		$106,645
Equipment		7,990
Operating supplies		8,000
Travel		1,471
	TOTAL	$124,106

Fiscal Year 1972

Source of Funds

Regional Research Funds (Pooled)		$ 36,500
Regional Research Funds (Ga. Sta.)		25,434*
Hatch		2,000
State & Sales		2,977
USDA, New Crops Research Branch		51,566
	TOTAL	$118,477

Proposed Expenditures

Salaries and Labor		$110,077
Operating supplies		7,100
Travel		1,300
Equipment		0
	TOTAL	$118,477

* Excluding land and office space furnished by the Georgia Station
** For support of 2 Georgia Station Projects contributing to Regional Project S-9.

Appendix B

State & Federal Reports

Regional Plant Introduction Station

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

Soil Conservation Service
Northern Marketing and Nutrition Research Division
New Crops Research Branch

Report of Regional Station Activities
to S-9 Technical Committee, 1971

Plant Introduction

Seed or plants of 1531 new introductions were received during the year ending June 30, 1971. Two-thirds of these are cowpeas and other Vigna spp. obtained from India and Ethiopia. The new material includes vegetative stocks of 149 accessions of Digitaria spp. and other warm season grasses collected in South Africa. The other 350 new introductions represent a wide assortment of plant species.

Seed Production

3145 accessions were grown for seed increase in 1970. Good increases were obtained from 320 peanut introductions, 340 cantaloupes, 180 watermelons, 105 cowpeas, 115 sorghums, 245 grasses and 175 legumes. The 1967 Ethiopian sorghum collection consisting of 1200 accessions was planted for increase but a high percentage of these did not flower before frost. However, seed of 980 of these late maturing sorghums were obtained from plantings made at Mayaguez by Mr. Fred Miller. Small increases of seed were obtained from greenhouse plantings of 450 other late maturing sorghums that we accumulated over a period of several years. Dr. Matlock and his associates at the Oklahoma Experiment Station replenished the regional seedstocks of 198 accessions of Urdbean, Mungbean, and chickpea.

In addition to the Ethiopian sorghums there were numerous introductions of tropical grasses and legumes that produced no seed. A few of these were sent to the Federal Experiment Station, Mayaguez, P.R. for seed production. Some of the plants that failed to mature at Experiment are: Aeschynomene, Alysicarpus, Cajanus, Cassia, Crotalaria, Desmodium, Indigofera, Sesbania, Stizolobium, Stylosanthes, Vigna, Brachiaria, Chloris, Digitaria, Euchlaena, Panicum, Tripsacum, and Pennisetum.

Chemurgic Crops

Seventeen accessions representing 11 species of Solanum were grown in a replicated test to get an estimate of fruit yield and Solasodine content. Fruit yield ranged from none to 29,000 pounds per acre. Samples of fresh mature fruits were sent to the Federal Experiment Station at Mayaguez for solasodine analysis.

37 accessions of Brassica campestris were planted last fall but none susvived the first cold wave of winter. Nine of these were planted again this spring in isolated plots for seed production. They flowered profusely but seed set was very poor.

Crepis alpina and Eryngium were the only two species in the chemurgic crops program that showed even fair agronomic potential.

Plant Disease Investigations

Peanut Stunt Virus: In cooperation with Dr's. Demski and Kuhn 1104 peanut introductions were screened for resistance to peanut stunt virus. PI 259610 which showed apparent resistance in an earlier test proved to be susceptible. All of the introductions screened thus far are susceptible to the virus when inoculated mechanically.

Rhizoctonia on Peanut: Five introductions that appeared to be resistant in petri dish tests were tested in soil infested with R. solani. Pre-emergence damping off was severe and only 18% emergence was obtained with the best introduction as compared to 2% emergence for Argentine. An unidentified phycomycete of the Mucoraceae present in the seed of certain groups of introductions made it necessary to discontinue preliminary screening tests. Attempts to inhibit the phycomycete without interfering with Rhizoctonia were unsuccessful.

Leafspot of Peanut: In cooperation with Dr. D. H. Smith 1404 introductions have been tested for resistance to Cercospora leafspot. Introductions that had an average of three or less leafspots per leaflet and an average of 4 leaflets or less defoliated in preliminary greenhouse tests were placed in replicated field tests. In addition to the introductions tested in the field in 1969 four introductions have demonstrated apparent resistance in preliminary tests. PI 109839, the only introduction which showed promise in the 1969 field test, was compared with Argentine in a replicated field test in 1970. Defoliation by C. arachidicola and C. personata were significantly less on the introduction. The introduction matured late and yielded less than Argentine.

WMV-2 on Squash: Further tests with introductions showing delayed symptom expression failed to confirm a useful source of resistance to this disease.

Gummy-stem-blight on Watermelon and Cantaloupe: PI 271778 was intermediate between PI 189225 and Crimson Sweet in resistance to Gummy-stem-blight in the field. Five single-fruit selections of PI 271778 were tested for resistance in a replicated greenhouse test. Significant differences in their resistance were observed. PI 271778 is already in use as a source of resistance by at least one plant breeder. The larger fruit size (up to 30 cm.) of this introduction and the possibility that this source of resistance can be transferred to commercial types easier than the resistance from PI 189225 may make PI 271778 useful as a breeding line.

Twelve single-spore isolates were made from a single leafspot on a breeding line which has PI 140471 in its pedigree. Results from preliminary tests did not indicate a difference in pathogenicity between the single-spore isolates from resistant material and a single colony isolate obtained from susceptible watermelon. Significant

differences were observed in the stem resistance of PI 140471 (mean length of stem canker 2.2 mm.) and the new resistant cultivar Gulfcoast (mean length of stem canker 110.9 mm.) in a replicated greenhouse test. Field observations indicate that Gulfcoast and breeding lines containing resistance from PI 140471 are consistently resistant in Alabama and Georgia. Reports from Hughes and Hamilton in South Carolina, however, indicate that both PI 140471 and breeding lines developed from it are susceptible.

The disease resistance of a new introduction of cantaloupe, PI 321005 from Taiwan, was noted in the field and confirmed in greenhouse tests in cooperation with Mr. Corley. The mean length of gummy-stem-blight stem canker was 37 mm. as compared to 2.2 mm. for PI 140471 and 113 mm. for the susceptible check. The mean index for powdery mildew was 1.2 as compared to 4.8 for Hales Best Jumbo (0-5 scale). This is a high quality melon grown in Taiwan as Tainan #2.

Anthracnose and Ripe Rot of Pepper: Forty plant introductions and the cultivar California Wonder were grown to maturity in 6-inch pots. Two mature fruits from each of 5 plants were inoculated with Glomerella cingulata and the ripe-rot pathogen (Colletotrichum sp. of the C. dematium group). None of the introductions showed significant resistance to inoculation by wounding as measured by the diameter of the fruit lesions.

Bacterial Spot of Pepper: Twenty-three introductions, which had less than 30 percent of the seedlings infected and a defoliation index of 1 or less in preliminary screening tests, were tested in a replicated greenhouse test.

Table 1. New sources of resistance to bacterial spot

PI number	Source	Species
271322	India	Capsicum annuum
260571	Bolivia	C. pendulum
260579	Bolivia	C. pendulum
260581	Bolivia	C. pendulum
260582	Bolivia	C. pendulum
260583	Bolivia	C. pendulum
281423	Puerto Rico	C. chinensis

Seven introductions exhibited a defoliation index of 1 or less (Table 1) while California Wonder averaged 2.5.

Bacterial Spot of Tomato: A replicated field planting of all tomato introductions which were previously reported as resistant to bacterial spot (PI's 65023, 92863, 99782, 126923, 126932, 126948, 124235, 133542, 196004, 280669, 280671, 280672 and 280670) were inoculated twice with Xanthomonas vesicatoria. Bacterial spot infection was not severe. A few spots were observed on the fruits of Marglobe but not on fruits of any of the introductions.

None of the introductions, including PI 124235, were resistant to all Florida isolates of the bacterium in greenhouse tests. Since previous work indicated that India might be the center of origin of resistance to bacterial spot in tomato, we screened all tomato introductions from India and Africa (138). None of the introductions were resistant to all isolates of the pathogen.

Pathogens in Original Seed: One hundred original seed of each of five peanut introductions from Senegal were surface sterilized and plated on V-8 agar. A fungus of the Aspergillus niger group grew from 13-94% of the seed. Yellow-green Aspergillus spp. grew from 19% of the seed of one introduction. Some of these may be in the A. flavus group. The other fungi that grew from these peanuts were miscellaneous saprophytes. Fifty seed of each introduction was planted in flats of fumigated soil. The emergence of one introduction was very poor and a number of the emerged seedlings were affected by a disease. The fungus of the A. niger group was isolated from necrotic cotyledons on the diseased plants. The plants did not show virus symptoms and attempts to detect viruses from in 15 symptomless plants by rubbing sap on Topcrop bean and Early Ramshorn southern pea were unsuccessful. Neither fungi nor viruses could be detected in original seed of Phaseolus aureus.

Viruses in Vegetative Peanuts: Kahn[a/] has called attention to the increased risk of introducing viruses with vegetative propagations as compared to seed. This is due, he states, to the relatively small percentage of viruses known to be seed transmitted and the fact that propagules derived from virus-infected mother plants are almost always virus-infected themselves. As previously reported, symptoms on tester plants rubbed at Experiment indicated the presence of two viruses or two strains of the same virus[b/]. The symptoms on peanut and Chenopodium quinoa rubbed at Glenn Dale, Md. by Dr. Kahn indicated the presence of a distinct virus in certain other introductions. The importance of variations in technique and growing conditions in detecting viruses in plant tissue was well illustrated by the fact that duplicate results were not obtained with any introductions. The technique used at Glenn Dale or the one used at Experiment did not detect all viruses detected by both techniques.

a/ Kahn, R. P. and R. L. Monroe. Virus infection in plant introductions collected as vegetative propagations. I. Wild vs cultivated Solanum species. FAO Plant Protection Bul. 18:97-101. 1970.

b/ Kahn, R. P. and Grover Sawell, Jr. Incidence of virus infection in plant introductions collected as vegetative propagations. II. Wild vs cultivated Arachis species. FAO Plant Protection Bul. 18:142-144. 1970.

The results of this and other research by Kahn indicate that all introductions collected and introduced as vegetative material should be indexed for viruses before they are distributed. It it is impossible to do this either through lack of adequate techniques or manpower the introductions should be grown under the careful observation of a plant pathologist during the first season.

Seed Distribution

Distribution of seeds and plants in the Southern Region is summarized in the following table. Plant scientists in the South were supplied with 9250 lots of seed from Experiment and they received 4337 lots from other regional and federal stations, making a total of 13587 packets distributed in the South. We supplied 8734 packets to personnel outside the region, making a total of 17984 samples distributed from Experiment.

Distribution of seed in the Southern Region

State	S-9	NE-9	NC-7	W-6	Miami	Savannah	Beltsville	Total
Alabama			1		9	3	9	22
Arkansas	526		51					577
Florida	2324	184	1136	128	831	18	34	4655
Georgia	3641	1	26	134	13	32		3847
Kentucky	29	119	75	1009		2	3	1237
Louisiana	15					13		28
Mississippi	4	5	35			10		54
North Carolina	1176		27	3		8	7	1221
Oklahoma	31							31
Puerto Rico	108							108
South Carolina	430	50	2	8		4	37	491
Tennessee	25		13	80		3		121
Texas	923	1	24	49	29	10=		1036
Virginia	18	26	70	2		3		119
TOTAL	8354	386	1460	1413	882	106	90	13587

NE-9	144
NC-7	1464
W-6	1459
Beltsville	289
Foreign	5378
TOTAL	8734
NSSL	36

Catalogues listing summer grasses, peanuts, peppers, sorghums, and winter legumes were revised and brought up to date. The inventory of summer legumes has been revised but it has not been printed. Because of the large inventory of material now held at the regional station it is no longer practical to revise the entire catalogue annually as we did in the past. Catalogues of cantaloupes, watermelons, and edible legumes will be revised before the next planting season.

ALABAMA S-9 (Plant Introduction) ACTIVITIES

July 1970 - July 1971

Carl S. Hoveland, Agronomy and Soils Department

Auburn University, Auburn, Alabama 36830

No records were received from the Plant Introduction Station of any new plant introductions sent to Alabama. This is the first year in over a decade that no new plant introductions were received.

HORTICULTURAL CROPS

Cowpeas

Dr. O. L. Chambliss (Horticulture Dept.) and Dr. D. R. Strength (Animal Science Dept.) have screened a large number of Vigna introductions to find germplasm high in protein and certain amino acids for use in breeding and improvement of nutritive value for human and animal consumption.

Approximately 40% of the total number of Vigna plant introductions have been screened for protein content. These vary in protein content from 18 to over 30%. Those introductions that contain over 27% of protein (moisture-free basis) are listed in Table 1. Certain varieties that possess a high protein content, as well as other desirable characteristics, will be selected for seed increase. The most promising selections will be used in plant breeding studies with the objective of producing peas of high nutritional value. Amino acids analyses will be conducted on selected varieties. Special attention will be given to methionine, cystine-cystene, lysine and tryptophan. The PI's which appear to be significantly higher in protein and the amono acids lysine methionine, and tryptophan of importance in supplementing cereal diets will be increased for further study and for use as parents in the breeding program.

Table 1. Selected high protein cowpeas from Vigna plant introduction

P.I. No.	% Crude Protein*	P.I. No.	% Crude Protein*
255815	24.2	293536	26.5
293450	25.6	293541	27.1
293466	24.4	293542	25.1
293473	26.0	293544	25.0
293479	25.2	293545	26.9
293480	24.7	293548	25.4
293481	24.3	293564	24.8
293494	26.2	293571	29.0
293500	24.9	293572	31.5
293401	24.2	293580	27.5
293504	25.7	293582	25.0
293506	26.0	293584	27.1
293509	24.5	293588	26.4
293512	27.5	297561	25.1
293515	27.1	297562	24.9
293519	25.1	298051	25.1
293533	25.0		

* All values reported are for crude protein in whole ground peas without correction for moisture. Moisture determinations are in progress but are now available only for 70% of samples above. Moistures determined average about 10% and range between 8.3 and 12.5%. Crude protein was determined by micro-Kjeldahl. Selected values are from about 200 varieties analyzed.

Peppers

Dr. W. L. Greenleaf (Horticulture Dept.) released a new tobacco etch virus resistant tabasco pepper named Greenleaf. The virus threatened

survival of the tabasco hot sauce industry. In addition to virus resistance, the new variety has resistance to ripe rot, a more concentrated fruit set, darker red mature fruit color, brighter yellow immature fruit color, and a higher pungency. The Greenleaf variety utilized P.I. 152225 and P.I. 159236 from Peru in its development. Both P.I.'s are resistant to initial infection with tobacco-etch virus and tolerant following infection.

Pimiento pepper accessions 1554 and 1555 of Dr. Paul Smith, Univ. of California, Davis, have very high resistance to ripe rot (Colletotrichum sp.). Pimiento types derived from these accessions promise entirely novel and superior performance levels.

Tomatoes

Dr. W. L. Greenleaf (Horticulture Dept.) reported on several superior plant introductions now being used in his breeding program. P.I. 272735 (San Salvador). Superior flavor, acidity, very high crack resistance in a rare combination with the dark green shoulder fruit desired for greenwrap fresh market tomatoes. Pink, smooth, thick-walled oval-elongated fruit 1½" x 1". Indeterminate, very vigorous vine. P.I. 273444 (T. D. Graham, Canada). Extremely concentrated maturity essential for breeding successful processing tomato varieties for once-over mechanical harvest. Dwarf plant, very short internodes, prolific, birdsnest fruiting habit.

Ornamentals

Dr. H. P. Orr (Horticulture Dept.) reported that the following woody plants should be valuable ornamentals:

P.I. No.		P.I. No.	
240756	Buxus microphylla	239246	Hedra helix 'Poetica'
337618	Rhododendron sp. 'Ben Morrison'	317359	Callicarpa japonica
330367	Rhododendron maternichii	324969	Cunninghamia lanceolata
325036	Rhododendron Oldhamii	325008	Photinia sp.
274839	Rhododendron weyrichii	331204	Ilex 'Howard Dorsett'
	242523 Buxus sempervirens 'Pendula'		

Peanuts

Dr. A. C. Mixon (Agronomy and Soils Dept.) evaluated 273 newly-acquired progeny samples of peanut introductions for resistance to strain 3794 of Aspergillus flavus. Five inoculated and incubated samples (PI's 331768, 336933, 337409, 337458, and 343364) were rated as having 10% or less seed infection. An additional 185 selections from previously acquired peanut introductions were reevaluated for A. flavus resistance. PI's 337316, 337427 and 337394 were among the most promising selections. Eighty hybrids made by hand-pollination for use in a breeding and selection program had one or more PI's as either their male or female parent.

These and other plant introductions will be evaluated in further tests to determine their response in relation to A. flavus infection and/or agronomic performance.

Pearlmillet

Dr. W. P. Caldwell (Northrup, King & Co., Atmore, Ala.) released a high yielding new hybrid pearlmillet variety, Millex 23. The male parent for this single cross hybrid is a selection from a cross between P.I. 286834 and 185642.

Ryegrass

Dr. W. P. Caldwell (Northrup, King & Co., Atmore, Ala.) expects to have a heat resistant turf-type ryegrass ready for release, selected from P.I. 231603.

Tall fescue and Phalaris

Dr. C. D. Berry (Agronomy and Soils Dept.) has a breeding project in progress on Festuca arundinacea Schreb. and Phalaris aquatica L. Improved varieties of these cool-season perennial grass species are needed to provide a dependable source of forage for grazing during the winter

months. The primary objective of his breeding project is to produce varieties with improved forage growth during the period from early December through February. This characteristic must be combined with resistance or tolerance to cold injury, resistance to the prevalent diseases, persistent plant survival, persistent summer dormancy, good seedling vigor, good early fall growth, extended spring growth, and good quality forage which is acceptable to livestock. Previous evaluation of Phalaris aquatica introductions in Alabama has shown that many P.I.'s are winter productive and highly digestible.

With this wide range of objectives, it is imperative that a broad germplasm base be available base be available for isolation of individuals or populations of individuals which maximize the expression of the desired characteristics. He has included some 119 F. arundinacea and 109 P. aquatica plant introductions in his breeding program as the source of variability. Spaced plant nuseries of some 7,000 plants have been established and are being evaluated. The populations included are highly variable providing good opportunity to select plants with improved production potential in our region of adaptation. Severe selection pressure will be applied for the desired characteristics when sufficient time has elapsed to evaluate persistence.

Although considerable variability is found in the populations being evaluated, additional accessions are needed to provide P. aquatica genotypes that are more resistant to winter injury, yet remain productive during the mid-winter months. In addition, better early-season and late-season growth types, than are found in these populations, are needed to extend the grazing season on this species. An extended season will provide a better transition when grazing warm-season and cool-season perennial grass species.

Populations of F. arundinacea presently available have been selected, for the most part, for use in northern regions where winter dormancy is required for survival; consequently, these become dormant during our relatively mild winters, even though conditions are generally favorable for growth. More plant collections of this species are needed to provide additional variability for this character as well as for resistance to the many tall fescue diseases, and for late maturing types.

Plant introduction must remain as a major source of variability to be incorporated into this breeding project. A systematic program of plant collections is necessary to support continuing breeding programs.

Arrowleaf clover

Research has been expanded on management culture and utilization of Yuchi arrowleaf clover (from P.I. 233816) by C. S. Hoveland (Agronomy and Soils Dept.) and W. B. Anthony (Animal Science Dept.). Acreage of Yuchi has grown rapidly and generally displaced crimson clover. In 1971, crimson clover seed production in Alabama dropped to only 1500 acres. This year for the first time, the Crop Reporting Service will be issuing acreage figures on arrowleaf clover seed production.

In a 4-year grazing trial at the Piedmont Substation, steers have grazed a mixture of rye-ryegrass-Yuchi arrowleaf clover from November to June with daily gains of over 2 lbs/steer and a total of over 400 lbs/acre beef at a cost of about 12¢ per pound of gain. Clover was available for grazing in November and again during the period March to June.

Yuchi arrowleaf appears to have tremendous potential on perennial summer grass sods. In small-plot trials on Coastal bermudagrass, yields of clover alone in three cuttings exceeded 5000 lbs/acre. Coastal bermuda yields after clover yielded an additional 7000 lbs/acre when fertilized with 100 lbs/acre N. In a grazing trial at the Piedmont Substation with

beef cows and calves on Coastal bermuda overseeded with Yuchi arrowleaf, calves gained 335 lbs/acre, cows 316 lbs/acre, making a total of 651 lbs/acre. Clover persisted and was grazed until mid-July, about 3 months longer than crimson clover.

Forage quality of Yuchi arrowleaf is high. Digestible dry matter ranged from 90% in winter to 70% at early bloom stage in late May. The relatively high tannin content (3 to 6%) of the forage, possibly acting as an anti-foaming agent, may explain the low incidence of bloat in cattle grazing this clover. The tannin content may also account for the insect resistance of this clover.

Sorghums

Screening of over 1200 gain accessions in the World Sorghum collection for nutritive value by W. B. Anthony (Animal Science Dept.) and C. S. Hoveland (Agronomy and Soils Dept.) has given some interesting results that should be useful to plant breeders. Dry matter digestibility (DDM) was determined by the in-vivo nylon bag method, where the sorghum was placed in a fistulated steer for 24 hours. DDM of the plant introductions ranged from 60% down to 31%. The wide range in DDM values is important and suggests that the nutritive quality of sorghum can be improved by breeding. Differences in seed color were highly correlated with digestibility. Breaking strength of the sorghum grain was measured and found to be correlated with DDM. Accessions differed considerably in breaking strentth. Results of these studies will be published later this year.

Publications issued during the year:

1. Anthony, W. B,, C. S. Hoveland, E. L. Mayton, and H. E. Burgess. 1971. Rye-ryegrass-Yuchi arrowleaf clover for production of slaughter cattle. Auburn Univ. Agr. Exp. Sta. Cir. 182.

2. Buchanan, G. A. and C. S. Hoveland. 1971. Tolerance of Yuchi arrowleaf clover to herbicides. Weed Sci. 19:254-256.

3. Greenleaf, W. H., J. A. Martin, J. G. Lease, E. T. Sims, and L. O. Van Blaricom. 1970. Greenleaf tabasco, a new tobacco etch virus resistant tabasco pepper variety (Capsicum frutescens L.). Auburn Univ. Agr. Exp. Sta. Leaflet 81.

4. Hoveland, C. S. and W. B. Anthony. 1971. Winter forage production and in-vitro digestibility of some Phalaris aquatica introductions. Crop Sci. 11:461-463.

5. Hoveland, C. S., E. L. Carden, W. B. Anthony, and J. P. Cunningham. 1970. Management effects on forage production and digestibility of Yuchi arrowleaf clover (Trifolium vesiculosum Savi.). Agron. J. 62:115-116.

S-9 Technical Committee Report
Arkansas Agricultural Experiment Station
Fayetteville, Arkansas
Period of July, 1970 to July, 1971

The Arkansas Agricultural Experiment Station received a total of 794 plant accessions in this fiscal year. This included 519 accessions of the cowpea (Southern pea), 51 of rape, 3 of Brassica carinata, 33 of grapes, 3 of lupines and 185 of spinach.

Small Fruits: Dr. J. N. Moore, horticulturist, supplied this report.

In 1970, 9 lines of grapes were received and these will be fruiting in 1972. In 1971, we received 24 more lines and these have been planted in the field. The 32 lines of grapes received in 1969 will be fruiting this season and will be evaluated in late July and August. P.I. 203088 bears large elongated blue fruit which are meaty and possess crisp texture. The plants are fairly healthy in a year in which diseases have been prevalent. This is a late ripening attractive table grape which has been selected for use in the breeding program.

Rape: Dr. Charles Lincoln, entomologist, has received 51 accessions of rape and these will be planted this fall on the Southeast Branch Experiment Station to evaluate their ability to survive during winter months in Southern Arkansas and produce a good crop of seed.

Lupines: Dr. M. S. Offutt has obtained three samples of white lupiness (Lupinus albus L.) seed which had been requested in the 1969-70 annual report. The three samples are from Czechoslovakia and are listed as follows: 361870 "neutra", 361871 "Pflags Ultra" and 361872 "Viglas." These lines will be planted this fall at Fayetteville for the purpose of evaluation.

Southern peas: 519 accrssions have been planted on the Vegetable Substation at Van Buren and these will be evaluated from the standpoints of virus tolerance and cercospora leaf spot resistance as well as for fruit and vine growth characteristics.

Spinach: 185 accessions were grown in the field this spring on the Vegetable Substation and innoculated with white rust (Albugo occidentalis). The water suspension of germinated spores were applied by hand sprayer three different times. The appearance of white rust lesions on the check rows did not indicate a good take. Most of the accessions in this test appeared to be very susceptible. There were a few accessions: 167195 and 169026 in which lesion development was small and appeared to be restricted. The field innoculation screening operation will be carried out again this fall to see if we can obtain a more reliable reading on this material.

FLORIDA
S-9 'New Plants' July 26-28, 1971
Beltsville, Maryland

G. B. Killinger

At Gainesville, 37 new Brassica campestris introductions received from F. R. Earle of the Northern Regional Laboratory were planted on November 18, 1970. These were P.I. numbers 352789 through 352825. P.I. numbers 352803 through 352809 were planted in isolated plots 100-200 feet between introductions. There was no germination on most of the introductions and all plants winterkilled by mid-January with temperatures of 26-28°F. Kenaf varieties (E41, E71, G4, C108, C2032, Ivory Coast) yielded 19602 to 15428 pounds of oven-dry stem per acre with E41 having the highest yield and C2032 the lowest. One hundred pigeonpea (Cajanus cajan) introductions from India, P.I. numbers 346083 through 346182 were planted on April 8, 1970, for seed increase. Seed color varied from white, gray, tan, brown to black. The plants grew to 10 feet in height and only six introductions flowered early enough to harvest a few immature seed. All plants were flowering by mid-November when a frost defoliated all introductions. P.I. 346093, 346094, 346084, 346086, 346181, and 346182 were the earliest to flower in mid and late September. Hemarthria spp., P.I. numbers 349748 through 349754 and 349796 through 349798 were received, planted in a greenhouse and transferred to the field. The Institute of Food and Agricultural Sciences at Florida applied for and has a patent pending on the use of Hemarthria spp. for beverage purposes. Preliminary investigations at the University of Florida and the Northern Regional Laboratory gave indications of this genera being used as a drink quite similar to tea in taste and aroma. Seed of Crepis alpina, P.I. 326551, were planted October 28, 1970, and plants were in full flower, 30 inches tall, on April 1 with seed harvested on May 5. Sunflower, Peredovik, Krasnodarets, and NK H01 varieties planted on February 10 and March 9 matured and were harvested on June 10 with seed yields of 1800 to 2200 pounds per acre.

P. L. Pfahler at Gainesville reports P.I. 253956 (Secale montanum Guss) an introduced wild perennial species had no particular disease resistance. He noted, however, in interspecific hybrids with adapted varieties of Secale cereale the vegetative vigor of the F_1 plants greatly exceeded either parent. If seed numbers on F_1 plants can be increased, the hybrids have potential for winter forage.

F. T. Boyd, Gainesville, reports P.I. 299601 (Digitaria decumbens Stent) as having resistance to the sting nematode (Belonolaimus longicaudatus Rau) and is being increased for livestock evaluation.

Frequent frosts during the past winter indicate its adaptation southward from 30°N latitude. Chloris uliginosa, P.I. 309975, from Brazil has frost resistance and is being used in making interspecific crosses with spreading types of Chloris.

James M. Crall, Leesburg, notes that P.I. 255137 is being used in watermelon breeding, but a variety is not close to being released. This P.I. has the most resistance to watermelon mosaic virus of all lines tested.

Bryson L. James, Fort Lauderdale, reports that at present no P.I. ornamental being evaluated at his station exhibits worthwhile characteristics better than those of existing varieties.

A. E. Kretschmer, Fort Pierce, notes the evaluation of 70 Medicago sp. and 150 winter annual grasses, with continued selection of Berseem, Alsike, and Persian clovers for hard seed character.

H. Y. Ozaki, Delray Beach, reports Avelar pepper (P.I. 342948) are mildly infected with virus and produce U. S. No. 2 pepper pods as contrasted to Early Calwonder plants which are severely infected with tobacco etch and potato virus and are producing only a few chloratic, mishappen cull pods.

D. W. Gorbet, Marianna, has 57 peanut (Arachis hypogaea) P.I.'s in a nursery for evaluation. These were selected from previous observations on potential for vigor to disease and/or insect resistance and will be incorporated in Florida's peanut improvement program.

J. B. Brolmann, Fort Pierce, reports the testing of 174 clover varieties with highest yields from Chesapeake red clover (F.C. 39970), Kenland (F.C. 39972), and Ky. Syn. A-2 (F.C. 39819). Abon Persian clover was next in yield. Regal white clover was highest yielding of the white varieties. Sixty-seven Alfalfa lines were received from the Northeast region but none yielded as well as Florida 66.

R. J. McMillan, Jr., Homestead, reports selections underway from P.I. tomato lines:

(1) 23 Individual selections for resistance to root lesions.
(2) 40 Bulk selections for resistance to root lesions.
(3) 45 Individual selections for resistance to bacterial spot.

He has also selected from 7 Black Bean (Phaseolus vulgaris) accessions, 7 individual and 30 bulk, for maturity, number of pods, pod size, seed size, mechanical harvesting adaptability, plant size, and disease resistance.

T. W. Young, Homestead, introduced directly 41 lychee air layers representing 8 varieties from India. Presently only 3 'Seedless Crimson Red', 1 'Seedless No. 1' and 1 'McLean' have survived the fumigation and handling.

Publications and Varieties:

Wilms, H. J., J. W. Carmichael, and S. C. Schank. 1970. Cytological and Morphological Investigations on the Grass Hemarthria altissima (Poir) Stapf et C. E. Hubb. Crop Science 10:309-312.

Lorz, A. P. 1970. Zipper Cream, A High Producing Fresh Market Pea with Processing Potential. Fla. Agr. Exp. Sta. Cir. S-210.

Norden, A. J., R. W. Lipscomb, and W. A. Carver. 1969. Florunner--A New Peanut Variety. Fla. Agr. Exp. Sta. Circ. S-196.

Killinger, G. B. 1969. Importance of Plant Introductions to Florida Agriculture. Soil and Crop Science Soc. of Fla. 29:8-11.

Georgia Report to S-9 Committee
July 26 - 28, 1971

Hatch 172 (S-9)

Agronomic Evaluation of New Plants for the Production of Oils, Gums, Drugs, and Insecticides

Project Leader: John H. Massey

Fall planted experiments to compare fall and spring applied N at various levels on Brassica carinata and B. napus produced stands too poor to evaluate in seed increase blocks. Briza spicata bloomed in mid-May and grew about 10 inches high with fair seed yield. Crepis alpina bloomed about the same time and grew to 2.5-3 feet. Seed production was good. Bifora radicans and Stokesia laveis did not germinate.

In a Crambe abyssinica experiment, four plantings at 1-week intervals from March 17 did not affect seed yield. Row spacings of 14, 21, and 28 inches gave significant seed yield increases for each decrease in row width. In a similar experiment involving Brassica carinata (beginning April 14) seed yields for the first two plantings did not differ but were significantly higher than the third. The fourth planting did not yield enough to harvest. Row spacing did not affect yields.

Kenaf and roselle varieties Everglades 71, Guatemala 4, Guatemala 45, and SH/15R were planted at 2-week intervals beginning April 24. There were no significant differences in dry matter yield among varieties or planting dates. In another experiment, Everglades 71 and Guatemala 4 were grown at 3-, 6-, 9-, and 12-inch spacings in 20-inch rows. Dry matter yields, as affected by variety and spacing, did not differ.

Publications:

1. Massey, John H. 1971. Effects of Nitrogen Rates and Plant Spacing on Sunflower Seed Yields and Other Characteristics. Agron. J. 63:137-138.

2. Massey, John H. 1971. Harvesting Vernonia anthelmintica L. Willd. to Reduce Seed Shattering Losses. Agron. J. (accepted for publication in September).

