File

MINUTES

of the

MEETING OF THE S-9 TECHNICAL COMMITTEE

"NEW PLANTS"

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

Auburn University
Auburn, Alabama

July 6-7, 1972

Agenda for Meeting
of the
S-9 Regional Technical Committee

July 6-7, 1972

Auburn University, Alabama

1. Call to order and introduction of visitors

2. Welcome from Auburn University

3. Review and approval of Minutes of 1971 S-9 Meeting and deletions or additions to agenda

4. Appointment of committees - Nominations
   Date and location of next meeting
   Resolutions

5. Field Trip

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 Marketing and Nutrition Research Division
   New Crops Research Branch, Plant Science Research Division
   Cooperative State Research Service

   c. Regional Station

7. Review of meeting of National Coordinating Committee

8. Regional Station budget

9. Requests for plant explorations

10. Publications

11. State of revision of the S-9 Regional Project

(Continued)

12. Comments - Administrative Advisor

13. Plan of work for 1973

14. Committee reports

15. Appointment of Committees for 1973

16. Adjournment

1. Call to Order and Introduction

The meeting of the S-9 Technical Committee was called to order by Dr. R. E. Sigafus at 8:30 a.m., July 6, 1972 in the Conference Room of Comer Hall on the Auburn University Campus. Minutes were taken by W. T. Fike, Secretary. Each person introduced himself. Those in attendance were

S-9 Committee Members

C. R. Jackson	Administrative Advisor
W. R. Langford	Regional Coordinator, Georgia
C. S. Hoveland	Alabama
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
Charles Galeotti	Oklahoma
A. Sotomayor-Rios	Puerto Rico
J. A. Martin	South Carolina
M. J. Constantin	Tennessee
E. L. Whiteley	Texas
H. L. Hyland	Germplasm Resources Laboratory, USDA
W. H. Tallent	Northern Regional Research Laboratory USDA

Visitors

R. D. Rouse	Associate Director, Experiment Station, Auburn University
L. E. Ensminger	Head, Agronomy and Soils Department, Auburn University
C. D. Berry	Agronomy and Soils Department, Auburn University
Grover Sowell	Regional P.I. Station, Experiment, Georgia
Dan Milbocker	Department of Horticulture, University of Kentucky
Charles Adamson	Regional P.I. Station, Savannah, Georgia
John Floyd	Department of Horticulture, Clemson University

2. Welcome

R. D. Rouse, Associate Director of Agriculture Experiment Station of Auburn University welcomed the group to the Auburn Campus. He explained that he and his office would be glad to help us in any way possible during our stay in Alabama.

3. Minutes and Agenda

Additions or corrections of the 1971 Minutes were called for. The minutes of the 1971 meeting held at Beltsville, Maryland were approved. The agenda as shown on Page 1 was adopted for the 1972 meeting.

4. Appointment of Committees

The following committees were named by Chairman Sigafus

Nominating Committee

W. T. Fike
H. W. Bennett
A. Stotomayor-Rios

Resolutions Committee

H. L. Hyland
W. H. Tallent

Time and Place of Next Meeting

C. R. Jackson
M. J. Constantin
R. E. Sigafus

5. Field Tour - Thursday a.m., July 6, 1972

9:30 - Ornamentals - Dr. Fred Perry

9:45 - Phalaris and Tall Fescue Grass Breeding - Dr. Charles Berry

10:00 - Rhizotron - Dr. Howard Taylor and Dr. Betty Klepper

10:30 - Travel to Horticulture Farm

10:45 - Tomato and Pepper Breeding - Dr. Walter Greenleaf

11:00 - Improving Protein Quantity and Quality in Cowpeas - Dr. Oyette Chambliss

11:15 - Cantaloupe and Watermelon Breeding - Dr. Joe Norton

While on the tour many of the S-9 committee members had a chance to visit with Dr. D. Y. Perkins, Head, Department of Horticulture at Auburn who was a former CSRS Representative to S-9.

6. State and Federal Agency Progress Reports

Committee members and visitors presented their reports on New Crops Research in their respective states. These reports are appended hereto as Appendix A. Comments concerning the reports follow:

Alabama - C. S. Hoveland

More plant introductions are needed of fescue, which have less winter dormancy than those presently available.

A testimonial by Dr. Caldwell of Northrup King Seed Company would be of great value to the New Crops Program due to his usage of PI's of pearl millet in selecting the new variety Millex-23 from a cross PI 286834 X PI 185648. Dr. Jackson will contact Dr. Caldwell.

The following publications were distributed:

Hoveland, C. S., R. F. McCormick, W. B. Anthony and F. T. Glaze. Managing Arrowleaf Clover for Grazing and Hay. Reprint from Auburn Highlights of Agricultural Research 18: (4), Winter 1971.

Wade, R. H., C. S. Hoveland and A. E. Hiltbold. Inoculation Essential for Production of Yuchi Arrowleaf Clover. Reprint from Auburn Highlights of Agricultural Research 19 (2), Summer 1972.

Norton, J. D., Gulfcoast - A Sweet Cantaloupe for the Produce Chain Store Market. Auburn University Leaflet 82, March 1971.

Hoveland, C. S. Pastures for Beef Cattle in the Piedmont - Serala Sericea, Daliagrass - Regal Ladino Clover, Coastal Bermuda-Yuchi Arrowleaf Clover. Auburn University Circular 196, March 1972.

Harris, R. R., C. S. Hoveland, J. K. Boseck, and W. B. Webster. Wheat, Oats or Rye with Ryegrass and Yuchi Arrowleaf Clover as Grazing for Stocker Calves. Auburn University Circular 197, March 1972.

Arkansas - J. L. Bowers

Since the Brassicas were being evaluated for their oil content, Dr. Tallent suggested that samples be sent to the Northern Lab for erucic acid analyses. Since rapeseed cannot be sold in the United States for the edible trade all lines grown must be high in erucic acid content.

Florida - G. B. Killinger

Discussion on a rust new to the United States (*Puccinia cacao*) found on PI 349796 (*Hemarthria altissima*). Please mention to your cooperators to be very careful especially with vegetative material brought into the county. Keep the material isolated and have the local Plant Pathologist check the plant before further distribution.

Mention was made on possible research on potential narcotic drug plants.

The following publications were distributed to committee members:

Tropi-Red - A determinate tomato with excellent color and multiple disease resistances. Circular S-182, October 1967.

Tropi-Glo - A determinate tomato with a new combination of disease resistances. Circular S-183, October 1967.

Tropic - A new disease-resistant indeterminate tomato for pink harvest. Circular S-198, April 1969.

Sungold, A nectarine for North Florida. Circular S-200, July 1969.

Slenderstem Digitgrass. Circular S-201, September 1969.

Earlibelle, A New Early Blight Resistant Celery. Circular S-207, June 1970.

June-Belle. A new early blight resistant celery for spring harvest in South Florida. Circular S-208, June 1970.

Bluegem Blueberry. Circular S-209, October 1970.

Zipper Cream - A high producing fresh market southern pea with processing potential. Circular S-210, December 1970.

Smokylee - A high quality watermelon with resistance to Anthrocnose and Fusarium wilt. Circular S-211, June 1971.

Flordia MH-1, Florida's first machine harvest fresh market tomato. Circular S-212, September 1971.

Siratro (Phaseolus atropurpureus D.C.) - A Summer Growing Perennial Pasture Legume for Central and South Florida. Circular S-214, January 1972.

Altika, A Peanut Variety for the Tropics (Guyana). Circular S-215, January 1972.

Jupiter, A New Soybean Variety for Tropical Latitudes. Circular S-217, June 1972.

Georgia - W. R. Langford

The Rockefeller Foundation has just collected 100 corn types in Nepal. These are flinty types.

Drs. Corley and Dempsey have had spreads in the Sunday Atlanta Journal - Constitution on Ornamental Peppers and on Impatiens. These were in color and requests for publication have been tremendous.

Dr. Killinger mentioned that those beautiful and leafy forms of Impatiens are being planted all over the University of Florida campus.

Kentucky - R. E. Sigafus

Dr. Taylor is close to publishing his work on clover out of Kenland.

Panicum virgatum, switchgrass looks good.

Better stands result when seed of crown vetch are pelleted.

Louisiana - R. J. Stadtherr

Material was passed out on ornamentals research at Louisiana State University. Discussion revolved around how an ornamental is to get into the trade.

Who will increase it - Who will sell it? John Floyd of Clemson stated that increases of Ornamental PI's are passed onto the nurseries through the Extension Service of South Carolina.

Mississippi - H. W. Bennett

As shown by the list of publications issued during the past year, "Peter" has been a very busy boy on the Paspalum breeding program.

North Carolina - W. T. Fike

The increase of the Norman pigeon pea is being handled within the International Crop Improvement Association and the seed sold is Upper Volta Certified Norman pigeon pea.

W. H. Tallent stated that kenaf might sell for $15 per ton of dry matter. This would make kenaf an uneconomical crop in the area where presently grown in North Carolina, and that being near local pulp plants. Yields have averaged between five and six tons of dry matter per acre.

Dr. Milbocker expressed an interest in obtaining selections of the blueberry explorations from Dr. Galletta. A M.S. thesis has been written on the cytology of the collection. Crossing of all selections are being made with an eye to horticultural specimens, botanical specimens and ornamentals. Drs. Ballinger and Cushman have tested each species for pigments, sugars, acidity, firmness, and keeping quality. A list of the PI's available will be issued in the fall and sent to Dr. Langford.

Oklahoma - Charles Galeotti

Many PI's were being evaluated as potential crops for Oklahoma.

A need was expressed for an early variety of guar which would prevent shattering.

Puerto Rico - A. Sotomayor-Rios

Yields of Panicum maximum approach 100 tons green matter per acre per year which is five tons dry matter per acre per year.

Soybeans from Illinois have yielded well at the Corozal Experiment Station. They get three crops per year.

J. Velez-Fortuno is on a sabbatical leave during the 1972-73 year. He will be visiting research stations in Mexico, Central America and South America.

South Carolina - J. A. Martin and John Floyd

Dr. Barnes is retiring in November from the Charleston Vegetable Station. He has used a great many PI's in his work with vegetable crops.

John Floyd is looking at the ornamental PI's classifying them from a landscape design viewpoint. He showed slides taken of close-up leaves and flowers showing outstanding ornamentals in the collection. These are listed in the Appendix. He mentioned that the Osmanthus with its variegated foliage turning purple in the fall is very attractive.

Tennessee - M. J. Constantin

It was reported that PI 279746 Cryptomeria japonica is a dwarf while in North Carolina one of three plants of the same introduction is 18 feet tall.

Texas - Eli Whiteley

The Kenaf "Monster Plant" of Eli's is being used in crosses. This line of kenaf was found in a regular kenaf field.

Sugarcane will be grown commercially in Texas during 1973. A refinery is being built and acreage for production has been allocated by the USDA.

Virginia - Absent

No report given

Soil Conservation Service - W. C. Young absent

No report given

Northern Regional Research Lab - W. H. Tallent and Charles Adamson

Plastic chips made out of Nylon 1313 were passed out to the group. Nylon 1313 is made from Crambe. A leaflet describing Nylon 1313 was passed out to the group.

An article describing the 5000 acre Midwest Crambe operation appeared in the June 3 issue of Prairie Farmer.

The use of sperm oil for industrial lubricants will be prohibited after 1972. Replacements are being evaluated.

Over 1000 species screened for L-dopa with Velvetbeans containing the greatest amount. Gordon Killinger asked about L-dopa in the pods also. Tallent said it was easier to get the L-dopa from the seed, a cleaner process. A publication on the L-dopa screening program will be sent to all committee members.

Dr. Adamson reported on his kenaf breeding and production program. He is getting some nematode resistant lines in the program. "Vandals" have harvested prematurely many sections of his kenaf crop. One problem in growing kenaf near large populated areas.

Germplasm Resource Laboratory - H. L. Hyland

New title for former New Crops Research Branch. Dr. George White heads up this group. Dr. John Creech and Dr. Quentin Jones have been moved up to the Planning Committee of USDA. A discussion of the USDA's reorganization was made by Mr. Hyland.

The cancer screening and narcotics program have top priority.

Any persons from universities in the region making plant explorations should be asked about incorporating collections into the PI system as working stocks.

Dr. Bernard from Urbana, Illinois will be collecting soybeans in the Western Pacific area in cooperation with the Germplasm Resource Laboratory.

Vegetative increases of plant material at the Glenn Dale Station is being hindered by a shortage of technicians.

Cooperative State Research Service - C. I. Harris absent

No report given

Regional Station - W. R. Langford and Grover Sowell

Many PI's of various crops arrive at the Experiment, Georgia Station even though no major exploration is in progress. An example of this is the arrival over the year of 40+ lines of peanuts from ten different countries.

Forty-three percent of the 12,669 PI's received by S-9 cooperators come from other U.S. Plant Introduction Stations while fifty-three percent of the 15,176 PI's distributed from the S-9 region were sent to other areas of the U.S. and overseas.

There is an urgent need for extra land at the Regional Station to grow out seed increases of the many PI lines. Accessions were grown on rented land but most of the seed increases were lost to dry weather and vandals.

Grover Sowell reported that all of the Cucurbits are being inoculated with WMV-2. Let your Plant Pathologists know of this program.

Grover also made a point of the real danger of new diseases getting into the country on vegetative material brought in by various collectors. Example - *Puccinia cacao* on Hemarthria, see Page 3 of his report.

Gummy stem blight is becoming a very serious disease on melons. Two PI's show resistance to this disease. South Carolina conditions more pathogenic than those of Georgia or Alabama.

Two peanut PI's show resistance to leafspot. However, the lines are late maturing. Newer PI's may be of interest to breeders.