Hatch 1060 (S-9)

Evaluation of New Ornamental Plant Introductions

Project Leader: W. L. Corley

Rooted cuttings of 41 new woody ornamentals were obtained from the Glenn Dale Plant Introduction Station and National Arboretum. These are being grown as container stock under lath for one year prior to planting in the field nursery.

Twenty ornamental pepper accessions are being evaluated for their performance in relation to those reported in Ga. Agric. Expt. Sta. Res. Bul. 83 "Ornamental Peppers for Georgia". This test will culminate the evaluation of ornamental peppers until additional accessions are available in the future.

Eight "wild" Cucumis species are being evaluated for their usefulness as ornamental gourds of the Cucurbita pepo var. ovifera types. Preliminary tests indicate that several of the species would complement the cultivars which are now available in the seed trade.

Scarlet Runner Beans, Phaseolus coccineus, are being evaluated for their use as annual ornamental vines. Eleven PI accessions appear to show promise. Hopefully, this years test will complete this evaluation study.

Over 200 accessions of grasses have been assembled and are being tested for their possible use as ornamentals. This collection includes PI material from the regional stations, accessions from SCS Plant Materials Centers, and accessions from private cooperators.

Publications:

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

2. Corley, W. L. and A. H. Dempsey. 1971. Evaluation of New Ornamental Peppers. HortScience (In press).

In addition to the above projects, plant breeders and other acientists at Experiment, Athens, and Tifton reported the following:

R. O. Hammons - Thirty-seven (52%) of 71 peanut introductions outyielded commercial cultivar checks in agronomic trials. The shelling properties, genotypic stability in different environments, organoleptic properties,

quality and chemical characteristics, and other factors which affect their end use suitability are largely unexplored. Further yield tests are in progress. (Cooperative research: R. O. Hammons, USDA-ARS-PSR, and Georgia Agronomists S. A. Harmon and J. S. Drexler).

Screening of peanut germ plasm for genotypes resistant to larval foliage feeders in the insect complex was continued. The complex includes the fall armyworm, Spodoptera frugiparda (J. E. Smith), the cornearworm, Heliothis zea (Roddie), and the velvetbean caterpillar, Anticarsia gemmatalis Hubner, as principal components. To date, some 2186 lines (PI's, breeding lines, and all U.S. commercial varieties) have been screened in replicated field trials for nonpreference resistance to these larval foliage feeders. One member of the larval complex, the fall armyworm, is being investigated in the laboratory for antibiosis effects on the insect's biology. Results indicate that meaningful resistance among the 2186 lines is present and that this resistance will reduce the insect populations.

During the period 1965-1970, the following peanut lines (PI's, cultivars, breeding lines) were screened in greenhouse tests under surface disinfected larvae for resistance to the nematode species shown: a) Meloidogyne arenaria, 340 lines; b) Meloidogyne hapla, 68 lines; c) Pratylenchus brachyurus, 6 peanut cultivars, including PI 121070, were evaluated for reaction to this nematode. To date no usable resistance has been found.

Ian Forbes - Dolichos lablab, PI 316899, was used as the early-flowering parent in crosses aimed at combining earlier flowering and thus reliable seed production with the greater vigor and productivity of the Australian commercial variety 'Rongai'. Most D. lablab introductions including Rongai flower too late to produce good seed crops before killing frosts. PI 316899 flowers in June at the Tifton latitude, which makes it a good source of earliness.

Lupinus albus, white lupine, PI 177456 from Turkey was used as a winter-hardy parent in crosses with commercial European low-alkaloid varieties in an attempt to combine the winterhardiness of PI 177456 with the low-alkaloid content and soft seededness of the European varieties.

Lupinus angustifolius, blue lupine, PI 168535, was the source of the winterhardiness present in 'Frost' blue lupine released in Georgia and Florida in 1969. This introduction also provided the resistance to anthracnose present in 'Rancher' blue lupine and the gray leafspot resistance present in Frost.

Of the many introduced Desmodium species tested, D. uncinatum, PI 284797 'Silverleaf' from Australia has shown the most promise as a perennial summer-growing legume. It is presently being evaluated in association with Coastal Bermudagrass and Pensacola bahiagrass.

G. W. Burton - Has a graduate student, Mr. Juan Millot, evaluating Panicum maximum introductions for sexual plants.

R. H. Brown - Has a graduate student studying the response of wild Arachis spp. to photoperiods.

H. B. Harris - Too busy to make a report.

M. D. Jellum - No reply.

T. S. Davis - Evaluating trees for shade and for landscaping. Has 24 accessions in programs. The following show promise to date: Quercus acutissima - PI 168939; Quercus myrsinaefolia - PI 74022; Dawn Redwood - PI 286608. Pinus thunbergii, PI 342930, looks good for use as a specimen plant. This plant is of interest because of the short angular crooks of the main stem. Crytomeria japonica, PI's 279746 and 279748 are rapidly growing evergreens with pyrimidal shape. Some are easily rooted under mist. Ulmus pumila, PI 310432, grows rapidly and has a bushy appearance like Phyllis Diller's hair. This would be useful for screening unsightly areas.

KENTUCKY S-9 (NEW CROPS) TECHNICAL COMMITTEE REPORT
ROY E. SIGAFUS, AGRONOMY DEPARTMENT
KENTUCKY AGRICULTURAL EXPERIMENT STATION, LEXINGTON
BELTSVILLE, MARYLAND, JULY 26-28, 1971

In the period from July 1970 through June 1971, Kentucky workers received over 1700 accessions. Plant materials received in previous years are still being maintained as many appeared to be potentially useful. Most materials obtained were grown for crop producing value but a few were obtained for use in perfecting analytical techniques or for use in academic programs.

Dr. D. W. Beatty, Murrary State University, has received three species of Medicago and two lots of Lotus pedunculatus.

Dr. R. C. Buckner and co-workers are following through on the successful hybridization of Festuca arundinacea with F. gigantea. Of about 20 hybrids, two show much promise. They have obtained three additional species of Festuca for use in improving tall fescue.

Dr. G. B. Collins is using Vicia faba in his genetics course.

Dr. J. M. Concon has found it difficult to extract the proteins and to determine the critical amino acids in four different Sorghum species. Methods which work with other cereals do not work with Sorghum seed.

Mr. L. Henson reports that in his preliminary testing of several dozen birdsfoot trefoil, Lotus corniculatus, strains that none appear to be more resistant to Rhizoctonia solani than some of the commercial varieties. He found PI's 157531, 207765, 276801, 227318, and 253441 to be most resistant. The most susceptible PI's were 182770, 202700, 213566, 228233, 231123, 232098, 233807, 234670, 234808, 250972, 251827, 266796, and 283619.

Dr. D. E. Knavel has not found satisfactory resistance to spider mite in 1500 Phaseolus vulgaris lines. An additional 500 are presently being screened in the greenhouse.

Last winter Dr. Knavel grew cucumber accessions in flats in the greenhouse. PI's 197088, 197085, and 279465 were selected for apparent resistance to a natural infection of powdery mildew and have been used to cross on other greenhouse types. Later cucumber accessions are now being grown in the field for bacterial wilt and powdery mildew resistance.

In cantaloupe, Dr. Knavel has found PI 164320 to be immune or very resistant to powdery mildew in the greenhouse. PMP-6 as a check had mildew whereas 164320 was clean. Other accessions are still being screened.

Dr. H. C. Mohr is in the process of field testing Cucumis and Cucurbita received.

Dr. N. L. Taylor, and others have tested species representing the genera Medicago, Melilotus, Trifolium, and Trigonella of the Tribe Trifolieae in the

greenhouse and bioassayed by (1) whole plant, (2) trifoliolate leaves, and (3) leaf discs for degree of feeding of the alfalfa weevil, Hypera postica (Gyllenhal). Tests were conducted on 2 separate dates. Analyses of variance of data showed no differences or interactions between dates of methods. All 3 types of tests appeared satisfactory to screen species for feeding response of the weevil. Hop clover species were the most resistant to feeding. (See Publications at end of report).

Drs. M. K. Anderson, N. L. Taylor, and G. B. Collins have prepared a paper on the Somatic Chromosome numbers in certain Trifolium species. They determined the chromosome numbers of 8 species of Trifolium. This brings the total of chromosome numbers which have been reported in this genera to 139. Six of the 8 species observed have 16 chromosomes (n=8). T. bocconei Savi was found to have 12 chromosomes (n=6) and T. desvauxii Boiss. & Bl. was found to have 10 chromosomes (n=5). Karyotype analyses of T. bocconei and T. desvauxii revealed that the chromosomes of each species could be differentiated on the basis of arm ratios and chromosome length.

Dr. R. E. Sigafus grew Kenaf, Hibiscus cannabinus in 20-inch rows at a rate of about 150,000 plants per acre. The 12 varieties yielded from 1.9 to 3.0 tons dry stalks per acre. Very dry weather restricted late season growth as the tallet plants were only about 6 feet tall at frost. Briza spicata may have been restricted in fall growth by dry weather but in 10-inch rows and in light stand it resisted weed invasion. Yield estimates were not made of the plant which matured in late June.

Seed of Roselle, Hibiscus sabdariffa, has been imported from Thailand with the aid of Mr. Howard Hyland. Animal feeding trials will be run on leaves and tops of plants and correlated with various laboratory methods of analyses.

Publications: Keller, C. J., N. L. Taylor, C. L. VanMeter, and B. C. Pass. 1970. Feeding Response of the Adult Alfalfa Weevil to Plant Species Phylogenetically Related to Alfalfa. J. Econ. Entom. 63:302-303.

Annual Report to S-9 Committee
"New Plants"

Louisiana July 1971

Ornamentals Richard Stadtherr

Accessions received in 1968 and 1969 were moved to the Burden Research Plantation. A report on survival of these plants will be made next year. The varieties of viburnums appear to lack necessary cold requirements and all have died.

The following plants were received in 1970-1971:

Rhododendrons

	Plant number	Scientific name	Plants Rec'd	Surviving
1970	P.I. 325029	Rhododendron morii	3	3
	P.I. 325030	" "	3	3
	P.I. 325031	" "	3	2
	P.I. 325036	" oldhamii	3	3
	P.I. 325037	" "	3	3
	P.I. 325038	" "	3	3
	P.I. 325039	" "	3	3
	P.I. 325043	" rubropilosum	3	2
	P.I. 325045	" "	3	3
	P.I. 325048	" "	3	3
	P.I. 325582	" "	3	3
	P.I. 237484	" arboreum	1	1
	P.I. 324975	Eurya crenatifolia	3	3
1970	P.I. 337618	Rhododendron 'Ben Morrison'	4	4
	P.I. 337619	" 'Mrs. LBJ'	4	4
	P.I. 315034	" brachycarpum	1	1
	P.I. 325023	" ellipticum	1	1
	P.I. 325024	" "	2	2
	P.I. 276257	" farrerae	1	1
	P.I. 325025	" formosanum	3	3
	P.I. 325026	" Kanehirari	4	4
	P.I. 325027	" Kawakamii	dead	
	P.I. 330367	" metternichii	1	1
	P.I. 330368	" "	2	1
	P.I. 325029	" morii	4	4
	P.I. 325030	" "	4	2 weak
	P.I. 325031	" "	4	2 weak
	P.I. 325033	" "	dead	
	P.I. 275032	" obtusum var. kaempferi	1	1 weak
	P.I. 275535	" " "	1	1 weak

	P.I. 325036	Rhododendron old hamii	4	4	
	P.I. 325037	" "	4	4	
	P.I. 325038	" "	4	4	
	P.I. 325039	" "	4	4	
	P.I. 325043	" rubropilosum	4	4	
	P.I. 325044	" "	4	4	
	P.I. 325045	" "	4	4	
	P.I. 325046	" "	1	1	
	P.I. 325048	" "	4	4	
	P.I. 325582	" "	4	4	
	P.I. 316984	" schlippenbachii	1	1	
1971	NA 30158	Abies bornmuelleriana	1	1	
	NA 30050	" holophylla	1	1	
	NA 30051	" koreana	3	3	
	NA 31120	" distylum	1	1	
	NA 31688	Alnus hirsuta var. sibirica	1	1	
	NA 31689	" pendula	1	1	
	NA 31687	" sieboldiana	1	1	
	NA 30030	Arbutus texana	3	3	
	NA 29184 C	Camellia 'Fragrant Pink'	1	1	
	NA 31741	Cassia (hybrid)	2	2	
	NA 31690	Chamaecyparis obtusa	1	1	
	NA 30383 C	Clematis orientalis	1	1	container
	NA 13454 C	Cryptomeria japonica 'Yoshino'	1	1	
	NA 20068 C	Cryptomeria japonica 'Bandai-Sugi'	1	1	
	NA 18295 C	Cryptomeria japonica 'Globosa Nana'	1	1	
	NA 31452	Cardenia spatulifolia	2	2	
	NA 30347 C	Hedera canariensis 'Gloire de Marengo'	1	1	container
	NA 30349 C	Hedera colchica var. dentata 'Aurea Striata'	1	1	container
	NA 8103 C	Hedera helix 'Jubilee'	1	1	container
	NA 30348 C	Hedera colchica	2	2	container
	NA 31250	Juniperus ashei	1	1	
	NA 31171	Kirengeshoma palmata	6	0	
	NA 32218 Cq	Myrceugenia apiculata	1	1	
	NA 31693	Pinus densiflora	1	1	
	NA 31694	" Thunbergii	2	2	
	NA 7829 C	Rhododendron bakeri 'Camp's Red'	1	1	
	NA 32966 C	Rhododendron 'Bowie'	1	1	
	NA 11996 C C	Rhododendron indicum balsaminaeflorum	1	1	
	NA 14086 C	Rhododendron prunifolium 'Hohman'	1	1	
	NA 18355 C	Prunus x incam 'Okame'	1	1	

NA 13038 C	Sycopsis sinensis	1	1
NA 29609 C C	Viburnum setigerum 'Aurantiacum'	3	3
P.I. 316678	Viburnum dilatatum 'Iroquois'	2	2
P.I. 315889	Viburnum x 'Mohawk'	2	2
P.I. 316682	Viburnum sieboldii 'Seneca'	2	2
P.I. 324940	Abies Kawakamii	2	2
P.I. 317188	" Koreana	3	3
P.I. 317189	" nephrolepis	1	1
P.I. 323962	Cotinus coggygria	2	2
P.I. 317238	Juniperus chinensis var. 'Sargentii	2	2

SWEET POTATO

Encourage a universal search for germplasm of sweet potatoes with resistance to soil insect and sweet potato weevils. Also, it is important to continue to look for plant material with resistance to black rot, scurf and other diseases and insects. P.I. 343-721 is being tested for sweet potato weevil resistance. This is an introduction from Mogadiscio Africa.

Teme P. Hernandez
Professor of Horticulture
Louisiana State University
Baton Rouge, Louisiana 70803

POTATOES

We have used plant introduction material in our potato breeding program for several years and are pleased that some of these lines are worthy parents. This is evident when checking the parentage of the 261 first year clones selected at Rhinelander, Wisconsin in 1970. Over 50 per cent of these selections have plant introduction germ plasm.

The newest plant introductions we have researched with are P.I. 319885, P.I. 319888, and P.I. 319889. These three lines originally came from New Zealand; however, these clones did not produce blossoms in Baton Rouge under artificially imposed long day conditions during the 1971 season.

James F. Fontenot
Professor of Horticulture
Louisiana State University
Baton Rouge, Louisiana 70803

OKRA

The following plant introductions are being used in our breeding program: 169703, 181853, 204546, 305400, 306379, 310474, 310475, 310477 and 311106.

Three lines, P.I. 311106, P.I. 310477 and P.I. 310474 were found to be resistant to three races of Melodogyne incognita as tested in the greenhouse.

James F. Fontenot
Professor of Horticulture
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Baton Rouge, Louisiana 70803

A C. frutescens Selection Resistant to TEV and CMV

Two virus diseases commonly found in commercial peppers grown in Louisiana are caused by the tobacco etch virus (TEV) and cucumber mosaic virus (CMV). The 'Tabasco' cultivar, Capsicum frutescens L., is especially susceptible to both diseases, and cultivars of C. annuum (Cayenne, Chili) are also susceptible.

Germ plasm resistant to both viruses was found in a single source, designated as 'LP-1'. This selection possesses resistance to two races of TEV and four races of CMV which have been found in Louisiana pepper areas. Resistance is indicated by symptomless response or mild leaf mottling when inoculated with purified isolates of these viruses.

'LP-1' has been grown in Louisiana home gardens for some time. Mature plants are about 43.5 cm in height and 76.2 cm wide, of determinate bearing nature, and about 30 days earlier than 'Tabasco'. Pods are borne erect, ranging from 1.2 to 1.5 cm in length and 0.5 to 1.2 cm diameter at the base. Fruit pedicels are located at the nodes, mostly 1 or 2, and, occasionally, 3 per node. Immature pods are sulfur-yellow to orange, becoming red when mature.

Seed of this selection will be available in limited amounts to breeders in the Fall of 1971.

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Associate Professor of Horticulture
Louisiana State University
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1970-71 Report

Regional Project S-9 New Plants

Contributing Project 470

Mississippi

During 1970, 500 accessions of Vigna sinensis, and V. cylindrica were grown for increase and for testing with cowpea weevils. It was found that the insect would reproduce on all material but there was definite preference for some introductions.

PI tomato lines involving interspecific crosses were obtained from Processor, Washington, and Beltsville. Lines carrying PI 272,636 as a parent showed good resistance to foliage and fruit diseases under field conditions with certain lines virtually free of diseases. Fruit set in hot weather was fair to good, small size, and concentration of set fair. Three selections are now being increased.

Ornamentals now in a healthy growing condition and heavy with fruit are: Chinese Holly 331203-331205-221306; and Forsythia seiboldii suspensa-914669. These will be used on the MSU campus. An ornamental research position and program has been established at the South Mississippi Branch Experiment Station.

Currently there are 13 pear and 12 plum selections from the domestic fruit exploration producing fruit at State College. Four plum selections are being evaluated for use as fresh market plums on a commercial basis.

PI grass species were tested for reaction to maize dwarf mosaic virus in an effort to determine the host range of this virus. Six, before unreported, new species of grass were found to be susceptible to MDMV.

PI 290814 bermudagrass continues to produce as much dry matter as Coastal and under all nitrogen levels.

Tibbee, a new reseeding crimson clover selection from PI 233812, and Dale, a new variety of sweet sorghum containing PI 152857 were released during 1970.

Publications issued during year:

1. Bennett, H. W. and Byron L. Burson. 1971. Effect of culm breakage on seed set in seven Paspalum species and an intraspecific hybrid. Crop Sci. 11:229-231.

2. Broadhead, D. M., O. H. Coleman, and K. C. Freeman. 1970. Dale, a new variety of sweet sorghum for sirup production. Miss. Agr. Exp. Sta. Inf. Sheet 1099.

3. Burson, B. L. and Hugh W. Bennett. 1970. Cytology and reproduction of three Paspalum species. J. Hered. 61:129-132.

4. _____ and _____. 1970. Cytology, method of reproduction, and fertility of Brunswickgrass, Paspalum nicorae Parodi. Crop Sci. 10:184-187.

5. _____ and _____. 1971. Chromosome numbers, microsporogenesis, and mode of reproduction of seven Paspalum species. Crop Sci. 11:292-294.

6. Knight, W. E. 1970. Tibbee: a new reseeding variety of crimson clover. Miss. Agr. Exp. Sta. Inf. Sheet 1131.

North Carolina - New Plant Project

Report to S-9 Technical Committee, Beltsville, Maryland, July 26-28, 1971

Of the 29 campus research personnel who receive PI catalogues and information through my office and others who receive information direct, twelve cooperators received a total of 1444 lines consisting of 52 species of 29 plant genera. The largest order was for 1114 peanut PI's. These are just a small part of the total number of plant introductions under test in North Carolina as many hundreds of PI's are in various stages of advanced testing.

I. New Varieties Released

Two new tomato varieties Venus and Saturn were released in December 1970. The two varieties were described in a recent issue of Research and Farming 29 (3-4):10 Winter-Spring 1971. (See appendix). A station bulletin describing the two varieties in more detail is in preparation.

PI 129080, a cherry tomato Lycopersicon esculentum var. cerasiforme from Colombia was used as one source of resistance to southern bacterial wilt.

Foundation seed will be available to seedsmen after November 15, 1971.

II. Seed now Available of Norman Pigeon Pea Released in 1968

Even though the Norman pigeon pea (seed increase of PI 218066) was released as a variety in 1968, the variety has never been sold to the farmer because of lack of seed for planting purposes. An acre planting of seed in Florida during 1968 produced 1000 pounds of clean seed per acre with an equivalent amount having passed through the combine. Plantings during 1969 however were failures due to poor control of the corn earworm.

During 1969 and 1970 Mr. James Keel of Keel Peanut Company, Greenville, North Carolina grew a small acreage of Norman pigeon pea in Bobo-Dioulasso, Upper Volta, Africa. Mr. Keel, through Cover Crop Seed Company, distributed 10,000 pounds of certified Norman pigeon pea seed to over 600 county agents, seed dealers, and farmers in the United States. He hopes to offer up to 200 tons of quality certified seed to farmers in the States in 1972.

III. Plant Introductions of Special Interest

A. Dr. Tom Konsler - "I believe the only information I have that would be useful in your S-9 report is that concerning our use of a tomato introduction (PI 251305) in a breeding program that has been underway a couple of years. The possible value of this introduction to the program lies in its high level of resistance to bacterial canker of tomato (causal agent, Corynebacterium michiganense). The release of a new variety resulting from crosses with this introduction is likely to be a long way in the future."

B. Dr. W. A. Cope - "A number of crownvetch introductions, Coronilla varia L. are being maintained for the purpose of intercrossing to form a broad-base population for maintenance of the available germplasm. They are identified below by PI numbers.

204871	251808	325255	325264
206847	253435	325257	325265
210365	274040	325258	325266
228373	274041	325259	326324
229627	278698	325260	326369
228411	286203	325261	340779
229968	308980	325262	326366"
238142	230340	325263	

C. Mr. Harry Collins working with Dr. Thad Busbice - "We have used the following Medicago sativa plant introductions along with several other lines in an intercross to incorporate the types of resistant they are supposed to carry into the progeny. This intercross was made to develop a multi-resistant line of alfalfa.

PI 205887	pea aphid resistance
PI 205891	pea aphid resistance
PI 206100	pea aphid resistance
PI 206103	pea aphid, spotted alfalfa aphid, and potato leafhopper resistance
PI 206105	pea aphid resistance
PI 206106	pea aphid resistance
PI 206110	pea aphid resistance
PI 206111	pea aphid, spotted alfalfa aphid resistance
PI 206113	pea aphid resistance
PI 234673	stem nematode resistance
PI 236605	blackstem resistance
PI 236606	blackstem, common leaf spot, and potato leafhopper resistance
PI 237213	pea aphid resistance"

D. Dr. Dave Timothy - "The PI's of the Pennisetiums in our 1969 publications are promising but seed production is a very serious problem. It may limit the usefulness of them." These two species P. flaccidum and P. orientale show promise as perennial forage grasses in North Carolina and perhaps in North Carolina and in other areas of the southeastern United States. Preliminary grazing and clipping studies near Raleigh indicate that the plants withstand defoliation at approximately three to four week intervals from early May until shortly before frost. Yields are superior to orchardgrass and fescue.

IV. Evaluation of Potential Industrial Crops, Pulp Crops and other Crops

A. Brassicas

Thirty-eight PI's of Brassica campestris were received on November 6 and planted at the Lewiston Station on November 9, 1970. Stands

were spotty, however all plants were killed by cold weather.

Seven of the above lines and 21 lines from previous years were planted at Plymouth in March. The seven lines received from Experiment in November did not germinate. The only PI that gave an adequate yield was PI 305275.

B. Miscellaneous Oil Crops

Six PI's were planted November 9 at Lewiston consisting of the following genera:

1. PI 319407 Chamaepeuce afra: Biennial, thistle like-rosette type plant. These plants were transplanted to Plymouth in July 1971.

2. PI 347645 Stokesia laevis: No germination
   PI 354065

3. PI 325871 Bifora radiams: No germination

4. PI 326551 Crepis alpina: Plant to 3'. Yields low. Seed very light.

5. PI 304981 Briza spicata: Plants short, seed light, not harvested.

C. Tephrosia vogelii - PI 257533

Three plant populations were planted in 20 and 30-inch rows and one-plant population was planted in 10-inch rows. Total dry matter yields ranged from 3.1 to 4.8 tons per acre with the yields of leaves ranging from .62 to .94 tons per acre.

1) Highest total yield and yield of leaves were obtained in 10-inch rows followed by the 20-inch row spacing then the 30-inch row spacing.

2) Increasing plant populations in both 30 and 20-inch rows increased the yields of total leaves.

3) Many leaves had fallen when these plants were harvested. A date of harvest experiment is being grown in 1971 for the evaluation of proper harvest date.

D. Kenaf

Studies with kenaf were restricted to the Tidewater Research Station at Plymouth during the 1970 season. Kenaf was planted at two dates May 7 and July 10. Row widths, varieties and herbicides were evaluated. Row widths are being evaluated in 1971 and chopped kenaf will be made into pulp at the North Carolina State University pulp laboratory by Mr. Barry Crouse of Eastman Kodak working at Duke University.

Summary

1) Yields of the May planting were lowered by drought and insect damage but were double the yields in the July plantings.

2) Yields of kenaf are highest when planted two rows to a bed. Two 7-inch rows per bed gave better yields, 6.2 tons per acre than did two 14-inch rows per bed, 6.0 tons per bed. Less stubble would be left by a forage chopper harvesting two 7-inch rows. The one row forage chopper used restricts bed widths to 38 inches.

3) The Everglades 41 variety was the highest yielder in the test yielding 4.3 tons per acre to 3.2 tons per acre for Everglades 71. Five other varieties were also lower. Yields were lower due to heavy weed infestation in the variety tests. The seed of the variety SH 15 R gave very low yields.

4) Those herbicides known to control weeds on organic soils were evaluated on a late planting of kenaf to determine their effect on the kenaf stand and yield.

   a) Kenaf is tolerant to trifluralin, but the organic soil tends to tie up the herbicide and reduce weed control effectiveness.

   b) The herbicides C-6989, propachlor, alachlor, trifluralin and C-6313 gave adequate weed control with no noticeable reduction in crop stand or yield.

   d) The highest yield of kenaf occurred when oryzelan was used at the 1.5 pound rate. Raising the rate to 3.0 was very detrimental to plant stand yield.

   d) Herbicides causing stand reduction and lower yields were dichlobenil, amiben, metobromuran, atrazine, SD 15418, and linuron. The higher rate of oryzelan, BAS 2903 and fluometuron also caused yields below the check plot which had no cultivation.

   e) Even though the kenaf was planted late and the climatic conditions were not the same as those at the recommended planting day, the preliminary results tend to show a trend as to the use of certain herbicides on kenaf.

E. Sugarbeets

Yields of sugarbeets ranged from 19-24 tons per acre, better than average yields. Yields of corn in comparison studies averaged 165 bushels per acre and of soybeans 43 bushels per acre making them very competetive to sugarbeets. Sugarbeets are looked at only because each year for the past six years ground is to be broken for a raw sugar refinery in the Portsmouth, Virginia area.

F. Sunflowers

A yield trial testing 25 varieties was evaluated in 1970 at Rocky Mount and Salisbury. Yields ranged from 1100 to 2331 pounds per acre with the birdfood varieties outyielding the oilseeded varieties. The oilseed varieties cannot be economically grown in North Carolina at the present contract price of the oilseed. A variety test comparing 24 varieties is also being grown at both locations in 1971.

G. Nepeta cataria

Catnip is usually collected in the wild but the demand now exceeds the supply due to a shortage of pickers. Twenty farmer cooperators will be growing forty acres of catnip under contract in 1972. Yields will range from 4000 to 6000 pounds of the herb and once established a stand will last from two to three years. Seed were planted in a plant bed in November and plants were transplanted to the field in April. The herb will be harvested in early August. The net return per acre should approach that of burley tobacco in the production area. Various cultural and herbicide experiments are being evaluated this year.

H. Digitalis lanata

Dried leaves of this crop are bought by the Burroughs Wellcome Company and used as a source of digoxin. At present the leaves are imported but quality has been down. Plants should be transplanted to the field in November for highest yields of the leaves during the next summer. An adequate supply of seed has held the experiment up but an abundant seed supply will be harvested in the near future from last year's plants.

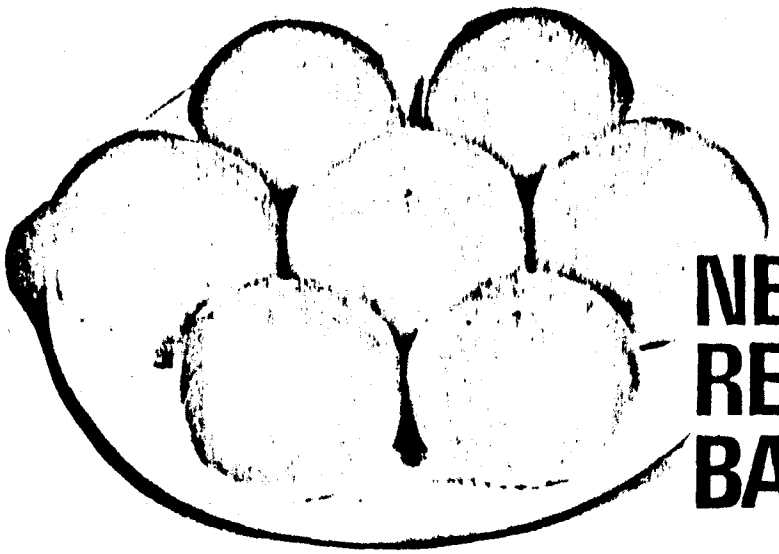
I. Lespedeza capitata

A local drug firm is also interested in obtaining the herbage from this plant for export purposes. Lespedeza capitata grows wild in the Eastern United States and buying stations were set up in North Carolina, South Carolina, and Michigan in 1970. Twenty-eight PI's and two local strains are being grown for evaluation plots. Karl Graetz of the Soil Conservation Service is also collecting seed for further evaluation.

V. Domestic Plant Exploration

The domestic collections of Eastern Vaccinium species for use in the Southeast is being maintained at the Castle Hayne Experiment Station near Wilmington. The lines are being evaluated by Dr. Galletta and selections are being made of the more promising material. Mr. Hyland was a visitor to the station in early June. The highbush blueberry is the species grown commercially in North Carolina. Other species are being used for rootstocks such as rabbiteye in order to extend Vaccinium culture to different soils. One article has so far appeared from this collection.

Hall, Susan H. and G. J. Galletta, Comparative Chromosome Morphology of Diploid Vaccinium Species. J. Amer. Soc. Hort. Sci. 96(3): 289-292, 1971.



NEW TOMATOES RESISTANT TO BACTERIAL WILT

New Venus variety.

VENUS and SATURN, two new fresh market tomato varieties, have been released by the N. C. Agricultural Experiment Station.

The introduction of Venus and Saturn represents a breakthrough in tomato breeding in that they are the first tomato varieties available that combine desirable horticultural characteristics with resistance to southern bacterial wilt. They also exhibit a usable level of field resistance to bacterial canker.

Tomato production in North Carolina, especially in the Coastal Plains and Piedmont, has been virtually impossible in soils infested with southern bacterial wilt. This is also a serious disease of tomato in many other areas of the world, particularly tropical, semi-tropical and warm temperate regions.

Venus and Saturn, formerly designated N.C. 70-TR7 and N.C. 70-TR5 respectively, have a long history and a complex pedigree. The original cross between Louisiana Pink and Beltsville #3814 was made 30 years ago by the late Professor Robert Schmidt. Two sources of resistance to southern bacterial wilt are common to both Venus and Saturn. They are Beltsville #3814, a pear-shaped type from Puerto Rico, and PI 129080, a cherry tomato from Columbia. Germ plasm was also contributed by the varieties Pan America, Marglobe, Rutgers, STEP 174 and Manalucie.

Fruits of Venus and Saturn are an attractive red, moderately resistant to radial cracking and have a good foliage cover. Maturity is midseason-late and plant habit is indeterminate. Fruits are medium in size. Venus averaged 0.32 pounds per fruit, Saturn 0.34, compared to Fireball 0.25, Homestead 24 - 0.38 and Floradel 0.41 pounds. Fruit shape is the principal difference between Venus which is a slightly flattened globe, and Saturn which is a deep globe in shape.

The new varieties were developed for the fresh market and have performed well in both trellis and ground culture. Nine yield trials were conducted in North Carolina during 1969 and 1970. The average marketable yield of the new varieties on wilt-free soil was not statistically different from Homestead 24 or Floradel. On southern bacterial wilt-infested soil, the marketable yield of the resistant varieties was from two to ten times that of the susceptible varieties. Generally, Venus produced a slightly higher yield than Saturn. However, Saturn appeared to retain fruit size somewhat better on deep sandy soils when nitrogen became deficient.

Resistance to southern bacterial wilt was tested in four field trials during 1969 and 1970. The average percent diseased plants was: Venus 3.7, Saturn 8.7, Homestead 24 - 93.6, Floradel 96.2 and Fireball 96.5. A disease index was used to measure the rate and extent of disease development in the 1969 greenhouse test. The disease index for both Venus and Saturn was 1.7 and for Homestead 24 - 6.4. (The lower the disease index, the greater the resistance.) Thus, Venus and Saturn were considered as moderately to highly resistant to southern bacterial wilt.

Both new varieties carry immunity to Fusarium wilt, race 1. Resistance to bacterial canker was field tested by petiole inoculation in 1970. Venus and Saturn showed significantly less foliar damage than did Manapel, Floradel or Homestead 24. However, further testing is needed to establish the level and stability of resistance.

The N. C. Foundation Seed Producers, Inc., will have seed available to bona fide seedsmen after November 15, 1971. Thus, seedsmen should have seed available to growers for the 1973 season.

By W. R. Henderson, associate professor of horticultural science; and S. F. Jenkins, Jr., associate professor of plant pathology.

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NORMAN PIGEON PEA - A NEW GREEN MANURE CROP

W. T. Fike - N.C.S.U.

A New Crop

The pigeon pea (Cajanus cajan) is a legume cultivated in tropical countries for the edible small seeds which often are known simply as "peas."

The Norman pigeon pea is a summer annual legume adapted to the poorer soils of North Carolina. It is suggested as a replacement green manure crop for the banned Crotalarias. The Norman pigeon pea shows more promise than other green manure crops because the plants emerge quicker, grow faster, are more resistant to nematodes and the seed are nontoxic.

It is estimated that about 70,000 acres of diverted cropland in North Carolina could profitably be planted to Norman pigeon peas. Seed of this crop has been increased in Africa and will be available for farmer planting in 1971.

Growth and Yield

The Norman pigeon pea is grown as an annual from seeds, reaches a height of from four to seven feet and on a dry matter basis produces three to five tons of top growth per acre. In four years of tests at Lewiston, Norman yielded 25% more dry matter than Crotalaria striata and 42% more dry matter than hairy indigo. It flowers profusely in late August, producing two to four seed in slender pods which are from 3/4 to 1-1/2 inches long. The seed are larger than those of common vetch and smaller than soybean seed. Seed yields are low in North Carolina because of the lateness in flowering. Pods are also damaged by the corn ear worm. Plants start quickly and are usually able to keep ahead of weeds. The stems are thick and become woody as the plant matures.

Nontoxic Seed and Nematode Resistance

Crotalarias were banned as green manure crops because their seed are toxic. Pigeon pea seed are nontoxic and are cultivated in tropical countries for green and dry "pea" edible markets.

The Norman pigeon pea is resistant to the two main North Carolina root knot nematodes, Meloidogyne: Southern, M. incognita and Northern, M. hapla. It also shows partial resistance to two other root knot nematodes M. javanica and M. arenaria. It is, however, susceptible to the lesion nematode, Pratylenchus and the sting nematode, Belonolaimus.

HOW TO GROW PIGEON PEA

Adaptation: The Norman variety is the only variety available at this time. It is adapted to most any well drained soil. It does well on sandy soils with adequate rainfall.

Fertilization: Inoculate seed with cowpea-peanut inoculant. Seedlings will respond to 100-200 pounds per acre of an 0-20-20 fertilizer. Larger amounts do not give increased yields. Land should be turned and disked before planting.

Seeding: Highest yields are obtained from April seedings with lower yields expected as seedings are delayed into June. Drilled seedings give the highest dry matter yields, the more uniform stands and require the least amount of seed per acre. Dry matter yields from a drilled 25 pound per acre seeding rate were significantly higher than either drilled 40 and 60 pound per acre rates, or broadcast rates of 40, 60, 80 or 100 pounds per acre. A drilled 25 pound per acre seeding rate is equivalent to 2 to 3 seed per row foot using a standard grain drill seeding in 7 inch rows. For broadcast plantings, a 40 to 50 pound seeding rate must be used for adequate crop stands.

Rotation: Pigeon peas are best suited to a rotation where corn follows the green manure crop. Corn yields are increased ten percent following pigeon peas. Cotton and peanut yields change little following pigeon peas, but the support price of the peanuts is slightly lowered. Yields of peanuts are however increased when peanuts follow corn following pigeon peas. A suggested rotation therefore would be pigeon peas, then corn, followed by peanuts or cotton.

Management: The greatest amount of organic matter is present just before frost. Yields of peanuts, corn and cotton following pigeon peas are further increased by fall plowing of the green manure crop. Pigeon peas are grazed in the tropics. Cattle placed on a frozen pigeon pea crop in late November 1970 at Salisbury did not like the frozen and wilted plants.

S-9 Report, Oklahoma Agricultural Experiment Station

Charles Galeotti and Ralph S. Matlock

PULSE CROPS

Cowpea (*Vigna sinensis*)

In 1971, 426 varieties and accessions were planted in the scarce seed nursery for revitalizing seed and to note entries having promise for mechanical harvesting. A new variety, Ligon Blackeye cowpea, was released July, 1971 by the Oklahoma Agricultural Experiment Station. The new variety is semi-upright in growth, a good yielder and has moderate resistance to fusarium wilt. Dry seed yields have been 1,032 pounds per acre in 12 Oklahoma tests.

Mungbean (*Phaseolus* spp.)

Some 40 accessions were planted May 20, 1971 for increase and to find uniform maturing large-seeded types. Robert Adcock has developed a method to screen accessions for root knot nematode. He is in the process of screening the available mungbean germ plasm and expects to complete the study by June, 1972.

Chickpea (*Cicer arietinum*)

Some 150 accessions were planted April 6, 1971 at the Stillwater Agronomy Research Station. About 100 survived and have been harvested.

The yield (grams per plot), seed size (grams per 100 seed) and other information are shown for the accessions harvested July, 1971.

Okla. Cp. No.	Accession Number	Yield (Gms)	Gms/100 Seed	Plants Harvested	Mature Ht. (Ins)
7	212090	487	16.8	42	12
9	212595	3	10.0	1	6
12	214313	120	10.4	6	6

Okla. Cp. No.	Accession Number	Yield (Gms)	Gms/100 Seed	Plants Harvested	Mature Ht. (Ins)
13	215588	570	12.4	41	11
16	218068	90	11.0	18	8
17	219727	10	20.3	2	7
18	219728	80	10.8	26	7
19	219729	350	12.0	33	9
20	219730	30	14.0	5	8
23	222095	2	10.0	4	7
26	222770	10	22.6	5	7
27	222771	205	9.5	27	7
28	222772	8	8.8	2	6
29	222774	56	10.8	14	7
32	257583	210	10.4	22	8
35	257586	175	11.0	24	8
36	OAE Cp-59-1	220	13.6	22	8
40	OAE Cp-59-5	550	12.5	64	8
43	Lot 1	625	11.8	81	9
46	214152	55	11.0	9	6
47	212892	24	9.8	3	7
48	212893	150	14.9	11	7
50	214151	75	10.5	8	8
51	255138	445	12.6	59	9
54	257583	555	13.2	63	9
59	244332	280	10.5	28	7
61	246396	55	10.0	11	6
65	251514	210	11.1	17	9
66	251784	290	19.8	31	11
75	253228	10	7.2	4	7
88	223762	555	11.0	84	9
89	214314	154	12.5	21	8
91	217520	125	10.4	16	8
92	217521	295	11.6	36	8
94	250143	25	19.8	3	13
95	250144	535	12.6	43	9
96	250210	430	13.6	43	8
100	OAES-61-1	20	8.1	4	7
103	OAES-61-4	5	18.0	2	5
104	OAES-61-5	165	27.5	34	13
109	OAES-61-10	25	25.6	13	8
113	OAES-61-14	40	10.8	4	8
114	OAES-61-15	545	15.9	58	11
116	OAES-61-17	143	11.6	6	7
120	Cicer arietinum L. Fabaceae	115	14.4	16	6
121	" "	55	11.4	6	5
122	" "	20	14.6	2	5
123	" "	28	11.5	6	6
124	" "	40	13.9	8	7
127	193481	390	10.3	68	6
128	203142	103	14.8	9	6
129	211727	217	15.8	33	8

Okla. Cp. No.	Accession Number	Yield (Gms)	Gms/100 Seed	Plants Harvested	Mature Ht. (Ins)
130	212026	135	13.0	33	6
131	212091	600	14.0	44	12
132	212891	430	13.5	41	8
133	212892	175	12.7	30	6
135	239859	835	11.4	82	11
136	249981	190	15.0	10	8
137	251024	95	26.4	10	9
138	251026	190	23.1	23	7
139	251027	140	29.3	6	8
140	251783	55	16.0	8	13
141	253226	15	29.6	7	12
144	254547	15	24.0	3	6
145	254548	4	16.0	2	5
146	273879	180	13.0	36	9
147	273880	75	10.3	19	6
150	Cross-3	85	11.9	14	7
151	Cross-4	610	13.4	61	9
152	Cross-5	405	13.1	90	9
153	Cross-6	250	15.9	30	7
160	115448	230	11.4	27	8
161	115449	100	13.6	12	7
170	128909	50	9.5	11	6
172	140291	553	10.0	26	10
173	140292	367	11.6	35	10
174	140293	225	17.0	21	13
175	140294	518	12.3	50	11
177	268881	550	12.2	72	10
178	268882	115	11.2	17	7
179	271323	648	12.0	59	9
180	271324	460	11.0	45	10
183	292006	35	21.2	8	6
184	297256	20	9.6	4	5
185	297257	355	12.4	44	7
186	297258	150	10.1	24	7
188	297261	305	11.0	29	8
189	297262	75	9.9	14	6
190	297263	240	13.2	42	8
191	297264	355	11.2	52	8
193	297270	335	14.4	30	9
195	297272	415	11.0	56	10
196	297275	590	16.8	48	9
198	315782	135	11.2	20	7
199	315783	253	11.3	32	6
200	315784	650	13.0	58	7
201	315785	525	10.4	66	9
202	315786	339	25.3	30	11
203	315787	755	11.5	69	9
204	315788	275	10.8	33	9

(*Dolichos* spp.)

Accessions of *D. biflorus* and *D. lablab* are grown at Perkins and Stillwater. Sp-162, P.I. 212636, produced abundant seed which are used for medicinal purposes.

OILSEED CROPS

Sunflower (*Helianthus annuns*)

In 1971, Regional tests consisting of twelve varieties and strains were planted at Perkins, Chickasha and Goodwell. In addition twelve advanced lines were planted in a preliminary yield test at Perkins.

The mean seed yield at Perkins and Goodwell in 1970 were 627 and 1,294 pounds per acre, respectively. The test at Chickasha was lost due to drought conditions.

Brassica spp. and *Briza spicata*

Some 55 accessions of the cool season oilseed crop were planted February 16, 1971 in two-row plots, ten feet in length. Prolonged dry weather resulted in poor stands and the test was replanted April 6, 1971. Oklahoma Sp-numbers 625, 629, 631, 635, 639, 641, 641-1, 648, 654, 659, 660, 662 and 663 did not emerge after the April planting. The accessions harvested, thus far, produced low yields. The table below shows the results obtained in the 1971 study except for the later maturing, higher producing accessions:

1971 Brassica Test - Stillwater

Sp-No.	P.I. or Strain	Plot Yield (Gms)	Stand %	Plant Ht. (Ins)
		B. campestris		
626	46756	63	60	15
627	46760	4	20	13

Sp-No.	P.I. or Strain	Plot Yield (Gms)	Stand %	Plant Ht. (Ins)
		B. campestris (cont.)		
628	48051	54	80	14
632	48060	36	70	18
633	48062	26	40	13
634	48063	37	85	16
636	48067	23	45	28
637	48071	37	75	11
638	48074	1	5	9
640	48076	11	50	30
643	48079	2	5	12
644	48172	7	15	11
645	84143	7	40	15
645-1	-----	82	75	17
646	48180	43	75	18
647	P.I. 312845	1	5	6
		B. juncea		
649	48083	3	10	11
650	48087	21	70	24
651	48090	39	65	27
652	48091	4	25	15
653	48099	72	80	20
653-1	-----	6	35	18
655	48110	19	45	17
656	48116	18	45	21
657	48119	9	80	15
661	48155	6	10	20
661-1	-----	34	75	17
		Briza spicata		
669	P.I. 279704	1	5	6

MUCILAGE CROPS

Guar (*Cyamopsis tetragonoloba*)

The 1971 performance tests were planted on research stations near Perkins, Ft. Cobb, Mangum and Tipton. The tests include 24 entries. In addition, observation and seed increase plantings were made involving 595 accessions near Mangum and 150 accessions near Perkins. Guar is particularly suited to the sandy dryland soils in southwestern Oklahoma and north central Texas where the acreage is steadily increasing. The objective is to find high gum yielding strains possessing disease tolerance.

FORAGE CROPS

Eragrostis spp.

Currently available plant introductions of *Eragrostis curvula* and other closely related species are under extensive evaluation by Dr. Paul W. Voigt, U.S. Southern Great Plains Field Station, Woodward, Oklahoma. The introductions are being screened first for winter-survival ability and mode of reproduction and second for forage quality and forage production. Results from these programs will become available over the next several years.

Winter-survival scores have been obtained for many of the introductions. Because these scores were obtained in different years and under different managements, combined results will not be presented in tabular form at this time. Any inquiries regarding specific introduction are welcome.

Progeny performance results suggest that several introductions reproduce sexually. These introductions are:

P.I.	n	Classification	Winter hardiness at Woodward, Oklahoma
208214	10	*E. curvula* var. *conferta*	Non hardy
299919	10	*E. curvula* var. *conferta*	Non hardy
299928	10	*E. curvula* var. *conferta*	Slightly hardy
299920	10	*E. curvula*	Relatively hardy

Digitaria smutsii

We had hoped to find a winter-hardy type. However, during the winter of 1968-69 all *Digitaria* then in the field were killed or very severely injured. The material does not have enough hardiness for this location.

Winter killed 1968-69

P.I. 258439	P.I. 296568
284474	296569
284542	296572
296563	299063
296564	299808
296565	299828
296566	299843
296567	

Additional accessions of Digitaria were evaluated during the less severe winters of 1966 and 1967. They were classified as follows:

Non-hardy	Slightly-hardy	Moderately-hardy
P.I. 299812	P.I. 299810	P.I. 299820
299813	299811	299826
299817	299814	
	299818	
	299819	

Probably all of the above would have been killed in the more severe winter of 1968-69.

In 1970 the Oklahoma Agricultural Experiment Station and the Crops Research Division, Agricultural Research Service, U.S. Department of Agriculture released Morpa weeping lovegrass (Voigt, 1971). Morpa is a bulk seed increase from surviving winter-hardy plants of P.I. 208994, and was tested under that designation.

The following recent publications were possible because of the availability of weeping lovegrass introductions:

Voigt, P. W. 1970. New varieties of weeping lovegrass through plant evaluation and selection, p. 14-20. In R. L. Dalrymple Ed. Proc. of the First Weeping Lovegrass Symp. Samuel Roberts Noble Found., Inc. Ardmore, Oklahoma.

Voigt, P. W., W. R. Kneebone, E. H. McIlvain, M. C. Shoop, and J. E. Webster. 1970. Palatability, chemical composition, and animal gains from selections of weeping lovegrass, Eragrostis curvula (Schrad.) Nees. Agron. J. 62: 673-676.

Voigt, P. W. 1971. Morpa weeping lovegrass. Oklahoma Agr. Exp. Sta. Bull. B-690. 6 p.

Voigt, P. W. 1971. Registration of Morpa weeping lovegrass. Crop Sci. 11: 312-313.

Voigt, P. W. 1971. Discovery of sexuality in Eragrostis curvula (Schrad.) Nees. Crop Sci. 11: 424-425.

ORNAMENTALS

Of the several accessions evaluated by the Department of Horticulture, we are reporting the following:

The most desirable accessions that have been evaluated sufficient period of time to conclude that they are well adapted to Oklahoma conditions include:

Zelkova serrata - P.I. number not available. The plant is approximately ten years old, has withstood considerable drought, has not been affected by elm leaf beetle and has a clean appearance, attractive foliage, good branching and no breakage. The principal objection is the fairly large thorns.

Cotoneaster sp - P.I. 113092. Originally from China. The plant appears to be as drought hardy or more hardy than C. divaricata. The foliage appears similar to C. divaricata with the fruit and plant about 1/3 larger. The fruit had an attractive rose color in July.

Rosa rugosa - P.I. 227432. A medium size compact plant with attractive shiny green foliage. It appears to withstand drought very well. Flowers are unfrequent following the spring period but do occur occasionally.

Lagerstromea indica - P.I. 316672. A very light pink-lavender plant with a different and attractive color.

Malus sieboldii - P.I. 316711. The plant is approximately 4 feet tall, has attractive foliage and is fairly well-branched. It has done better than M. baccata.

Accessions showing promise but do possess some specific problems are:

Ulmus pumila chinkota - P.I. 294102. The plant has been fed upon by elm leaf beetle. Affected foliage is not attractive.

Ulmus laevis - P.I. 260993. Affected as above with elm leaf beetle. Growth of both selections has been satisfactory.

Lagerstromea indica - P.I. 316671 (cv. Catawba) and P.I. 316674 (cv. Powhatan). Both selections have a lavender-purple flower and selections of similar flower color are already available. For this reason they do not appear to have an advantage in this climatic region.

Malus baccata - P.I. 316650. The plant has clean attractive foliage but appears to be much slower in growth than M. sieboldii.

Lonicera insularis - P.I. 316409. This is a fairly young plant which has withstood the rigors of the region. It appears to have retained all of the foliage without marginal leaf scorch which is typical of shrub forms of Lonicera.

University of Puerto Rico
Mayaguez Campus
AGRICULTURAL EXPERIMENT STATION
Río Piedras, Puerto Rico

NEW CROPS INVESTIGATIONS IN PUERTO RICO

J. VELEZ-FORTUÑO, PLANT BREEDING DEPARTMENT

JULY 1970 - JUNE 1971

A total of 132 accessions were received for the research program during the year 1970-71. These consisted of 27 fruits, 4 vegetables, 14 root crops (starchy), 8 bananas, 7 grains, 2 forage grasses, 4 ornamentals and 66 sods.

Fruit Crops

Sapodilla

A variety collection was planted at Fortuna and duplicated at Isabela, two potential areas for commercial plantings. The planting at Fortuna includes 17 varieties, 5 trees of each, spaced 20'x30' comprising an area of 1.17 acres. The planting at Isabela consists of 3 trees of the same varieties, occupying 0.7 acre. The varieties are Jamaica #1, 3, 4, 5, 8, 10, Blacksberg, Mary's Fancy, Morning Star, Larsen, Russel, Blackwood, Aruz, Ponce, Timothee, Prolific and Adelaide.

In the meantime, 17 additional new varieties have been obtained through introduction and domestic collection, some of which appear to be of unusually large size and good quality. The new varieties include Modello, Homestead Seedless, both introduced from Florida, U.S.A., and 15 selections obtained locally, mostly in Ponce, P.R. namely: Henna, Santiago, Vasallo #1, 2, 3, 4, Arcilagos, Mendigos #1, 2, 3, 4, Gallera #1, 2, Guilbe and Timothee #2 (from Vieques). All of these selections have been successfully grafted and will be added to the collection.

Ilama

Half acre plantings of Ilama (Annona diversifolia) were established both at Fortuna and Isabela. Clonal selections will be made when the trees come into bearing.

Macadamia nut

This crop is growing very well, vigorous, at Adjuntas, showing good adaptation to that region. Our studies at present are directed towards determining the capacity of this crop to produce adequate economic yields in our coffee highlands.

Grapes

Four grape varieties, Ribier and Exotic among them, have performed consistently well at Fortuna for several years. Studies at present, under intensive cultural practices, are directed to determine the feasibility of commercial grape production in Puerto Rico.

Mangosteen

Trees at Río Piedras attained the age of 16 years. Fifty-two bearing trees yielded a total of 2169 fruits or a mean yield per tree of 42 fruits.

Root (Starchy) Crops

Tanier

A tanier (tannia) variety trial was harvested at Gurabo in which 12 varieties were evaluated under irrigation and no irrigation management. There were no significant differences between varieties Blanca del País, Choubutton, Rascana, Drearies, Kelly, Charanelle, Viequera under irrigation and no irrigation. Blanca del País was the highest yielder under both managements, 160 and 124 cwts. per acre. The results do not show difference between both treatments although there are indications of varietal response to supplemented moisture. The year 1970 was a wet one, so in dry ones, irrigation can be applied to assure high yields.

Cassava

Two cassava (manioc) variety trials were harvested at Arecibo and Isabela on August 20 and September 17, 1970, respectively. Pana, P.R.P.I.. 9568 and Tremensina, P.R.P.I. 9566, yielded 9.55 and 7.73 tons of root tubers per acre at Arecibo and 16.26 and 13.98 at Isabela, respectively. P.I. 9568 was much superior to other 15 varieties tested.

Plantains and Bananas

Several plantain introductions and banana cultivar Valerie were introduced, but are maintained under quarantine restrictions as a protection from diseases from other regions of the world.

Also a large number of plantain selections have been collected in the island for propagation and evaluation. All of these selections are based on number of fruits per bunch.

Coffee

A number of introduced varieties are being evaluated at Adjuntas and selections particularly those claimed to be resistant to rust, are being increased.

Vegetables

Pepper

Preliminary screening tests made during 1969, indicated that P.I. 174810 might be resistant to both PVY and VPLLT (Virus that Produces Localized Lesions in Tobacco). Several groups of F_1 and F_2 progenies between this line and commercial varieties were produced and are now under testing and selection.

Pigeon peas

Most pigeon pea introductions received have very small grain, which is undesirable for both the fresh market and the cannery. However, they are being screened for protein content, as possible germ plasm for the improvement of protein in commercial varieties.

Ornamentals

Lawn grasses

Seventy-four accessions, including Bermuda, Centipede, Zoysia and St. Augustine are being evaluated.

Among twelve Centipede seletions obtained from the University of Florida, some appear to be shorter (length of internode, and upright growth of leaves) than our Centipede clone. The selections also show variation as to vigor and color.

In the Zoysia group P.I. 23146 looks more attractive.

San Augustine P.I.'s 290888 and 300130 appear to be less susceptible to the chinch bug injury.

Publications:

Sotomayor-Ríos, A., J. Vélez-Fortuño, and G. Spain; Forage yields and plant character correlations in 30 Digitaria selections, J. Agr. Univ. P.R. 55(1): 53-62, 1971.

_____, A. Acosta-Matienzo, and J. Vélez-Fortuño; Yield comparisons and plant character correlations on 16 Panicum accessions, J. Agr. Univ. P.R. 55(2): 174-183, 1971.

Annual Report
New Crops Research in South Carolina
J. A. Martin
July 1970 to June 1971

S-9 Technical Committee Meeting at Plant Industry Station, Beltsville, Maryland, July 26-28, 1971.

There were 450 accessions of seeds and plants distributed to cooperators in South Carolina since July 1, 1970. These accessions, along with promising accessions received in prior years are being tested and evaluated. Many accessions have been isolated and increased for use in breeding programs.

Reports from cooperators are presented as follows:

Dr. Pryce B. Gibson, Clover Investigations, Agronomy & Soils, Clemson University, Clemson, S. C., 29631.

In the period 1959-1971 we selected several T. repens clones that are tolerant to root-knot nematodes. Several of these clones were selected from Plant Introductions of T. repens.

The clones we selected were propagated vegetatively and seed increase is being obtained at Prosser, Washington. Out tentative plan is to release this seed as a source of germ plasm tolerant to root-knot.

I have sent a list of the clones we selected to Dr. D. D. Dolan and advised him of our tentative plans.

Also, we are using T. uniflorum in our studies of species hybridization. T. uniflorum is a plant introduction. The same is true for T. occidentale.

Dr. R. E. Schoenike, Associate Professor of Forestry, Department of Forestry, Clemson University, Clemson, S. C., 29631.

I can report on the following material received in recent years. Background information on various accessions was given in previous years' reports and are not repeated here.

Accession P.I. 168939 Quercus acutissima:

A publication, Clemson Forestry Bulletin No. 6 has been issued regarding this accession and is appended to this report.

Accession PIM 19451 Eucalyptus cinerea:

All eight plants top killed last winter and are resprouting from the ground. The tallest trees reached 15' in height from the previous year's shoots which were top killed in 1970. Some new sprouts are presently four feet in height. Considered not reliably hardy in our area.

Accession P.I. 293810 Pinus stankewiczii:

Two plants remaining. Some winter burn of foliage, but basically healthy and growing slowly in the Arboretum.

Accession P.I. 293809 Pinus nigra pallasiana:

One plant survives and is rated vigorous - about 20" tall at 4 years.

Accession NA 26310 Pinus pinaster maghrebiana:

One plant received and at 4 years of age is hardy but growing slowly - about 18" tall.

Accession NA 29211 Viburnum obovatum:

Two plants of 3 are vigorous and growing well. The third plant, winter-damaged in 1969-70 succumbed in the winter of 1970-71.

Accession P.I. 307591 Sambucus sieboldiana:

One of two remaining plants died back last summer but has resprouted. The second plant is healthy but growing slowly.

Accession P.I. _____ Alnus hirsuta:

One plant is alive and growing well; Ht. 4 1/2 ft. after 4 years.

Accession P.I. _____ Alnus inoukumai:

One plant is alive and growing well; Ht. 4 ft. after 4 years.

Accession NA 29284 Acer capilles:

The remaining plant died in a summer drought last year.

Accession NA 29285 Acer grosseri:

The one plant is alive and growing well; Ht. 3 ft. after 4 years.

Accession NA 29841 Pinckneya pubens:

The one plant was accidentally cut off last year in cleaning a plot. It did not resprout.

Accession NA 827-S Quercus chenii:

All five plants received are growing well. The tallest plant is 3 ft. in ht. going into its 3rd growing season.

Accession NA 30152 Sophora tetraptera:

All 3 plants died in the nursery during the winter of 1970-71.

Accession NA 31291 Glyptostrobus lineatus:

One plant received and is growing well - about 2 ft. in ht.

Accession P.I. 320525 Larix gmelini var. olgensis:

One plant received; it was accidentally mowed off shortly after field planting.

Accession NA 23214C Ilex x koehneana:

Three plants received. Field planted in March 1971 and currently doing well.

Accession NA 31200 Rhododendron amogiamanum:

One plant received and died in nursery bed during summer 1970.

The following items were received in April 1970 and are currently in our nursery bed to be field planted next winter.

PI 316679 Viburnum lantana (2 plants)
PI 316681 Viburnum sargentii (2 plants)

The following items were received in March 1971 and are currently in containers to be field planted next winter.

PI 324940 Abies kawakami (2 plants)
PI 3171888 Abies koreana (2 plants)
NA 30158 Abies Bornmuelleriana (1 plant)
NA 30050 Abies holophylla (1 plant)
NA 30051 Abies koreana (1 plant)

NA 31120 Acer distylum (1 plant)
NA 30030 Arbutus texana (6 plants)
NA 31452 Gardenia spatulifolia (3 plants)

The following items were received in March 1971 and were field planted shortly after being received. They are all growing well at this time.

NA 31688 Alnus hirsuta siberica (2 plants)
NA 31689 Alnus pendula (2 plants)
NA 31687 Alnus sieboldiana (1 plant)

Dr. W. C. Barnes, Professor of Horticulture, Truck Station, P. O. Box 3158, Clemson University, Charleston, S. C., 29407.

We have turned the downy mildew resistant cabbage and broccoli lines over to the seed companies to use as parents in hybrid production. The first test hybrids indicate resistance to be essentially dominant. Cabbage has P.I. 261774 and broccoli P.I. 189028 as resistant parents.

Mr. F. P. Cuthbert, Jr., Research Entomologist, U.S.D.A. - A.R.S., Entomology Research Division, P. O. Box 3187, Charleston, S. C., 29407.

Cowpea PI 343449 has been found to have tolerance to thrips injury. This line does not fruit here until late fall; consequently, it has not been evaluated for cowpea curculio resistance. PI's 162699, 205139, 196301, and 205140 were promising in preliminary screening for curculio resistance and are being evaluated more thoroughly.

Seven sweet potato PI's which I had a chance to observe last year showed promising insect resistance. These were: 318851, 344120, 318856, 277636, 318848, 308208, and 208029. PI 259164 was outstanding. I think this line has the highest level of resistance to wireworms, Diabrotica larvae, and white grubs that I have seen to date.

Mr. R. B. Taylor, Greer Nursery, 1501 West Poinsett Street, Greer, S. C., 29651.

I received my first plant list in 1926 and from that I got the Chinese Chestnut and spread it all over the South. We have some good varieties from chestnuts and we are growing some from seed. In 1938, we received the Chinese Frienge. It has proved to be a very outstanding plant for hedge and background. It is being used more in the last few years.

I received the Laurel Leaf Holly in 1934-35 and this plant should be promoted more than ever in the South. It is a very outstanding plant.

The Junipers Conferta, known as shore juniper, has proved to be one of the finest and most outstanding creeping junipers in the nation. It will withstand all kinds of weather conditions, etc.

The Dwarf Variegated Osmanthus - should be used more because of its dwarf condition and around dwarf places. We are propagating quite a few of these.

Lagerstroemia Indica: The four varieties we received are doing nicely and we are propagating and should prove to be an improvement over other varieties of dwarf crepe myrtle. I will make further reports on other plants at a later date.

Dr. Morris B. Hughes, Professor of Horticulture Edisto Experiment Station, Blackville, S. C., 29817.

We are still using the following PI's in our cantaloupe breeding - 124108, 124109, 165449, 116915, 140806, 165003, 145594, 140471, 102077, 123188, 93438, 126030, 164179, 93800, and 126147. These exhibit various degrees of Alternaria resistance and we are growing out F 1's and F 2's to determine which transmits the highest level of resistance. We are also using 124111 because it has not only a high level of powdery mildew resistance but is simply inherited.

Dr. F. B. Ledeboer, Assistant Professor, Department of Horticulture, Clemson University, Clemson, S. C., 29631.

Performance report of turfgrass seeds from PI accessions:

The following grasses were planted last winter in the greenhouses and transferred to nursery rows in the field this spring for seed increase during 1972:

1. Ky. bluegrass (Poa pratensis)	PI 303660
	PI 303655
2. Tall Fescue (Festuca arundinacea)	PI 237559
	PI 234890
	PI 234747
	PI 234982

In uncut condition both Ky. bluegrasses are suffering slightly from mildew and the tall fescues from Helminthosporium leaf spot infections.

Prof. J. A. Martin, Associate Professor, Department of Horticulture, Clemson University, Clemson, S. C., 29631.

Pepper: Approximately 250 selections of pepper were saved from over 1600 PI accessions tested in 1970. Most of these selections appear to possess pod and plant characteristics which may be advantageous in a mechanized harvesting program. For instance, many small podded types shake off the plant with ease at maturity and some of the long podded types also possess this character except that they require more force for removal from the plant. Agricultural engineers at Clemson will be co-operating with the horticulturists in making plans for future studies in mechanical harvesting of peppers. In the meantime, most promising pepper accessions will be selected for advance testing and seed stock increase for the years ahead.