7. Review of Meeting of National Coordinating Committee

The NCC meeting was held at the Northern Utilization Research and Development Division Laboratory, Peoria, Illinois, on September 20-22, 1971. S-9 was represented by C. R. Jackson, W. R. Langford, and R. E. Sigafus.

A motion was passed that the need for a national clonal repository be referred to the Fruit Breeding Committee of the American Society for Horticultural Science. The intent of the motion was to obtain an expression of usefulness and need from researchers that would be most closely concerned with the repository. It would be their responsibility to obtain significant data on justification. A favorable response should be followed by a request for a feasibility study to research the various aspects of the repository.

A resolution was drafted and made a part of the minutes which related to the importance of and the need for increased support of the National Seed Storage Laboratory. There has not been a budget increase for the laboratory since establishment.

Other items of interest to S-9 were: 1) a resolution was passed recommending expediting the development of a system for increasing seed of short day plants for the four regions with the NCRB to explore the possibilities; 2) the placement of an Entomologist at the S-9 and NE-9 stations was urged, and 3) a resolution was passed recommending the NCRB take every possible step to initiate plant exploration and collection in China.

Discussion was held on Canadian participation in regional programs with a motion passed that an invitation be extended to the Canadians through the NCRB. Each region is to determine the type of representation desired.

Dr. Jackson, Chairman of the NCC for the next four years discussed the progress of each resolution. Many of the resolutions depend on the availability of funds.

Dr. Jackson also discussed a meeting of the Southern Prunus Committee held at Clemson University this spring. The aim is to have three plant breeding centers - North, Central and South stations in the Southeastern Region. The central station will be at Byrum, Georgia. This could possibly be a location of a Southern Repository.

8. Regional Station Budget

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

The committee further approved a resolution that Dr. Jackson approach the Southern Directors about much needed funds for the operation of the Plant Introduction Center at Experiment.

BUDGETS

Regional Station Budget 1971-72

Source of Funds		
Regional Research Funds (Pooled)		$ 38,000
Regional Research Funds (Georgia Station)		25,000
Hatch		4,663
State and Sales		2,977
USDA, New Crops Research Branch		50,265
	Total	$ 120,905

Expenditures		
Salaries and labor		$ 108,231
Equipment		1,383
Operating supplies		9,346
Travel		1,684
	Total	$ 120,644

Regional Station Budget 1972-73

Source of Funds		
Regional Research Funds		$ 67,333
Hatch		4,042
State and Sales		2,577
ARS		51,500
	Total	125,452

Proposed Expenditures		
Salaries and labor		$ 113,352
Operating supplies		11,500
Travel		600
Equipment		0
	Total	$ 125,452

9. Requests for Plant Introductions

a. More than 300 accessions of kenaf have been screened for possible nematode resistance. Only one introduction, P.I. 292207, from Kenya appears to have usable resistance. Kenaf occurs much more widely in Africa than represented in our germ plasm collection. Dempsey and Crandall, kenaf cordage fiber experts, feel strongly that nematode resistant material occurs and that further collection would be worthwhile. Therefore, the S-9 Technical Committee recommends an African collection of kenaf and closely related species to provide a wider germ plasm base for nematode screening and for other desirable traits.

b. Requests from Florida

New introductions of Digitaria spp. resistant to disease and cold hardy are still sought by Florida grass breeders.

N. R. Lake at Gainesville would like to try the following ornamentals on campus: Pyracantha (Koidzumix coccinea) 'Mohave', Pyracantha spp. 'Shawnee', Desmodium gyrans - Telegraph plant, and Solamum nodiflorum. Perhaps these are available at Experiment or Glenn Dale.

W. B. Sherman and R. H. Sharpe would like to receive scions of Taiwan plums (Prunus salieina) rather than the seed.

G. B. Killinger would like to have a collection of large diameter stem kenaf (Hibiscus cannabinus). It would also be desirable to have more introductions which would flower only with less than 11 hours of light. These might be collected in India or Africa.

Pigeonpeas (Cajanus cajan) which start flowering with 12 to 13 hours of light would also be an asset.

10. Status of the Regional Publication

Plant Introduction and Development of New Crops in the South - Southern Cooperatives Series Bulletin 161, April 1971 has just now come off the press.

This bulletin is a review of the accomplishment made under Southern Regional Project S-9 during the period 1960-69. This report was prepared by the S-9 Technical Committee with much of the information resulting from cooperative state research workers who used PI's for breeding stocks to improve established crops.

Please distribute a copy of this Bulletin to your respective Directors prior to September 5, the date of the Southern Directors Meeting.

11. State of Revision - S-9 Regional Project

W. T. Fike and W. R. Langford met at Experiment, Georgia in December and reworked the project. After corrections were made by C. R. Jackson and E. L. Whiteley the project was sent to all S-9 committee members.

Following suggested corrections and revisions, Dr. Jackson took the completed project to the Southern Directors Meeting this spring. All of the Southern Directors signed the project outline at this meeting.

The Committee of Nine approved the S-9 project "Introduction Evlauation and Improvement of New Crops for Industrial and Agricultural Uses" at their June meeting. The termination date of this project is June 30, 1977.

Copies of the project outline will be sent to each Station Director and to each S-9 representative.

12. Administrative Advisor

There is a concern among Southern Directors of what effect the reorganization of ARS will have on the various regional projects. Communications between the new groups and S-9 will be very important.

Dr. Jackson is the Southern Representative to IR-I. There is a meeting of this committee scheduled July 10-11 at Sturgeon Bay, Wisconsin. Remind your potato breeders to participate.

Under IR-2 auspices, a clonal repository of stone fruits is maintained virus-free at Prosser, Washington. Budwood from this repository is available free of charge and free of virus.

Ornamental information discussed at this meeting has been very worthwhile. Do not over-react, however, and forget that we are also representatives for other crop groupings.

Perhaps future meetings might be held jointly with other regional committees such as W-9, NC-7 or NE-9. These combined meetings would be of great value to all concerned. It would give members of the Southern Region a chance to see what New Crops Research is being done in other areas of the United States. It may be possible to invite another committee to meet jointly with us at our 1973 meeting.

Research on new crops is reported on at the S-9 meetings and included in our minutes. Much of these data remain buried and are not published. It is hoped that Southern Cooperative Series Bulletins can be written on ornamentals and/or new crops that would provide any interested person with the cultural and management practices for growing the crop as well as the botany of and end uses of the particular new crop. The publication of these bulletins would be the responsibility of a group of interested committee members and the bulletins would be produced by different states within the region.

13. Plan of Work for 1973

W. R. Langford should forward to interested cooperators any seeds of new industrial crops that may be of value to our region. The end use of these crops, as well as any known cultural information should be included.

14. Report of Committees

a. Nominating

The Nominating Committee suggested the promotion of the Secretary, W. T. Fike to Chairman of the S-9 Technical Committee for 1972-73 and M. J. Constantin for Secretary. Motion was made, seconded and passed.

b. Time and Place of Next Meeting

An invitation from Kentucky was accepted by the group. The meeting will be held during July on a date set by the host station and the Administrative Advisor. Perhaps another Regional Technical Committee could be invited to this meeting.

c. Resolutions Committee Report

Be it resolved that the S-9 New Crops Technical Committee convey it's utmost appreciation to Auburn University for the facilities and hospitality granted, to Associate Director R. D. Rouse for his welcoming remarks, and to Drs. Charles Berry, Oyette Chambliss, Walter Greenleaf, Joe Norton, Fred Perry and Howard Taylor for a most informative and well organized field tour.

The Committee further resolves that special thanks be extended to our more immediate host Dr. Carl Hoveland for his courtesies and guidance, for sharing the delightful evening trip to New Zealand via colored slides, and for his splendid persuasive power with the local weather arranger.

It is further resolved that Director Curtis Jackson be commended for his interest and leadership related to the Projects demanding business matters, and Dr. W. R. Langford for his continued endeavors to improve the Project's image and contributions as related to the needs within the respective States.

Respectively submitted,

H. L. Hyland
W. H. Tallent

15. Appointment of Committees for 1972-73

Chairman-elect W. T. Fike appointed the following committee chairmen to evaluate the writing of Southern Cooperative Series Bulletins. The respective chairman will appoint interested committee members to work with them.

Ornamental Crops - R. J. Stadtherr
Industrial Crops - E. L. Whiteley

16. Adjournment

The meeting was adjourned at 11:30 by Chairman Sigafus.

State & Federal Reports

Regional Plant Introduction Station

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

Soil Conservation Service
Northern Regional Research Laboratory
New Crops Research Branch

Report of Regional Station Activities
to S-9 Technical Committee, 1972

Plant Introduction

Seed or plants of 2386 new introductions were received during the year ending June 30, 1972. A few large collections such as (1) the Digitaria and other grasses collected in South Africa by Dr. Oakes, (2) 1091 accessions of mungbean obtained through P.L. 480 from India, and (3) 220 clovers and medics from Australia account for a high percentage of the new material. The other new introductions arrived in small shipments from widely diverse sources, and they represent numerous species. More than 27,000 accessions representing 263 plant genera are now held at the regional station.

Seed Production

3300 accessions were planted for seed increase and preliminary evaluation during 1971. Good seed increases were obtained from cantaloupes, peppers, and grasses. Introductions of peanut, watermelon, and cowpeas were grown on a site with no irrigation facilities about 7 miles from the campus. Poor stands of peanuts and peas were obtained because of inadequate soil moisture at time of planting. Most of the melons and some of the peanuts were lost to thieves and vandals.

Species that showed potential for meeting certain needs include _Paspalum distichum_, _Indigofera endecaphylla_, and _Zornia_ spp. _P. distichum_ is a low-growing, rhizomatous grass that appears useful on rights-of-way of secondary roads that receive little or no maintenance. _I. endecaphylla_ and _Zornia_ are prolific seeders, and might reseed themselves as summer legumes in grass sods.

Chemurgic Crops

In the Chemurgic Crops program 16 accessions representing _Ecballium_, _Stokesia_, _Leavenworthia_, _Selenia_, and _Synthlipsis_ were planted during March for seed increase and preliminary evaluation. Only _Stokesia laevis_ and _Ecballium elaterium_ produced seed. _Ecballium_ failed to retain seed after maturity and the striped cucumber beetle likes this species.

Plant Disease Investigations

A. Screening for Disease Resistance

Capsicum annuum PI 271322 and _C. pendulum_ PI's 260511, 281423, 260579 and 260582 had significantly less defoliation due to bacterial spot in the field than did California Wonder PI 260581 and PI 260583. These new sources of resistance to bacterial spot will be tested for resistance to the new pathotype of the bacterium reported in Florida.

In further tests with tomato introductions none of them, including PI 124235, were resistant to all Florida isolates of the bacterial spot bacterium.

In cooperation with Dr. D. H. Smith 1404 introductions of peanut have been tested for resistance to leafspot caused by Cercospora arachidicola. 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. PI 109839 and PI 269685 retained their leaves better than Argentine in the 1971 field tests. The percent leaf area intercepting light on these two introductions was approximately 50% as compared to 0% for Argentine late in the season. This difference was significant at the 1% level of statistical significance. The most promising introductions from previous field tests are being tested this summer in an isolated field planting where we believe it will be possible to test field resistance more accurately than in conventional field tests where high inoculum concentrations may mask significant field resistance.

All of the Cucurbita pepo introductions maintained by the North-central Plant Introduction Station have been planted in the field and inoculated with WMV-2. Dr. Demski and I plan to look for resistance to symptom expression on the fruits as well as resistance to fruit rots and other diseases.

Progress in evaluating the field significance of hypocotyl resistance of peanut introductions by Rhizoctonia solani in laboratory tests has been retarded by the lack of a convenient technique for measuring the level of infestation of soil. The level of infestation of the soil in the greenhouse test reported last year was so high that the resistance of plant introductions may have been masked. Tests have now been completed comparing levels of infestation in different soils in the Griffin area with levels of infestation in fumigated soil to which were added different amounts of cornmeal-sand inoculum of Rhizoctonia solani. Percent emergence of bean seeds and percent of bean seedlings showing stem cankers were used to measure the level of infestation, The percent emergence of seeds covered with soil containing 1 ml. of cornmeal-sand inoculum of R. solani per 1000 ml. fumigated soil was comparable to that of seed covered with soil of what appeared to be average to high levels of infestation of soil samples collected in several fields at our station. A field test to evaluate the significance of hypocotyl resistance is in progress. Emergence of Argentine and PI 161866 was not affected by inoculation with R. solani at planting. Yields will be determined.

No evidence of a new race of the gummy-stem-blight pathogen Mycosphaerella citrullina was found in cultures isolated from a single leaf lesion on Gulfcoast cantaloupe growing in Alabama or from infected PI 140471 shipped to our laboratory by Dr. M. G. Hamilton, Blackville, S. C.

Statistically significant differences in mean length of stem canker caused by M. citrullina were noted on PI 321005 (33 mm.), Georgia 47 (53 mm.), Planters Jumbo (42 mm.), Improved Rocky Ford (113 mm.) and PI 140471 (2 mm.).

The powdery mildew resistance of original and increase seed did not differ significantly with 22 out of 24 introductions tested. There also has been little plant to plant variation within resistant introductions in reaction to the disease.

B. Diseases Associated with Plant Introductions

A rust, Puccinia cacao, was found on several introductions of Hemarthria altissima. Since the Plant Quarantine Division informed us that this rust is not established in the United States we dug up and destroyed all affected introductions. The disease also appeared on a single introduction in a pot in the greenhouse. This plant was clipped back to the soil and treated with a drench of Ferbam. The disease has not been found on subsequent new growth of the infected introduction or on plants of any other introductions. It is interesting to note that this rust is the second disease to be found in our nursery which is apparently new to the United States in almost 14 years. We have not found a single new disease of a major crop species in our nursery during this period. The rust of Hemarthria illustrates the danger of planting newly introduced vegetative material directly in the field. If this had been a disease capable of spreading rapidly and affecting an established crop species it probably would have been impossible to prevent its becoming established in this country. Some researchers have received vegetative material of new introductions at the same time that the regional station receives this material. When this happens I recommend that it be grown for at least 6-8 weeks in the greenhouse and examined for disease symptoms by a pathologist as a minimum precaution.