Okra: A number of refinements have been made on the okra harvester by Dr. Mel Richardson and others of the Clemson Agricultural Engineering Department. Actual field tests will be made as soon as okra pods are ready for harvesting. It is hoped that some good news will be forth-coming from this field work this summer. Many selections were made from the 221 PI okra accessions in 1970. The most remarkable charac-ter noted on these accessions was continuous bearing of pods through-out the hot and dry weather. Some commercial varieties of okra have a tendency to produce in cycles of optimum conditions - leaving a space on stalks with no pods during extreme hot and dry weather. A limited amount of breeding work is being conducted, but more is planed as soon as we learn more about the exact needs for adaptation to mechanical harvesting.

Brassica: Sixteen varieties of Brassicas were grown in a quadrupli-cated and randomized yield test during the winter of 1970-71. Yields, heights of plants at maturity, and harvest dates are presented in the following table:

Variety	Height of Plants (inches)	Harvest Dates	Yield lbs/Acre
Aphid Resistant	42	6-16	693
W. W. 521	44	6-11	500
Argus	38	6-14	553
Matador	45	6-14	820
W. W. 544	42	6-11	482
Victor	45	6-14	598
Heimer	44	6-14	513
Golden	42	6-14	554
Regina	DID NOT GERMINATE		
Pauter	44	6-14	620
Gorczanski	44	6-14	879
PI 305275	26	6-10	443

Variety	Height of Plants (inches)	Harvest Dates	Yield lbs/Acre
PI 305279	40	6-14	632
PI 305280	40	6-11	387
PI 305281	42	6-14	509
PI 311727	15	6-10	659

L.S.D. - .05% -- 219.45 lbs.
Brassicas planted October 6, 1971
Row spacing - 42 inches
Samples taken from 27' -- 6" on each replicate
Fertilizer: 1000 lbs/Acre of 5-10-10 broadcast prior to planting
150 lbs. Ammonium nitrate as a sidedressing in early spring

Perfect stands were obtained for all varieties except Regina in which case no seed germinated. There were no insects nor diseases present. The yield for all varieties was considered low due to deficiency in rainfall during spring months.

Sunflower: The U. S. Regional Sunflower Yield Test is being conducted at the Edisto Experiment Station, Blackville, S. C. this year. An excellent stand was obtained. No yield data was obtained in 1970 as a hail storm wiped out the entire sunflower planting as well as other crops within a five mile radius.

Kenaf: Results of the 1970 Kenaf varietal and nitrogen tests at Clemson are presented in the following table:

Kenaf - Yield in pounds per acre, Clemson 1970

Variety	Treatments	Yield[x]
Everglades 71	Check	5820
	200 lbs N/acre	6159
	400 lbs N/acre	6572
	600 lbs N/acre	6522
C-108	Check	6093
	200 lbs N/acre	5258
	400 lbs N/acre	5094
	600 lbs N/acre	5167
SH/15R	Check	6113
	200 lbs N/acre	6933
	400 lbs N/acre	5321
	600 lbs N/acre	5532

LSD = 646.16
[X]Yield based on oven dry weight of stalks from four replicated plots for each treatment.
Details of experiment:
Four row plots - 20 feet long
Planted May 12, 1970
Row spacing - 42 inches
Plant spacing - 4 plants per foot
Harvest date - November 23, 1970 (after killing frost)
Fertilizer - 1,000 pounds per acre of 5-10-10 broadcast prior to planting
Perfect stand obtained - hole No. 18 in Planet, Jr. planter used

Sidedressing Treatments:
1. Check - no nitrogen used as sidedressing
2. 200 lbs. of N per acre from Ammonium nitrate applied on August 18
3. 400 lbs. of N per acre from Ammonium nitrate, 200 lbs. applied on August 18 and 200 lbs. applied on September 1
4. 600 lbs. of N per acre from Ammonium nitrate, 200 lbs. applied on August 18, 200 lbs. applied on September 1, and last application was omitted due to extreme dry and hot weather

Jerusalem Artichokes and Dahlias: There has been a great deal of interest in the production of Jerusalem artichoke tubers for human food. Recently, much interest has been noted in the use of tubers of Dahlias and Jerusalem artichoke for the manufacture of inulin, commercial fructose, and levulose. Studies have been initiated with these crops to test and evaluate PI accessions and domestic varieties for both of these crops.

On January 22, 1971, the following Russian varieties of Jerusalem artichokes were received from U.S.D.A. - A.R.S., Plant Introduction Station, Beltsville, in excellent condition:

PI 357297 - Hybrid 120
PI 357298 - Kiev's White
PI 357299 - Leningrad
PI 357300 - Nakhodka
PI 357301 - Skorospelka
PI 357302 - Vadim
PI 357303 - Volga - 2
PI 357304 - White Crop

Since it was impossible to plant these varieties in the field, the tubers were placed in moist sawdust in metal seed flats and kept in cold storage at 38 degrees F until March 18, at which time the tubers were planted to the field. The tubers came through the storage period in excellent condition and a perfect stand was obtained for all varieties. At this time the plants are growing well.

Mr. Robert B. Killingsworth, 31 Baynard Cove Road, Hilton Head Island, S. C., 29928, has been growing Dahlias for some time for his chemical investigations for a good source of levulose. He has also made studies with Jerusalem artichokes, but he says that the Dahlia serves his purpose better. However, the propagation of Dahlias would be much greater than that for Jerusalem artichokes. We have agreed to see what can be done to produce Dahlia seed in order to reduce the cost of seedage of this crop. Mr. Killingsworth is working with a large tuber type of Dahlia which should produce high yields. We hope to obtain some seed from the best types for future studies.

Since Mr. Killingsworth and I have worked up some interesting information on these crops it is being presented as follows for the record:

Tephrosia vogelii: The 1969 and 1970 tests on effect of row spacing, plant spacing, location, and harvest date on leaf and stem yield have been completed. Since this work was in cooperation with Dr. Joseph J. Higgins and others, the statistical analysis of data and write-up of the results have been left up to him for completion.

Stokesia laveis (354065): No germination has been obtained under field conditions in fall and spring plantings. However, when planted in peat pots in the greenhouse good germination has been obtained. Plants were transplanted to field and appear to be doing well at this time.

Briza humilis Bieb (304981): Excellent stand was obtained from seed planted on October 23, 1970, as well as from the old plot which was seeded in October 1969. For some unknown factor the seed heads do not fill out properly. The material was cut on June 14, 1971, with a small sickle bar machine, dried, and stored. It was planted in the drill in 9-inch rows in an area 80' x 10'.

Crepis alpina (326551): Planted October 23, 1970, and harvested June 24, 1971. An excellent stand was obtained. The stalks (40 inches high) were cut, bundled, and dried in a greenhouse. Since the seeds are very light we plan to thresh with as little moving air as possible.

Bifora radians (325871): Planted October 23, 1970, started blooming on April 23, and harvested June 14, 1971. An excellent stand was obtained on 100 feet of row. Average height was 20 inches. The crop has a spreading growth habit, spreading to about 24 inches.

Limnanthes: L. alba (~~293701~~ 283701), L. gracilis var. parishii (~~293704~~ 283705), L. Alba var. versicolor (~~293705~~ 283724), and L. douglassii (278170) were planted in quadruplicate six row plots, Latin square design, on October 23, 1971. L. alba (283701) and L. Alba var. versicolor (283705) germinated well and produced well - they began blooming on April 17 and were harvested by hand on June 1, 1971. L. gracilis var. parishii (~~293704~~) and L. douglassii 283724 (278170) were not harvested as the stand was very poor. This crop shatters its seed very badly at maturity by wind and rain. The plants are very dwarf or about 10 inches high and with a spreading growth habit.

Publications:

Schoenike, R. E. 1971. Sawtooth Oak - Promising Exotic Tree Species for the Piedmont. Forestry Bulletin No. 6, Department of Forestry Department, Clemson University.

DAHLIAS vs JERUSALEM ARTICHOKES FOR PRODUCTION OF TUBERS FOR INULIN IN SOUTH CAROLINA

J. A. Martin
Robert B. Killingsworth

Factors	Dahlias	Jerusalem Artichokes
Adaptability To S. C.	In the Hilton Head area (Jono 7) dahlia tubers in the ground through the winter. When the main stalk was left exposed, there was evidence of tuber decomposition. A high percentage of tubers, however, were unaffected as to quality, i.e., re-sprouting or in inulin content. Hence it has been concluded that dahlia tubers could be dug over an extended period, based on demand, with, however, some loss in yield.	May be left in ground throughout the winter months as the tubers are winter hardy.
Varieties	Many large sized tuber types are available. Tests will have to be conducted for the isolation of high yielding types with desired characteristics.	Recent introductions of eight varieties from Leningrad, Russia, are now being tested at Simpson Experiment Station. Several domestic varieties are also included in these tests. Varieties - During 1967-68 the following varieties of Jerusalem Artichokes obtained from Beltsville, Maryland, with results as indicated.

Factors	Dahlias	Jerusalem Artichokes
Varieties Cont.		Chicago - medium size, rather nubby but tubers very sensitive to darkening on exposure to air. Poor yield. Tait - nubby but good quality and yield. Scott - fair quality and yield. Waterer - good size and taste. Rather smooth tubers. Good yield - second best. White Improved - best variety from standpoint of yield, taste, color, and size. Ordinary Variety - from Newberry area - about as good as Waterer in size and yield.
Soils and Fertilizers	Needs an abundance of available plant nutrients and water if it is to produce high yields. The crop has been found to be best adapted to rich sandy loams, to rich light loams, and to well-drained river bottom soils. No experiments have been conducted on yields for specific varieties.	Same as for Dahlias.

Factors	Dahlias	Jerusalem Artichokes
Method of Propagation	Planting - Dahlias may be planted by seed, cuttings or separated tuber-stem section. Varietal testing is needed as it may be possible to find varieties which produce seed abundantly.	Whole tubers or tuber pieces about 2 ounces in size should be planted. Tests are now underway to evaluate present varieties for ease of propagation. It is believed that propagation of Jerusalem artichokes will be far more practical than that for Dahlias.
Time of Planting	After danger of frost and as early as possible in spring.	May be planted just as early as possible in the spring, as soon as the soil can be satisfactorily worked, regardless of temperatures. The tubers will sprout as the weather warms up.
Depth of Planting	The tubers or plants should be planted as recommended. The tubers should be laid one to a hill with the basal or eye portion covered to a depth of two inches. The terminal or apex portion of the tuber should be lower than the basal portion. The plants should be planted 4 or 5 inches deep.	The tubers should be planted like potatoes and covered to a depth of 4 inches.

Factors	Dahlias	Jerusalem Artichokes
Planting Distances	From our past experience with Dahlias the plants should be planted 2 feet apart in the row with the row being 3 to 3 1/2 feet apart. Closer spacings may be possible for higher yields with more optimum growing conditions.	Same as for Dahlias. Closer spacings may be possible for higher yields with more favorable growing conditions.
Cultivation	Cultivation - Dahlias will undoubtedly be more expensive to grow. Cultivation should be shallow. The crop should be cultivated sufficiently to control the weeds. Herbicide weed control may be possible, but tests are needed.	Less cultivation may be needed as the plants grow tall with heavy foliage which reduces weeds by shading.
Harvesting of Tubers	Harvesting - In the generally sandy loam condition of the S. C. Coastal Plains, dahlia tubers should be much easier to harvest than artichokes. Tubers remain attached to main stalk so are bunched close to surface.	Before the tubers can be dug from the soil it is necessary to cut and remove the large woody tops from the rows. At present the problem of efficient harvesting on a commercial scale at low cost appears to be the main problem. It is hoped that a modified potato digging machine and that a large tuber type can be developed which will aid in mechanical digging.

Factors	Dahlias	Jerusalem Artichokes
Time of Digging	Before freezing weather arrives.	Anytime during the winter months when weather and soil conditions are favorable.
Storage and Handling	Must be used before freezing weather sets in or stored at 50 to 55°F.	Should be used immediately after harvesting, thus eliminating the necessity for storage.
Yield of Tubers	No yields of tubers are available. However, it is felt that some varieties may produce very high yields. Experiments are needed to ascertain yield potentials.	Ten to forty tons of tubers per acre have been reported. Future tests will be valuable for those anticipating commercial productions in S. C.
Source of Inulin	Dahlia tubers have a much higher content of inulin as opposed to lower molecular weight polymers of levulose generally referred to as Levulins. Since inulin easily crystallizes from treated juices, dahlia tubers are a far better source.	Much greater tendency to darken on exposure to air and therefore juices are more difficult to decolorize. Finally, artichoke tubers are nubby, odd-shaped and the outer peel is more difficult to remove. Cleaning in preparation for processing is likely to be more expensive.
Pests	Flowers are more susceptible to insect damage and stalks are more likely to be damaged by wind and heavy rains.	Susceptibility to fungus and nematode damage may, however, be greater with artichokes.

Factors	
Cost of Production	There is no information on cost of production on these crops under present day conditions. However, it is felt that with the advanced development of machinery for the harvesting of roots crops that both of these crops can be completely mechanized. However, the propagation and multiplication of the dahlia presents a real expensive problem because cold frames and greenhouses may be necessary to produce the plants. If so, then the expense involved in plant production may make it impractical. However, research is needed for both crops before any commercial plantings are made.

Tennessee Report on S-9 "New Plants"

To Technical Committee, July 1970 to July 1971

W. E. Roever

Fifty-three P. I. accessions were obtained during the course of the year.

Approximately 130 forage type Bermuda grass selections have been retained out of the nearly 600 accessions planted at Martin by Dr. B. N. Duck. Although principal emphasis is on winter hardiness, yield, seasonal distribution and disease resistance, about 80 selections having turf potentials have also been retained. Repeated flooding of the nursery site has slowed this work and necessitated a change of location. A new greenhouse will facilitate hybridization with these grasses.

T.V.A. plantings of Rosa rugosa 227432 are proliferating but are not yet at a stage where their adaptation can be evaluated.

Five hundred seedling hills of eight parental combinations involving the German strawberry variety Senga Sengana 274680 as male parent were set for evaluation in the spring of 1972.

Quercus acuminata 168939 is being viewed with interest as a food source for wildlife because of its observed dependability as an annual producer of an abundant crop of acorns. Loss of the American chestnut has left a vacuum in food supply for wildlife that has yet to be filled.

Dr. William D. Barber is initiating an observation planting for forage species with the purpose of evaluating acquisitions for adaptation as forage producers under Tennessee climatic conditions. He has also acquired some fifty Medicago P. I.'s for use in his breeding program on alfalfa weevil resistance.

A new plot has been fumigated in preparation for setting ornamental P. I.'s.

Annual Report on New Crops Research in Texas
Contributing to Southern Regional Project S-9
Prepared by Eli L. Whiteley
Beltsville, Md.
July 26-28, 1971

The 1970-71 crop year has been very dry to date. 1970 rainfall was about 10 inches below the long-time average. 1971 continued dry with little effective rainfall during the first four months of the year.

Most of the researchers in Texas have a backlog of accessions to evaluate, therefore only 409 PI's were received in 1970-71. These consisted of forage grasses, Sorghums, vegetables (lettuce), peanuts, and miscellaneous legumes.

Crops for Industrial Use

Fall and spring planting were made of Bifora radians (325871), Briza spicata (304981), Crepis alpina (326551), Eryngium sanquisorba (341894), Eryngium sp. (341893), and Stokesia laveis (354065). These plantings failed to germinate to a good stand and the tests were abandoned.

A number of soybean varieties and PI's were grown in the Blacklands for Phymatotrichum root rot observations. Due to weather conditions and other factors, root rot was not serious in 1970 and the desired observations were not made. Fifty-six varieties and lines were planted in 1971, observations to date indicate that a rating can be made for root rot damage this year.

About fifty Brassicas were planted in October 1970, but due to the very dry weather, stands were very poor and no indication of the adaptation of these materials could be obtained.

Kenaf

Three test were conducted with kenaf in 1970, these were a spacing study, a variety test, and a fertilizer test. The results from these tests are presented below in Table 1 to 3.

TABLE 1. The yield of kenaf as influenced by different spacings within and between the rows.

Spacing between the rows	Yield in tons per acre Spacing within the rows				
	2 in.	3 in.	4 in.	6 in.	mean
20 inch	4.10	3.65	3.61	3.09	3.61 a
30 in. 1 row/bed	3.56	3.51	3.03	3.38	3.37 a
30 in. 2 rows/bed	3.08	3.05	3.53	3.08	3.19 a
15 inch	2.69	2.66	1.85	2.38	2.40 a
mean	3.36 a	3.22 a	3.01 a	2.98 a	

There were no significant differences between the yields at the various sparings. Yields were quite low due to the very dry weather in the summer of 1970.

TABLE 2. The yield of kenaf varieties in 1970.

Variety	Yield in tons per acre
PI 270122	4.43
St/15R	4.33
PI 270105	4.28
PI 270111	4.24
PI 329192	4.24
Everglades 41	4.24
Cuba 2032	4.11
Cuba 108	3.99
Everglades 71	3.94
Guatemala 4	3.91
PI 270015	3.91
PI 270107	3.85
PI 270116	3.71
PI 270117	3.63
St/11760	3.56
El Salvador	3.54
Guatemala 45	3.39
PI 265319	3.00
Mean	3.91

There were no significant differences in yield between the varieties grown in 1970.

TABLE 3. The yield of kenaf under selected fertilizer treatments.

Treatment N - P_2O_5 - K_2O	Yield in tons per acre
0 - 0 - 0	5.09
50 - 60 - 60	5.92
100 - 60 - 60	5.65
150 - 60 - 60	5.86
200 - 60 - 60	5.39
250 - 60 - 60	6.34
250 - 200 - 200	6.90
250 - 300 - 300	7.42
400 - 400 - 400	7.54
500 - 500 - 500	6.62
600 - 600 - 600	5.64

Yields were quite low in this test due to the extremely dry weather in the summer of 1970.

Extension Service.

Sweet Sorghum

Work with sweet sorghum for sugar production continues to be promising. The data on the juice samples are presented in tables 4, 5, and 6.

TABLE 4. Sweet sorghum variety test College Station, Texas 1970.

Variety	Rep. No.	Bottle No.	Brix	Pol	Apparent Purity
Rio	I	8	22.02	12.8	58.1
	II	57	20.22	9.5	47.0
	III	73	21.74	13.1	60.3
Mer 64-7	I	49	14.96	3.7	24.7
	II	72	16.81	2.0	11.9
	III	55	22.67	14.8	65.3
Mer 67-1	I	9	15.56	9.85	63.3
	II	64	20.24	12.1	59.8
	III	16	15.92	1.5	9.4
Mer 67-14	I	51	23.02	8.8	38.2
	II	13	15.22	2.1	13.8
	III	2	19.96	9.4	47.1
Mer 67-15	I	78	21.16	8.8	41.6
	II	12	21.36	10.0	46.8
	III	54	23.05	13.2	57.3
Mer 68-7	I	29	23.70	15.9	67.1
	II	67	23.34	15.1	64.7
	III	19	21.01	14.4	68.5
Mer 68-10	I	26	23.32	16.4	70.3
	II	18	25.04	17.1	68.3
	III	77	23.75	15.0	63.2

TABLE 5. Sweet sorghum nursery grown at College Station, Texas 1970.

Line or Variety	Bottle No.	Brix	Pol	Apparent Purity
Mer 66-10	39	14.17	5.9	41.6
Mer 67-3	59	11.27	-0.7	0
Mer 67-6	75	18.47	3.5	18.9
Mer 67-9	25	12.07	1.3	10.8
Mer 67-11	7	15.97	-1.7	0
Mer 67-12	5	14.88	-0.6	0
Mer 67-18	63	12.88	-0.5	0
Mer 68-1	50	12.01	-0.1	0
Mer 68-2	58	27.15	17.2	63.4
Mer 68-4	80	20.31	8.3	40.9
Mer 68-5	22	16.64	-0.3	0
Mer 68-6	60	15.11	3.0	19.9
Mer 68-8	11	21.88	14.55	66.5
Mer 68-9	3	25.23	15.6	61.8
Mer 69-1	17	16.93	0.2	1.2
Mer 69-2	65	23.50	15.5	66.0
Mer 69-3	10	20.91	14.55	69.6
Mer 69-4	45	23.00	14.9	64.8
Mer 69-5	30	19.04	2.65	13.9
Mer 69-6	76	22.84	9.8	42.9
Mer 69-7	53	19.51	4.5	23.1
Mer 69-8	27	20.61	11.2	54.3
Mer 69-9	42	22.65	8.2	36.2
Mer 69-11	41	22.84	14.9	65.2
Mer 69-12	44	11.92	-0.7	0
Mer 69-14	48	22.07	12.2	55.3
Mer 69-15	21	24.22	14.2	58.6
Brandes	24	11.07	-0.3	0
Dale	20	8.65	-0.2	0
Wiley	33	13.76	5.1	37.1
Mer 64-7	32	15.41	9.0	58.4
Rio	34	21.21	15.5	73.1
Honey	36	10.92	2.2	20.1

TABLE 6. Sweet sorghum syrup test grown at College Station, Texas 1970.

Variety or Line	Rep. No.	Bottle No.	Brix	Pol	Apparent Purity
Brandes	I	68	10.35	0.2	1.9
	II	15	11.47	0.4	3.5
	III	52	11.72	0.4	3.4
Dale	I	6	16.57	-1.0	0
	II	70	13.27	-1.0	0
	III	74	14.67	-0.6	0
Mer 65-18	I	71	18.02	-1.3	0
	II	37	20.74	15.2	73.3-
	III	4	15.17	-0.9	0
Mer 67-10	I	28	13.91	-0.1	0
	II	23	13.77	0.6	4.4
	III	46	14.22	0.0	0
Mer 67-17	I	61	17.96	0.0	0
	II	79	19.41	1.1	5.7
	III	43	18.17	-0.5	0
Mer 67-20	I	31	15.11	-0.6	0
	II	62	15.51	-0.8	0
	III	56	14.80	-0.4	0
Mer 68-3	I	14	21.21	11.0	52.3
	II	66	22.11	12.0	54.3
	III	69	19.47	8.1	41.6

Dr. R. D. Brigham reports that he is using PI 200503 and PI 227555 as a source of resistance to soybean moisaic virus to study the inheritance of the virus. He is also using D65-3168, a resistant selection from Hill x PI 96983 in the study.

Dr. M. L. Kinman reports the male-sterile sunflower lines (A lines) cms PI 343763, cms PI 343764, and cms PI 343765 and their counterpart maintainer lines (B lines) received in 1969 from France, are being used as the source of male-sterile cytoplasm for converting the best inbred lines developed in the Texas - USDA sunflower breeding program to male-sterile cytoplasm for use as female parents of F_1 commercial hybrids. He anticipates release of a few male-sterile lines in the near future. The first usable source of restoration of this cytoplasmic male sterility was discovered at College Station, Texas in 1969. Restoration is conditioned by a single dominant gene, designated Rf_1. Two R lines (homozygous for Rf_1), one early and the other medium late maturing, both being resistant to rust and producing high oil content seed, are being increased during the 1971 season.

Dr. W. G. Menn reports that Sporobolus virginacus (PI 300126) may lend itself for turf use in that it has good color, relatively rapid growth, and possibly some shade tolerance. Its main drawbacks would appear to be excessive seed head production and relatively low density. One of the Zoysias (Z. japonice, PI 235334) appeared quite promising from the standpoint of growth rate. The rate of establishment in the greenhouse was much faster than the other Zoysias that were observed. Its texture falls somewhere between that of Emerald and Meyer Zoysia which would make it quite acceptable for turf use.

Dr. A. L. Harrison reports that he is using PIs. 196602, 196625, 196627 and 196666 in developing peanut lines resistant to Cercospora

leaf spot. Some of the progenies from these crosses have resistance to leaf spot but additional work needs to be done before acceptable varieties can be released.

Dr. J. W. Johnson reports that the following sorghums have resistance to the aphid Schizaphis graminum.

Sorghum verticilliflorum	PI 226096
S. nigricans	PI 229828
S. bicolor	PI 264453
S. verticilliflorum	PI 302231
S. hewisonii	PI 302236
S. nigricans	PI 302178
S. sudanense	PI 308976

Plants Released

Roma, a new, disease resistant, high yielding variety of sweet sorghum was released by the Plant Science Research Division, USDA, and the Texas Agricultural Experiment Station.

The new variety is a selection from progeny of a cross between Mer. 45-45 X MN 10-60 that was made at Meridian, Miss. Roma has been evaluated in Mississippi and at two locations in Texas.

Roma yields more than Rio in both tons of stalks and sugar per acre in the Lower Rio Grande Valley, but somewhat less in the High Plains area of Texas. Harvesting and milling operations are greatly facilitated because the stalks are very erect. Roma is resistant to downy mildew, leaf anthracnose, red rot, and rust. It is susceptible to cotton insecticides and care must be used in selecting planting sites. Roma matures about 10 days later than Rio. It is sensitive to day length and temperature and should be planted about May 1 for maximum yields.

Work Planned for Next Year

Spacing and fertilizer studies will be continued on kenaf in 1971-72. A breeding program on kenaf was initiated in 1971 and well be continued in 1971-72. The primary objective is to find resistance to the root knot nematode and transfer it to an adapted variety.

Publications

1. White, G. A., W. C. Adamson, E. L. Whiteley, and J. H. Massey. 1971. Emergence of Kenaf Seedlings as Affected by Seed Fangicides. Agron. Jour. 63:484-486.

2. Whiteley, Eli L. 1971. Influence of Date of Harvest on the Yield of Kenaf (Hibiscus cannabinus L). Agron. Jour. 63:509-510.

3. Whiteley, Eli L. 1971. The Influence of Data of Planting on the Yield of Kenaf (Hibiscus cannabinus L). Agron. Jour. 63:135-36.

UNITED STATES DEPARTMENT OF AGRICULTURE

SOIL CONSERVATION SERVICE

Fort Worth, Texas

The Soil Conservation Service Report on S-9 New Crops for 1970 in its Southern Region, July 26-28, 1971 Beltsville, Maryland

By

W. C. Young, Regional Plant Materials Specialist-South

The Soil Conservation Service continues to operate four plant materials centers in its South Region. Each center produces an annual report of its activities. Limited numbers of copies of these are reproduced but interested scientists can get access to them or inquire directly to the center managers for information not provided in this report about specific accessions. The accompanying tables list those accessions carrying PI numbers under observation at the different centers and shows the status of it at that center. The center managers are:

John D. Powell, Americus Plant Materials Center, POBox 688, Americus, Ga. 31709.

Robert D. Roush, Brooksville Plant Materials Center, Route 2, Box 242, Brooksville, Fla. 33512.

B. B. Billingsley, Jr., Coffeeville Plant Materials Center, POBox D, Coffeeville, Miss. 38922.

Jacob C. Garrison, James E. "Bud" Smith, Jr. Plant Materials Center, Route 1, Box 133a, Knox City, Tex. 79529.

Some explanation of the column headings will help understand what is meant by status.

Initial evaluations. The Service usually evaluates herbaceous material for about three years and then advances it to further tests or discards it. You can determine from the table whether it is newly acquired or of an earlier date. Any plant noted as existing in a status in columns 7, 8, 9, 10, 11, or 12 have characteristics which in one way or another make them appealing for some conservation purpose.

Column 7 may be most any kind of a test to compare a new item with a standard to determine if it is superior.

Column 8, Developing cultural management - tests to determine needs for rate, date, depth of planting, or whether it survives normal competition and the like.

Column 9 is similar to 4, 5, 6, 7, or 8 but tests are carried out on sites off the center.

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Columns 10, 11, and 12 are self-explanatory with this note: in column 11, field scale increase is the step that provides seed for field scale testing on district cooperators' farms with the use involvement to which the new plant is to be put.

The material which follows was secured from our plant materials specialists, mainly from the field plantings. These reports came from A. H. Quintero, Plant Materials Specialist headquartered in Gainesville, Fla., serving Puerto Rico, Florida, and Alabama; T. A. Bown, PMS headquartered in Jackson, Miss., serving Mississippi, Louisiana, and Arkansas; H. J. Haynsworth, PMS headquartered in Athens, Ga., serving Georgia and Tennessee; and A. G. Davis, PMS headquartered in Temple, Tex., serving Texas. Their initials are denoted following their comments.

Arachis glabrata - PI-118457 and 262839

In addition to forage potential, these perennial rhizomatous peanuts are being used for ground cover and beautification in parks, on road shoulders and banks, and in urban developments in Florida. AHQ

Arachis monticola - PI-263393

Plantings in the Coastal Plain of Georgia were very successful and excellent volunteering was obtained. The same was true for the Piedmont except the volunteering was scattered. No records were made of use by wildlife. Other areas have reported good use by turkey. HJH

Elaeagnus umbellata - PI-294098

This autumn olive is doing exceptionally good in mid and south Alabama and is fairly well adapted to north and central Florida. AHQ

Eragrostis curvula - PI-208994 and 232813, PMT-603 and 604

Twenty active field plantings containing both PI numbers are well distributed throughout the state of Texas. Production, forage, and seed are about equal for the two in all plantings. Livestock preference in cafeteria-style grazing is about the same. We got non-consistent trend toward one or the other with average farmer management practices in the limited grazing experiences to date. AGD

Eragrostis curvula - PI-295689, PMT-718

We have cooperative plantings at the Blackland Research Station, Prairie View A & M College, and three field plantings in east and south Texas. Forage production of this number is better than common E. curvula, and palatability better in the one planting that was grazed. Winter greenness is good in mild winters, and it is readily grazed then. It starts growth in early spring and matures seed earlier than common. Indications are that seed production will be less than PMT-729 in some years. AGD

Eragrostis curvula - PI-295703, PMT-729

We also have cooperative plantings of this accession with the Blackland Research Station and Prairie View A & M College. We have six field plantings in east, central, and south Texas. All were made in 1970.