Based on our experience at the regional station the danger of introducing a new disease on seed is much less than it is with material introduced in the vegetative form. A common problem of concern to the recipient of plant introductions reproduced by seed is the presence of established pathogens which may interfere with accurate testing of a few species. The presence of seed borne pathogens on seed of Cucumis melo and Citrullus lanatus introductions for example will seriously interfere with greenhouse screening tests for disease resistance if the seed is not treated before planting. It is impractical if not impossible to grown pathogen-free seeds in the environment of Experiment, Georgia. Routine control measures at best reduce, but do not eliminate, seedborne pathogens. I have experienced no serious difficulty in using seed of Sorghum bicolor, Cucumis sativus, Cucurbita pepo, Capsicum (all species), Arachis hypogaea (greenhouse tests) and Vigna sinensis in screening tests without treating the seed. Serious unwanted diseases have appeared in experiments using Cucumis melo, Citrullus lanatus and Arachis hypogaea (laboratory tests).

C. Diseases of Industrial Crops

A fungus which appeared to be identical to the one consistently isolated from leafspots on kenaf was isolated from small (1-4 mm.) leafspots on 4 weed species growing in and near a kenaf planting. Isolates from weeds and from kenaf remained vegetative on V-8 agar, kenaf leaf extract agar sterilized by filtration, and sterilized green beans. Mycelial suspensions of these cultures did not cause symptoms. The preliminary work indicates that considerable research will be necessary to determine a means of producing infective units of Cristulariella pyramidalis for use in screening for resistance. Experiments with the standard isolate of Collectotrihum of kenaf obtained from a plant patholcgist in Zambia were successful in reproducing disease symptoms on PI 189210 (susceptible) and G4 (resistant). The association of the occurrence of low temperature with all serious epidemics of this disease in the southeast makes it seem doubtful if it will be a serious limiting factor in the growth of kenaf during the summer in this area.

Materials Catalogued and Distributed

Some of the materials held at the Regional Station have not been catalogued for distribution. These consist of new introductions received since the 1971 planting season and an accumulation of unadapted accessions that we cannot increase in central Georgia. Yet there has been a sharp increase in the materials catalogued during the last 4 years. The 1968 inventory contained 14,700 accessions. Four years later the S-9 inventory contained 22,752 accessions. Some of the noteworthy additions are summarized in the following table:

Crop	Accessions available 1968	1972	Percent increase
Peanuts	2228	3776	69
Sorghum	1407	3423	143
Pepper	1146	1784	56
Cowpeas	485	1212	150
Cantaloupe	1083	1656	53
Watermelon	535	688	29
Grasses	2001	4303	115

Plant materials distributed to research workers during the last year are summarized below:

State	S-9	NE-9	NC-7	W-6	Miami	Savannah	Belts-ville	Glenn Dale	Total
Alabama	50		1						51
Arkansas	5		3						8
Florida	561	53	202	675	230	4	29	52	1806
Georgia	2659	50	323	53		34	33	47	3199
Kentucky	128	168		260					556
Louisiana	46		30		4	4			84
Mississippi	191	35	46	16		1			289
N. Carolina	19	23	477			7			526
Oklahoma	1346	7	62	421		6			1842
Puerto Rico	502		340			1	122		965
S. Carolina	512	5	1480			11			2008
Tennessee	7	1	17			7			32
Texas	1145	1	20	32		7			1205
Virginia	12	29	57						98
TOTAL	7183	372	3058	1457	234	82	184	99	12,669

NE-9	912
NC-7	642
W-6	1288
Beltsville	39
Foreign	4664
Total	7545
NSSL	448

BUDGETS

Regional Station Budget 1971-72

Source of Funds		
Regional Research Funds (Pooled)		$ 38,000
Regional Research Funds (Ga. Sta.)		25,000
Hatch		4,663
State and Sales		2,977
USDA, New Crops Research Branch		50,265
	TOTAL	$120,905

Expenditures		
Salaries and labor		$108,231
Equipment		1,383
Operating supplies		9,346
Travel		1,684
	TOTAL	$120,644

Regional Station Budget 1972-73

Source of Funds		
Regional Research Funds		$ 67,333
Hatch		4,042
State and Sales		2,577
ARS		51,500
	TOTAL	$125,452

Proposed Expenditures		
Salaries and labor		$113,352
Operating supplies		11,500
Travel		600
Equipment		0
	TOTAL	$125,452

Improvements and Needs

During the last year enough 3" PVC pipe with necessary fittings was purchased for installation of an underground irrigation system on approximately 8 acres. Some of the pipe has not been delivered but we hope to get it installed before the 1973 crop season. A prefabricated metal building purchased from FY 71 funds was erected recently. This building was aquired to replace a similar one at the old nursery site. It has no electric power or other utilities yet, but when completed the building will be used for drying and cleaning seed and for storing field equipment. Also, during the last year a mimeograph machine, typewriter, and rotary mower were replaced with new equipment.

The nursery area (approximately 8 acres) now assigned to the regional station is inadequate for the seed increase and evaluation work assigned to the station. With this limited area we have to plow under many introductions before determining their winter survival and persistence. No area is available for growing introductions of clover, vetch and other cool season crops next fall and winter.

Certain pieces of nursery equipment have been replaced and a few new items have been added in recent years. However funds have not been available to replace any of the tractors, three of which are nine years old and require frequent repairs.

Assistance is still needed toward increasing introductions of short-day species.

ALABAMA S-9 (Plant Introduction) ACTIVITIES
July 1971 - July 1972

Carl S. Hoveland, Agronomy & Soils Department
Auburn Univ., Auburn, Alabama 36830

A total of 50 recorded introductions were received from the Plant Introduction by Alabama cooperators this past year. They included 42 summer annual forage legumes, 4 peanuts, 3 cantaloupes, and 1 pepper.

HORTICULTURAL CROPS

Cowpeas

Dr. O. L. Chambliss (Horticulture Dept.) and Dr. D. R. Strength (Animal Science Dept.) are continuing to screen *Vigna* plant introductions for improved nutritive value as food for both human and animal consumption.

Analysis of the *Vigna sinensis* plant introduction collection for protein content was completed. A total of 492 PI lines were analyzed. Crude protein content ranged from approximately 18% to a high of 36%. Seed increase plots of selected high protein lines are currently being grown in the field for further studies on protein quality and subsequent use in the southern pea breeding program. The PI's found to have 28.5% crude protein or greater are shown in Table 1.

Table 1. The crude protein contents of seeds of selected Vigna plant introductions

PI number	Crude protein (%)	PI number	Crude protein* (%)
A. High protein samples (greater than 30% crude protein)			
115679	30.7	293512	30.5
115681	31.2	293515	31.8
115683	31.1	293541	31.7
115739	30.3	293545	30.6
146113	30.7	293572	30.2
147562	30.0	293580	30.9
163448	30.6	293584	30.8
189099	36.0	304150	30.1
189380	30.4	307560	30.0
194206	30.4	307562	30.4
209971	30.9	311119	30.5
214354	30.3	325776	30.9
220851	30.1	339565	30.5
292871	31.7		
B. Protein content 28.5 to 30% in Vigna samples (high protein)			
170849	28.6	292913	28.5
179533	28.8	292914	29.9
186459	28.6	293487	28.8
194207	29.4	293504	28.8
194214	28.8	293519	28.8
205240	29.8	293533	28.8
208771	28.9	293536	28.7
208845	28.8	293542	28.6
211642	28.6	293544	28.6
269667	29.1	293548	28.8
292889	28.9	293588	28.8
292893	28.7	307556	28.5
292904	29.7	307561	28.5
292907	29.0	337044	28.9
292911	29.3		

* Dry wt. basis

Peppers and Tomatoes

No report was obtained from Dr. Greenleaf (Horticulture Dept.).

Cantaloupes

Advanced breeding lines with resistance to gummy stem blight, (*Mycosphaerella citrullina*) from P.I. 140471, have produced high yields of fruit with excellent quality. Vines have continued to grow and fruit throughout the summer and fall seasons. Four small-fruited lines, AC-67-14 (Gulfcoast), AC-67-17, AC-67-59 and AC-68-55 were evaluated in grower trials in 1968, 1969, 1970, and 1971 for the produce chain store trade. The tests indicated that the 4 melons were acceptable quality in competition with western-grown fruit. Two jumbo size lines, AC-68-51 and AC-68-52 have produced high yields of quality fruit in grower tests.

The Gulfcoast cantaloupe cultivar (an inbred line from the cross AC-63-11 X PI 140471) was released. Since the fruit are somewhat larger in size than the other small fruited lines, this cultivar may prove to be superior for non-irrigated plantings.

An interspecific cross of *Cucumis melo* (PI 140471), susceptible x *Cucumis metiliferus*, resistant and subsequent outcross of the F_1 to cantaloupe breeding line, AC-67-14, *C. melo*, indicates that incorporation of resistance to *Meloidogyne incognita acrita*, root-knot nematode, into commercial types is practicable. Two different fruit types were observed in the F_1. A difference in susceptibility to powdery mildew was observed in the F_2 plants from the two different

F_1 plants.

In the field studies, segregation for resistance to M. incognita acrita, was observed in the F_2 and outcross populations. The plants that resulted from the outcross of resistant F_1 x AC-67-14 were vigorous and possessed a high degree of general disease resistance. The plants resistance to the root-knot nematode continued to grow vigorously throughout the growing season.

An exclusive release has been made to Hollan & Co., Inc. , Rocky Ford, Colorado for seed increase and sale of Gulfcoast and Chilton varieties of cantaloupe. Seed will be available the spring of 1973 for planting.

Watermelons

Severe crop losses and reduced yields of melons have resulted from the disease gummy stem blight (Mycosphaerella citrullina) in certain fields in Alabama. Although the damage seemed to be more widespread in the Gulfcoast area, frequent reports of damage in central and northern Alabama have occurred.

Seed of gummy stem blight - resistant plant introductions PI 189225 and PI 271778 secured for tests. Since facilities were available for screening seedlings, a planting of PI 189225 and PI 271778 and desirable cultivars was made in the greenhouse in the winter of 1969-1970 to permit crosses of the resistant and susceptible material. A backcrossing and screening program is being followed to incorporate resistance to M. citrullina into commercial icebox and field types. The mode of inheritance of resistance to M. citrullina is also being determined. The inheritance-of color and quality factors make the development of commercial type breeding lines difficult and long term work.

Ornamentals

Dr. Fred B. Perry (Horticulture Dept.) reports that the following introductions appear promising and will receive more extensive testing:

P.I. No.	Name
317270	Rhododendron mucronulatum var. ciliatum
317272	Rhododendron yedoense var. poulchanense
316983	Rhododendron luachycarpum var. rosaflorum
228004	Rhododendron tschonoskii
317285	Spiraea fritschiana
317271	Rhododendron mucronulatum var. ciliatum
316982	Rhododendron brachycarpum var. rosaeflorum
239247	Hedera helix var. poetica
337618	Rhododendron 'Ben Morrison'
239247	Hedera helix var. poetica
337619	Rhododendron 'Mrs. LBJ'
235758	Rhododendron indicum
266769	Pyracantha coccinea 'Orange Giant'
242522	Buxus sempervirens 'Myosotifolia'
242519	Buxus sempervirens 'Latifolia'
240756	Buxus microphylla
242520	Buxus sempervirens 'Latifolia Maculata'
242525	Buxus sempervirens 'Salicifolia Elata'
242523	Buxus sempervirens 'Pendula'
261848	Buxus sempervirens

276274	Buxus microphylla 'Suffrutriosa'
315887	Pyracantha 'Shawnee'
265032	Cotoneaster wardii
159034	Hibiscus - White Beauty
226542	Rhododendron kiusianum
317270	Rhododendron muscronulatum var. ciliatum

AGRONOMIC CROPS

Peanuts

Dr. A. C. Mixon (Agronomy & Soils Dept., ARS, USDA) reports that a new laboratory procedure with conditions conducive to optimum growth of Aspergillus flavus Link ex Fr. revealed that two peanut accessions were resistant to toxin-producing strains of the fungus. Seed with flesh seedcoats from P.I. 337394 had an average of 5% seed infection for hand-picked and hand-shelled samples evaluated at optimum seed maturity in five separate evaluations during 4 years. Also, seed infection for samples of P.I. 337409 averaged 9% for similar evaluation. For two years, comparable checks of susceptible accessions, P.I. 331326 and P.I. 343419, had an average of 92% and 91% seed infection, respectively, and 'Argentine', 'Florunner' and 'Wilco I' had an average of 34%, 39%, and 30%, respectively.

Pearlmillet

Dr. W. P. Caldwell (Northrup King & Co. Plant Breeding Station, Atmore, Alabama) noted that about 250,000 acres of Millex-23 pearl-millet will be planted by Southeastern farmers in 1972. This variety, developed by Dr. Caldwell at Atmore, is a selection from the cross

P.I. 286834 x P.I. 185648.

Ryegrass

Dr. W. P. Caldwell (Northrup King & Co., Atmore, Ala.) is currently increasing a ryegrass selection from P.I. 231603 which exhibits good turf quality and more heat tolerance than other ryegrass.

Tall fescue and Phalaris

Dr. C. D. Berry (Agronomy & Soils Dept.) in his breeding program is seeking improved winter forage production, persistence, and disease resistance in these two grass species. Good variability for these characteristics have been found among the P.I. material in nurseries and synthetic varieties are now being tested. Additional collections of *Phalaris aquatica* are needed for improving seedling vigor, persistence, and cold tolerance of winter-productive types.

Rust is a serious problem in tall fescue pastures from Kentucky to the Gulf Coast. None of the present varieties are resistant. P.I. material is presently being screened and additional collections are needed to develop rust resistance in this important pasture grass.

Arrowleaf Clover

Acreage of Yuchi arrowleaf clover (from P.I. 233816) continues to increase. Demand for seed has been good. Acreage estimates this spring were 75,000 acres in east Texas and 100,000 acres in Alabama.

Grazing trials continue to show excellent animal performance on this clover, even under drought conditions. Steers grazing rye-ryegrass-Yuchi arrowleaf clover from November 8 until June 5 at the Piedmont Substation gained 2.16 lb/day/steer and a total of 454 lb/steer. Most of the forage in late May was Yuchi and gains during this period exceeded 2 lb/day. At slaughter, carcasses of 14 steers 3 graded Choice and the remainder high Good. This was the same grade ratio as from steers in the feedlot on silage and corn.

Poor nodulation has been a problem when Yuchi arrowleaf is planted the first time on sandy soils. Increasing the inoculation rate by 2 or 3 times the normal recommended rate helps but pelleting the clover seed with methyl cellulose, inoculum, and $CaCO_3$ has been even more successful. Winter forage yields were increases 300% as compared to the normal rate of inoculum. Total annual dry forage yields were increased as much as 2,500 lb/A by planting pelleted seed.

<u>Publications issued during the year dealing with P.I. material:</u>

1. Harris, R. R., C. S. Hoveland, J. K. Boseck, and W. B. Webster. 1972. Wheat, oats, or rye with ryegrass and Yuchi arrowleaf clover as grazing for stocker calves. Auburn Univ. (Ala.) Agr. Exp. Sta. Circ. 197.
2. Hoveland, C. S., W. B. Anthony, E.L. Mayton, and H. E. Burgess. 1972. Pastures for beef cattle in the Piedmont (Serala sericea dallisgrass - Regal ladino clover, Coastal bermuda-Yuchi arrowleaf clover). Auburn Univ. (Ala.) Agr. Exp. Sta. Circ. 196.
3. Hoveland, C. S., E. L. Carden, J. R. Wilson, and P. A. Mott. 1971 Summer grass residue affects growth of winter legumes under sod.

Auburn Univ.(Ala.) Agr. Exp. Sta. Highlights of Agr. Res. Vol. 18, No. 3.

4. Hoveland, C. S., R. F. McCormick, W. B. Anthony, and F. T. Glaze. 1971. Managing arrowleaf clover for grazing and hay. Auburn Univ. (Ala.) Agr. Exp. Sta. Highlights of Agr. Res. Vol. 18, No. 4.
5. Norton, J. D. 1971. Gulfcoast - a sweet cantaloupe for the produce chain store market. Auburn Univ. (Ala.) Agr. Exp. Sta. Leaflet 82.
6. Norton, J. D. 1972. Gulfcoast cantaloupe - New variety for commercial production. Auburn Univ. (Ala.) Agr. Exp. Sta. Highlights of Agr. Res. Vol. 19, No. 1.
7. Wade, R. H., C. S. Hoveland, and A. E. Hiltbold. 1972. Inoculation essential for production of Yuchi arrowleaf clover. Auburn Univ. (Ala.) Agr. Exp. Sta. Highlights of Agr. Res. Vol. 19, No. 2.

S-9 Technical Committee Report
Arkansas Agricultural Experiment Station
Fayetteville, Arkansas 72701
Period of July, 1971 to July 1, 1972
J. L. Bowers

Rape: The 51 accessions of rape obtained in 1971 were planted in November on the Southeast Branch Experiment Station at Rohwer, Arkansas. The first notes taken on this planting were made by Dr. Charles Lincoln and Mr. G. L. Dean of the Department of Entomology. P.I. 251240, P.I. 323270 from Pakistan, P.I. 324507, Brazil and P.I. 323939, England were taken out by cold weather. Part of the plants in P.I. 169078, Turkey and P.I. 311711, Chile were killed by low temperatures. On February 23 these notes were recorded on stage of bolting (seedstalk development). Complete bolting was observed in these P.I.'s: 269449, 271452, 282570, 282571, 251614, 251240, 251236, 250135, 232895, 324507, 323939, 311731 and 323270.

In all other plant accessions the seedstalk had initiated with these exceptions: 170032, 171521, 171538, 305278, 305379, 305280, 305281, 305282, 311732, and 311733.

On April 17, Mr. Dean and I took notes and made the decision on what lines to harvest for seed. We decided to get seed yield on 31 of the accessions. The plant accessions showing the greatest yield potential at this time were: P.I. 269449, P.I. 271452, P.I. 282570, P.I. 305278, P.I. 311731, and P.I. 311732. Plants in these accessions had a very heavy crop of pods set. Yield records are being taken on the 31 accessions and samples will be analyzed for their oil content.

Southern Peas: 519 accessions were grown in a late June planting on the Vegetable Substation at Van Buren, Arkansas. Several accessions appeared to possess a good level of resistance to powdery mildew and cercospora leaf spot. These were: P.I. 339584, P.I. 255785, P.I. 205241, and P.I. 186340. Two plant accessions in the cream group P.I. 293437 and P.I. 293546 are being used in crosses with Stations' cream breeding lines, the former for its long pod character and the latter for its earliness. Several other selections from the plant introduction material are being used in the Station's breeding program.

Spinach: The Station has recently initiated a spinach breeding program on the development of disease resistant spinach. The primary objective is to obtain white rust resistance and to combine it with both downy mildew and blight resistance into a good spinach type. Two plant accessions, P.I. 167195 and P.I. 169025, which had shown a good level of resistance in a field screening test, are being used in this program.

Grapes: (Dr. J. N. Moore, Horticulturist). During 1971, a total of 45 P.I. grapes fruited and were evaluated. Most of these were susceptible to one or more diseases, but a few had characters of possible value in a breeding program. Specific clones with table grape varieties follow: P.I. 231353-Iran seedless; blue, small fruit, small, very tight clusters, very early maturing, susceptible to downy mildew. P.I. 203088-Argentina, blue, large elongated berries, very crisp; good vigor; susceptible to powdery mildew. P.I. 277577-Italy, white large berry; very large cluster; attractive table grape; very crisp texture; good vigor; susceptible to downy mildew. P.I. 287735 (USSR); red, large berry; very large cluster; very attractive table grape; vigorous and productive; susceptible to powdery mildew.

Crosses were made in 1972 using P.I. 277577 and P.I. 287735 as parents in combination with disease resistant American grapes.

Several P.I. clones showed characteristics indicative of wine grape qualities, but no evaluations of wine have been made.

Lupines: (Dr. M. S. Offutt, Agronomist). Three introductions of *Lupinus albus* L. were obtained through the Regional Plant Introduction Station, Experiment, Georgia. These were: P.I. 361870 (Neutra), P.I. 361871 (Pfluga Ultra) and P.I. 361872 (Viglas). One-half of the seed from these three introductions was planted in the fall of 1971 at Fayetteville, Arkansas. Normal seedling emergence and early fall growth occurred. A rapid drop in temperature from 60°F to 0°F killed all of the plants in January, 1972. The remainder of the seed will be used to establish seedlings in the greenhouse for evaluation of their Phytophthora root rot resistance.

FLORIDA S-9 'NEW PLANTS' REPORT

July 6-7, 1972

Auburn, Alabama

G. B. Killinger

S.C. Schank reports receiving over 300 Digitarias, Hemarthrias, and Brachiarias over the past year with many originating from the 1971 collection trip of A.J. Oakes. An outbreak of rust (Purccinia cacao) was observed on PI 349796 (Hemarthria altissima). All field plantings of Hemarthria in the area were destroyed and the soil treated with formaldehyde. Of the 1971 digitgrass introductions, PI 364619 established rapidly and appeared promising.

At Gainesville Rex Smith notes that sexual (Panicum maximum) plants were isolated from PI 156542, 277901 and 27[illegible]962 seedings. The search for these sexual plants involved the screening of 742 progenies for within-progeny varia bility. Sexual plants were 20 times more frequent among off-type selections than typical selections. The isolation of these plants now makes it possible to release all of the genetic variability in the species to genetic recombination and manipulation. Evidence also suggests that apomixis is subject to genetic manipulation.

E.S. Horner at Gainesville reported the following PI's fairly resistant to Southern Corn Leaf Blight, (Helminthosporium maydis): 194385, 194389, 194390, 209135, 226685, 253730, 257607, 260614, 274014, 317330, 317331, and 318728. These are being used in a breeding program.

Mr. N.R. Lake, Landscape Superintendent at the U of F notes the 23 different Impatiens (PI's) are outstanding in many leafy forms. He expects to make many cuttings for planting on campus. Lagerstoemia subcostata (PI 324994) has earned its right to be used in the landscape development of the new Music Building. The plants are 3' to 4' tall and were covered with small white flowers last summer. Callicarpa formosana (PI 324954) and C. japonica (PI 317359) are 3 feet high and produced lavender colored fruit last summer. Liquidambar formosana (PI 302822) is as satisfactory in the Gainesville area as Liquidambar syraciflua and has become rather widely planted on campus.

A.J. Norden reports from Gainesville that nine Arachis hypogaea introductions are currently being utilized as parents of crosses with the objective of improving disease resistance, maturity, and strength of peg attachment of peanut varieties and experimental lines as well as the conduct of inheritance studies. The PI no.'s are as follows: 262092, 262110, 237337, 268661, 279956, 292281, 306222, 337394, and 337409.

D.W. Gorbet reports from Marianna that 57 PI's of peanuts were visually evaluated for various plant, pod, and seed characteristics. Specific emphasis was given to pod damage, leafspot incidence, seed coat quality, and uniformity. Twelve of these introductions PI 200444, 261906, 262090, 274191, 121067, 145681, 203396, 259785, 261911, 268883, 269063, and 269114 were planted in the greenhouse for use in crossing. The first 4 PI's are involved in a genetic study & the remainder for breeding purposes.

R.H. Sharpe and W.B. Sherman report from Gainesville that apple PI's 280400 and 280401, 'Anna' and 'EinShemer' are described in a recent paper published in Vol. 84(1971) of the Florida State Horticultural Society. Crosses resulting from seedlings of Taiwan plums by high quality Prunus salieina varieties will be fruiting this year. The plant introduction was similar to PI 343711.

A.P. Lorz at Gainesville reports the following PI's used in a tomato breeding program which were all crossed to multiple disease resistant commercial types. PI 272735 and 272751 from El Salvador were pink and red plum types with small cores and good interior ripening. G-1594, the cultivar Red Pickler, was used because of its determinate habit and concentrated ripening. G-20126,
358508 Chamasyk Early, was excellent for determinate early flowering and smooth fruits. Promising F_2 selections from this crossed to larger commercial are being further backcrossed to commercial types.

M.J. Bassett, C.E. Peterson, J.O Strandberg and R.D. Berger at Gainesville screened the entire PI carrot collections kept at Ames, Iowa. Three PI lines, 261648, 294090, and 226043 were found to have outstanding resistance to Alternaria dauci fungus. This fungus is the principal disease problem of Florida carrots and prevents the use of most carrot varieties in Florida for commercial production. The resistance is not complete immunity as the leaflets still become infected in the form of local lesions, but the disease spreads much more slowly.

J.R. Shumaker reports from Hastings on the evaluation of two potato varieties and ten seedlings potato stocks, in cooperation with the USDA for resistance to the root knot nematode, Meloidogrne incognita. Resistance in these stocks is a result of germplasm obtained from Plant Introduction and the Inter-Regional Potato Introduction Project (IR-1). Seedlings from Solanum tuberosum group andigena and S. vernei have shown resistance to the golden nematode. Wauseon, a variety from a cross with PI 205624 released in 1967 for its golden nematode resistance also has high resistance to the root knot nematodes. This opens up the possibility of building multiple resistance in commercial varieties.

From the Leesburg Station, J.M. Crall notes the use of PI 255137 in breeding for tolerance to watermelon mosaic virus (WMV). G.W. Elmstrom at Leesburg is developing F_1 hybrid cantaloupes. PI 123517 and PI 140471 have been incorporated in parent lines.

E.A. Wolf reports from Belle Glade two Apium introductions PI 169007 and 171499 have been used in a celery breeding project as sources of resistance to bacterial leafspot and early blight. F_2 segregates of crosses of commercial celery varieties with these PI's are currently being backcrossed to the commercial varieties in an attempt to utilize these sources of disease resistance.

From Homestead, S.E. Malo notes the introductions of over 50 cultivars of avocados from different areas of the world. About 10 mango types mostly from Southeast Asia have also been introduced. A "Dwarf" avocado from California, 'Mt-4' has turned out medium-sized and it will be tested as a rootstock and interstock.

E.M. Hodges at Ona notes the performance of seven grass introductions which produced as much or more forage in 1971, from replicated plots, as pangolagrass, which yielded 5.8 tons over-dry material per acre in 5 harvests. Rhodesian Bermuda PI 224566, Limpograss PI 299994, B. humidicola PI 257678, B. sp. PI 299498, Ethiopian Bermuda PI 225957, UF I Digitgrass 299601, and D. milanjiana PI 299675. A digitgrass PI 299323 growing at the Range Cattle Station and Immokalee shows promise.

At Fort Pierce, J.B. Brolmann notes the favorable performance of several varieties of Stylosanthes guyanensis. Special attention is being given to a Desmodium heterocarpon PI 217810 which makes fast regrowth in the spring.