Eragrostis curvula - PI-295703 (continued)

We got good forage production in year of establishment. It produced up to 30 percent more than common E. curvula in one planting. Cattle graze it readily in the growing season. Apparently it is slower to start growth in the spring than is common or PMT-718. It is a strong seed producer. AGD

Eragrostis lehmanniana - PI-295698, PMT-732

We have 10 active field plantings in the western part of Texas in the 16- to 20-inch rainfall area. One planting produced approximately two times the forage of the standard in the establishment year. Seed production is apparently adequate. AGD

Eragrostis robusta - PI-234218

This Eragrostis is very well adapted to mine spoil areas in central Florida and is volunteering in adjacent areas where mining had occurred but plantings had not been made. AHQ

Glycine ussuriensis - PI-163453

This plant is an excellent quail food and is being increased for seed sale in one district seed increase planting in Mississippi. TAB

Hemarthria altissima - PI-299993, 299994, 299995

All three of these accessions survived the first winter in Tuskegee, Ala. The 299994 survived at Huntsville, Ala., but was damaged considerably and recuperation is doubtful. All three accessions seem to do better in the organic soils in central and south Florida with 299995 being the highest forage producer. AHQ

Hemarthria altissima - PI-299993, 299994

Planted in the spring of 1970, both accessions survived the winters at Nashville and Cookeville, Tenn. Both accessions competed very well with crabgrass and other annual competition. HJH

Lespedeza virgata - PI-218004

Plantings on highway banks in Georgia look very good. The degree of success in Tennessee varies from very good to poor. Approximately 50 acres has been planted for seed production in Georgia. HJH

Malus hupehensis - PI-122586, Golden crabapple

Success with this plant has been good in Georgia and Tennessee. Fruiting has occurred in three years from year of setting plants when good care was provided. HJH

A white flowering crabapple of columnar form, bright green leaves, and small yellow-orange fruit is attractive to birds. The fruit dries to raisin consistency under most fall weather conditions. The dry fruit appears to be taken by birds during the early winter months in Mississippi. This plant is going into commercial production in Tennessee. TAB

Panicum coloratum - PI-166400, Selection 75 kleingrass

Approximately 30,000 pounds of seed produced last year in Texas. About 75 percent of it was certified. Grass gaining wide acceptance for solid seeding pasture plantings throughout much of Texas in the 20-inch-plus rainfall area. It makes a good pasture grass in a rotation grazing system with Coastal bermudagrass. Animal gains compare favorably with Coastal at lower fertility rates. AGD

Panicum miliaceum - PI-196692

Good reception is given this plant for food plantings to attract doves. Seed is being produced in good volume in Georgia, and these seed are finding markets outside of Georgia. HJH

Paspalum nicorae - PI-202044

Brunswickgrass appears to be winter hardy south of a line extending east and west through Texarkana, Ark.; Warren, Ark.; Greenwood, Miss.; and Starkville, Miss. This grass has produced 50 percent and 30 percent more forage respectively for the past two years from a field planting located at Mansfield, La. than the Pensacola bahiagrass control plot. A forage sample was analyzed and the brunswickgrass was reported to have three times as much digestible protein as that in the Pensacola bahiagrass control sample. The brunswickgrass produces a much denser sod in all of our field plantings than Pensacola bahiagrass. TAB

Plantings in test plots along highway shoulders and low backslopes in the Coastal Plain of Georgia have been very successful. Highway department officials are impressed. Plantings outside of the Coastal Plain have not been successful. Success has been obtained on field waterways where weed competition has been controlled. Close mowing or grazing appears beneficial to this grass. HJH

Pistacia chinensis - PI-21970

This plant appears to be well adapted to Georgia and Tennessee when planted on soils with good drainage. Early frost sometimes damages late growth or tender buds but this doesn't seem to materially damage the plant. HJH

Quercus acutissima - PI-233782

The Georgia Forestry Commission has produced this plant in moderate volume. Approximately 55,000 were produced and planted this last season and beds have been planted for production this year. This plant should find an increasing demand for use as a wildlife food producing plant and for ornamental use. HJH

Trifolium vesiculosum - PI-233782

Meechee clover is adapted to all of Arkansas, Louisiana, and Mississippi. It is a high forage producer that continues to grow into early summer and produces seed in late July or early August. This plant is in seed production in Arkansas, Louisiana, Mississippi, and Oregon. TAB

We received the following information after the material was already in type but thought it well to add the following:

Arachis glabrata - PI-262817, F-1333

Is a strong, early season growing legume with excellent potential. Growth is 12 to 14 inches tall in the droughty portions of the spring when other non-irrigated legumes and grasses are still dormant or very slow in growth. This accession is scheduled to be transferred from hold planting to an initial increase planting. RDR

Brachiaria mutica - PI-316447, F-4651, signalgrass

A strong stoloniferous grass which produces abundant quantities of forage to 48 inches in height. The stolons develop to 10 to 15 feet in length with root and shoot formation occurring at the nodes. Although introduced in seed form, it has never bloomed here. Frost kills the plant back to the rooted crowns. Origin - Fiji Islands. RDR

Clitoria ternatea - PI-322366, F-4321, pigeonwings

A moderately strong, perennial, summer growing legume which produces abundant leaves and fine stems. It produces beautiful deep blue-purple flowers of good size and sets a good quantity of firmly held, hard seed. This is an excellent, dense ground cover which maintains good growth and a high degree of vigor until frost. The plant needs to be tested for adaptability to grazing. It may also be well suited for use in grass-legume mixtures with such plants as the guineagrasses, switchgrasses, or elephant grasses. A series of clippings made monthly throughout the summer indicated little plant kill and clipped areas responded with good new growth. Quantities of good firm seed per unit of area clipped were noted to decrease with advancing season beyond mid to late July. Origin - Brazil. RDR

Desmodium heterocarpon - PI-217910, F-4576, tickclover

A strong perennial legume which spreads both through growth of volunteer seedlings and by root and shoot formation at the nodes of decumbent stems. Growth is dense and potential yields of forage are good. Production of the very small seeds is good and is firmly held on the stems. Origin - India. RDR

Pistacia atlantica - PI-246336, 246337, 276701, 276702, 276703; F-4557,4558,4559, 4560, 4561, pistache

These accessions have potential for use as small ornamental trees. They vary in brilliant colors of yellow, orange or red appearing in the leaves following autumn frost. These accessions appear to be more resistant to disease, insect, and nematode attack than other accessions received. Origin - Chico, Calif. PI Station via Americus PMC. RDR

Tables listing the PI accessions under observation at the individual plant materials centers start on the following pages:

The following legend will explain the initials used in column 5 of the tables:

G or GL.....germinated, lived

GD.....germinated, died

NG.....no germination

VL.....vegetative planting lived

VD.....vegetative planting died

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RTSC-FW-PM-4
3-70
(File Code PM)

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

TABLE OF PI ACCESSIONS UNDER TEST, IN PRODUCTION OR OTHERWISE FOR THE AMERICUS, GA. PLANT MATERIALS CENTER FOR THE YEAR 1970

SPECIES	ACCESSIONS		STATUS									
			INITIAL EVALUATIONS									
			This Year		Former Years							
	Center AM- Number	PI, BN, or Other No.	Planted	Germination		Advanced Evaluations	Developing Cultural Management	Field Evaluation Plantings	Initial Increase	Field Scale Increase	Breeder or Foundation Fields	Seed orchard Holding block, or Other
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Acroceras macrum	2626	PI-295113	Aug	VL								
Agropyron elongatum	1687	PI-109542			x							
Ampelopsis brevipedunculata	2402	BN-18527							x			
Andropogon scoparius	1523	PI-216751				x						
Andropogon scoparius	1524	PI-216752				x						
Andropogon scoparius	1525	PI-216757				x						
Andropogon scoparius	1526	PI-216759				x						
Andropogon scoparius	1527	PI-216778				x						
Andropogon scoparius	1528	PI-217039				x						
Arachis burkartii	692	PI-261851			x							
Arachis duranensis	1631	PI-219823			x							
Arachis glabrata	694	PI-262287			x							
Arachis glabrata	696	PI-262797			x							
Arachis glabrata	697	PI-262798			x							
Arachis glabrata	699	PI-261865			x							
Arachis glabrata	700	PI-262294			x							
Arachis glabrata	704	PI-262839			x							
Arachis glabrata	708	PI-262294			x							
Arachis glabrata	710	PI-262794			x							
Arachis glabrata	711	PI-262796			x							
Arachis glabrata	712	PI-262801			x							
Arachis glabrata	713	PI-262811			x							
Arachis glabrata	723	PI-162801			x							
Arachis glabrata	1529	PI-116976			x							
Arachis glabrata	1530	PI-116979			x							

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Continuation sheet no. 1

Table of PI Accessions under test, in production, or otherwise for AMERICUS, GA. PMC, Year 1970

SPECIES	ACCESSIONS		STATUS									
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Arachis glabrata var. hagenbeckii	1532	PI-172224			x							
Arachis glabrata var. hagenbeckii	1533	PI-151982			x							
Arachis sp.	564	PI-263393	May	VL								
Arachis sp.	693	PI-262847			x							
Arachis sp.	695	PI-262286			x							
Arachis sp.	698	PI-262813			x							
Arachis sp.	701	PI-262834			x							
Arachis sp.	702	PI-262816			x							
Arachis sp.	703	PI-262817			x							
Arachis sp.	705	PI-262814			x							
Arachis sp.	706	PI-262820			x							
Arachis sp.	709	PI-252301			x							
Arachis sp.	714	PI-262812			x							
Arachis sp.	715	PI-262815			x							
Arachis sp.	716	PI-262818			x							
Arachis sp.	717	PI-262819			x							
Arachis sp.	718	PI-262821			x							
Arachis sp.	719	PI-262826			x							
Arachis sp.	720	PI-262828			x							
Arachis sp.	721	PI-262832			x							
Arachis sp.	722	PI-262840			x							
Arundinella hirta	402	PI-263693			x							
Berberis julianae	1252	BN-15905			x							
Bothriochloa ischaemum	1240	PI-269364			x							
Brachiaria brizantha	1605	PI-255346	May	NG								
Brachiaria decumbens	2619	PI-344767	May	VL								
Brachiaria ruziziensis	643	PI-247404	May	NG								
Brachiaria ruziziensis	2617	PI-344764	May	VL								
Brachiaria ruziziensis	2618	PI-344765	May	VL								
Brachypodium phoenicoides	1449	PI-287785			x							

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Continuation sheet no. 2

Table of PI Accessions under test, in production, or otherwise for AMERICUS, GA. PMC, Year 1970

SPECIES	ACCESSIONS		STATUS									
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Brachypodium phoenicoides	2210	PI-257680			x							
Callicarpa formosana	2403	PI-324954							x			
Callicarpa japonica	2404	PI-317359							x			
Castanea mollissima	284	BN-8299								x		
Castanea mollissima	1535	PI-58602			x							
Castanopsis sclerophylla	2133	PI-95630								x		
Celastrus sp.	2521	PI-324963			x							
Chloris distichophylla	1368	PI-162637			x							
Chrysopogon fulvus	1402	PI-213885			x							
Cryptomeria japonica	793	PI-279746			x							
Cryptomeria japonica	794	PI-279748			x							
Desmodium barbatum	2483	PI-338593	May	G								
Desmodium intortum	2484	PI-338594	May	G								
Desmodium ovalifolium	2485	PI-338595										
Dichanthium annulatum	1426	PI-199240			x							
Digitaria milanjana	1646	PI-299689			x							
Digitaria milanjana sub.sp.eylesiana	1648	PI-299736			x							
Digitaria pentzii	190	PI-106663				x						
Digitaria pentzii	1649	PI-299743			x							
Digitaria pentzii	1668	PI-302766			x							
Digitaria smutsii	1655	PI-299819			x							
Digitaria smutsii	1656	PI-299826			x							
Digitaria smutsii	1657	PI-299828			x							
Digitaria valida	1653	PI-299879			x							
Digitaria valida	1660	PI-299858			x							
Digitaria valida	1661	PI-299863			x							
Digitaria valida	1664	PI-299877			x							
Digitaria valida	1665	PI-299878			x							
Echinochloa polystachya	2621	PI-344771			x							
Echinochloa sp.	2386	PI-331387			x							

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Continuation sheet no. 3

Table of PI Accessions under test, in production, or otherwise for AMERICUS, GA. PMC, Year 1970

SPECIES	ACCESSIONS		STATUS									
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Elaeagnus umbellata	347	BN-11373								x		
Elaeagnus umbellata	349	BN-11385			x							
Elaeagnus umbellata	350	BN-11387			x							
Elaeagnus umbellata	351	BN-11246			x							
Elaeagnus umbellata	352	BN-12090			x							
Elaeagnus umbellata	783	BN-13460								x		
Elaeagnus umbellata	1273	BN-14517			x							
Elaeagnus umbellata	1274	BN-14518			x							
Elaeagnus umbellata	1333	PI-294098			x							
Elaeagnus umbellata	2353	BN-12090	x							x		
Eragrostis chloromelas	2223	PI-234209			x							
Eragrostis chloromelas	2214	PI-208087			x							
Eragrostis curvula	2219	PI-208384			x							
Eragrostis curvula	2225	BN-208385			x							
Eragrostis curvula	2641	PI-299920	May	G								
Eragrostis curvula	2642	PI-299943	May	G								
Eragrostis curvula	2647	PI-295107	May	G								
Eragrostis curvula	2648	PI-232813	May	G								
Eragrostis curvula	2649	PI-208994	May	G								
Eragrostis curvula	2651	PI-295689	May	G								
Eragrostis ferruginea	2643	BN-18263	May	NG								
Eragrostis robusta	360	PI-234218			x							
Eragrostis robusta	2637	PI-209385	May	G								
Eremochloa ophiuroides	2026	BN-15989			x							
Erianthus ravennae	2636	BN-8009	May	G								
Eurya ochnacea	2515	PI-235502			x							
Festuca ampla	276	PI-240157			x							
Festuca ampla	1355	PI-240156			x							
Festuca arundinacea	1354	PI-264766			x							
Festuca arundinacea	1400	PI-203728				x						
Festuca arundinacea	2209	PI-292602			x							

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Continuation sheet no. 4

Table of PI Accessions under test, in production, or otherwise for AMERICUS, GA. PMC. Year 1970

SPECIES	ACCESSIONS		STATUS									
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Festuca arundinacea	2227	PI-292603			x							
Festuca psammophila	1231	PI-283320			x							
Hemarthria altissima	2313	PI-299993	May	VL								
Hemarthria altissima	2314	PI-299994	May	VL								
Hemarthria altissima	2315	PI-299995			x							
Hemarthria altissima	2316	PI-299039			x							
Hemarthria altissima	2671	PI-349796	Sep.	VL								
Hemarthria altissima	2672	PI-349797	Sep.	VL								
Hemarthria altissima	2673	PI-349798	Sep.	VL								
Ilex cassine	2399	PI-254592	Mar.	VL								
Ilex latifolia	2509	PI-274838			x							
Ilex rotunda	2371	PI-112222	x	VL								
Ilex rotunda	2510	PI-112222			x							
Indigofera echinata	2106	PI-225575							x			
Indigofera pseudotinctoria	325	PI-197075								x		
Iris rossii	2522	PI-316648			x							
Juglans regia	2568	PI-125248	x	G								
Juglans regia	2569	PI-127460	x	G								
Juglans regia	2570	PI-159566	x	G								
Juglans regia	2571	PI-163539	x	NG								
Juglans regia	2572	PI-265716	x	NG								
Lagerstromea indica	2516	PI-316672			x							
Lagerstromea indica	2517	PI-316674			x							
Lathyrus sylvestris	1899	PI-282765			x							
Lespedeza bicolor	313	BN-9147								x		
Lespedeza cuneata	2010	BN-10849							x			
Lespedeza japonica	1904	BN-6448							x			
Lespedeza japonica intermedia	2015	BN-3532							x			
Lespedeza latissima	1478	BN-1139			x							
Lespedeza serpens	1592	PI-297385								x		

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Continuation sheet no. 5

Table of PI Accessions under test, in production, or otherwise for AMERICUS, GA. PMC, Year 1970

SPECIES	ACCESSIONS		STATUS									
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Lespedeza serpens	1905	PI-193950								x		
Lespedeza virgata	1456	PI-218004								x		
Liriope graminfolia	2020	BN-10762								x		
Liriope sp.	2021	BN-11069							x			
Lithocarpus henryii	2134	PI-120651	x	G								
Lonicera maacki	1538	BN-8318								x		
Lotus corniculatus	465	PI-260012			x							
Lotus corniculatus	1297	PI-260011			x							
Lotus corniculatus	1298	PI-260013			x							
Malus baccata	1539	PI-99907										x
Malus hupehensis	1540	PI-122586								x		
Osmanthus heterophyllus purpurpeus	683	PI-242291			x							
Osmanthus heterophyllus x. o. fortunei	687	PI-238030			x							
Osmanthus x osmarea burkwoodii	689	PI-242241			x							
Panicum amarulum	326	BN-8360			x							
Panicum amarulum	1244	BN-14005			x							
Panicum amarulum	1361	BN-2259			x							
Panicum amarulum	2016	BN-2258			x							
Panicum antidotale	364	PI-185456			x							
Panicum antidotale	365	PI-185457			x							
Panicum antidotale	366	PI-196337			x							
Panicum antidotale	367	PI-213272			x							
Panicum antidotale	1430	PI-284150			x							
Panicum antidotale	2630	PI-268410	May	VL								
Panicum antidotale	2631	PI-271590	May	VL								
Panicum antidotale	2632	PI-271589	May	VL								
Panicum antidotale	2633	PI-284151	May	VL								
Panicum antidotale	2634	PI-300034	May	VL								
Panicum coloratum	378	PI-208005			x							
Panicum coloratum	381	PI-255335			x							

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Continuation sheet no. 6

Table of PI Accessions under test, in production, or otherwise for AMERICUS, GA. PMC, Year 1970

SPECIES	ACCESSIONS		STATUS									
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Panicum coloratum	383	PI-263602			x							
Panicum coloratum	384	PI-263603			x							
Panicum coloratum	386	PI-263606			x							
Panicum coloratum	387	PI-263607			x							
Panicum coloratum	1925	PI-300039	May	G								
Panicum coloratum v. makarikariense	361	PI-203520			x							
Panicum coloratum v. makarikariense	363	PI-210692						x				
Panicum miliaceum	520	PI-196692				x						
Panicum stapfianum	388	BN-5814								x		
Panicum stapfianum	2611	PI-145794	May	G								
Panicum stapfianum	2612	PI-206371	May	G								
Panicum virgatum	77	BN-8264				x						
Panicum virgatum	314	BN-14668				x				x		
Panicum virgatum	327	BN-11362				x						
Panicum virgatum	328	BN-11361				x						
Panicum virgatum	329	BN-8574				x						
Panicum virgatum	735	BN-12323				x						
Panicum virgatum	760	BN-5446				x						
Panicum virgatum	1363	BN-8617				x						
Panicum virgatum	1364	BN-309				x						
Panicum virgatum	1445	BN-10860				x						
Panicum virgatum	2017	BN-8354				x						
Panicum virgatum v. cubense	330	BN-9195				x						
Panicum virgatum v. cubense	2019	BN-9195				x						
Panicum virgatum v. cubense	2298	PI-315728				x						
Paspalum boscianum	1978	PI-310049			x							
Paspalum boscianum	1979	PI-310051			x							
Paspalum boscianum	1980	PI-310052			x							
Paspalum cromyorhizon	2397	PI-310059			x							
Paspalum cromyorhizon	2398	PI-310070			x							

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Continuation sheet no. 7

Table of PI Accessions under test, in production, or otherwise for AMERICUS, GA. PMC, Year 1970

SPECIES	ACCESSIONS		STATUS									
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Paspalum cromyorhizon	2665	PI-310061	May	VL								
Paspalum cromyorhizon	2666	PI-310065	May	VL								
Paspalum cromyorhizon	2667	PI-310071	May	VL								
Paspalum intermedium	1983	PI-310112			x							
Paspalum nicorae	469	PI-202044								x		
Paspalum nicorae	470	PI-276248							x			
Paspalum nicorae	471	PI-276249							x			
Paspalum nicorae	1266	PI-284171							x			
Paspalum nicorae	1267	PI-209983							x			
Paspalum nicorae	1985	PI-304004				x						
Paspalum nicorae	1986	PI-310128				x						
Paspalum nicorae	1987	PI-310129			x							
Paspalum nicorae	1988	PI-310130				x						
Paspalum nicorae	1989	PI-310131				x						
Paspalum nicorae	1990	PI-310132				x						
Paspalum nicorae	1991	PI-310133				x						
Paspalum nicorae	1992	PI-310134				x						
Paspalum nicorae	1993	PI-310135				x						
Paspalum notatum	1239	BN-11573			x							
Paspalum notatum	1284	BN-3028								x		
Paspalum notatum	1629	BN-1309				x					x	
Paspalum notatum	2289	PI-284172			x							
Paspalum notatum	2290	PI-162791			x							
Paspalum notatum	2294	PI-276251			x							
Paspalum plicatulum	2491	PI-339896	May	G								
Paspalum plicatulum	2492	PI-339897	May	G								
Paspalum cf. quadrifarum	1977	PI-310046			x							
Pennisetum clandestinum	2620	PI-344768	Mar.	VD								
Pennisetum purpureum	2086	PI-300086			x							
Pennisetum purpureum	2088	PI-304751			x							

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Continuation sheet no. 8

Table of PI Accessions under test, in production, or otherwise for AMERICUS, GA. PMC, Year 1970

SPECIES	ACCESSIONS		STATUS									
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Pennisetum sp.	2098	PI-315868			x							
Pennisetum sp.	2322	PI-271603			x							
Pennisetum unisetum	2087	PI-304750			x							
Phalaris tuberosa hirtiglumis	2091	PI-202480			x	x						
Pistacia atlantica	1882	PI-246336			x							
Pistacia atlantica	1883	PI-246337			x							
Pistacia atlantica	1884	PI-276701			x							
Pistacia atlantica	1885	PI-276702			x							
Pistacia atlantica	1886	PI-276703			x							
Pistacia chinensis	1405	PI-21970			x					x		
Pistacia terebinthus	1887	PI-91608			x							
Pistacia terebinthus	1888	PI-246341			x							
Pistacia terebinthus	1889	PI-246342			x							
Pistacia vera	1890	PI-12815			x							
Pistacia vera	1892	PI-17250			x							
Pterocarya stenoptera	2370	PI-61938								x		
Quercus acutissima	1544	BN-8298										x
Quercus acutissima	1545	BN-8317										x
Quercus acutissima	2089	PI-317372								x		
Quercus myrsinaefolia	281	PI-74222								x		x
Quercus myrsinaefolia	1761	PI-74227										x
Quercus pumila	1546	BN-10352										x
Salix purpurea nana	2071	BN-8950			x							
Sasa pygmaea	1470	PI-52674										x
Setaria sphacelota	1407	PI-153695			x							
Stipa splendens	1508	PI-147820			x							
Themeda australis	2339	PI-281968			x							
Themeda japonica	418	PI-246782			x							
Themeda triandra	2337	PI-274091			x							
Themeda triandra	2342	PI-208197	Mar.	G	x							

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Table of PI Accessions under test, in production, or otherwise for AMERICUS, GA. PMC, Year 1970

SPECIES	ACCESSIONS		STATUS									
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Themeda triandra	2343	PI-276070	Mar.	G	x							
Trifolium vesiculosum	1452	PI-234310									x	
Viburnam lantana	2100	PI-316679			x							
Zoysia japonica	2024	BN-8120										x

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(File Code PM)

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

TABLE OF ALL PI ACCESSIONS UNDER TEST, IN PRODUCTION OR OTHERWISE FOR THE BROOKSVILLE, FLORIDA PLANT MATERIALS CENTER FOR THE YEAR 1970

SPECIES	ACCESSIONS		STATUS										
			INITIAL EVALUATIONS										
			This Year		Former Years								
	Center F- Number	PI, BN, or Other No.	Planted	Germination		Advanced Evaluations	Developing Cultural Management	Field Evaluation Plantings	Initial Increase	Field Scale Increase	Breeder or Foundation Fields	Seed orchard Holding block, or Other
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Andrópogon gerardi	4752	BN-9703			x							
Arachis benthamii	5094	PI-338252			x							
Arachis benthamii	5095	PI-338282			x							
Arachis burkartii	1320	PI-261851			x							
Arachis burkartii	5096	PI-338254			x							
Arachis burkartii	5097	PI-338255			x							
Arachis burkartii	5098	PI-338325			x							
Arachis diogoi	5099	PI-338268			x							
Arachis glabrata	135	PI-118457			x	x	x			x	x	
Arachis glabrata	1322	PI-262287			x							
Arachis glabrata	1325	PI-262797			x							x
Arachis glabrata	1334	PI-262839			x	x	x	x		x		
Arachis glabrata	1346	PI-262794			x							x
Arachis glabrata	1349	PI-262801			x							x
Arachis glabrata	5100	PI-338256			x							
Arachis glabrata	5101	PI-338257			x							
Arachis glabrata	5102	PI-338258			x							
Arachis glabrata	5103	PI-338259			x							
Arachis glabrata	5104	PI-338260			x							
Arachis glabrata	5105	PI-338261			x							
Arachis glabrata	5106	PI-338262			x							
Arachis glabrata	5107	PI-338263			x							
Arachis glabrata	5108	PI-338264			x							
Arachis glabrata	5109	PI-338265			x							
Arachis glabrata	5110	PI-338266			x							

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Continuation sheet no. 1

Table of PI Accessions under test, in production, or otherwise for BROOKSVILLE, FLORIDA PMC, Year 1970

SPECIES	ACCESSIONS		STATUS									
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Arachis glabrata	5111	PI-338267			x							
Arachis glabrata	5112	PI-338304			x							
Arachis glabrata	5113	PI-338305			x							
Arachis martii	5115	PI-338270			x							
Arachis oteroi	5116	PI-338286			x							
Arachis paraguariensis	5117	PI-338271			x							
Arachis paraguariensis	5518	PI-338306			x							
Arachis pintoi	5519	PI-338314			x							
Arachis pseudoangustifolia	5120	PI-338302			x							
Arachis pseudovillosa	5121	PI-338273			x							
Arachis repens	5122	PI-338274			x							
Arachis repens	5123	PI-338275			x							
Arachis repens	5124	PI-338276			x							
Arachis repens	5125	PI-338277			x							
Arachis sp.	1323	PI-262286			x							x
Arachis sp.	1331	PI-262834			x							x
Arachis sp.	1333	PI-262817			x							x
Arachis sp.	1359	PI-262828			x							x
Arachis sp.	1360	PI-262832			x							x
Arachis sp.	1361	PI-262840			x							x
Arachis sp.	5129	PI-338201			x							
Arachis sp.	5130	PI-338280			x							
Arachis sp.	5131	PI-338283			x							
Arachis sp.	5132	PI-338284			x							
Arachis sp.	5133	PI-338288			x							
Arachis sp.	5134	PI-338289			x							
Arachis sp.	5135	PI-338291			x							
Arachis sp.	5136	PI-338293			x							
Arachis sp.	5137	PI-338295			x							
Arachis sp.	5138	PI-338296			x							

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Continuation sheet no. 2

Table of PI Accessions under test, in production, or otherwise for BROOKSVILLE, FLORIDA PMC, Year 1970

SPECIES	ACCESSIONS		STATUS									
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Arachis sp.	5139	PI-338299			x							
Arachis sp.	5140	PI-338300			x							
Arachis sp.	5141	PI-338301			x							
Arachis sp.	5142	PI-338303			x							
Arachis sp.	5143	PI-338313			x							
Arachis sp.	5144	PI-338313			x							
Arachis sp.	5145	PI-338316			x							
Arachis sp.	5146	PI-338317			x							
Arachis sp.	5147	PI-338318			x							
Arachis sp.	5148	PI-338319			x							
Arachis sp.	5149	PI-338320			x							
Arachis sp.	5150	PI-338326			x							
Arachis sp.	5151	PI-338327			x							
Arachis sp.	5152	PI-338329			x							
Arachis sp.	5153	PI-338292			x							
Arachis sp.	5162	PI-338279			x							
Arachis sp.	5168	PI-338287			x							
Arachis sp.	5169	PI-338294			x							
Arachis sp.	5170	PI-338298			x							
Arachis villosa	5126	PI-338309			x							
Arachis villosa	5127	PI-338310			x							
Arachis villosa	5128	PI-338323			x							
Arachis villosa	5163	PI-330651			x							
Arachis villosa	5164	PI-330652			x							
Arachis villosa	5165	PI-330653			x							
Argyrolobium linnaeanum	4176	PI-302847			x							
Atylosia marmorata	4177	BN-16467			x							
Axonopus affinis	1216	PI-237128			x							x
Brachiaria brizantha	2286	PI-292182			x							x
Brachiaria brizantha	2287	PI-292183			x							x

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Continuation sheet no. 3

Table of PI Accessions under test, in production, or otherwise for BROOKSVILLE, FLORIDA PMC, Year 1970

SPECIES	ACCESSIONS		STATUS									
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Brachiaria brizantha	2711	PI-298975			x							x
Brachiaria decumbens	4841	PI-316445			x							
Brachiaria decumbens	5271	PI-344767	Mar.	VL								
Brachiaria dictyoneura	140	PI-153053	Sep.	VL	x					x		x
Brachiaria dictyoneura	4842	PI-316446			x							
Brachiaria humidicola	924	PI-257678			x							x
Brachiaria mutica	4651	PI-316447			x							
Brachiaria ruziziensis	4986	PI-338220			x							
Brachiaria ruziziensis	4987	PI-338221	June	VL								
Brachiaria ruziziensis	4988	PI-338225	June	VL								
Brachiaria ruziziensis	5174	PI-344764	Mar.	VL								
Brachiaria ruziziensis	5175	PI-344765	Mar.	VL								
Brachiaria ruziziensis	5269	PI-347236	Mar.	VL								
Brachiaria ruziziensis	5270	PI-347237	Mar.	VL								
Bromus unioloides	4580	PI-316176			x							
Bromus willdenowii	4581	PI-164347			x							
Cajanus indica var. Norman	1050	PI-218066			x				x			
Cajanus indicus	4582	PI-304646			x							
Callicarpa formosana	4940	PI-324954			x							
Callicarpa japonica	4941	PI-316359			x							
Cassia alata	4180	PI-164034			x							
Cassia angulata	4278	PI-322312			x							
Cassia bicapsularis	4279	PI-322313			x							
Cassia bicapsularis	4280	PI-322314			x							
Cassia flexuosa	4283	PI-322318			x							
Cassia sp.	4290	PI-322325			x							
Cassia sp.	4291	PI-322326			x							
Castanea mollissima	2844	PI-70314			x				x			
Castanea mollissima	4532	PI-58602			x							
Cenchrus ciliaris	137	PI-155084			x							x

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Table of PI Accessions under test, in production, or otherwise for BROOKSVILLE, FLORIDA PMC, Year 1970

SPECIES	ACCESSIONS		STATUS									
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Cenchrus ciliaris	678	PI-153671			x	x						
Cenchrus ciliaris	1502	PI-271198			x	x				x		
Cenchrus ciliaris	4783	PI-165749			x							
Centrosema kermesi	4293	PI-322328			x							
Centrosema pubescens	3872	PI-316190			x							
Centrosema pubescens	3873	PI-316191			x							
Centrosema pubescens	3876	PI-316194			x							
Centrosema pubescens	3877	PI-316195			x							
Centrosema pubescens	3879	PI-316197			x							
Centrosema pubescens	3880	PI-316198			x							
Centrosema pubescens	4295	PI-322330			x							
Centrosema pubescens	4296	PI-322331			x							
Centrosema pubescens	4297	PI-322332			x							
Centrosema pubescens	4298	PI-322333			x							
Centrosema pubescens	4299	PI-322334			x							
Centrosema sp.	4300	PI-322338			x							
Centrosema sp.	4301	PI-322339			x							
Centrosema sp.	4303	PI-322341			x							
Centrosema sp.	4305	PI-322344			x							
Centrosema sp.	4309	PI-322350			x							
Centrosema sp.	4311	PI-322352			x							
Centrosema sp.	4314	PI-322355			x							
Centrosema virginianum	4302	PI-322340			x							
Centrosema virginianum aff.	4306	PI-322345			x							
Centrosema virginianum aff.	4307	PI-322348			x							
Centrosema virginianum	4308	PI-322349			x							
Centrosema virginianum	4316	PI-322336			x							
Chloris caribaea	4844	PI-203626			x							
Chloris castilloniana	4585	PI-316200			x							
Chloris gayana	4181	PI-316411			x							

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Table of PI Accessions under test, in production, or otherwise for BROOKSVILLE, FLORIDA PMC, Year 1970

SPECIES	ACCESSIONS		STATUS									
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Chloris gayana	4586	PI-316203			x							
Chloris gayana	4845	PI-317342			x							
Chloris gayana	4847	PI-203519			x							
Chloris gayana	4848	PI-298981			x							
Chloris gayana	4849	PI-298982			x							
Chloris gayana	4850	PI-298983			x							
Chloris gayana	4851	PI-298984			x							
Chloris gayana	4852	PI-318747			x							
Chloris gayana	4853	PI-319460			x							
Chloris gayana	4854	PI-319461			x							
Chloris gayana	4855	PI-319462			x							
Chloris gayana	4856	PI-319463			x							
Chloris gayana	4857	PI-319464			x							
Chloris gayana	4858	PI-316202			x							
Chloris latisquamea	4860	BN-18941			x							
Clitoria laurifolia	4317	PI-322357			x							
Clitoria laurifolia	4318	PI-322358			x							
Clitoria ternatea	4319	PI-322364			x							
Clitoria ternatea	4320	PI-322365			x							
Clitoria ternatea	4321	PI-322366	April	G	x				x			
Cotoneaster racemiflora	5260	PI-297599	Feb-Mar	VL								
Crotalaria anagyroides	4323	PI-322369			x							
Crotalaria anagyroides	4325	PI-322371			x							
Crotalaria balansae	4324	PI-322370			x							
Crotalaria brachystachya	4322	PI-322367			x							
Crotalaria brachystachya	4326	PI-322372			x							
Crotalaria brachystachya	4327	PI-322373			x							
Crotalaria eriocarpa	4328	PI-322374			x							
Crotalaria grantiana	4329	PI-322375			x							

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Table of PI Accessions under test, in production, or otherwise for BROOKSVILLE, FLORIDA PMC, Year 1970