From Fort Lauderdale, P.L. Neel reports on a number of PI's which have died and lists those still living in containers which will be planted out for evaluation. These are all ornamentals and a meaningful evaluation will be made in the next several years.

L.S. Dunavin from Jay notes Phalaris aquatica, PI 302455, and Phalaris aquatica PI 319066 as the most productive of a number of cool season grass introductions planted in 1970. Arachis monticola PI 263393 has persisted and bloomed well. Hemarthria altissima PI 299993 and 299994 have made very good spring growth in 1972.

From Gainesville, G.B Killinger reports that sunflower varieties tested in 1971 were Peredovik, Krasnodarets, and NK-HO1 with yields of seed harvested 2360, 2418, and 2548 pounds per acre. These were planted on February 10, 1971 and harvested in early June. Dr. James Robertson at the Russell Agricultural Research Center reported these seed produced at Gainesville as having 44.4, 44.4, and 41.7 percent oil. The 'Norman' variety of pigeonpea (PI 218066) continues to show promise as a seed, cover, and/or forage crop. Some segregating lines determined by seed coat color are being selected from this introduction. Over 4,000 pounds of 'Norman' seed were distributed in the spring of 1972 to farmers in 18 Florida counties for evaluation. Everglades kenaf planted on soil fumigated with Ethylene Dibromide, Nemagon, and Mocap yielded 19891, 15931, and 15486 pounds of oven-dry stem compared to 12140 pounds on non-fumigated soil. Kenaf introductions PI 326024, 343443, and A45312 grew well and show promise. In a yield test E71, E41, G4, Cuba 2032, and Cuba 108 yielded 16765, 17465, 17461, 13500, 8160, and 12230 pounds per acre of oven-dry stem. Limpograss (Hemarthria altissima) PI 299993, 299994, and 299995 continue to look good and all are being considered as tea-like beverage plants as well as forage plants. A number of more recent introductions of this grass are being evaluated.

PUBLICATIONS

1. Crall, J.M. 1971. Smokylee- A high-quality watermelon with resistance to Anthracnose and Fusarium Wilt. Fla. Agr. Exp. Sta. Cir. S-211.

2. Crill, Pat, J.W. Strobel, D.S. Burgess, H.H. Bryan, C.A. John, P.H. Everett, J.A. Bartz, N.C. Hayslip, and W.W. Deen. 1971. Florida MH-1 Florida's first machine harvest fresh market tomato. Fla. Agr. Exp. Sta. Cir. S-212.

3. Killinger, G.B. 1969. Importance of plant introductions to Florida agriculture. Soil Crop Sci. Soc. of Fla. 29:8-11.

4. Lorz, A.P. 1970. Zipper cream- A high producing fresh market southern pea with processing potential. Fla. Agr. Exp. Sta. Cir. S-210.

5. McCaleb, J.E. and E.M. Hodges. 1969. Slenderstem digitgrass. Fla. Agr. Exp. Sta. Cir. S-201.

6. Norden, A.J., H.A.D. Chesney and A.P. Stephenson. 1972. Altika- A peanut variety for the tropics (Guyana). Fla. Agr. Exp. Sta. Cir. S-215.

7. Oakes, A.J., W.L. Langford and S.C.Schank. 1970. Winter hardiness in Digitaria. Soil Crop Sci. Soc. of Fla. Proc. 222-229.

8. Sharpe, R.H. and W.B. Sherman. 1970. Bluegem Blueberry. Fla. Agr. Exp. Sta. Cir. S-209.

9. Sotomayor-Rios, A., S.C. Schank and R.Woodbury. 1970. Cytology and taxonomic description of two Brachiarias. (Congograss and Tannergrass). J. Agr. Univ. Puerto Rico 54(2). 1970.

10. White, G.A., D.G. Cummings, E.L. Whitley, W.T. Fike, J.K. Greig, J.A. Martin, G.B. Killinger, J.J. Higgins and T.F Clark. 1970. Cultural and harvesting methods for kenaf. U.S. Dept. of Agr. Agron. Prod. Res. Rept. No. 113. 38pp.

11. Wolf, Emil A. 1970. Earlibelle- A new early blight resistant celery. Fla. Agr. Exp. Sta. Cir. S-207.

REQUESTS FOR NEW PLANTS

New introductions of Digitaria spp. resistant to disease and cold hardy are still sought by Florida grass breeders.

N.R. Lake at Gainesville would like to try the following ornamentals on campus: Pyracantha (Koidzumix coccinea) 'Mohave', Pyracantha spp. 'Shawnee', Desmodium gyrans - Telegraph plant, and Solamum nodiflorum. Perhaps these are available at Experiment or Glenn Dale.

W.B. Sherman and R.H. Sharpe would like to receive scions of Taiwan plums (Prunus salieina) rather than the seed.

G.B. Killinger would like to have a collection of large diameter stem kenaf (Hibiscus cannabinus). It would also be desirable to have more introductions which would flower only with less than 11 hours of light. These might be collected in India or Africa.

Pigeonpeas (Cajanus cajan) which start flowering with 12 to 13 hours of light would also be an asset.

Georgia Report to S-9 Committee
July 6 - 7, 1972

Hatch 172 (S-9)

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

Project Leader: John H. Massey

Five accessions of Stokesia laevis were planted for observation in the fall of 1971. Of these, PI 366021 did not germinate. A replicated test was planted to compare the adaptability of six accessions of Limnanthes spp. Good stands were obtained, but no Stokesia or Limnanthes plants survived the winter.

Two kenaf experiments involving two row widths in one and three varieties in the other were grown at different levels of nitrogen. Levels of N and variety did not affect any agronomic characteristic measured in either experiment. Average stem diameter was greater in 28- than in 14-inch rows, but dry matter yield was greater in 14-inch rows.

Three varieties of kenaf and roselle were planted at four 2-week intervals beginning May 25. Dry matter yield, plant height, and stem diameter were greatest at the earliest planting and decreased at each later planting date. Each characteristic measured was similiar for all varieties.

The kenaf varieties Everglades 71 and Guatemala 4 were grown at four within-row spacings. Plant height and stem diameter for both varieties were similiar. Yield difference between varieties was highly significant. There were no yield differences among 3-, 6-, and 9-inch spacings, but 12-inch spacing gave significantly lower yields.

All kenaf experiments were planted about May 25. The total rainfall for June, July and August was above normal. Cristulariella defoliated the plants by mid-September.

Publications:

Massey, John H. 1971. Effect of Planting Date and Row Width on Seed Yield and Height of Crambe abyssinica. Ga. Agron. Abst. 14:1.

Massey, John H. 1971. Influence of Planting Time and Row Spacing on the Performance of Crambe abyssinica. Agron. Abst. 63:36.

Hatch 1060 (S-9)

Evaluation of New Ornamental Plant Introductions

Project Leader: W. L. Corley

Rooted cuttings of 74 new ornamentals were obtained from the Glenn Dale Plant Introduction Station and the National Arboretum. These are being grown as container stock under lath for one year prior to planting in the field nursery.

Evaluation of annual ornamentals continues with objectives of the 1971 Report. Twelve ornamental peppers are in their final year of evaluation. This will conclude ornamental pepper evaluation until new sources are discovered. One pepper, Capsicum annuum PI 357579 from Yugoslavia, is being used as the non-pungent parent in developing a small fruited, sweet ornamental pepper.

Thirty eight determinate and semi-determinate PI tomatoes obtained from the NE-9 station are being evaluated for their possible use as container or patio plants and in city apartment "mini" gardens.

The 1972 spring planting of ornamental grasses raises the total accessions tested to 289. Primary emphasis in the evaluation of ornamental grasses is on performance as specimen plants in landscaping and for use in floral arrangements.

Publications:

Corley, W. L. 1972. A new annual ornamental - Solanum nodiflorum. Amer. Horticulturist. 51(1):31.

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

R. H. Brown - Thanks for sending seed of two wild peanut species I asked for. I would also like to take this opportunity to thank you for seeds we have used in several experiments over the last two or three years. This has been a valuable service for us. I am enclosing a reprint of a paper which reports on some research we conducted using some of the grass species which you supplied seed of.

We atarted last year a study of photosynthesis rates on several strains and varieties of Arachis hypogaea as well as some wild species of peanut. One years data showed a range of photosynthesis on individual peanut leaves of from 21.7 mg CO_2 absorbed per dm^2 of leaf area per hr. for A. pintoi to

40 mg per dm^2 per hr. for the Starr and Florigiant varieties of A. hypogaea. Most of the common peanuts had rates of 30-35 $mg/dm^2/hr$. Wild species tended to be lower. We are repeating the work this year and are anxious to see if the differences are similar to those from last year.

Clanton Black - The Panicum maximum shipped to me 12/14/71 from the Introduction Station was used to study the pathway of carbon assimilation during photosynthesis. Enclosed is a manuscript from some of our P. maximum work which outlines the course of our research. We'll publish about 3 more papers in the next year or so on P. maximum photosynthesis including biochemistry and some leaf electron microscopy work.

R. E. Burns - We have selections of Festuca rubra and Centipepd grass set out in the field but it is too early to get results. Sixteen Centipedes received through you are in test. The 13 Puerto Rico entries (identified as R-1 to R-13) appear to root and spread rapidly. No differences have been observed as yet among 11 accessions of Festuca rubra.

T. S. Davis - Observations of woody ornamentals:

Pinus thunbergii PI 317258 has potential for specimen tree, now 15 feet tall in 4th year, has zigzag trunk. Bears cones at early age.

Crytomeria - Evergreen, fast growing, attractive in summer, but rusty brown in winter.

Pistachia chinensis - Rapid growth, colorful foliage in fall, very hard wood, a good ornamental tree.

Quercus myrsinaefolia PI 74222 - Evergreen oak from Japan - obtained from Savannah. Transplanted Nov. 3, 1969, now 7 ft. tall. Green in winter.

Cunninghamia lanceolata PI 324969 - China fir tree from Taiwan. Not cold-hardy enough at Experiment, turns yellow in winter, sometimes freezes back to ground.

Quercus chenii PI 102653 - China oak. Has poor form.

Acer rubrum var. tridens, NA 31022. - Red maple. Not as good as some maples already available.

Metasequoia glyptostroboides PI 286608 - After 3 yrs. 10.1' high (Dawn Redwood).

Ulmus pumila PI 310432. Fast growing, requires much pruning, now 10 ft. tall even after severe pruning. Use for screen.

Betula platyphylla PI 235128 - Japanese birch. Seed obtained from Glenn Dale. Germinated and grown in lathe house, then transplanted to field. Now 18-20 inches high.

R. O. Hammons - Resistance to a Jamaican strain of peanut rust (*Puccinia arachidis*) has been reported in PI's 259747, 298115, 314817, 341879 and 350680. (Marion Cook, Plant Dis. Reptr. 56(5):382-386).

Rust resistance was also reported in PI 315608 (Bromfield and Cevario, Plant Dis. Reptr 54:381-383).

M. D. Jellum - Plant introductions of corn have been used in a continuing breeding program for development of strains with unique fatty acid composition of oil. Selections have been made for types with high and low proportions for each of the major fatty acids. PI 175334 from Nepal has been used as a source for strains with unusually high stearic acid composition. Strains with 15 to 20% stearic acid have been developed as compared to commercial corn oil which contains 2% stearic.

Plant introductions have also been included in a selection program for developing possible sources of resistance to corn stunt and maize dwarf mosaic virus diseases.

LSU S-9 (New Plants) Report

July 1971-72

Richard J. Stadtherr
Horticulture Department
Louisiana State University
Baton Rouge, Louisiana 70803

Dr. Earl P. Barrios, who is teaching and doing research on turf grasses, requests sprigs of two St. Augustine grasses, PI 290888 and PI 30010. He would also like any Centipede grasses which show some cold tolerance.

Professor P. L. Hawthorne reports that PI 19412, Fragaria x 'Hume Grandee', has been used in his breeding program. Selections have been made of the progeny of crosses using this variety. These seedlings have very large fruits of extremely soft texture, are very productive, and show no resistance to Colletotrichum fragariae. Backcrossing to resistant varieties with better fruit texture has been done to incorporate the desirable features from PI 19412 to new selections.

Dr. Joseph Novak is teaching and doing research on adaptability of vegetable crops. He requested varieties of the vegetable soybean, Glycine max., with long and short day requirements for crop rotations and pod production from April through October. Characteristics to be evaluated are plant habit, growing season, pod set, ease of shelling, and potential as a frozen vegetable. Garlic, Allium sativum, having relatively few varieties, is grown intensively in many parts of the world. New varieties are needed for evaluation as a winter crop in Louisiana for hardiness, bulb and clove size, yield per acre, and storage. The rice straw mushroom, Volvaria volvocales, is wanted for trials to utilize available rice straw to provide small canneries with another crop, and to use greenhouse space during months when other crops are not in them. A papaya, Carica papaya, which would fruit in a relatively short period of time, not exceeding a year, is requested also.

Dr. Leon Standifer requested Annona moricata and Annona cherimola.

The rest of our report concerns ornamentals which we have had since I came to L.S.U. in October, 1967. We received 13 PI's in 1967. We plan to propagate the following which look very promising: PI 315887, Pyracantha 'Shawnee', PI 316671, 316672, 316674, Lagerstroemia indica varieties; respectively, Catawba, Conestoga, and Powhatan. We don't know what happened to our plant of Potamac, PI 316673, but presume it would have done well here too. We'd like to urge selection of varieties, especially for our area, which are resistant to mildew and adaptable to our climate.

In 1968 we obtained 84 different selections. Many of the rhododendron species do not receive enough chilling here to grow well. The vigurnums Mohican, Oneida, and Susquehana also need more chilling. The better adapted selections include the following PI numbers: 317357, 317211, 316616, 317365, 317259, 317371, 316528, 297426, 77014, and 329155.

In 1969, we requested 75 PI's. Those which appear to be better adapted include: 317354, 324959, 324969, 324982, 307304, 325008, 317258, 317297, 254592, 317234, 317235, 331202, 331203, 331204, 331205, 331206, 226542, 330375, 330379, 330380, and 330381. Those which were received from the National Arboretum which look good include the following N.A. numbers: 29008, 28521, 827-s, 30284, 31453, and 30289.

The following PI's received in 1970 appear to be best adapted in about two years under testing: 337618, 337619, 317614, 325036, 325037, 325038, and 325039. The N.A. numbers include: 31291, 14278-c, 23214-c, 15513-1-s, 16012-s, 28261-c, and 28322-c. The two azaleas Ben Morrison and Mrs. LBJ are excellent varieties which should become popularized. I think that both should be tried for year-round forcing. Mrs. LBJ, with its large pure white hose-in-hose flowers, is an excellent variety. Most of the *Rhododendron oldhamii* plants tend to be everblooming here, thus are being used in our breeding program. Incorporation of this characteristic into new varieties offers much potential in the future for both nurserymen and greenhouse operators.

Louisiana State University
Annual Report, S-9 Committee
Ornamentals, R. J. Stadtherr

NAME	P.I. OR N.A. NO'S	NO. PLANTS REC'D	NO. PLANTS LIVING	AVERAGE HT. & WIDTH	COMMENTS
Received 10/9/67					
Pyracantha 'Shawnee'	PI 315887,NA 28179-c	1	1	6' x 5'	Well adapted
Rhododendron arboreum	PI 307329,NA 27315	2	0		Dead 11/68
Rhododendron arboreum	PI 311318,NA 27932	2	0		Dead 11/68
Rhododendron cinnabarinum var. roylei	PI 307348,NA 27334	2	0		Dead 11/68
Rhododendron sp.	PI 307353,NA27339	2	0		Dead 11/68
Received 10/11/67					
Lagerstroemia indica 'Catawba'	PI 316671,NA 28861-c	1	1	6' x 6'	Good bloom; well adapted
Lagerstroemia indica 'Conestoga'	PI 316672,NA 28862-c	1	1	5' x 3'	Good bloom; well adapted
Lagerstroemia indica 'Potomac'	PI 316673,NA 28863-c	1	?		Question rec'd; cannot locate
Lagerstroemia indica 'Powhatan'	PI 316674,NA 28864-c	1	1	6' x 5'	Well adapted
Received 11/14/67					
Viburnum lantana L. 'Mohican'	PI 316679,NA 28868-c	3	0		Dead; appar. not enough cold
Viburnum X 'Oneida'	PI 316676,NA 28869-c	3	0		Dead; appar. not enough cold
Viburnum sargentii Koehne 'Susquehana	PI 316681,NA 28872-c	3	0		Dead; appar. not enough cold
Received 11/15/67 Geneva					
Cotoneaster microphylla	PI 285343	1	1	2 1/2' x 4 1/2'	
Received 2/15/68					
Rhododendron anthopogon	PI 307327	2	0		Dead
Rhododendron anthopogon	PI 311317	1	0		Dead
Rododendron molle	PI 159034	6	5	3' x 1'	Leaf curl; lack of enough cold
Rhododendron mucronulatum	PI 317269	3	2		Numbers mixed up
Rhododendron mucronulatum	PI 317378	3	2	2' x 3'	" " "

N A M E	P.I. or N.A. NO'S.	NO. PLANTS REC'D.	NO. PLANTS LIVING	AVERAGE HT. & WIDTH	C O M M E N T S
(Received 2/15/68 continued)					
Rhododendron mucronulatum	PI 317379	2	1	4'	
Rhododendron schlippenbachii	PI 317380	3	0		Dead
Rhododendron weyrichii	PI 317273	3	3	4'	
Received 2/21/68					
Actinidia polygama	PI 316959	1	0	Dead 9/20/68	
Agapanthus sp.	PI 270534	1	0		Dropped
Alnus mayrii	PI 317356	3	0		Dead 9/20/68
Amelanchier asiatica	PI 317357	2	2	6' x 4'	Well adapted
Betula ermanii	PI 316961	1	0		Dead
Betula ermanii	PI 317209	4	0		Dead
Betula ermanii	PI 317210	2	0		Dead
Betula platyphylla var. japonica	PI 317211	3	2	8'	Well adapted
Campanula takesimana	PI 318520	1	0		Dead
Carex fusanensis	PI 318521	1	0		Lost
Chrysanthemum arcticum	PI 261066	1	0		Dropped
Chrysanthemum sibiricum	PI 318524	2	0		Dropped
Chrysanthemum zawadskii	PI 318525	1	0		Dropped
Cornus controversa	PI 316616	2	2	5'	Well adapted
Cornus kousa	PI 317223	1	0		Dead
Cotoneaster lucida	PI 313962	1	1	4' x 3'	Bad insect infestation
Cotoneaster racemiflora	PI 313964	4	2	8" x 8"	
Disporum sessile	PI 317364	3	0		Dead
Firmiana simplex	PI 317365	1	1	11' x 5'	Well adapted
Forsythia ovata	PI 316967	6	1	1' x 2'	Needs more cold
Gaultheria fragrantissima	PI 285357	2	0		Dead
Hedera rhombea	PI 318540	2	2		Barely alive
Hemerocallis coreana	PI 316702	1	0		Dropped
Hemerocallis sp.	PI 316617	1	0		Dropped
Hypericum hookerianum	PI 307270	4	0		Dead
Hypericum hookerianum	PI 307271	2	0		Dead
Hypericum hookerianum	PI 307272	1	0		Dead

N A M E	P.I. or N.A. NO'S.	NO. PLANTS REC'D	NO. PLANTS LIVING	AVERAGE HT. & WIDTH	C O M M E N T S
(Received 2/21/68 continued)					
Iris ensata var. spontanea	PI 316053	2	0		Dead
Iris rossii	PI 316648	3	3	3'	
Ligustrum ovalifolium 'Argenteum'	PI 265262	3	1	5' x 3'	Mutates to full green
Lonicera insularis	PI 316409	4	2	5' x 4'	Not enough cold
Lonicera sp.	PI 314263	6	4	2' x 10'	
Malus baccata	PI 316650	1	1		Fire blight susceptible
Malus sieboldii	PI 316711	1	1		Dead
Pentapterygium serpens	PI 307303	4	0		Dead
Pinus koraiensis	PI 316977	3	0		Dead on moving
Pinus koraiensis	PI 317256	1	0		Dead on moving
Pinus parviflora	PI 317257	1	0		Dead
Pittosporum tobira	PI 317259	3	1	4' x 6'	Slow growth
Potentilla recta	PI 314474	2	0		Dead
Prunus cerasoides	PI 289939	1	0		Dead
Prunus cerasoides	PI 307323	2	1		
Pyrus calleryana var. fauriei	PI 317371	1	1	4'x 3 1/2	Bloom
Rapanea neriifolia 'Taimintachibana'	PI 227998	1	1	1' x 1'	Die Back
Rosa X fortuneana	PI 316528	1	1		Have cuttings
Rosa maximowicziana	PI 317381	6	0		Dead
Rosa sp.	PI 265572	2	0		Dropped
Rosa sp.	PI 314317	2	0		Dead
Rosa wichuraiana	PI 317276	4	0		Drop
Sambucus williamsii	PI 316631	6	0		Drop
Schisandra chinensis	PI 316712	1	1		Barely alive
Styrax japonica	PI 316988	2	1	4 1/2'x40"	
Syringa velutina	PI 317293	6	1	1' x 6"	
Ulmus pumila var. arborea	PI 297426	1	1	15' x 8'	
Viburnum dilatatum	PI 296028	1	0		Dead
Received 3/5/68					
Abies pinsapo subsp. marocana	NA 26306	1	0		Dead
Acer capillipes	NA 29284	1	0		Dead
Acer grosseri	NA 29285	1	0		Dead
Ardisia japonica	NA 18686	1	1	8"	Losses lower leaves

N A M E	P.I. or N.A. NO'S.	NO. PLANTS REC'D	NO. PLANTS LIVING	AVERAGE HT. & WIDTH	C O M M E N T S
(Received 3/5/68 continued)					
Ardisia japonica var. angusta	PI 274526, NA 21858-c	1	0		Dead
Aucuba japonica 'Limbata'	PI 236211, NA 13007-c	1	0		Dead; lived 3 years
Bambusa multiplex var. riviereorum	PI 77014, NA 29842	1	1	2'	
Cedrela fissilis	PI 316932, NA 28921	2	1		Kills to ground
Chamaecyparis pisifera 'Squarrosa Argentea'	PI 236222, NA 28070-c	1	0		Dead
Cordia allidora	NA 28485	3	0		Dead
Duranta sp.	NA 29843	3	0		Dead
Juania australis	NA 29028	3	0		Dead
Pyrrosia lingua	PI 235271, NA 26379-d	1	0		Dead
Rhododendron bakeri	NA 29094	3	0		Dead
Rhododendron decandrum	PI 318656, NA 29131	5	2	4' x 1'	
Rhododendron japonicum	PI 318657, NA 29132	5	3	3' x 2'	Lack of cold
Rhododendron kiusianum	PI 318658, NA 29133	5	3	3' x 4'	
Rubus calycinoides	NA 25740	1	0		Lost
Sinarundinaria nitida	PI 265286, NA 17469-d	1	0		Dead
Received 9/9/68					
Viburnum X 'Alleghany'	PI 316675, NA 28865-c	3	0		Dead
Magnolia X 'Ann'	PI 326570, NA 28344-c	1	1	4' x 3'	Everbloom since Nov.; slow growth
Magnolia X 'Betty'	PI 326574, NA 28348-c	1	1	4 1/2'x 29"	Slow growth
Magnolia X 'Jane'	PI 326576, NA 28349-c	1	1	4 1/2'x 3'	Slow growth
Magnolia X 'Judy'	PI 326571, NA 28345-c	1	1	33" x 17"	Slow growth
Magnolia X 'Pinkie'	PI 326577, NA 28351-c	1	1	6 1/2'x 3'	Slow growth
Magnolia X 'Randy'	PI 326572, NA 28346-c	1	1	19"	Some dieback
Magnolia X 'Ricki'	PI 326573, NA 28347-c	1	1	4' x 20"	Slow growth
Magnolia X 'Susan'	PI 326575, NA 28350-c	1	1	4 1/2' x 33"	Slow growth
Received 9/16/68					
Ilex X 'Tanager'	PI 329155, NA 28322-c	1	1	4 1/2' x 4'	Well adapted fruiting

N A M E	P.I. or N.A. NO'S.	NO. PLANTS RECEIVED	NO. PLANTS LIVING	AVERAGE HT. & WIDTH	C O M M E N T S
Received 1/28/69					
Malus sieboldii 'Fuji'	PI 325156, NA 2073-sc	1	0		Scion - none lived
Received 2/4/69					
Acer morrisonense	PI 324941	3	3	4' x 20"	Slow growth
Alnus hirsuta	PI 317354	1	1	12' x 8'	Well adapted; fast growth
Callicarpa formosana	PI 324954	5	5	5' x 6'	Kills to ground yearly
Callicarpa japonica	PI 317359	3	0		Dead
Carpinus kawakamii	PI 324959	1	1	6' x 4'	Slow growth
Castanopsis carlesii	PI 324961	1	0		Dead
Clethra barbinervis	PI 316047	1	0		Dead
Cunninghamia lanceolata	PI 324969	3	3	6'	Pruned severely in moving
Deutzia pulchra	PI 324971	4	0		Dead
Gordonia axillaris	PI 324982	2	2	6' x 4'	Well adapted
Hedera helix var. poetica	PI 239247	5	5	6' x 12'	Container
Hydrangea chinensis	PI 324984	2	2	2' x 4'	
Hypericum ascyron	PI 317233	2	0		Dead
Keteleeria davidiana	PI 324993	1	1	1' x 1'	
Lagerstroemia subcostata	PI 324994	3	2	6' x 3'	
Lilium philippinense var. formosanum	PI 325000	3	3	3'	Reseeds
Lindera erythrocarpa	PI 317240	3	1	5 1/2'x3 1/2'	
Lindera obtusiloba	PI 317241	1	0		Dead
Lyonia ovalifolia	PI 325002	7	0		Dead
Pelargonium zonale	PI 241396	2	0		Dropped
Photinia integrifolia	PI 307304	3	0		Died in moving
Photinia sp.	PI 325008	5	5	8' x 6'	Flowered fruiting
Pinus densiflora	PI 317254	2	2	2 1/2'	
Pinus thunbergii	PI 317258	4	3	3'	One lost in moving
Taiwania cryptomerioides	PI 325071	4	3	1'	
Thuja koraiensis	PI 317297	3	2	6" x 1'	
Vaccinium delavayi	PI 242255	1	0		Dead
Viburnum harryanum	PI 261219	1	0		Dead
Ilex cassine	PI 254592	1	1	6' x 4'	Well adapted
Ilex crenata f. microphylla	PI 317234	1	1	6" x 8"	Slow growth
Ilex crenata f. microphylla	PI 317235	2	2	1 1/2'x6"	Fruit
Ilex insignis	PI 243267	1	0		Dead