SPECIES	ACCESSIONS		STATUS									
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Crotalaria incana	4345	PI-322402			x							
Crotalaria incana	4348	PI-322405			x							
Crotalaria incana	4588	PI-304647			x							
Crotalaria incana	4590	PI-165715			x							
Crotalaria intermedia	4589	PI-304648			x							
Crotalaria juncea	4182	PI-316208			x							
Crotalaria lanceolata	4331	PI-322378			x							
Crotalaria lanceolata	4332	PI-322379			x							
Crotalaria lanceolata	4343	PI-322399			x							
Crotalaria lanceolata	4349	PI-322408			x							
Crotalaria orixensis	3933	PI-186303			x							
Crotalaria paulina	4333	PI-322380			x							
Crotalaria pilosa	4334	PI-322381			x							
Crotalaria saltiana	4335	PI-322382			x							
Crotalaria saltiana	4336	PI-322383			x							
Crotalaria saltiana	4337	PI-322384			x							
Crotalaria saltiana	4338	PI-322386			x							
Crotalaria saltiana	4339	PI-322387			x							
Crotalaria saltiana	4340	PI-322388			x							
Crotalaria saltiana	4341	PI-322389			x							
Crotalaria sp.	4342	PI-322398			x							
Crotalaria sp.	4344	PI-322400			x							
Crotalaria sp.	4347	PI-322404			x							
Crotalaria sp.	4350	PI-322409			x							
Crotalaria sp.	4447	PI-172277			x							
Crotalaria spectabilis	4346	PI-322403			x							
Crotalaria spectabilis	4885	PI-316944			x							
Crotalaria spectabilis	4886	PI-316945			x							
Crotalaria stipularia	4351	PI-322394			x							
Crotalaria stipularia	4352	PI-332395			x							

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Table of PI Accessions under test, in production, or otherwise for BROOKSVILLE, FLORIDA PMC, Year 1970

SPECIES	ACCESSIONS		STATUS									
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Crotalaria stipularia	4887	PI-316946			x							
Crotalaria stipularia	4888	PI-316947			x							
Crotalaria usaramoensis	4353	PI-322396			x							
Cynodon dactylon	1651	BN-4158			x							
Desmodium cinerascens	1754	PI-282691	April	G					x			
Desmodium heterocarpon	4576	PI-217910	April	G	x				x			
Desmodium intortum	4184	PI-316213			x							
Desmodium neomexicanum	4193	PI-312130			x							
Desmodium nicaraguense	4190	PI-311105			x							
Desmodium scorpiurus	4396	PI-322474			x							
Digitaria decumbens	139	PI-111110	July	VL	x	x						
Digitaria macroglossa	3842	PI-299648	June	VL	x				x			
Digitaria milanjiana	5384	PI-299655	July	VL								
Digitaria pentzii	3844	PI-299702			x							
Digitaria pentzii	3845	PI-299752			x							x
Digitaria setivalva	4751	PI-299795			x							
Digitaria smutsii	3846	PI-299828			x							x
Digitaria sp.	3107	PI-300935			x							x
Dioclea sp.	4431	PI-322526			x							
Dioclea sp.	4432	PI-322527			x							
Dolichos axillaris	4443	PI-322528			x							
Dolichos lablab	4436	PI-322531	April	G					x			
Dombeya sp. aff. burgessiae	4262	PI-205654			x							
Echinochloa polystachya	5274	PI-344771	March	VL								
Elaeagnus umbellata	4009	BN-14518			x							
Eleocharis dulcis	4646	PI-106274			x							
Eleusine tristachya	4861	PI-331691			x							
Eragrostis chloromelas	4042	PI-234209			x				x			
Eragrostis chloromelas	4044	PI-276036			x							x
Eragrostis curvula	3942	PI-299924			x							x

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Table of PI Accessions under test, in production, or otherwise for BROOKSVILLE, FLORIDA PMC, Year 1970

SPECIES	ACCESSIONS		STATUS									
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Eragrostis curvula	3943	PI-299925			x							x
Eragrostis curvula	3944	PI-299926			x							x
Eragrostis curvula	4593	PI-299911			x							
Eragrostis curvula	4594	PI-299917			x							
Eragrostis curvula	4595	PI-299918			x							
Eragrostis curvula	4596	PI-299919			x							
Eragrostis curvula	4597	PI-310403			x							
Eragrostis robusta	1580	PI-234218	June	G	x				x	x		
Eriosema floribundum	4442	PI-322537			x							
Eriosema floribundum	4443	PI-322538			x							
Eriosema sp.	4444	PI-322539			x							
Festuca arundinacea	852	PI-203728			x							
Festuca arundinacea	1079	BN-12464			x							
Galactia acapulcensis	3886	PI-188883			x							
Galactia jussiaeana	4446	PI-322541			x							
Glycine wightii	4599	PI-319475			x							
Glycine wightii	4600	PI-319476			x							
Glycine wightii	4602	PI-319478			x							
Glycine wightii	4603	PI-319479			x							
Glycine wightii	4471	PI-322602			x							
Glycine wightii	4472	PI-322603			x							
Glycine wightii	4473	PI-322604			x							
Glycine wightii	4474	PI-322605			x							
Glycine wightii	4475	PI-322606			x							
Glycine wightii	4476	PI-322607			x							
Glycine wightii	4477	PI-322609			x							
Glycine wightii	4478	PI-322610			x							
Glycine wightii	4479	PI-322611			x							
Glycine wightii	4480	PI-322612			x							
Hemarthria altissima	2534	PI-299993			x	x				x		

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Table of PI Accessions under test, in production, or otherwise for BROOKSVILLE, FLORIDA PMC, Year 1970

SPECIES	ACCESSIONS		STATUS									
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Hemarthria altissima	2535	PI-299994			x	x			x	x		
Hemarthria altissima	2536	PI-299995			x	x			x	x		x
Hemarthria altissima	2569	PI-299039			x							x
Hemarthria altissima	5418	PI-349796	Aug.	VL								
Hemarthria altissima	5419	PI-349797	Aug.	VL								
Hemarthria altissima	5420	PI-349798	Aug.	VL								
Indigofera pseudotinctoria	4533	PI-197075	June	G						x		
Ischaemum indicum	5273	PI-344770	March	VL								
Lespedeza cuneata	351	BN-12470			x				x			
Lespedeza cuneata	4455	PI-322551			x							
Lespedeza cuneata	4755	PI-246769			x							
Lespedeza cuneata	4756	PI-310409			x							
Lespedeza japonica	4758	BN-3528			x							
Lespedeza maximowiczi	4760	BN-2230			x							
Lespedeza pilosa	4761	PI-246771			x							
Lespedeza serpens	4527	PI-297385			x							
Leucaena leucocephala	3881	PI-316263			x							
Leucaena leucocephala	4619	PI-304650			x							
Liriope graminifolia	4018	BN-10762	Jan.	VL	x				x			
Liriope sp.	4019	BN-11069			x							
Lonicera maackii podocarpa	3208	BN-8318			x							
Lotus corniculatus	4457	PI-322556			x							
Lupinus angustifolius	114	BN-11281								x		
Lupinus elegans	11	PI-185099			x					x		
Medicago ciliaris	1921	PI-292415			x				x			
Melinis minutiflora	4621	PI-319484			x							
Oleo europea	3096	PI-298030			x							
Ornithopus compressus	4604	PI-284130			x							
Panicum amarulum	3977	BN-14005			x							
Panicum amarum	4014	BN-10581			x							

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Table of PI Accessions under test, in production, or otherwise for BROOKSVILLE, FLORIDA PMC, Year 1970

SPECIES	ACCESSIONS		STATUS									
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Panicum coloratum	1072	PI-263603			x							x
Panicum coloratum	3964	PI-300041			x							
Panicum maximum	1621	PI-156080			x							x
Panicum maximum	1647	PI-259573			x				x			
Panicum maximum	4215	PI-316303			x							
Panicum maximum	4863	PI-337660			x							
Panicum sp.	4865	PI-331347			x							
Panicum texanum	639	BN-11637			x					x		
Panicum virgatum	686	BN-10825			x							
Panicum virgatum	687	BN-10826			x							
Panicum virgatum	1422	BN-11362			x							
Panicum virgatum	3981	BN-8574			x							
Panicum virgatum	3989	BN-8617			x							
Panicum virgatum	3991	BN-10860			x							
Panicum virgatum	4674	BN-17099			x							
Panicum virgatum	4771	BN-8566			x							
Panicum virgatum	4772	BN-8567			x							
Panicum virgatum	4773	BN-9009			x							
Panicum virgatum	4774	BN-9985			x							
Panicum virgatum	4776	BN-9704			x							
Panicum virgatum v. cubense	3968	PI-315728			x							
Panicum virgatum v. cubense	4775	BN-9195			x							
Paspalum boscianum	3635	PI-310047			x				x			
Paspalum boscianum	3639	PI-310051			x							x
Paspalum cromyorhizon	3647	PI-310059			x				x			
Paspalum cromyorhizon	4931	PI-276242			x							
Paspalum notatum v. saurae	358	BN-1309			x	x						
Pennisetum clandestinum	5272	PI-344768	March	VL								
Pennisetum hybrid	3889	BN-17962			x							
Pennisetum purpureum	4168	PI-304751			x				x			

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Table of PIAccessions under test, in production, or otherwise for BROOKSVILLE, FLORIDA PMC, Year 1970

SPECIES	ACCESSIONS		STATUS									
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Pennisetum purpureum	4255	PI-300086			x							
Pennisetum purpureum	4747	PI-300086			x							
Pennisetum sp.	4782	BN-13577			x							
Periandra heterophylla	4459	PI-322570			x							
Phalaris arundinacea	4716	PI-297362			x							
Phalaris arundinacea	4731	PI-236525			x							
Phaseolus atropurpureus	4460	PI-322575			x							
Phaseolus atropurpureus	4461	PI-322576			x							
Phaseolus atropurpureus	4462	PI-322577			x							
Phaseolus atropurpureus	4463	PI-322578			x							
Phaseolus atropurpureus	4464	PI-322579			x							
Phaseolus atropurpureus	4465	PI-322581			x							
Phaseolus atropurpureus	4622	PI-316339			x							
Phaseolus lathyroides	4156	PI-153704			x							
Phaseolus lathyroides	4466	PI-322591			x							
Phaseolus lathyroides	4467	PI-322592			x							
Phaseolus lathyroides	4468	PI-322593			x							
Pistacia atlantica	4557	PI-246336			x							
Pistacia atlantica	4558	PI-246337			x							
Pistacia atlantica	4559	PI-276701			x							
Pistacia atlantica	4560	PI-276702			x							
Pistacia atlantica	4561	PI-276703			x							
Pistacia chinensis	5204	PI-21970	Jan.	VL					x			
Pistacia terebinthus	4562	PI-91608			x							
Pistacia terebinthus	4563	PI-246341			x							
Pistacia terebinthus	4564	PI-246342			x							
Pistacia vera	4565	PI-121776			x							
Pistacia vera	4566	PI-17250			x							
Pistacia vera	4567	PI-12815			x							
Pterocarya stenoptera	4836	PI-61938	Jan.	VL					x			

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Continuation sheet no. 12

Table of PI Accessions under test, in production, or otherwise for BROOKSVILLE, FLORIDA PMC, Year 1970

SPECIES	ACCESSIONS		STATUS									
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Quercus acutissima	3295	PI-168939			x							
Quercus acutissima	4837	PI-54433			x				x			
Quercus myrsinaefolia	4838	PI-74222			x				x			
Quercus pumila	4008	BN-10352			x							
Rhododendron sp.	5283	PI-337618	Apr-Jun	VL								
Rhododendron sp.	5284	PI-337619	Apr-Jun	VL								
Rhododendron kanchirai	5285	PI-325026	Apr-Jun	VL								
Rhododendron oldhamii	5286	PI-325036	Apr-Jun	VL								
Rhynchosia minima	4445	PI-322540			x							
Rhynchosia minima	4481	PI-322614			x							
Rhynchosia minima	4482	PI-322615			x							
Rhynchosia minima	4485	PI-322619			x							
Rhynchosia minima	4488	PI-322622			x							
Rhynchosia minima	4490	PI-322624			x							
Rhynchosia phaseoloides	4483	PI-322616			x							
Rhynchosia phaseoloides	4484	PI-322617			x							
Rhynchosia sp.	4486	PI-322620			x							
Rhynchosia sp.	4487	PI-322621			x							
Rhynchosia sp.	4489	PI-322623			x							
Rhynchosia sp.	4491	PI-322625			x							
Salix purpurea nana	4833	BN-8950			x							
Salix sp.	4743	BN-13667			x							
Salix sp.	4744	BN-13679			x							
Salix sp.	4745	BN-13671			x							
Sesbania punicea	4494	PI-322628			x							
Setaria longiseta	4607	PI-315885			x							
Setaria sphacelata	4869	PI-316468			x							
Setaria sphacelata	4868	PI-316465			x							
Setaria sphacelata	4870	PI-319489			x							
Stylosanthes gracilis	4497	PI-322635	April	G					x			
Stylosanthes gracilis	4498	PI-322636			x							
Stylosanthes gracilis	4499	PI-322637	April	G	x				x			

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Continuation sheet no. 13

Table of PIAccessions under test, in production, or otherwise for BROOKSVILLE, FLORIDA PMC, Year 1970

SPECIES	ACCESSIONS		STATUS									
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Stylosanthes guyanensis	4503	PI-322642			x							
Teramnus uncinatus	4508	PI-322664			x							
Teramnus uncinatus	4509	PI-322665			x							
Teramnus uncinatus	4510	PI-322666			x							
Teramnus uncinatus	4511	PI-322667			x							
Teramnus uncinatus	4512	PI-322668			x							
Teramnus uncinatus	4513	PI-332669			x							
Teramnus uncinatus	4514	PI-322670			x							
Teramnus uncinatus	4515	PI-322671			x							
Teramnus volubilis	4516	PI-322672			x							
Tetrachne dregei	4613	PI-300137			x							
Trifolium amabile	4047	PI-194827			x							
Trifolium clypeatum	4612	PI-308079			x							
Trifolium repens	3922	PI-300147			x							
Trifolium resupinatum	2223	PI-268432			x							
unidentified legume	3866	BN-6028			x							
Vicia benghalensis	4795	PI-220880			x							
Vicia cordata	4093	PI-121275			x							
Vicia ervilia	4796	BN-14040			x							
Vicia ervilia	4797	BN-14041			x							
Vicia pannonica	2975	PI-170008			x							
Vicia sativa	3018	PI-228301			x				x			
Vicia sativa	3019	PI-228305			x							
Vicia sativa	3020	PI-230362			x				x			
Vicia sp.	5071	BN-19650			x				x			
Vicia villosa	3048	PI-229970			x							
Zornia diphylla	4519	PI-322685			x							
Zornia diphylla	4520	PI-322686			x							
Zoysia japonica	4011	BN-8120			x							

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U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

TABLE OF PI ACCESSIONS UNDER TEST, IN PRODUCTION OR OTHERWISE FOR THE Coffeeville, Miss. PLANT MATERIALS CENTER FOR THE YEAR 1970

SPECIES	ACCESSIONS		STATUS									
			INITIAL EVALUATIONS									
			This Year		Former Years							
	Center / Number	PI, BN, or Other No.	Planted	Germination		Advanced Evaluations	Developing Cultural Management	Field Evaluation Plantings	Initial Increase	Field Scale Increase	Breeder or Foundation Fields	Seed orchard Holding block, or Other
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Adesmia angustifolia	3110	283159	10-30-69	GD								
" "	3111	285103	"	GD								
" "	3112	285104	"	GD								
" bicolor	3113	323407	"	NG								
" microphylla	3114	285109	"	NG								
" muricata	3115	186274	"	NG								
" "	3116	238221	"	NG								
" "	3117	285110	"	NG								
" tenella	3119	285113	"	NG								
" "	3118	285112	"	NG								
" "	3120	285114	"	NG								
Agropyron elongatum	3011	142012	"	GL								
" "	3012	98526	"	GL								
" "	3013	150123	"	GL								
" "	3017	119603	"	NG								
" "	3019	283164	"	GL								
" "	3020	297871	"	GL								
" "	3021	315352	"	GL								
" "	3028	98526	"	GL								
" "	3029	179169	"	CL								
" "	3030	204383	"	GL								
" "	3031	205279	"	GL								
" "	3032	206622	"	GL								
" "	3033	206623	"	GL								

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Continuation sheet no. 2

Table of PI Accessions under test, in production, or otherwise for Coffeeville, Miss. PMC, Year 1970

SPECIES	ACCESSIONS		STATUS									
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Agropyron elongatum	3034	206624	10-30-69	GL								
" "	3035	222958	"	GL								
" "	3036	222959	"	GD								
" "	3037	234708	"	NG								
" "	3038	249144	"	GL								
" "	3039	251443	"	GL								
" "	3040	255146	"	GL								
" "	3041	255148	"	GL								
" "	3042	255149	"	GL								
" junceum	2695	297873	"	GL								
" obtusiusculum	387	261099			1962				x			
" pectiniforme	2696	297874	10-30-69	GD								
Andropogon gerardi	139	9982-59			1961							
Alnus mayerii	2902	317356			1968							
Arachis glabrata	955	162801			1969							
" monticola	528	263393			1965			x		x		
Atriplex atacamensis	3048	330655	10-30-69	NG								
" canescens	3050	330657	"	NG								
" " v.linearis	3051	330658	"	NG								
" halimus	3052	330659	"	NG								
" lentiformis	3053	330661	"	NG								
" leucoclada	3054	330662	"	NG								
" " v.turcomanica	3055	339807	"	NG								
" muelleria	3056	330663	5-19-70	NG								
" nummularia	3057	330664	5-19-70	NG								
" polycarpa	3058	330665	"	NG								
" pseudocampanulata	3059	330666	"	NG								
" rosea	3060	330667	"	NG								
" sp.	3062	330670	"	NG								
" "	3063	330671	"	NG								

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Continuation sheet no. 3

Table of PI Accessions under test, in production, or otherwise for Coffeeville PMC, Miss. PMC, Year 3

SPECIES	ACCESSIONS		STATUS									
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Atriplex verrucifera	3065	330697	5-19-70	NG								
" vesicaria	3064	330669	"	NG								
Bothriocloa intermedia v.indica	2910	6580			1969							
Bromus erectus	805	254881			1963							
" "	807	251106			1963							
" "	808	253301			1963							
" "	809	251107			1963							
" inermis	2957	314071	10-30-69	GL								
" papovii	757	283197			1963							
" sitchensis	1924	292257			1965							
" unioloides	1925	292258			"							
" "	2697	316176	10-30-69	GL								
" "	2698	316177	"	GL								
" willdenowii	1907	284107			1965							
" "	1908	284109			"							
" "	1909	284110			"							
" "	1910	284111			"							
" "	1911	284112			"							
" "	1912	284788			"							
" "	2699	164347	10-30-69	GL								
Castanea sp.,	157	58602			1961							
Castanopsis sp. scherophylla	359	95630	12-4-69	NG						x		
" chrysophylla	2949	244348	"	NG						x		
" schlerophylla	3171	58394	"	GL						x		
Chloris acidularis	2958	23825			1969							
" castilloniana	2959	316200			"							
" cucullata	2960	315683			"							
" myriostachya	2985	20213			"							
" pectinata	2986	238260			"							
" pycnothrix	2987	199955			"							
" roxburghiana	2980	207632			"							

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Continuation sheet no. 4

Table of PI Accessions under test, in production, or otherwise for Coffeeville, Miss. PMC, Year 1970

SPECIES	ACCESSIONS		STATUS									
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Chloris roxburghiana	2980	207632			1969							
" truncata	2988	279931			"							
" ventricosa	2989	257692			"							
Coronilla Crown varia	485	204871			1966							
" " "	486	206487			"							
" " "	487	210365			"							
" " "	489	228411			"							
" " "	491	229968			"							
" " "	492	238142			"							
" " "	493	251808			"							
" " "	494	253435			"							
" " "	495	274040			"							
" " "	496	274041			"							
" " "	497	278698			"							
" parviflora	2873	283240	5-20-70	NG								
Cotoneaster racemiflora	2936A	297597			1969					x		
Cynodon dactylon	2990	325282	5-22-70	NG								
" "	2991	325283	"	NG								
Cytisus decumbens	3129	315686	10-30-69	NG								
" mollis	3131	338638	"	GL								
" nigricans	3132	331437	"	NG								
" sp.	3135	251327	"	NG								
" supinus	3136	315688	"	NG								
" triflorus	3137	331438	"	NG								
Digitaria eriantha	522	106663			1965						x	
" pentzii	2605	302766			1967							
" setivalva	2607	299800			1967							
" smutsii	2609	299826			"							
" sp.	2606	286505			"							
" valida	2612	299858			"							

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Continuation sheet no. 5

Table of PI Accessions under test, in production, or otherwise for Coffeeville, Miss. PMC, Year 1970

SPECIES	ACCESSIONS		STATUS									
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Digitaria pentzii	2605	302766			1967							
" setivalva	2607	299800			"							
" smutsii	2609	299826			"							
" sp.	2606	286505			"							
" valida	2612	299858			"							
" "	2616	299878			"							
" "	2619	299879			"							
Echinochloa crusgallis	2992	325314			1969							
" haplocladia	3074	226065			"							
" holubii	924	207924			1964							
" sp.	2993	331385			1969							
" sp.	2994	331387			"							
Eleocharis dulcis	1642	106274			1964							
Eragrostis robusta	443	234218			1967					x		
Euonymus fortunei	2379	295073			1966							
Eurya crenatifolia	3215	324975	4-23-70	GL								
Festuca ampla	275	238315			1962							
" "	688	240157			"							
" arundinacea	691	264766			1964							
" "	2262	302996			1967							
" "	2329	203728			"							
" "	2707	292602	10-30-69	GD								
" "	2708	292603	"	GD								
" elatoir	2411	270399			1966							
Glycine ussuriensis	128	163453			1967					x		
Helictotrichon asperum	2763	271524	10-30-69	NG								
" hookeri	2760	234767	"	NG								
" "	2761	234879	"	NG								
Hemarthria altissima	2916	299993			1968							
" "	2917	299039			"							
" "	2918	299994			"							

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Continuation sheet no. 6

Table of PI Accessions under test, in production, or otherwise for Coffeeville, Miss. PMC, Year 1970

SPECIES	ACCESSIONS		STATUS									
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Hemarthria altissima	2918	299994			1968							
" "	2919	299995			"							
Hydrangea integrifolia	3216	985	4-20-70	VL								
" scandens	3217	226119	"	VD								
Ilex cassine	3009	254592			1969							
" montana v.macropoda	3010	316703			"							
Kochia brevifolia	3067	330672			1969							
" indica	3069	330674			"							
Lespedeza cuneata	279	246769			1965							
" "	2535	310409			1967							
" intermixta	280	246770			1965							
" japonica	1643	90664			1964		x					
" pilosa	282	246771			1963							
" virgata	126	218004			1965	x		x		x		
Malus baccata	151	99907			1961							
" hupehensis	150	122586			"			x		x		
Metasequoia glyptostroboides	1729	286608										
Oryzopsis miliacea	3073	330678	5-20-70	GD								
" holciformis	3072	330716	5-15-70	GD								
Panicum antidotale	380	275096			1966							
" "	2726	300034			1968							
" coloratum	2543	300039			1967							
" stapfianum	2727	300058			1968							
" "	2874	145794			"							
" "	2876	206371			"							
Pappaphorum sp.	2998	331155			1969							
Paspalum cromyorhizon	1985	276242			"							
" "	3213	310059	1970	GL								
" "	3214	310070	4-17-70	GL								
" "	3251	310061	"	GL								

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Continuation sheet no. 7

Table of PI Accessions under test, in production, or otherwise for Coffeeville, Miss. PMC, Year 1970

SPECIES		ACCESSIONS		STATUS									
(1)		(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Paspalum	nicorae	904	276248			1969							
"	"	906	202044			"							
"	"	1000	209983			"							
"	"	1001	283020			"							
"	"	3080	304003			"							
"	"	3081	304004			"							
"	"	3082	310128			"							
"	"	3083	310129			"							
"	"	3084	310130			"							
"	"	3085	310131			"							
"	"	3086	310132			"							
"	"	3087	310133			"							
"	"	3088	310134			"							
"	"	3089	310135			"							
"	notatum	2023	276251			1965							
"	"	3003	337564			1969							
"	"	3005	331156			"							
"	plicatulum	2031	276253			"							
"	"	3091	299070			"							
"	"	3092	304025			"							
"	"	3093	304027			"							
"	"	3094	304029			"							
"	"	3095	304030			"							
"	"	3096	304031			"							
"	"	3097	304032			"							
"	"	3098	304035			"							
"	"	3099	304036			"							
"	"	3101	310234			"							
"	"	3102	310239			"							
"	"	3103	310244			"							

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Continuation sheet no. 8

Table of PI Accessions under test, in production, or otherwise for Coffeeville, Miss. PMC, Year 1970

SPECIES	ACCESSIONS		STATUS									
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Paspalum plicatulum	3104	310246			1969							
" "	3105	310247			"							
" "	3106	310287			"							
" "	3107	310291			"							
" "	3108	312896			"							
" "	3140	339896	5-15-70	GL								
" "	3141	339897	5-20-70	"								
" quadrifarium	2033	161886			1965							
" "	2034	283022			"							
" sp.	3192	347536	5-15-70	GL								
" vaginatum	2061	284500			1965							
Pennisetum sp.	484	271603			1968							
" "	2728	315868			"							
" "	3122	304751			1969							
" spicatum	2978	337999			"							
Phalaris arundinacea	2840	297362			1968							
Phyllostachys bissetii	499	143540			1962			x		x		
" meyerii	498	116768			"							
Pinus koraiensis	2903	316977			1968							
" "	2904	317255			"							
" "	2905	317256			"							
" sylvestris	3142	343945			1969							
" "	3143	343946			"							
Pistacia atlantica	2500	276701			1967							
" "	2501	276702			"							
" "	2502	276703			"							
" chinensis	2182	21970			1965							
Poa angustifolia	3241	251251	5-19-70	NG								
" australis	3242	209102	"	"								

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Continuation sheet no. 9

Table of PI Accessions under test, in production, or otherwise for Coffeeville, Miss. PMC, Year 1970

SPECIES	ACCESSIONS		STATUS									
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Poa iridifolia	3243	285254	5-19-70	NG								
" ligularis	3244	284255	"	"								
" pilcomay	3245	337592	"	"								
Psoralea adscendens	2804	238351			1968							
" bituminosa	780	283969			1963							
" eriantha	2888	287922			1968							
" tenax	2884	246747			1968							
Pterocarya stenoptera	3188	61938	4-70	GL								
Quercus acutissima	2	76481			1961							
" "	3	168939			1962					X		
" myrsinaefolia	6	74222			1960							
" "	2433	74227			1960							
Robinia pseudacacia	2906	257022			1968							
Salix purpurea	1972	266477			1965							
" repens v.rosmarinifolia	843	265667			1963							
" x chrysostala	843	265663			1963							
Sasa pygmaea	838	52674			1963							
Setaria argentina	2066	186965			1966							
" gerrardi	2073	208303			1967							
" italica	2081	230136			1966							
" macrostachya	2082	217229			1966							
" "	2083	229129			"							
" "	2084	229131			"							
" neglecta	2548	300110			1967							
" sphacelata	2848	284477			1968							
" "	2890	280125			"							
" "	2894	314881			"							
" "	2895	314882			"							
Sporobolus virginicus	3296	287252	10-26-69	VL								
" "	3297	300126	"	VL								
Stipa barbata	3006	330722	10-30-69	GL								

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Continuation sheet no. 10

Table of PI Accessions under test, in production, or otherwise for Coffeeville, Miss. PMC, Year 1970

SPECIES	ACCESSIONS		STATUS									
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Tetrachne dregei	2926	300136			1968							
Tetragonolobus siliquosus	2806	204884			1968							
Themeda anathera	478	218114			1967							
" australis	1859	281968			1965							
" triandra	1860	206349			1965							
" "	1863	207932			1965							
" "	1867	208198			"							
" "	1870	276070			"							
Tridens brasiliensis	2909	310319			1968							
" muticus	2900	241079			"							
Trifolium incarnatum	3138	338673			1969							
" "	3139	338674			"							
" vesiculosum	329	233782			1967			x		x	x	
Viburnum x rhytidophylloides	3256	316675	4-23-70	VL								
" lantana	3219	316679	"	VL								
" "	3257	316679	"	VL								
" dilatatum x lobophyllum	3258	316676	"	VL								
" sargentii	3259	316681	"	VL								
Vicia sativa	2745	289483			1968							
Zoysia japonica	340	231060			1961							x
" "	341	235334			"							x
" "	2841	324184			1968							x
" matrella	343	264343			1961							x

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U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

TABLE OF P I ACCESSIONS UNDER TEST, IN PRODUCTION OR OTHERWISE FOR THE JAMES E."BUD" SMITH PLANT MATERIALS CENTER FOR THE YEAR 1970

SPECIES	ACCESSIONS		STATUS									
			INITIAL EVALUATIONS									
			This Year		Former Years							
GRASSES	Center PMT Number	PI, BN, or Other No.	Planted	Germination		Advanced Evaluations	Developing Cultural Management	Field Evaluation Plantings	Initial Increase	Field Scale Increase	Breeder or Foundation Fields	Seed orchard Holding block, or Other
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Agropyron elongatum	659	PI-150123			x							
Agropyron elongatum	928	PI-109452			x							
Agropyron elongatum	2126	PI-283163	x	G								
Agropyron elongatum	2127	PI-283164	x	G								
Agropyron intermedium	929	PI-131532			x							
Agropyron juncium	1195	PI-281863			x							
Agropyron juncium	2129	PI-292580	x	G								
Agropyron juncium	2131	PI-297873	x	G								
Agropyron obtusinaculum	931	PI-261099			x							
Agropyron scabrifolium	2132	PI-297875	x	G								
Agropyron trichophorum	932	PI-106831			x							
Agropyron tsukushiense	1197	PI-283170			x							
Bothriochloa ischaemum	1128	PI-161669			x							
Bothriochloa ischaemum	1129	PI-171397			x							
Bothriochloa ischaemum	1131	PI-269364			x							
Bothriochloa ischaemum	1132	PI-263192			x							
Bothriochloa ischaemum	1133	PI-253444			x							
Bromus willdenowii	1338	PI-315677			x							
Bromus willdenowii	2231	PI-164347	x	G								
Chrysopogon fulvus	973	PI-215586			x							
Chrysopogon fulvus	1301	PI-213885			x							
Cymbopogon distans	1350	PI-271552			x							
Cynodon plectostachys	1524	PI-224693			x							
Desmostachya bipinnata	1351	PI-268417			x							
Elymus arenarius	2140	PI-297344	x	G								

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Continuation sheet no. 1

Table of PI Accessions under test, in production, or otherwise for JAMES E. "BUD" SMITH PMC, Year 1970

SPECIES	ACCESSIONS		STATUS									
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Elymus giganteus	1211	PI-108491			x							
Elyonurus hirsutus	1353	PI-271565			x							
Elyonurus hirsutus	1354	PI-271566			x							
Eragrostis atherstonei	1303	PI-276033			x							
Eragrostis lehmanniana	732	PI-295698			x						x	
Eragrostis curvula	718	PI-295689			x					x		
Eragrostis curvula	729	PI-295702			x					x		
Eragrostis lehmanniana	1373	PI-299936			x							
Eragrostis lehmanniana	1374	PI-299937			x							
Eragrostis lehmanniana	1375	PI-299938			x							
Eragrostis superba	1140	PI-295704			x							
Eragrostis superba	1405	PI-299959			x							
Festuca ampla	1199	PI-283275			x							
Festuca ampla	1558	PI-238315			x							
Festuca arundinacea	1200	PI-203728			x							
Festuca arundinacea	1546	PI-292602			x							
Festuca arundinacea	1547	PI-292603			x							
Festuca arundinacea	1548	PI-316243			x							
Festuca arundinacea	1549	PI-316245			x							
Festuca arundinacea	1550	PI-316246			x							
Festuca arundinacea	1551	BN-15608			x							
Festuca arundinacea	2229	PI-292604	x	G								
Festuca elatior	2230	BN-15609	x	G								
Festuca orientalis	1202	PI-283314			x							
Festuca uechtritziana	1203	PI-283324			x							
Hemarthria altissima	1532	PI-299993			x							
Hemarthria altissima	2167	PI-299994			x							
Hordium bulbosum	1204	PI-274910			x							
Hordium bulbosum	2142	PI-287840	x	G								
Hordium bulbosum	2143	PI-306731	x	G								

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Continuation sheet no. 2

Table of PIAccessions under test, in production, or otherwise for JAMES E. "BUD" SMITH PMC, Year 1970

SPECIES	ACCESSIONS		STATUS									
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Panicum amarulum	1410	BN-2258			x							
Panicum amarulum	1411	BN-8360			x							
Panicum amarulum	1412	BN-8627			x							
Panicum amarulum	1413	BN-14005			x							
Panicum anceps	1409	BN-13553			x							
Panicum antidotale	1414	PI-284151			x							
Panicum antidotale	1415	PI-300034			x							
Panicum antidotale	1706	PI-268410			x							
Panicum antidotale	1707	PI-271590			x							
Panicum antidotale	1708	PI-271589			x							
Panicum coloratum	10	PI-166400								x		
Panicum coloratum	1080	PI-185546			x							
Panicum coloratum	1081	PI-185548			x							
Panicum coloratum	1082	PI-185550			x							
Panicum coloratum	1083	PI-185551			x							
Panicum coloratum	1084	PI-185558			x							
Panicum coloratum	1085	PI-188931			x							
Panicum coloratum	1086	PI-188932			x							
Panicum coloratum	1087	PI-196360			x							
Panicum coloratum	1088	PI-196361			x							
Panicum coloratum	1089	PI-196362			x							
Panicum coloratum	1090	PI-196363			x							
Panicum coloratum	1091	PI-196364			x							
Panicum coloratum	1092	PI-196365			x							
Panicum coloratum	1093	PI-206370			x							
Panicum coloratum	1094	PI-253240			x							
Panicum coloratum	1095	PI-253241			x							
Panicum coloratum	1096	PI-253242			x							
Panicum coloratum	1097	PI-253243			x							
Panicum coloratum	1098	PI-253246			x							

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Continuation sheet no. 3

Table of PI Accessions under test, in production, or otherwise for JAMES E. "BUD" SMITH PMC, Year 1970

SPECIES	ACCESSIONS		STATUS									
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Panicum coloratum	1099	PI-253247			x							
Panicum coloratum	1100	PI-253249			x							
Panicum coloratum	1101	PI-253254			x							
Panicum coloratum	1102	PI-253256			x							
Panicum coloratum	1103	PI-263605			x							
Panicum coloratum	1104	PI-207990			x							
Panicum coloratum	1105	PI-208003			x							
Panicum coloratum	1106	PI-208943			x							
Panicum coloratum	1107	PI-12322			x							
Panicum coloratum	1108	PI-284152			x							
Panicum coloratum	1109	PI-298988			x							
Panicum coloratum	1110	PI-298989			x							
Panicum coloratum	1111	PI-300041			x							
Panicum coloratum	1112	PI-209002			x							
Panicum coloratum	1113	PI-277963			x							
Panicum coloratum	1114	PI-295645			x							
Panicum coloratum	1182	PI-263603			x							
Panicum coloratum	1183	PI-203520			x							
Panicum stapfianum	1115	PI-145794			x							
Panicum stapfianum	1116	PI-178257			x							
Panicum stapfianum	1117	PI-185547			x							
Panicum stapfianum	1118	PI-190326			x							
Panicum stapfianum	1119	PI-190327			x							
Panicum stapfianum	1120	PI-196367			x							
Panicum stapfianum	1121	PI-196368			x							
Panicum stapfianum	1122	PI-198589			x							
Panicum stapfianum	1123	PI-206371			x							
Panicum virgatum	2272	BN-8624			x							
Panicum virgatum	2443	BN-10825	x	VD								
Panicum virgatum	2444	BN-10826	x	VD								

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Continuation sheet no. 4

Table of PI Accessions under test, in production, or otherwise for JAMES E. "BUD" SMITH PMC, Year 1970

SPECIES	ACCESSIONS		STATUS									
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Paspalum chromyorhizon	2196	PI-310059	x	G								
Paspalum nicorae	975	PI-202044			x							
Paspalum nicorae	976	PI-276248			x							
Paspalum notatum	1420	BN-11573			x							
Pennisetum sp.	2168	PI-304751			x							
Phalaris aquatica	1205	PI-284202			x							
Phalaris aquatica	1206	PI-284205			x							
Phalaris aquatica	1544	PI-284241			x							
Phalaris aquatica arundinacea	1207	PI-261030			x							
Phalaris aquatica arundinacea	1208	PI-261030			x							
Phalaris aquatica arundinacea	1545	BN-13575			x							
Phalaris aquatica arundinacea	1561	PI-217441			x							
Phalaris arundinacea	1962	PI-316347	x	G								
Phalaris arundinacea	2056	PI-236525	x	G								
Phalaris arundinacea tuberosa	2218	PI-233707	x	G								
Phalaris coerulescens	1543	BN-15614			x							
Setaria flabellata	2152	PI-300109			x							
Setaria magna	2153	BN-17107			x							
Setaria phanerococcia	2154	PI-299072			x							
Setaria sphacelata	2155	PI-299044			x							
Sporobolus fimbriatus	1422	PI-300123			x				x			
Stipa barbata	2066	PI-33072	x	G								
Stipa capillata	2060	PI-325477	x	G								
Stipa capillata	2065	PI-325478	x	G								
Stipa kirghisorum	2064	PI-310429	x	G								
Stipa lagascae	2063	PI-330723	x	G								
Stipa tortillis	2061	PI-330682	x	G								
Tetrachne dregei	2157	PI-15520	x	G								
Tetragonolobus reqienii	2159	PI-308072	x	G								
Tetrapogon mossambicensis	2160	PI-300139	x	G								

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Continuation sheet no. 5

Table of PI Accessions under test, in production, or otherwise for JAMES E. "BUD" SMITH PMC, Year 1970

SPECIES	ACCESSIONS		STATUS									
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Urochloa mosambicensis	2164	PI-314886			x							
Anthyllis tetraphylla	2134	PI-292846			x							
Arachis monticola	876	PI-263393			x							
Coronilla varia	1502	BN-8094			x							
Coronilla varia	1503	BN-11707			x							
Desmodium angustifolium	1511	PI-316210	x	G								
LEGUMES AND FORBS												
Helianthemum variable	1812	BN-14604			x							
Lespedeza bicolor	1766	BN-8379			x							
Lespedeza pilosa	990	PI-246771			x							
Lotus creticus	2145	PI-292407	x	G								
Lotus creticus	2146	PI-311428	x	G								
Lotus creticus	2147	PI-311429	x	G								
Lotus hispidus	2219	BN-12822	x	G								
Lotus ornithopodioides	2148	PI-308038	x	G								
Lotus ornithopodioides	2149	PI-310413	x	G								
Lotis palustris	2150	PI-2922408	x	G								
Lupinus albus	2223	PI-316276	x	G								
Medicago marina	2151	PI-292417	x	G								
Sanguisorba minor	1517	BN-9017			x							
Sanguisorba minor	1518	PI-287923			x							
Sanguisorba minor	1519	PI-297952			x							
Vicia lutea	2355	PI-249880	x	G								
WOODY PLANTS												
Atriplex canescens	2084	BN-11911	x	VL								
Atriplex canescens	2086	PI-330657	x	G								

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Continuation sheet no. 6

Table of PI Accessions under test, in production, or otherwise for JAMES E. "BUD" SMITH PMC, Year 1970

SPECIES	ACCESSIONS		STATUS									
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Atriplex halimus	2087	PI-330659	x	G								
Atriplex leniformis	2088	PI-330661	x	G								
Atriplex leucoclada var. turcomanica	2097	PI-339807	x	G								
Atriplex nummularia	2091	PI-20664	x	G								
Atriplex polycarpa	2092	PI-330665	x	NG								
Atriplex pseudocampanulate	2093	PI-330666	x	NG								
Atriplex rosea	2094	PI-330667	x	G								
Atriplex sp.	2095	PI-330670	x	G								
Cotoneaster racemiflora	2363	PI-15101	x	VL								
Pistacia atlantica	1578	PI-276703			x							
Pistacia chinensis	1297	PI-21970			x							
Pistacia terebinthus	1582	PI-246342			x							
Quercus acutissima		PI-142294	x	G								
Rosa wichuraina	2386	BN-9235	x	VL								

USDA-SCS-FORT WORTH, TEX. 1970

UNITED STATES DEPARTMENT OF AGRICULTURE

SOIL CONSERVATION SERVICE

Report to S-9 Technical Committee by
A. Sierra-Bracero, with editing by W. C. Young

Plant materials activities in the Caribbean area for the calendar year are summarized.

Twelve Brachiaria species were received during the year. Work was continued with 84 accessions from previous years. They are tabulated below.

CA No.	P.I. or Other Number	Scientific Name	Common Name
		ROD ROW PLANTINGS - 1968 Carryovers	
CA 266	P.I. 299993	Hemarthria altissima	
462	299994	" "	
463	299995	" "	
464	299039	" "	
465	299923	Eragrostis curvula	
466	299924	" "	
467	299925	" "	
468	234209	" chloromelas	
469	276036	" "	
400	292198	Brachiaria brizantha	
401	292179	" "	
402	292182	" "	
269	292183	" "	
470	298975	" "	
482	F- 3842	Digitaria macroglossa	
455	F- 4164	Pennisetum purpureum	
454	P.I.304193	" "	Urukuanu
448	P.I.304188	" "	Cameroon
449	F- 3078	" "	
453	P.I.304192	" "	Pungwe
460	304751	" "	
471	309962	Chloris gayana	
437	300086	Pennisetum purpureum	
458	F- 3889	" sp.	
452	P.I.304190	" purpureum	Gold Coast
457	P.I.291392	" "	
450	F- 1066	" "	
451	F- 3245	" "	Domira
445	P.I.284177	" pedicellatum	
461	P.I.304751	" sp.	

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CA No.	P.I. or Other Number	Scientific Name	Common Name
CA 491	F- 687	Panicum virgatum	
495	F- 2498	" "	
332	F- 1908	" "	
494	F- 686	" "	
492	F- 1668	" "	
493	F- 2499	" "	
477	F- 3089	Cynodon sp.	
478	F- 3092	" "	
479	F- 3093	" "	
481	P.I. 224152	" plectostachyus	
487		" Sp.	Las Marías
480	F- 3777	" dactylon	

ROD-ROW PLANTINGS - 1967 CARRYOVERS

CENCHRUS ASSEMBLED GROUP

CA 190	P.I. 243199	Cenchrus ciliaris	Grasslands
191	253725	" "	Bioela
241		" "	Bildela Strain D.
242		" "	Molopo Strain
243		" "	Numbank Strain
244		" "	Tarewinabar Strain
372	F- 3316	" "	
373	P.I. 299514	" "	
374	299517	" "	
375	299519	" "	
376	299520	" "	
377	299522	" "	
378	299523	" "	
379	299524	" "	
380	299525	" "	
381	299526	" "	
382	299527	" "	
383	299528	" "	
384	299532	" "	
385	299533	" "	
386	299534	" "	
387	299535	" "	
388	299536	" "	
389	299537	" "	

CA No.	P.I. or Other Number	Scientific Name	Common Name
CA 390	P.I. 299538	Cenchrus ciliaris	
391	299539	" "	
392	299540	" "	
393	299541	" "	
394	299542	" "	
395	299543	" "	
396	299544	" "	
397	299545	" "	
398	299546	" "	
423		" "	Higgins
424		" "	Native
425		" "	T-4464
426		" "	El Salvador
427		" "	Cabo Rojo
428		" "	PR-998
224	P.I. 210693	" "	F-61
225	271198	" "	F-1502
371	F- 2303	" "	

INITIAL INCREASES

CA 442	F- 1651	Cynodon dactylon	Tufcote
443	F- 4243	" sp.	Coastcross #1
438	P.I. 247404	Brachiaria ruziziensis	Congo
489	P.I. 288218	Cynodon coursii	
437	P.I. 300086	Pennisetum purpureum	
268	F- 140	Brachiaria dictyoneura	
439	P.I. 299499	" sp.	Tanner
444		Cynodon plectostachyus	Stargrass
248	F- 1334	Arachis sp.	Arblick Peanut
247	F- 135	Arachis glabrata	Arb Peanut
251	P.I. 299632	Digitaria swazilandensis	
152	P.I. 299826	" smutzii	
135	P.I. 299798	" setivalva	
114	P.I. 299752	" pentzii	
112	P.I. 299749	" "	
113	P.I. 299750	" "	
67	P.I. 299695	" milangiana	
490		" decumbens	Hexapangola

FIELD ACTIVITIES

Plant Materials Field Activities in the Caribbean Area have been mostly devoted to the solution of two main soil and water conservation problems: (1) the need for additional high-yielding forage grasses; (2) the need for drough-resistant species capable of providing adequate soil protection and supplying good yields of high quality forage. Lately, some emphasis is being exerted to make a contribution to urban-areas erosion control problems, beautification, and wildlife habitat improvement. To this respect, accessions such as Tufcote Bermudagrass, Arbpeanut, and Ricebean (Phaseolus calcaratus) are being tested under field plantings. Summarized notes on plant performance of accessions under field evaluations follow.

BUFFELGRASS T-4464 - CENCHRUS CILIARIS L.

Buffelgrass T-4464 was first introduced into Puerto Rico by the Soil Conservation Service in 1959. Field plantings were initially established at the CARIBE and SUROESTE Soil Conservation Districts on soils of the Coamo and Amelia series. Further evaluation trials were established specially at the CARIBE District. In both districts it has become one of the principal grasses for grazing and hay making.

In spite of the similar climatic conditions prevailing in both districts, soils seem to be a determining factor in plant behavior. In the SUROESTE District, the plant behaves as a self reseeder and natural invader. Such condition is not observed at the CARIBE District. Perhaps, this condition can be also influenced by the fact that at the SUROESTE District the grass is mostly being used for grazing, while at the CARIBE District stands are being subjected to frequent clippings for hay making.

Evaluation plantings have been lately established on Aguilita soils of the SUR District where plant performance has been really outstanding.

Among the plant advantages we can mention the following:

1. Excellent for soil protection and improvement (excellent root system).
2. Efficient water utilizer.
3. Drought tolerant.
4. Resistant to adverse management conditions such as heavy grazing.
5. Easy to establish if properly managed.

6. Self reseeder and natural invader on proper soils.

7. Makes a good quality hay.

8. No insect damage of economic importance observed.

9. Early and very fast recovery when conditions turn proper after a prolonged drought spell.

10. High yielder and short-season crop.

11. Good quality and palatable forage.

12. Seed is commercially available from reliable seed producers in Texas.

Buffellgrass T-4464 can be accounted for as a positive contribution of the Soil Conservation Service in the solution of soil conservation problems in the dry south and southwest coasts of Puerto Rico. A total of 5,871 acres of this grass is now in use in this arid area of the island. Plantings occur in size from 900 acres to 1 acre with the average being about 80 acres.

HIGGINS BUFFELGRASS

The good performance of Buffelgrass T-4464 in the CARIBE, SUR, and SUROESTE SCD's arouse our interest in evaluating the performance of other accessions of this species. Higgins Buffelgrass was included in the 1967 assembled group.

The initial performance of Higgins Buffelgrass at the Mayaguez Field Evaluation Planting was really outstanding when compared to the standard T-4464. This accession became available from commercial sources in Texas from whom limited amounts were bought for field testing.

Field evaluation plantings were established at the OESTE, SUROESTE, SUR, and CARIBE Soil Conservation Districts. Performance at the OESTE district was outstanding even under rainfall conditions exceeding the requirements of Buffelgrass.

Experience indicates that excessive rainfall, even under well drained conditions, tends to adversely affect plant development. In part, this explains the efficient water utilization of this species.

Plantings at the CARIBE and SUROESTE districts failed to establish due to poor land preparation and dry weather conditions following planting.

The only planting that deserves mention is one established at the SUR SCD. It is a planting of about 2 acres which is performing very well. Based on this planting observations, we have been able to reach some conclusions.

PLANT ADVANTAGES OVER THE STANDARD BUFFELGRASS T-4464

1. Plant vigor exceeds that of T-4464

2. Accession is slightly rhizomatous, producing wide clumps. This condition is advantageous to soil protection, as a more compact stand is obtained.

3. Definitely, it stands drought conditions as well as the standard.

4. A higher forage production is evident, even though not formally tested.

5. When observed under grazing, cattle seem to have preference for this accession over the standard. Further evaluations are needed to conclude that animals prefer this accession.

PLANT LIMITATIONS

1. Plant establishment seems to be more difficult.

2. Seed quality seems to be inferior to that of T-4464. This will limit plant increase.

3. As plants are more vigorous than those of T-4464, evidently they become coarser after maturity. This might limit quality of hay.

4. Seed availability from commercial sources is still limited and expensive.

Following is a relation of Higgins Buffelgrass Field Plantings.

District	Year Planted	Soil Type	Performance
Oeste	1967	Humatas Clay	Very good
Oeste	1969	Coloso	Good
Suroeste	1969	Amelia	Failed to establish
Caribe	1969	Coamo Clay	Failed to establish
Sur	1969	Aguilita Stony Clay	Excellent

STARGRASS PR-2341 - CYNODON PLECTOSTACHYUS

Stargrass PR-2341 is a plant accession introduced in 1957 by the Agricultural Experiment Station of the Mayagüez Campus of the University of Puerto Rico. Initial evaluations and research work were conducted at the Solis Farm of the Rio Piedras Station and at the Gurabo Agricultural Substation. After thorough evaluation under clipping conditions, propagating material was provided to the USDA-ARS Division for further evaluation under clipping conditions and formal grazing experiments. The ARS experiments are conducted at a private cooperator's farm in the TORRECILLAS Soil Conservation District in Orocovis, P.R. Conditions in this area represent the high-rainfall, acid soils, mountainous region of the Island. Experiments conducted at this area revealed the high potential of this grass accession in providing a perfect soil cover as well as its high yielding potential.

The Soil Conservation Service has taken leadership in evaluating stargrass in as many soils and conditions as possible throughout the whole Island.

Combined evaluation efforts have given us information to reach the following conclusions:

PLANT ADVANTAGES

1. Stargrass provides an excellent land cover. Plant is easily propagated by the sprigging method. It is vigorous and aggressive. Forms a very dense mat, which makes a wonderful job in soil and water conservation.

2. Forage yield is abundant and of excellent quality.

3. No disease damage has occurred up to now.

4. It is highly resistant to yellow-aphid injury, which has been the worst pest in our Pangolagrass stands in the Island.

5. Drought tolerance is superior to that of Pangolagrass, even though not recommended for dry areas, except for areas where irrigation water can be provided.

6. Plant performance under irrigation is excellent.

7. Stands poor drainage conditions for short periods. It can grow on areas where Pangolagrass would disappear.

8. Has shown tolerance to saline soil conditions.

9. Performs much better on high elevation areas and deep soils, even though excellent performance is being made on coastal areas and sandy soils.

10. Dry matter content has been proven to be higher than that of any other of our commercial grasses.

PLANT LIMITATIONS

1. All attempts to establish it under minimum tillage practices have failed. A good seedbed preparation, with complete elimination of initial plant competition, is desirable.

2. Excessive maturity of planting material is a limiting factor in plant propagation.

3. Excessive soil acidity should be corrected. Soil acidity is a limiting factor for initial plant establishment and a cause for stands deterioration. Best performance has been observed on slightly alkaline and neutral soils.

4. Would not stand any shade. All fields should be free of any shade at all times during the day. Exposure is very important in its performance.

5. Low contents of prusic acid have been detected. Care should be taken not to graze it under high-nitrogen content conditions.

The following chart demonstrates attempts for plant evaluation throughout the various districts as well as the overall plant performance on various soil series.

District	Year Established	Soil Series	Performance
Atlántico	1968	Bayamón Sandy Clay	Failed to establish
Caonillas	1968	Utuado Loam	Good
Cibuco	1968	Múcara Silty Clay	Good
Culebrinas	1967	Humatas	Poor
	1968	Cialitos Clay	Poor
	1968	Colinas	Fair to Poor
Noroeste	1969	Bejuco Silty Clay	Very good

Chart (Con.)

District	Year Established	Soil Series	Performance
Norte	1969	Bayamón Silty Clay	Poor
	1969	Almirante Silty Clay	Very good
	1969	Cialitos Clay	Good
	1969	Soller Clay	Good
	1970	Múcara Clay	Good
	1970	Jayuya Silty Clay	Good
	1970	Toa Silty Clay	Very good
Oeste	1968	Dique Silty Loam	Good
	1969	Consumo Clay	Fair to good
	1970	Consumo Clay	Failed to establish
	1970	Alonso Clay	Good
San Juan	1969	Vega Baja Silty Clay	Good
Este	1969	Cayagua Silty Clay	Good
Sur	1970	Múcara Clay	Good
	1970	Los Guineos Glay	Very good
Sureste	1967	Los Guineos Clay	Good
	1968	Pandúra Loam	Good
Suroeste	1969	Múcara	Very good
	1969	Matos	Good
	1969	Catalina Clay	Good
Torito	1969	Múcara	Good

The preceding chart shows an overall performance of Stargrass under various soil and climate conditions. It does not show magnitude of propagation or impact caused by these evaluation plantings at various districts.

The impact caused by a single field planting established at the Caonillas Soil Conservation District in 1968 deserves special mention. The Soil Conservationist at the district sub-unit office reports a total of 600 acres planted to this grass in the district, as a direct result of that field planting.

Data given in this report comes from only formal plantings established under Soil Conservation Service guidance, but we are aware of how this grass is spreading throughout the island.

COASTCROSS NO. 1 BERMUDAGRASS - Cynodon sp.

Initial observations made of Bermudagrass introduced from the Brooksville Plant Materials Center in 1968 demonstrated plant superiority for soil conservation. Based on these observations and on references supporting its superiority on digestibility and animal gains over other Bermuda hybrids, materials were provided to the Agricultural Experiment Station for formal research evaluation. Observation plot at the Mayaguez Field Evaluation Planting continues to show an acceptable performance.

By the end of 1970, the first and only field planting of this accession was made on a Descalabrado soil at the SUR Soil Conservation District. Initial establishment performance notes show that this accession seems to be very acceptable.

DIGITARIA SMUTZII P.I. 299826, CA-152

This accession belongs to the 1966 assembled group of Digitarias. It is an intense bluish-green stoloniferous, which produces abundant fine stems showing marked aggressiveness. Soil covering potential allows it to make a quick establishment even under competition with other grasses. Its soil covering potential, its ability to form very compact mat of stems --which is excellent for soil erosion control--and its marked resistance to yellow-aphid injury were among the most important features for its selection.

Field plantings of this grass ecotype established at the OESTE Soil Conservation District during the years 1968 and 1970 have provided a lot of information on its superiority over Pangolagrass in many aspects.

A brief summary of plant performance, as compared to the standard Pangolagrass, follows

1. Attains complete soil cover slightly faster than Pangolagrass.

2. Definitely, we have determined its higher resistance to yellow-aphid injury over the standard.

3. It is very well accepted by cattle.

4. Seems to have less loss by cattle trampling than Pangolagrass.

5. Cattle will eat it entirely even after completely mature.

6. Demonstrates much better characteristics for hay making than Pangolagrass.

PLANT LIMITATIONS

1. Total production is slightly less than that of Pangolagrass.

GENERAL COMMENTS

In spite of the slight difference in total dry matter production, this plant accession should be submitted to formal grazing experiments to determine its carrying capacity. Further evaluation trials for adaptation determination are also suggested.

DIGITARIA SWAZILANDENSIS P.I. 299837, CA-251

This accession looks very much like D. smutzii, CA-152. Description for CA-152 will fit to this ecotype. Attempts to establish field plantings of this accession were made at the NORESTE and ESTE Soil Conservation Districts. Poor management practices caused a complete failure of both plantings.

BRACHIARIA RUZIZIENSIS P.I. 247404 CONGOGRASS CA-438

Congograss belongs to the 1967 assembled group of accessions. Planting material was provided by the Agricultural Experiment Station, where this species has been screened as a promising plant.

Congograss is a vigorous, profuse tillering plant of fairly rapid growth. Exhibits a sub-erect to a nearly prostrate growth habit, condition which is excellent for soil and water conservation. Produces creeping culms, which root at their nodes as they come in contact with the soil. This

also help in plant spreading and soil protection. The best planting material has been determined to be the tender portions of the culms. Mature culm portions are more difficult to germinate.

Growth is divided into two growing spells. The first spell is fairly slow; it takes about a month under favorable conditions. The second growing spell is faster and will take another month. In about 60 days, it will be ready for clipping or grazing.

Once the plant matures, it should be clipped or grazed. If not utilized, plant tends to deteriorate becoming yellowish; and with further maturity, it tends to present dead spots on the whole stand. It shows to be a high yielder, but its profuse leaf-and-stem pubescence is limiting plant acceptability by cattle.

Plant recovery after clipping or grazing is fairly slow. Mature plants tend to disappear if clipped close to the ground. This condition is not so marked in more tender plants.

Plantings can be renewed by controlled burning. Seedlings have been observed growing on burned stands.

Information pertaining to this grass has been gathered by on-site observations at the Mayaguez Field Evaluation Planting and at the Field Plantings. Field plantings established at the CULEBRINAS and the NORTE Soil Conservation Districts in 1968 and 1969 are performing in an acceptable way. Soils represented at these plantings are the Cialitos Clay and Ciales Clay.

BRACHIARIA MUTICA P.I. 299499, TANNERGRASS CA-439

Tannergrass was provided by Grass Specialist Mr. José Muriente, Agricultural Extension Service of the University of Puerto Rico. Planting material was introduced in 1967 from the Ona Agricultural Experiment Station, Florida. Tannergrass is a vigorous, aggressive accession --perhaps the fastest soil covering plant evaluated in our facilities up to now. This condition is really amazing on new established plantings. Condition changes in ratoon crops. Recovery is relatively slow after clipping or grazing when compared to the initial aggressiveness.

Plant tends to deteriorate, but, if properly fertilized, performance is outstanding. It exhibits a marked dark-green color when young and tender, but tends to become yellowish with maturity. Leaf spots, supposedly fungus, appear with maturity. Uncultivated stands look stunted, indicating that plant is a heavy feeder.

Field plantings which performance shows to be promising are under observation at the OESTE, CULEBRINAS, CAONILLAS, and NORTE Soil Conservation Districts.

CYNODON Sp. TUFCOTE BERMUDAGRASS CA-442

Tufcote Bermudagrass was introduced from the Brooksville Plant Materials Center, Florida, in 1968. This was introduced having in mind our need for plant materials with potential for use in the control of erosion in urban and recreational areas.

Initial plant performance was so outstanding that we proceded with its field evaluation. Evaluation trials have already been established at the OESTE and SUROESTE districts and we have obtained very good results.

Plant description and performance can be summarized as follows:

Tufcote is a fast growing, aggressive turf-forming grass. Propagates easily by the sprigging method. Attains a height of around 12 to 14 inches if not mowed. When mowed, a nice looking sod is formed. Its marked aggressiveness has permitted a complete soil covering in 6 weeks, when sprigged 8 inches apart. It has proven to provide a perfect soil protection on construction embankments. Performs very well under very low-soil fertility conditions. Shade tolerance is acceptable. Drought tolerance is marked once it is established. References indicate that it stands trafficability and is resistant to salt drift. These two conditions have not been tested locally.

After this short period of evaluation, we think we are prepared to favorably recommend this accession for erosion control in urban areas. It also might have its place in roadbank protection and any other disturbed construction areas in the OESTE and SUROESTE SCD's. Further evaluation is planned under conditions throughout the Island.

ARACHIS GLABRATA F-135 ARB PEANUT

Arb peanut was introduced for evaluation as a legume with potential to be used in grass mixtures. In spite of its acceptable performance under our conditions, its slow growth has been a limiting factor.

Plant exhibits a marked vigor but a very poor aggressiveness and spreading ability. It will take about a year to attain a complete soil cover. Invasion by weeds is common, needing a lot of man labor to keep it clean.

Flowering is practically permanent through the year, producing fancy, attractive yellow flowers. This condition qualifies this plant to be used as an ornamental. In spite of its slow growth, once it covers the soil completely, provides a perfect soil protection. Based on these observations, trials have been initiated at the OESTE SCD to evaluate it as an ornamental in cuts or embankments. Very acceptable results are evident.

PHASEOLUS CALCARATUS AM-778 (Ricebean)

Ricebean was introduced from the Americus Plant Materials Center on March 1970. Another Phaseolus calcaratus accession from the Philippine Islands had already been planted at the Mayagüez Field Evaluation Planting with excellent results. Home pigeons invaded the evaluation plot making seed harvesting practically impossible. Mature seeds were eaten as soon as the pods become dry. This incident makes us think on the potential of this species for wildlife food, specially for wild pigeons.

Accession AM 778 - seed was reported to be available at the Americus Plant Materials Center. A 30-pound seed allotment was obtained from this Center. A field planting was established at the CARIBE SCD where very promising results were obtained. Plant germination was practically perfect. Development was normal, producing bushy type plants. (Accession from Philippine Islands is of the viny type.) We were amazed by the great amount of bacterial root nodules produced by this plant. Nitrogen fixation is another way in which this species can contribute to improve our soils.

Seed production was really abundant, but an abnormal 35-inch, 5 days, rainfall spell frustrated our plans for seed harvesting. Planting was practically destroyed. New plantings are planned.

INFORMATION

The following articles and brochures were prepared and published during the calendar year 1970:

1. YERBA BUFFEL: Muy Prometedora para las Areas Secas de Puerto Rico. Published May-June 1970 issue of AGRICULTURA AL DIA, which is a publication or journal of the Commonwealth Department of Agriculture.

2. Buffel Finds a Puerto Rican Home. Published in the January 1971 issue of the SOIL CONSERVATION, publication of the USDA-Soil Conservation Service.

3. YERBA SALINA (BUFFEL) TEXAS 4464. - Brochure published in February 1970. Joint publication with the Agricultural Extension Service of the Mayaguez Campus of the University of Puerto Rico.

Report for 1971 Meetings of Regional Technical Committees on New Crops

W. H. Tallent
Northern Marketing and Nutrition Research Division

General. Chemists from the Northern Marketing and Nutrition Research Division (formerly Northern Utilization Research and Development Division) participated with botanists and agronomists of the Plant Science Research Division (formerly Crops Research Division) and top administrative officials representing both Divisions in a review of new crops research held at Beltsville in April. At this meeting it was agreed that to follow up on all promising leads uncovered in the new crops program is to spread our efforts too thin, particularly in the light of budgetary limitations and personnel ceilings. Accordingly, six categories were selected for current emphasis: kenaf, crambe, Limnanthes, Lesquerella, sources of epoxy oils, and continued screening for additional discoveries comparable or superior to these in prospective economic significance. Limnanthes is of particular interest because of the potential of its seed oil as a raw material for making sperm oil replacements (about which more under Crambe). As the front-running new hydroxy-acid oilseed, Lesquerella makes the high priority list because it is a prospective source of raw material for the manufacture of grease thickeners (1970 NU report). A limited market survey and estimation of processing costs verified earlier views concerning commercial potential of epoxy oils and provided reassurance that agronomic studies underway or planned on Vernonia anthelmintica, Stokesia laevis, and Erlangea tomentosa are justified. The other three categories in the top priority list are discussed in separate sections below.

Crambe. The minimum demand for high-erucic oils is indicated by the 10 million pounds of rapeseed oil imported into the U.S. annually, and a recent market survey by a private firm indicated there should be no difficulty in selling 18 to 20 million pounds per year in the range of 18 cents per pound. Since Canada and Sweden are switching to production of zero-erucic rapeseed for nutritional reasons, an excellent opportunity is imminent for commercialization of crambe to satisfy this domestic industrial market. Not unaware of this opportunity, a group of crambe proponents in southern Indiana contracted for 438 acres of the new crop to be grown in their area in 1971 to renew and increase the seed supply. This group has applied to the Small Business Administration for a loan guarantee covering $300,000 of the expenses of installing a proposed 50 ton per day crambe extraction facility in Vincennes.