N A M E	P.I. or N.A. NO'S	NO. PLANTS REC'D	NO. PLANTS LIVING	AVERAGE HT. & WIDTH	C O M M E N T S
(Received 2/4/69 continued)					
Ilex montana var. macropoda	PI 316703	2	0		Dead
Ilex montana var. macropoda	PI 316704	1	0		Dead
Ilex pubescens	PI 324987	6	0		Dead
Ilex pubescens	PI 324988	6	1		Cultivation injury
Ilex rugosa	PI 276084	1	0		Dead
Ilex sugerokii	PI 275807	1	0		Dead
Ilex 'Albert Close'	PI 331202	2	2	3' x 1'	
Ilex 'William Cowgill'	PI 331203	2	1	3' x 2'	Fruit
Ilex 'Howard Dorsett'	PI 331204	1	1	2 1/2' x 1'	
Ilex 'Edward Goucher'	PI 331205	1	1	8" x 6"	
Ilex 'Harry Gunning'	PI 331206	2	2	3' x 2'	
Rhododendron brachycarpum var. rosaeflorum	PI 316982	3	0		Dead
Rhododendron brachycarpum var. rosae-florum	PI 316983	3	0		Dead
Rhododendron indicum	PI 235758	3	0		Dead
Rhododendron mucronulatum var. ciliatum	PI 317270	3	2		Barely alive
Rhododendron mucronulatum var. ciliatum	PI 317271	3	0		Dead
Rhododendron kiusianum	PI226542	3	2		Dieback
Rhododendron tschonoskii	PI 228004	1	1	4' x 3'	
Rhododendron yedoense var. poukhanense	PI 317272	3	2		Barely alive
Rhododendron 'Ben Morrison'	PI 337618	1	1	3'	Excellent plant
Received 3/3/69					
Cryptomeria japonica	NA29008	2	2	3'	Cut back hard; moved 2/3/71
Cunninghamia konishii	NA 28521	1	1	7 1/2'	Cuttings do not form upright growth
Magnolia virginiana var. australis	NA 31021	2	0		Dead
Pinckneya pubens	NA 29841	1	0		Dead
Quercus chenii	NA 827-s	5	5	6' x 6'	Spreading growth; variations within
Rhododendron atlanticum	NA 10024-s	1	0		Dead
Rhododendron canadense f. albiflorum	NA 29276	1	0		Dead

NAME	P.I. or N.A. NO'S	NO. PLANTS REC'D	NO. PLANTS LIVING	AVERAGE HT. & WIDTH	C O M M E N T S
(Received 3/3/69 continued)					
Salix gracilistyla var. melanostachys	NA 18960-c	1	0		Dead; lack of cold
Received 10/6/69 (Moved to Burden 2/3/71)					
Acacia albida	NA 31427	2	1		Kills to ground yearly
Afzelia quanzensis	NA 31433	1	0		Dead on moving
Albizzia evansii	NA 31435	1	0		Dead on moving
Albizzia versicolor	NA 31436	2	0		Dead on moving
Callistemon citrinus	PI 330375, NA 30282	3	2	5' x 5'	1 lost in moving
Callistemon sieberi	NA 30284	4	4	4' x 6'	Flower
Leptospermum laevigatum	NA 30286, PI 330379	3	0		Dead on moving
Leptospermum scoparium	PI 330380, NA 30287	3	0		Dead on moving
Lonchocarpus capassa	NA 31453	1	0		Dead on moving
Melaleuca ericifolia	PI 330381, NA 30288	4	0		Winter injury; dead on moving
Melaleuca incana	NA 30289	2	0		Dead; winter injury
Metrosideros kermadecensis	NA 30151	4	0		Dead first year
Rhaphithamnus venustus	NA 27899-c	2	2		Dieback to ground
Schotia brachypetala	NA 31454	2	0		Dead
Received 1/28/70					
Glyptostrobus lineatus	NA 31291	2	1	4' x 2'	Slow growth; well adapted
Ilex glabra 'Ivory Queen'	NA 14278-c	1	1	2' x 1 1/2'	Well adapted
Ilex x koehneana 'Wirt L. Winn'	NA 23214-c	4	4	3' x 3'	Well adapted
Quercus robur 'Salicifolia'	NA 15313-1-s	1	1	4' x 3'	Well adapted
Rhododendron amagiamanum	NA 31200	1	1	2' x 4'	Barely alive
Rhododendron 'Koromo Shikibu'	NA 16012-c	1	1	4' x 4'	Well adapted
Vaccinium cylindraceum	NA 29045-c, PI 317614	3	3	1' x 1'	One in flower
Received 4/14/70					
Rhododendron 'Ben Morrison'	PI 337618	4	4	3'	Well adapted
Rhododendron 'Mrs. LBJ'	PI 337619	4	4	4'	Well adapted
Rhododendron brachycarpum	PI 315034	1	0		Dead

N A M E	P.I. or N.A. NO'S	NO. PLANTS REC'D	NO. PLANTS LIVING	AVERAGE HT. & WIDTH	C O M M E N T S
(Received 4/14/70 continued)					
Rhododendron ellipticum	PI 325023	1	1	2 1/2'	Chlorotic
Rhododendron ellipticum	PI 325024	2	2	5'	Tipburn
Rhododendron farrerae	PI 276257	1	1	8"	Barely alive
Rhododendron formosanum	PI 325025	3	3	8"	Barely alive
Rhododendron kanehirai	PI 325026	4	4	3"	Tip dieback
Rhododendron kawakamii	PI 325027	1	0		Dead
Rhododendron metternichii	PI 330367	1	0		Dead
Rhododendron metternichii	PI 330368	2	0		Dead
Rhododendron morii	PI 325029	4	0		Dead
Rhododendron morii	PI 325030	4	0		Dead
Rhododendron morii	PI 325031	4	0		Dead
Rhododendron morii	PI 325033	1	0		Dead
Rhododendron obtusum var. kaempferi	PI 275032	1	1	3'	
Rhododendron obtusum var. kaempferi	PI 275535	1	1	2'	Barely alive; tip dieback
Rhododendron oldhamii	PI 325036	4	4	3 1/2'	Tip dieback
Rhododendron oldhamii	PI 325037	4	4	4'	
Rhododendron oldhamii	PI 325038	4	4	5'	
Rhododendron oldhamii	PI 325039	4	4	3'	
Rhododendron rubropilosum	PI 325043	4	2	2'	One is barely alive
Rhododendron rubropilosum	PI 325044	4	0		Dead
Rhododendron rubropilosum	PI 325045	4	1		Barely alive
Rhododendron rubropilosum	PI 325046	1	0		Dead
Rhododendron rubropilosum	PI 325048	4	4	4'	
Rhododendron rubropilosum	PI 325582	4	4	3'	
Rhododendron schlippenbachii	PI 316984	1	0		Dead
Ilex X 'Accent'	NA 28260-c	1	0		Could not locate
Ilex X 'Elegance'	NA 28261-c	1	1	2 1/2' x 1'	Doing well
Ilex X 'Oriole'	NA 28322-c	1	1	1 1/2' x 2'	Fruiting
Received 8/28/70					
Rhododendron morii	PI 325029	3	0		Dead
Rhododendron morii	PI 325030	3	0		Dead
Rhododendron morii	PI 325031	3	0		Dead

N A M E	P.I. or N.A. NO'S	NO. PLANTS REC'D	NO. PLANTS LIVING	AVERAGE HT. & WIDTH	C O M M E N T S
(Received 8/28/70 continued)					
Rhododendron oldhamii	PI 325036	3	2	3'	Well adapted;bloom sporadically throughout entire year
Rhododendrom oldhamii	PI 325037	3	3	3'	
Rhododendron oldhamii	PI 325038	3	3	3'	
Rhododendron oldhamii	PI 325039	3	3	4'	
Rhododendron rubropilosum	PI 325043	3	2	2'	
Rhododendron rubropilosum	PI 325045	3	3	3'	
Rhododendron rubropilosum	PI 325048	3	3	3 1/2'	
Rhododendron rubropilosum	PI 325582	3	3	3'	
Rhododendron arboreum	PI 237484	1	1	1 1/2'	Main stem split
Eurya crenatifolia	PI 324975	3	1		Container; barely alive

1971-72 Report

Regional Project S-9 New Plants

Contributing Project 3-206-436

Mississippi

Private, state, and federal agricultural workers obtained 289 plant accessions during the year.

During the harvest year of 1971 fruit records were made on 26 apple selections from the domestic fruit explorations made in the southern-most counties of the state. The wide diversity of plant and fruit characteristics served as the basis for further selection pressure. Detailed fruit records were made on the 12 plum selections producing fruit in 1971. Further testing on 4 selections for the fresh fruit market is still underway. Detailed fruit and tree evaluation is being made on 11 pear selections.

Sweet potato plant introduction 280036 flowers profusely and sets large numbers of seeds at State College. These seeds germinate earlier and seedlings are more vigorous than seeds and seedlings of other parental lines.

Seven introduced diploid Paspalum species have been of great value in determining the cytogenetic relationship among Paspalum species. Through a cytological study of interspecific hybrids between dallisgrass and the diploid species, it has been established that P. juergensii (303994) and P. intermedium (310,111 - 310,112) are closely related to dallisgrass. Chromosome behavior in hybrids between dallisgrass and P. notatum (310163) and P. vaginatum indicate that these species are not closely related.

Twenty-five additional Paspalum introductions were obtained and are being studied cytologically.

A breeding program is being initiated using 7 introductions each of Axonopus and Stenotapbrum secundatum. These introductions are presently being studied cytologically to better utilize them in the breeding program.

Publications issued during year:

1. Bennett, H. W. and B. L. Burson. 1971. A technique for determining seed set and viability in Paspalum spp. Proc. Assoc. So. Agric. Workers. p. 49.

2. Burson, B. L. and H. W. Bennett. 1971. Cytogenetic relationships between Vaseygrass, Paspalum urvillei and two diploid species, Paspalum juergensii and Paspalum vaginatum. Proc. Assoc. So. Agric. Workers. p. 49.

3. Burson, B. L. and H. W. Bennett. 1971. Chromosome numbers, microsporagenesis, and mode of reproduction of seven Paspalum species. Crop Sci. 11: 292-294.

4. Bennett, H. W. and B. L. Burson. 1971. The effect of culm breakage on seed set in seven *Paspalum* species and an intraspecific hybrid. Crop Sci. 11: 229-231.

5. Burson, B. L. and H. W. Bennett. 1971. Meiotic reproductive behavior of some introduced *Paspalum* species. Jour. Mississippi Acad. Sci. 17.

6. Lee, H. S., B. L. Burson and H. W. Bennett. 1971. Chromosome pairing and reproductive behavior of some interspecific *Paspalum* hybrids. Agron. Abstracts p. 10.

7. Burson, B. L. and H. W. Bennett. 1972. Cytogenetics of *Paspalum urvillei* x P. *vaginatum* and P. *urvillei* x P. *Juergensii* hybrids. Crop Science 12: 106-108.

8. Burson, Byron L. and Hugh W. Bennett. 1972. Cytology of hybrids between an intraspecific dallisgrass hybrid and two diploid species. Proc. Assoc. So. Agric. Workers.

9. Burson, Byron L. and Hugh W. Bennett. 1972. Genome relations between an intraspecific *Paspalum dilatatum* hybrid and two diploid *Paspalum* species. Canadian Journal of Genetics and Cytology.

North Carolina - New Plant Project

Report to S-9 Technical Committee, Auburn, Alabama, July 6-7, 1972

Of the 29 campus research personnel who receive PI catalogues and information through my office and others who receive information direct, six cooperators received a total of 558 lines consisting of 13 species of 8 plant genera. The largest order was for 475 assesions of Cucumus satdvas 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

A. No varieties were released during 1971-72. The station bulletins on the Venus and Saturn tomato varieties released last reporting period have not yet been printed. PI 129080, a cherry tomato from Columbia was used as a source of resistance to southern bacterial wilt.

B. Norman Pigeon Pea - To date there are between 85 and 100 demonstrations with county extension personnel, various dealers and distributors. These demonstrations cover Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee, Virginia, Texas, Oklahoma, Maryland, Delaware, New Jersey, Arizona, North Dakota, Oregon, Wisconsin, and Saskatchewan. Approximately 150 thousand pounds of Norman seed have been sold during the 1972 season. This variety has been approved for REAP cover crop payments in many counties of the above states.

II. Plant Introductions of Special Interest

A. Dr. J. M. Jenkins - One gladiolus seedling PI-349724 is being evaluated for Fusarium resistance.

B. Dr. D. L. Thompson - Corn crosses with Tehua and Tuxpheno, two Mexican corns hoping to transfer stalk strength to local varieties.

C. Dr. D. H. Timothy - The Pennisetums of previous years still look very good. (P. flaccidum: PI's 220606, 338714, 338715, 338716, 338717, P. orientale PI's 271593, 271594, 271595, 271596, 215600, 271593, 271594).

III. Ornamentals of Special Interest - Five hundred and seventy six PI's of ornamentals have been evaluated at the Rocky Mount Station since 1964. Only a few assesions show promise as ornamentals for this area.

PI 279746 Cryptomeria japonica - Evergreen tree from Japan grows to 180 feet high and 7 feet in diameter. One seedling of this PI is now 15 feet tall and six feet in diameter. Perfect shape and symmetry. Outstanding.

PI 279747 Cryptomeria japonica - One seedling of this PI is also 15 feet by 6 feet. It is not as full and perfectly shaped as PI 279746.

PI 285366 Iris sp. - A rhizomatous herb with flower spikes to 2 feet high. Flowers bluish, very leafy, spreads rapidly.

PI 159034 Rhododendron molle - Deciduous shrub with conspicuous yellow to orange flowers.

PI 226542 Rhododendron kiusianum - Evergreen shrub with purple flowers. Nice foliage with hairy leaves.

PI 337618 Rhododendron 'Ben Morrison' - Medium green leafed azalea. Flowers single rose with irregular white margins.