The pilot-scale synthesis of nylon 1313 from erucic acid that was initiated to obtain reliable information on industrial processing costs is well underway at the Southern Research Institute (SRI) in Birmingham, Alabama. Yields from the initial, and most expensive, steps in the synthesis of suitable C_{13} monomers have generally equalled those obtained in laboratory-scale experiments. Collaboration between NMN and SRI investigators has helped

to identify optimum conditions for the difficult ozonolysis of erucic acid. Preliminary runs through subsequent steps indicate that the synthesis of 300 pounds of nylon 1313 should be accomplished without difficulty within the next 6 months. After completion of the work, a "show-and-tell" event is planned at SRI at which the production and advantageous properties of the new nylon will be demonstrated for interested industrial representatives and the trade press.

Added interest in crambe and Limnanthes seed oils has arisen from an unusual quarter as a result of classification of the sperm whale as an endangered species by the Department of Interior. With U.S. trade in products from sperm oil scheduled for termination later this year, industry is actively seeking suitable replacements for sperm oil, which is used in various applications ranging from extreme pressure lubricant additives to leather softeners and cosmetics. Initial experiments have shown that crambe and Limnanthes oils can be converted into potential sperm oil replacements by relatively simple and economical processes. Present research efforts are directed toward preparing sufficient quantities of these potential replacements from both oils for further testing and simulated in-use evaluation. In this urgent research, crambe has the advantage of being farther along than Limnanthes agronomically. On the other hand, Limnanthes oil contains some erucic acid but is richer in other related long-chain acids, and its freedom from polyunsaturation is an important asset in achieving oxidative stability, a critical factor for some uses.

Kenaf. Two storage studies that involved green and field-dried kenaf were completed and results reported at a technical conference of TAPPI's Nonwood Plant Fibers Committee in November. Storage periods extended more than 1.5 years. Solids content and fiber quality of baled field-dried stalks stored at Experiment, Georgia, were maintained when bales were in a barn or in a rick covered with a tarpaulin. A top bale deteriorated considerably more than others from an uncovered rick. Quality of pulps from anaerobic storage of green kenaf was improved by thorough washing and dewatering before cooking. On the basis of raw materials and pulping chemical requirements only, the estimated cost to produce a unit of unbleached pulp from field-dried material stored with protective covering was less than for the same material stored in uncovered ricks or for green material preserved anaerobically in silos. Continuous immersion of chopped material in water might be a competitive approach if a practical method can be developed. Extended storage studies of the field-dried crop are being continued at Savannah, Ga., with the cooperation of PSR. These will include determination of the effects of moisture content at time of storage. Actual work on the contract research at the Herty Foundation, Savannah, Ga., began with harvest and pulping of green material in late October 1970. Unbleached and bleached pulps from green material by four chemical treatments were prepared to establish reference levels for evaluation of effects of the prepulping variables (e.g., debarking, depithing, etc.) that are to be tested.

In keeping with the high priority given to kenaf, in-house work on it was increased by addition of two SMY's, one by transfer and the other by hiring. These investigators are studying chemical and physical factors that relate to quality characteristics, especially drainage of kenaf pulps. Drainage properties are important in determining the speed at which paper can be made from kenaf pulp. Also under investigation are new techniques that might be applicable to the production of quality pulps from components of the kenaf stalk without contribution of undesirable substances to environmental contamination.

Screening. Analysis of the remaining Brassica samples from India (about 1,000) for oil content and for erucic acid in the oil was completed, and analysis for glucosinolates (formerly called thioglucosides) has begun. An automatic sample injector for the gas chromatograph used to determine erucic acid permitted overnight unattended operation of the instrument and enabled one technician to perform as many analyses per week as two or three could previously do. Oil from Linum mucronatum was found to contain 15% ricinoleic acid (the principal castor oil acid); no previous report of a hydroxy acid in Linum is known. Leavenworthia alabamica contains 48% of eicosenoic (monounsaturated C_{20}) acid, comparable with L. torulosa. Oxygenated acids in oil of Anemone corinaria increased from 9.4 to 18.9% in 12 years at 40° F., a new example of the buildup of such acids in storage. Examination of seed of 29 species of Trigonella, 6 of Medicago and 6 of Mellilotus failed to show any species with seed containing more diosgenin (steroid drug raw material) than Trigonella foenum-graecum (0.5-0.8%). Our new combination of gas chromatography and mass spectrometry has facilitated the determination of structures of numerous components in oils as well as of isolated pure compounds; e.g., the monounsaturated C_{14} acids in Thunbergia oil and the hydroxy acid in Linum.

Much higher contents of L-dopa were found in immature than in mature seeds of Mucuna holtonii (13% vs. 6%) supplied from El Salvador by Dr. E. P. Imle. An improved isolation procedure recovers nearly all of the L-dopa from Mucuna seeds. Further research to develop velvet beans as a commercial source of the new drug has been transferred to the Southeastern Marketing and Nutrition Research Division, Athens, Georgia. NMN retains responsibility for screening work to seek other better plant sources of it.

In addition to samples received through NCRB at Beltsville, many others were received from workers represented by the regional committees: 191 Brassica from Calhoun (Oregon), 25 Vernonia from Stone (Puerto Rico), 6 Mucuna from Marchant (Georgia) and 3 from Palmer (SCS, Hawaii), 10 samples from Davis (WRPIS, Pullman), 8 samples from Willingham (Chico), Indigofera from SRPIS and from Powell (SCS, Georgia), 16 Brassica from SRPIS, 12 Trigonella from NCRPIS, 1 Brassica and 1 Briza from Martin (S.C.), 7 Sesamum and Oenothera from National Seed Storage Laboratory, 2 samples from Plummer (FS, Utah), 3 from Metcalf (Montana), and 1 from Robinson (Minnesota).

Tephrosia. Studies completed this year have shown that the concentrations of both rotenone and deguelin, the two major natural insecticides in leaflets of Tephrosia vogelii, increase steadily with maturity. Further investigation of rotenoid concentration in individual leaves throughout the season are being made this year. In pilot-scale cooperative studies at the Bauer Bros. Co., Springfield, Ohio, a commercial separator operating on the air-flotation principle fractionated fresh T. vogelii material as effectively as dried plants. This separation provides the rotenoid-rich leaflet fraction without the expense and the destruction of these substances associated with drying.

New Crops Research Branch

Report to

Regional Technical Committees, NC-7, NE-9, S-9, and W-6

July 1, 1970 - June 30, 1971

This report uses a much abbreviated approach to the progress of the New Crops Research Branch. In this effort, we are attempting to follow the format of the CRIS system. At the same time, the report avoids considerable duplication of information that is provided by the respective Regional Coordinators. The Multiple Use Report formerly used as a pattern has been discontinued.

The illustrious individualist, Dr. Howard Scott Gentry, retired from the Branch in April and plans to pursue botanical interests in California and Arizona. We feel sure that he has earmarked some time for agaves. Howard collected over 12,000 accessions during his 21-year stint with the Branch.

Dr. James A. Duke rejoined the Plant Resources Investigations on June 21 after several years absence. He will be concerned with taxonomic matters and plant ecology.

The 20-year report entitled "The National Program for Conservation of Germ Plasm (A Progress Report on Federal-State Cooperation)" is now being published by the Georgia AES Editor.

An intensive review of the cooperative chemurgic crop program indicated that only those species with the best agronomic and utilization promise should be pursued. Kenaf was assigned top priority for development. Efforts on meadowfoam (Limnanthes) will be intensified as the oil in modified form may prove to be a good substitute for sperm whale oil.

The President's War on Cancer is going to be reflected in a doubling of our program of plant sample procurement.

With the focusing of public attention on pollution, ecology, and food supplies, there appears to be an increasing awareness of the need for germ plasm procurement, evaluation, and preservation. Perhaps this awareness will beneficially reflect on some of our goals pertaining to collections and repositories. Steady progress is being realized in the automation of collection and evaluation data. We look forward to a challenging year.

Investigations: Plant Introduction

CRIS Research Projects Covered: 1010-01-01, 01A, 02, and 03.

Progress:

The 9,103 accessions received during calendar year 1970 included 5,108 small grain cereals, 1,845 vegetables, 779 ornamentals, and 637 forages. Several new species of ornamentals were among the 595 collections from the Winters-Higgins exploration to New Guinea. Wide geographic coverage of the Ethiopian highlands by H. S. Gentry resulted in 110 samples of wild peas with great diversity in phenotypic characters. Pisum abyssinicum expecially should prove a valuable new genetic resource for pea breeders looking for disease resistance. C. M. Rick collected 330 seed samples in Bolivia, Ecuador, Peru, and the Galapagos during late 1970 and early 1971. These included 200 tomato and 115 vegetable, ornamental, and miscellaneous crop items for Branch programs as well as many non-tuber producing Solanums. The trip by A. J. Oakes to South African countries was terminated in early April 1971 with 940 vegetative and seed accessions of forage grasses. An active exchange with Czechoslovakia provided several new Salix hybrids and species to be used by Soil Conservation Service for soil bank erosion control. Through the courtesy of the Western Australian Laboratories in Perth, Commonwealth Scientific and Industrial Research Organization, the Branch was offered small lots of 1,600 accessions which had accumulated from various foreign sources for 25 years. A selected group of species has been requested. Approximately 8,000 samples of chickpeas, pigeonpeas, lentils, beans, and peas from the terminated India/US Regional Pulse Improvement Project were received for maintenance and preservation of germ plasm. There were 413 introductions received from the Soviet bloc countries, chiefly U.S.S.R., Rumania, and Poland. The regular international seed and plant exchange program involved 1,791 shipments covering 47,484 items to 113 countries. The increase in exchanges with Canada is very significant, but India, of all countries, continues to place the most requests for experimental stocks. USAID missions in 27 countries received 2,397 plant and/or seed items with greatest activity centered in Africa. A new strain of rust on coffee in Brazil focused attention on the long-range value of germ plasm held in Miami, Florida, and new hybrids indexed in Portugal are now being added to the U.S. collection. PL 480 projects continue to provide hundreds of small grain samples. From projects in India, 1,117 cowpeas, 262 peas, and 20 mango accessions were received, and approximately 1,500 vegetables from Yugoslavia.

Domestic exploration during this reporting period was curtailed. No new proposals were received from Projects NE-9, S-9, or W-6. Some activity was continued in NE-9 for the evergreen witches'-broom

project. The NC-7 project concentrating upon big bluestem, Indiangrass, and switchgrass was quite successful with 302 collections in 1970. Work will continue in South Dakota, Iowa, and Nebraska during 1971-72 to sample colonies of these native grasses which are rapidly being lost to "civilization". No progress has been made with the NC-7 pecan proposal. Field inspection in June 1971 of the Vacciniums collected from 1966-69 under the S-9 project revealed a wealth of diversity which should give the southern blueberry breeders ample germ plasm for the immediate future.

With the addition of 4,608 seed lots during 1970-71, the total is 78,602 accessions in permanent storage. The world collection of cotton varieties and wild species has been completely documented through automatic data processing. Seed disbursements totaled 1,358. Seeds of several medicinal and potential medicinal species held in strategic storage are retaining their viability well. Of the flexible packaging materials under test, only those containing a foil layer continue to provide adequate moisture protection for safe storage of seeds. Only adequately dried seeds can be stored safely in sealed moisture-barrier containers. Through 5 years, vacuum and gas (CO_2, N_2, He, A) storage had little or no advantage over sealed-in-air storage for lettuce, sesame, safflower, sorghum, and crimson clover seeds. A 2-year study on storage of cherry seeds is being prepared for publication. Arrangements are being made for storage of seed used by the American Type Culture Collection, All American Selections, and referee samples of sugarbeet varieties. The recently approved Plant Variety Protection Act will also utilize certain aspects of the NSSL storage facilities.

Publications:

BASS, L. N. Effects of temperature, relative humidity and protective packaging on longevity of peanut seeds. Proc. Assoc. Off. Seed Anal. 58-62. 1968.

BASS, L. N., EDWIN JAMES, and D. C. CLARK. Storage response of green and bleached lima beans (Phaseolus lunatus L.). HortSci. 5(3): 170-171. 1970

FISHER, H. H. Holly introductions by the United States Department of Agriculture. Am. Hort. Mag. 49(4). 1970

HYLAND, H. L. Plant Inventory No. 176. 1970

LEPPIK, E. E. Gene centers of plants as sources of disease resistance. Ann. Rev. of Phytopathology. 8:323-344. 1970

Total Other Publications: 9

Future Plans:

J. L. Creech has joined a Soviet collecting group (June-August) which will concentrate upon woody ornamentals in areas of Siberian U.S.S.R.

This is one of the USDA-Longwood sponsored trips. Range species for stabilization and other special requests will be considered. F. W. Martin, Federal Experiment Station, Mayaguez, Puerto Rico, under FAO funds, will be in the west African countries of Cameroon, Dahomey, Ghana, Ivory Coast, and Nigeria (October-December) to collect Dioscorea species for the edible root crop program currently centered in Mayaguez. Due to the Brazilian rust epidemic, F. G. Meyer, U.S. National Arboretum, Washington, D.C., plans to be in Ethiopia during the period of late November to mid-February 1972 collecting new coffee germ plasm. Preliminary consideration is being given to a trip in eastern Turkey and nearby Iran during the summer of 1972 for forage plants largely suited to the western States.

Investigations: Plant Resources

CRIS Research Projects Covered: 1010-05-01, 02

Progress:

Seed of 1,000 species were screened for L-dopa, a neurological drug useful in treating Parkinson's disease. Only seed of Mucuna, a legume contained L-dopa in amounts greater than 0.5%, maximum yield of 6.7% was from a wild tropical vine, M. holtonii. Cultivated mucunas (velvet beans) varied from 3.1 to 5%, suggesting that high-yielding varieties can be developed by breeding and selection.

Botanical-chemical screening yielded three species with unique seed oils and good agronomic potential. These are the mustards, Leavenworthia alabamica, Selenia aurea, and Synthlipsis greggii.

Seed samples of 30 legume species and one member of the family Tiliaceae were assayed for protein, pentosan, and water-soluble mucilage content. The highest percentages of mucilages were found in seeds of Cassia grandis (39%) and C. fistula (37%). Nine other legume species in four genera contained mucilage in amounts from 14 to 31%. All of the mucilages obtained in high yield were glactomannans, and the mucilages when dried varied in color from black to white. The white mucilages, which have special potential as paper additives, were found in C. fistula and Sesbania aegyptiaca; the latter contained 16.2% mucilage.

Observations made from these analyses contribute to an understanding of comparative seed composition and potential gum sources.

Anti-cancer screening yielded 100 new active plants--18 active against P-388 leukemia, and 82 active against KB cell culture.

Three new anti-cancer alkaloids were isolated from Cephalotaxus harringtonia. The anti-cancer activity of C. wilsoniana was shown to be due to alkaloids different from those of C. harringtonia.

An inventory of Thailand agriculture was completed as a basis for recommendation of new crops to meet deficiencies in Thai agriculture production.

Analysis of herbarium specimens established that Briza humilis Bieb is the correct name for the grass formerly known as B. spicata Sibth. and Sm. This is a potential new-crop source of glycolipids used as loaf extenders by the baking industry.

Descriptions of the seed characteristics of 40 important Temperate-Zone plant families were assembled, with an explanation of seed identification methodology, as the basis for a chapter in a new book on seed biology. These families include many species of economic importance.

Publications:

GENTRY, H. S. Two new agaves in Arizona. Cact. & Succ. J. 42: 222-228. 1970.

GUNN, C. R. History and taxonomy of the purple moonflower, Ipomoea turbinata Lagasca y Secura. Assoc. Off. Seed Anal. Proc. 59: 116-123. 1970.

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PERDUE, R. E. Jr., R. L. SMITH, M. E. WALL, J. L. HARTWELL, and B. J. ABBOTT. Camptotheca acuminata Decaisne (Nyssaceae), source of camptothecin, an anti-leukemic alkaloid. USDA Tech. Bull. 1415:1-26. 1970.

PERDUE, R. E. JR., B. J. ABBOTT, and J. L. HARTWELL. Screening plants for anti-tumor activity. II. A comparison of two methods of sampling herbaceous plants. Lloydia 33:1-6. 1970.

TERRELL, E. E. Spring flora of the Chesapeake and Ohio Canal area, Washington, D. C., to Seneca, Maryland. Castanea 35:1-26. 1970.

Total Other Publications: 3

Future Plans:

Procurement for the cancer program will include 5,000 small plant samples for initial anti-tumor screening and 160 large samples of confirmed-active plants suitable for fractionation. Procurement of these large samples will be limited to those active against KB, PS, and LE.

Seed and floret characteristics will be investigated as aids to knowledge of systematic relationships among festucoid and oryzoid grasses.

A guide for use of scientific names in manuscripts, for the benefit of authors of scientific papers, will be prepared.

Investigations: Plant Materials Investigations - Horticultural Crops

CRIS Research Projects Covered: 1010-04-01, 02, 03, 04, 06

Progress:

From January to April 1970, the Investigations Leader explored for germ plasm of ornamental plants in New Guinea. The collections totaled 860, of which 140 were Malesian species of Rhododendron. Collections of Hoya and Impatiens also will greatly expand the genetic base for these genera in America.

Preliminary research at Chico, California, demonstrated that leafy cuttings of Actinidia chinensis can be stimulated into growth after rooting if stored at 40 F for 6 to 9 weeks. A survey of several hundred seedling introductions of almond indicated that non-infectious bud failure, a genetic disorder, is present and therefore is not confined to 'Nonpareil' and 'Peerless' and their progenies as is generally thought. Two seedling apricots from Turkey and their progenies again demonstrated their ability to set crops under adverse weather conditions. Selections from open-pollinated progeny of Russian walnut introductions are outstanding for nut size, appearance, and crackout percentage.

At Glenn Dale a cold hardy selection of Camellia japonica named 'Frost Queen' was released to growers. A columnar seedling selection of Pyrus calleryana shows promise for specialized landscape use or as a living fence. A seedling selection of Canna 'Moonlight' appears superior to its parent. Research on detection of viruses in fruit introduction resulted in the release from quarantine of 15 Prunus, 26 apples, and 39 pears. Ten of the apples and 19 pears are infected with common latent viruses but are available with State approval. A virus from lilac was purified. A virus from dogwood was purified and identified as cherry leafroll.

Additional seedlings of introduced mangoes were evaluated at Miami, Florida. 'Kensington' progenies were precocious and true to variety. Unlike other polyembryonic varieties, 'Ono' seedlings varied. A seedling of Litchi chinensis (PI 51471) bore large garnet-colored early small seeded fruit of commercial possibility. Cold hardy Mexican avocado M 18686 transmits earliness and precocious bearing to its progeny. Five Passiflora species entered into 4 new hybrid combinations to be tested for rootstock and fruit. A white leaf spot which renders field grown Sansevierias unfit for sale during the winter months was induced when plants were exposed to prolonged chilling at moderately low temperatures or for shorter periods at near freezing temperatures.

Six of 20 Longwood Tecomaria hybrids appear satisfactory for local planting. Dombeya cultivars 'Perrine', 'Deep Pink', and 'Pink Clouds' were released. A daylength of 13 hours was required to induce flowering in Dombeya cultivars 'Pink Clouds' and 'Rosemound'. Dombeya selections A-15, S-16, and WE2-3-1 make excellent pot plants during their normal flowering season. Hirado Rhododendron hybrids perform better in full sun than most other hybrid groups.

At Savannah, Georgia, emphasis continued on ornamental research with particular application to the Gulf Coast area. The approach included the reevaluation of selected individuals from seedling populations Ilex crenata, I. cornuta, Pistacia chinensis, Sabal minor, and Hibiscus sp. (Rose Mallow).

Publications:

ACKERMAN, W. L. Repetitive flowering from a single flora axis in Camellia. HortScience 5(6): 514-515. 1970.

ACKERMAN, W. L. Winters hardiness of Camellias at Glenn Dale, Maryland. American Camellia Yearbook 1971. pp 107-114. 1970

ACKERMAN, W. L. Interspecific and intergeneric hybridization of Camellia. Dissertation Abstracts International XXXI:3. 1970.

FISHER, H. H. Holly introductions by the United States Department of Agriculture. The Am. Hort. Mag. 49(4):318-323. 1970.

KNIGHT, R. J. Jr., Tropical Crops. Dicotyledons. J. W. Purseglove. (A review). Ec. Bot. 23(3):293-294. 1969.

KNIGHT, R. J. Jr. Plant introduction and the Florida mango industry (Abstract). Proc. XVIII Internat. Hort. Congress. L:180. 1970.

MARLATT, R. B., R. J. KNIGHT, Jr., and S. GOLDWEBER. Verticillium wilt of mango. Plant Disease Reporter 54(7):569-571. 1970.

SMITH, R. L. Kiwi--A potential new crop for California. Lasca Leaves 20:8-11. 1970.

SMITH, R. L. and H. ALLINGER. Evaluation of Persian walnuts introduced from Russia, Hungary, and Korea. Northern Nut Growers Assoc. 60th Ann. Rpt. pp. 61-65. 1969.

WATERWORTH, H. E. A probable temperature-induced genetic disorder of apple seedlings resulting in small leaves. Pl. Dis. Reptr. 54: 1059-1060. 1970.

WINTERS, H. F. Our hardy hibiscus as ornamentals. Ec. Bot. 24(2): 155-164. 1970.

Total Other Publications: 3

Future Plans:

A replicated field experiment to test fruit yield and quality of Actinidia chinensis is being continued at Chico, California. Seeds have been harvested and planted of a cross between 'Hachiya' and 'Hana Fuyu'

oriental persimmons. This is an effort to combine characters of the leading commercial variety in California with a non-astringent introduction.

At Glenn Dale several dwarf "cushion" forms of yellow-fruited Ilex crenata are being evaluated. An F_2 population from controlled crosses of purple and white flowered forms of Rhododendron kiusianum are being studied for inheriatnce of flower color. Efforts will continue to purify a labile apple virus, to find resistance to virus infection and to treat infected scionwood chemotherapeutically.

At Miami, selection studies will be continued on various seedling progenies of woody ornamentals and tropical fruits.

Efforts will be continued to identify as to species the collections of ornamental plants introduced from New Guinea.

Investigations: Plant Materials Investigations - Agronomic Crops

CRIS Research Projects Covered: 1010-03-01, 02, 03, 04, 05

Progress:

The placement of plant introduction records on magnetic tape for storage and utilization is continuing at Beltsville. This past year was the first full year of record for this procedure for which an index was prepared. The inherent value of this system will increase with time as more accessions are acquired and information is accrued. The preparation of annual seed lists and special plant inventories by automated techniques is continuing at three Regional Plant Introduction Stations.

RPIS (NE-9) reports progress in its pathological screening program of clovers for diseases, particularly Stemphylium sarcinaeforme. The host range of Myrothecium leafspot on Lotus species is being ascertained through screening. The red clover collection is being screened for resistance to powdery mildew and yellow bean mosaic virus. Resistant germ plasm has been identified in these continuous screening trials.

RPIS (NC-7) reports a portion of the corn collection has been surveyed for oil content. Results of this screening should form the basis for the development of inbreds high in specific oils and oils of unique composition. Certain corn introductions are being used in a cytotaxonomic study to further elucidate the origin of Zea mays. 'Hayden' alfalfa, recently released, contains exotic germ plasm from India. Portions of the domestic grass collection from Alaska have been documented and some seed stocks are now available; evaluation of this collection continues.

RPIS (S-9) has identified high yielding introductions of guineagrass, rhodesgrass, and Brachiaria species. Cold tolerant clones of Cynodon, Digitaria, and Paspalum have been identified for use in plant improvement programs in extending the production range of these warm-season species. Over 700 peanut introductions were screened for stunt virus with no disease being found. Use of germ plasm previously selected as breeding stocks led to development and release of 'Tibbee' clover, 'Nova' vetch, and 'Dale' sorgo.

RPIS (W-6) reports preliminary results from screening Vicia species for resistance to vetch bruchid, Bruchus brachialis. 'Lutana', cicer milkvetch, released jointly by SCS and Montana State University, was derived from germ plasm from Sweden. Selected germ plasm containing desirable agronomic characteristics is being used by State Experiment

Stations, SCS, and the Forest Service in the improvement of crops within the W-6 region.

Publications:

BRAVERMAN, S. W. Longevity and pathogenicity of several isolates of Stemphylium species stored under mineral oil. Pl. Dis. Rptr. 54:580-582. 1970.

CLARK, R. L. Resistance to Diplodia stalk rot in plant introduction corn (Zea mays), 1966-68. Pl. Dis. Rptr. 54:624-626. 1970.

DAVIS, A. M. Variation in the protein content of a collection of Sainfoin from USSR. Mont. Agr. Exp. Sta. Bull. 627:102-103. 1970.

DIETZ, S. M. and G. W. FISHER. Melanotaenium oxalidis sp. nov. on Oxalis oregana from Washington State. Mycologia 12:402-405. 1970.

OAKES, A. J. Herbicidal control of guava (Psidium guajava L.) Turrialba 20:30-36. 1970.

OAKES, A. J. Legumes in the U.S. Virgin Islands. Turrialba 20:153-165. 1970.

OAKES, A. J. Herbicidal control of Acacia. Turrialba 20:213-216. 1970.

OAKES, A. J. Herbicidal control of Croton. Turrialba 20:299-301. 1970.

OAKES, A.J. Herbicidal control of Tecoma stans (L.) Juss, ex HBK. Turrialba 20:415-418. 1970.

Total Other Publications: 2

Future Plans:

RPIS (NE-9) plans to continue its pathological screening program of Trifolium and Lotus species with emphasis on screening Lotus for resistance to Myrothecium verrucaria.

RPIS (NC-7) is continuing the preparation of plant inventories of major crops by automated techniques. Increasing portions of the annual seed catalog are also being prepared by this procedure. Plans call for the continuation of pathology and entomology screening work. Portions of the corn collection are to be screened for resistance to the European corn borer.

RPIS (S-9) is continuing the preparation of special plant inventories by automated methods in addition to the increased use of this technique in the preparation of annual seed catalogs. Screening of the peanut collection for diseases will continue.

RPIS (W-6) is continuing the development of techniques for the utilization of data and information by automated methods in addition to the development of crop codes for major agronomic crops.

Plans for 1971 at NCRB include the continued placement of plant introduction data on magnetic tape for storage and future use. Continued assistance and guidance is provided Regional Coordinators and Head, National Seed Storage Laboratory, in the development of crop codes for evaluation data and techniques used in automation of records. Continue the review and collation of data and information from screening programs in collaboration with each RPIS. All Regional Plant Introduction Stations plan to continue development of crop codes for use in agronomic evaluation and entomological and pathological screening programs.

Each RPIS plans to continue automation of records and the transfer of seed stocks to NSSL. Screening Digitaria germ plasm for sugarcane aphid resistance will be continued. An exploration to southern Africa for germ plasm of warm-season grass and legume species is planned. A literature review of the pathology of 20 selected genera of warm-season grasses is planned.

Investigations: Chemurgic Crops

CRIS Research Projects Covered 1010-02-01, 04, 06, 07, 08, 15, 17 18, 19, 20 and 21

Progress:

Kenaf: Screening for root-knot nematode resistance of progeny of previously selected materials from PI 292207 indicated that resistance exists in this material. Another Kenyan accession, J69163, shows indication of seedling resistance to nematodes. The existance of significantly longer, woody fiber in certain kenaf materials (including a "nematode resistant" selection) has been reported. Approximately 5 dry weight tons each of Everglades 71 material was supplied for the research contract at Herty Foundation and to a private company. A storage study of baled kenaf was initiated. Varietal yields in Florida ranged from 7.7 to 9.8 tons per acre. Treatment of kenaf seed beneficially affected seedling emergence.

Crambe: The major effort on crambe is in Indiana. Several of the fields in southern Indiana looked very good in late May before extensive bolting occurred. The only pest problem of significance is Alternaria. Germ plasm is being screened at Ames for possible resistance. Crosses have been made between C. abyssinica and C. hispanica. Two selections of C. hispanica and two Nebraska selections of C. abyssinica have been very promising and, if good yields are obtained, they may be released for the 1972 season. The Canadians grew about 6,000 acres of crambe in 1970 and marketed the crop in the United States.

Limnanthes: A planting-depth study at Glenn Dale showed little difference in emergence between 3 and 13 mm. Emergence was satisfactory, but slower for 25 mm compared to shallower depths. Fall plantings at two locations in eastern Maryland were very successful. At Corvallis, direct combining of the mature crop was superior to windrowing or direct combining of a somewhat immature crop. Combine seed loss estimates varied from 19 to 37 percent. Selections from the 1969-70 crop were space-planted and are undergoing further selection in 1971. Only a few herbicides show much promise. Large 1970-71 plantings were effectively established with a grain drill.

Vernonia: Seven mutagenic treatments were applied to a short strain of Vernonia at Pullman. M'_2 have been planted in 1971 and observed for segregation and/or identification of any induced mutants. At Purdue University, F_1 seed from crosses involving four selected genotypes is

being grown for a diallel analysis for yield, oil, and maturity. A planting of 1/2 acre or more has been established in 1971 for selection purposes especially for improved seed retention. A few selections from the four genotypes mentioned above have been made which appear to have somewhat better retention than the genotypes as a whole.

Tephrosia vogelii: In a stand-establishment study at Glenn Dale, the best depth and chemical seed treatment were 1/2 inch and captan, respectively. In a 2-year study, a population of 86,000 plants/ha was superior to 43,000 plants for row widths of 50 and 76 cm.

Briza humilis: Excellent stands were established at Chico, Corvallis, and Glenn Dale. A vegetative response to nitrogen at each of these locations was visually evident. A new introduction appears to be taller and more vigorous. Some heretofore unscreened species of Briza are being increased.

Crepis alpina: This species can be grown as a winter annual at Glenn Dale, Chico, and Pullman (Snake). At Pullman, two seed harvests were made (a primary harvest followed by a later, lesser secondary flush) by cutting the plants high. Seed production was good with excellent retention.

Publications:

ADAMSON, W. C., G. A. WHITE, and N. A. MINTON. Kenaf for pulp--breeding and production research progress. Tappi Nonwood Fiber Pulping Progress Report, CA Rpt. No. 34:91-103. 1970.

HIGGINS, J. J., WHEELER CALHOUN, B. C. WILLINGHAM, D. H. DINKEL, W. L. RAISLER, and G. A. WHITE. Agronomic evaluation of prospective new crop species. II. The American Limnanthes. Econ. Bot. 25: 44-54. 1971.

MINTON, N. A., W. C. ADAMSON, and G. A. WHITE. Reaction of kenaf (Hibiscus cannabinus) and roselle (H. sabdariffa) to three root-knot nematode species. Phytopathology. 60:1844-1845. 1970.

WHITE, G. A., B. C. WILLINGHAM, W. H. SKRDLA, J. H. MASSEY, J. J. HIGGINS, WHEELER CALHOUN, A. M. DAVIS, D. D. DOLAN, and F. R. EARLE. Agronomic evaluation of prospective new crop species. Econ. Bot. 25:22-43. 1971.

WILSON, F. D. and W. C. ADAMSON. Reaction to the cotton root-knot nematode and the pollen and seed fertility of kenaf-roselle (Hibiscus cannabinus X H. sabdariffa allohexaploids. Euphytica 19(3):277-412. 1970.

Total Other Publications: 7

Future Plans:

Efforts on several species (including Tephrosia vogelii, Briza humilis, Crepis alpina, and Bifora radians), are being curtailed. SIPE efforts will be confined to just a few promising items. The intent is to concentrate our limited resources to research on the most promising new crop species. On July 1, Mr. Bowen Crandall, Poplarville, Mississippi, will join Chemurgic Crop Investigations for research on kenaf. We hope to concentrate kenaf crossing, selfing, and increases at Mayaguez, Puerto Rico. An ARS contract with Dr. McKinley Mayes, Southern University, Baton Rouge, Louisiana, has been approved. This contract calls for an intensive evaluation of agronomic potential of Stokesia laevis and Erlangea tomentosa as possible sources of epoxy oils.