PI 337619 Rhododendron 'Mrs. LBJ' - Medium green leafed azalea. Flowers semi-double and white.

PI 231692 Camellia japonica 'Shiro-byoshi'- Leaves dark glossy green. Flowers white, double, 4 1/2 inches in diameter very pretty.

PI 228187 Camellia rusticana 'Yoshida' - Leaves medium glossy green. Flowers red, double, very compact, 1 1/2 inches.

PI 241979 Camellia japonica 'Saudade de Martins Bronco' - Leaves medium green. Flowers bright red blotched with white, semi-double, 4 inches in diameter.

PI 231687 Camellia japonica 'Kamyotai' - Flowers pink, semi-double, 3 inches in diameter.

PI 265813 Rosa sp. (or PI 266805) - Dense foliage, neyron pink flower, double, early spring.

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

A. Lespedeza capitata - Plants of twenty-eight PI's were set out in the summer. Plants winterkilled before seed was set. Plants of these same PI's plus local seed have again been set out for evaluation. A local drug firm is interested in obtaining the herbage for export purposes. Price paid for wild plants is 10¢ per pound green.

B. Digitalis lanata - Dried leaves of this crop are bought by the Burroughs-Wellcome Company and used as a source of digoxin. Plants grown from seed obtained from Dr. James produce an excellent quality leaf. Plot yields have ranged from 2500 to 3800 pounds per acre. Plants are very slow in establishment.

C. Nepeta cataria - Twenty interested farmer cooperators are presently increasing their acreage of catnip under contract. The potential contract acreage will approach 50 acres in 1973. Yields of 3000-3500 pounds per acre were obtained in the establishment years. The yield from the second year's growth will be about double these in the range of 6000 pounds per acre. The herbage will be harvested in August. Various cultural and herbicide experiments are being evaluated this year.

D. Sunflowers - Twenty-four varieties were grown as part of a regional variety test at Rocky Mount and Salisbury. Yields ranged from 500 to 1900 pounds per acre on a sandy loam soil at Rocky Mount up to 1000 to 2400 pounds per acre on a clay loam soil at Salisbury. The contract price of sunflower seed will have to increase above the present 4¢ a pound to make sunflowers an attractive crop for North Carolina farmers.

E. Limmanthes - Seed of six introductions did not get planted due to inclement fall weather. This seed is being saved until this fall for planting.

F. Kenaf - Eleven kenaf varieties were evaluated during the 1971 growing season. The varieties A-37223, EV 41, EV 71, C 2032 and G-4 varied very little in yield. The three PI's tested 343442, 343443 and 343444 produced 40% lower yields than the above varieties. Various row patterns planted on 30 and 38-inch beds were evaluated. Two rows spaced 7 or 14 inches apart per bed gave highest dry matter yields per acre. Two 14-inch rows per 38-inch beds gave 5% higher yields than two 7-inch rows on 30-inch beds. In a rate of Nitrogen application test from 0 to 200 pounds per acre, the 50 pound rate per acre gave the highest yields by about 7%. These tests are being continued in 1972. Mr. Barry Crouse, working at Duke University took 450 pounds of kenaf from Plymouth to Syracuse University. He digested 225 pounds of this material and got 110 pounds of pulp, slightly less than 50%. He then made six rolls of paper at the Eastman Plant at Rochester. This paper is to be tried in the developing process.

V. Visitors of Interest to North Carolina

It was of special interest to NCSU faculty and students to have Dr. John Creech present a seminar on "The International Program for Conservation of Crop Germ Plasm and the United States' Role in International Cooperation." This very timely and interesting program was of great value to all concerned.

1972 S-9 Report, Oklahoma Agricultural Experiment Station

Charles Galeotti, James Kirby and Ralph S. Matlock

PULSE CROPS

Cowpea (*Vigna sinensis*)

From a seed increase nursery in 1971, containing 426 cowpea varieties and accessions, 21 were selected as possible wildlife types, 26 as combine types and 16 as Chinese red accessions. These were advanced to the preliminary yield tests on the Agronomy Research Station near Perkins.

There are 42 cowpea varieties and plant introductions planted in a Fusarium wilt test on the Agronomy Research Station near Stillwater.

Mean dry seed yields per acre for 12 cowpea varieties common to three locations in Oklahoma in 1971 were 330 pounds at Mangum, 638 pounds at Perkins, and 1,469 pounds at Stratford.

Chickpea (*Cicer arietinum*)

One hundred eighteen (118) accessions and selections with limited seed were planted at the Stillwater Agronomy Research Station on April 18, 1972 for observation and increase.

Fourteen accessions were planted on the same station April 14, 1972 in a replicated yield test.

Three accessions were planted on April 15 in a 10, 20, 30, and 40-inch row-spacing study.

Mungbean (*Phaseolus* spp.)

Some 1,406 accessions were planted at the Agronomy Research Station near Perkins on June 5, 1972 for observation and increase and to search for uniform-maturing, large-seeded accessions.

Dr. Yai-po Tai has started screening mungbean accessions for root knot nematode resistance.

Adsuki Bean (*Phaseolus angularis*)

The following Adsuki bean tests are now under study at the Agronomy Research Station near Stillwater:

A three (3) variety replicated 10, 20, 30, and 40-inch row-spacing test planted April 18, 1972.

A seven (7) variety replicated yield test planted May 30, 1972 and eighteen (18) varieties with limited seed planted May 30, 1972 in a nursery for observation and increase.

Pigeon Pea (*Cajanus cajan*)

In 1972, eleven (11) accessions were planted in a replicated yield test on the Agronomy Research Station near Perkins and 9 accessions with limited seed were planted in a nursery for observation and increase.

OILSEED CROPS

Brassica spp.

Twenty (20) plant introductions and strains were planted in a replicated test November 17, 1971 on the Agronomy Research Station near Stillwater. Seven of these (Numbers 48087, 48090, 48099, 48106, 48116, 48119, and 48155) were winter killed, and were replanted February 17, 1972. The early-maturing entries are now being harvested.

A row-spacing and seeding-rate study was planted at the Stillwater station on March 3, 1972 with a commercial yellow mustard variety (Oklahoma number Sp-766, however, this variety looks identical to Sp-743, P.I. 251613, which was planted in a seed increase nursery).

The yields (pounds per acre), seed rate per acre and other information are shown in the table that follows.

Row Spacing Inches	Rows Harvested	(Grams) Seed Rate 10' Row	Seed Rate lbs/A	Yield lbs/A	Plant Ht. Inches	% Lodging
10	8	1	11.5	185.3	21	25
10	8	2	23.0	209.0	22	25
10	8	3	34.5	226.6	23	35
20	4	1	5.8	146.0	21	17
20	4	2	11.5	194.9	21	20
20	4	3	17.3	165.8	21	23
30	3	1	4.3	117.2	16	12
30	3	2	8.6	124.6	18	15
30	3	3	12.9	133.5	18	20
40	2	1	2.9	72.3	18	7
40	2	2	5.8	108.6	14	15
40	2	3	8.6	94.4	20	22

Some 91 accessions and strains were planted February 29, 1972 in a scarce seed nursery for observation and increase. Thirty-one (31) of these failed to emerge (Numbers NU-40432, 288288, 288725, 46755, 48052, 288287, 48058, 48065, 48077, 48079, 48173, 48139, 131512, 169057, 173869, 174795, 179846, 179851, 183665, 193758, 195922, 209022, 209782, 220282, 226544, 248770, 254362, 271444, 273642, 284786, 347620). The early-maturing entries are now being harvested.

Briza humilus

In 1972 two (2) accessions were planted in a single plot consisting of 8 rows, 7 inches wide, and 10 feet long. Yields in pounds per acre and other information are shown in the table below.

Okla. Sp-No.	P.I. No.	Yield lbs/A	% Stand	Plant Ht. Inches	Area Harvested
669	279704	558.8	100	12	4 center rows
669	279704	760.2	100	13	4 outside rows
624	304981	53.9	5	13	5 plants

Limnanthes spp.

Five (5) strains were planted on the Agronomy Research Station near Stillwater October 5, 1971 in a replicated yield test. All were winter killed. Emergence dates are shown in the table below.

Okla. Sp-No.	P.I. No.	Species	Emergence Date
695	283701	*L. alba*	10-25-71
697	283705	*L. versicolor*	10-27-71
699	283724	*L. parishii*	10-25-71
700	278170	*L. douglasii*	10-16-71
701	B55687	*L. alba var. alba*	10-18-71

Sunflower (*Helianthus annuus* L.)

In 1972 regional tests consisting of ten varieties and hybrids were planted at Chickasha and Goodwell and sixteen at Perkins. In addition, sixteen cytoplasmic male-sterile, maintainer and restorer inbred lines were planted for observation at Perkins.

Mean yields in pounds per acre for twelve varieties and strains, common to all tests in 1971, were 932 at Perkins, 992 at Goodwell, and 1,118 at Chickasha.

MUCILAGE CROPS

Guar (*Cyamopsis tetragonoloba*)

In 1972 regional tests consisting of 24 varieties and strains were planted at Perkins, Chickasha, Ft. Cobb, Mangum and Tipton. In addition, twenty-six selections were planted in a nursery at Perkins for observation and increase.

A 10, 20, 30, and 40-inch row-spacing study involving two varieties and one strain was planted May 30, 1972 at the Stillwater Agronomy Station.

A guar-time of harvest study followed by small grains is being conducted at the Mangum station with the Brooks variety and a Mills-type selection. Harvest is to begin September 1, then at 10-day intervals through November 30.

The mean yields for 24 entries at locations in Oklahoma in 1971 were 965 lbs/A at Mangum, 1,058 lbs/A at Perkins, and 1,653 lbs/A at Tipton. A 24-entry test was planted at Ft. Cobb, Oklahoma in 1971 with remnant seed of the 1970 regional guar entries, 18 of the 24 entries were identical to entries grown in the 1971 regional guar trials. The 24 entries in the Ft. Cobb test averaged 1,223 lbs/A.

ORNAMENTAL

Raymond Kays

Of the various woody ornamental accessions tested in recent years, *Juniperus conferta* - Shore Juniper appears to be the more adapted. Plants have developed into solid circular units approximately eight feet in diameter.

The plant roots readily as cuttings and when established has been a consistent grower in a wide variety of soil types.

Other plants which have been identified in previous reports but which continue to grow successfully are: *Rosa rugosa*--P.I. 227432, *Cotoneaster* sp--P.I. 113092, and *Malus sieboldii*--P.I. 316711.

We are most interested in any report of fireblight resistance of *Cotoneaster* sp--P.I. 113092. The plant has many desirable attributes. Since a number of the commonly used species of Cotoneaster are susceptible to fireblight, we are hopeful of obtaining genetic resistance.

This season has been one of much activity with respect to the planting of many genera and species of woody ornamentals. The Department of Horticulture has developed plans and have been planting various genera, species and cultivars of deciduous and evergreen woody ornamental plants.

The planting is being designated as the Horticulture Teaching and Research Center. We are hopeful that this will become the nucleus of the university arboretum.

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

NEW CROPS INVESTIGATIONS IN PUERTO RICO
JULY 1971 - JUNE 1972
J. VELEZ-FORTUÑO, PLANT BREEDING DEPARTMENT

A total of 349 accessions were received for the research program during the year 1971-72. These consisted of 23 fruits, 122 vegetables, 6 bananas and/or plantains, 32 grains, 132 forage grasses, 33 ornamentals and 2 sods.

Fruit Crops - W. Pennock, A. Torres, J. López, C. Torres, A. Acosta, J. A. Rodríguez, A. Pérez and A. Serrano.

Sapodilla. Seven new clones were brought in as budwood from Nicaragua and successfully grafted, namely: 1) Incafe; 2) Rivas-Cordon; 3) San Cayetano; 4) Popayapa; 5) Cantina; 6) San Hipólito; and 7) Curtiembre. These will be added to the collection in Fortuna which, as well as the one at Isabela, are growing well. However, a fly larva similar to *Anastrepha* sp. has been observed in some of the fruit from Fortuna and efforts are being made towards its identification.

Ilama. The planting at Fortuna has improved after the loss of about 25% of the trees and general setback of the planting during the period between July 1971 and January 1972. No factors have been found as yet for explanation of this setback and loss of trees. At Isabela, the trees have been injured by successive attacks by lacewing bugs.

Macadamia nut. At Adjuntas intensive cultural practices such as clean cultivation, fertilization and shade clearance have been given to the trees. In a group of 28 trees planted in 1967, some of the trees have started to bloom and show some promise in regard to adaptation to the region. Observations on yield will be made. A planting of *M. ternifolia* established in June 1971, comprising 107 trees in about an acre, is showing good progress. This promisses to be a good source of stocks for grafting the best selected material. Also the *M. tetraphylla*, considered an excellent stock, has started to bloom, indicating promise of a good source of seed for the propagation of stocks for grafting.

Grapes. Last October, 6 new accessions were added to the planting making a total of 38. Two table types, one red and the other white, have been selected. Both yield well and possess good quality. Varieties Exotic and Ribier consistently produce high yields, this year higher than any previous crops, and one week earlier than last year.

Coffee - C. J. Torres

Studies on the behavior of 16 varieties of coffee in regard to the use of plastic nets for harvesting are underway in order to determine their capacity for dropping the coffee berries in a determined period of time, 6 weeks. Thus far, there are marked differences among the varieties, some retaining the berries for a long time, while others drop them faster and in a shorter period of time.

Varieties resistant to rust have been propagated and material has been supplied to the Agricultural Services Administration as follows: 15,000 trees of selection KP-532 and 10,000 trees of Geisha, also 25 and 110 lbs. respectively of these varieties for preparing seedbeds.

Root (starchy) Crops - O. D. Ramírez, H. Irizarry, G. Colom Covas, J. Vélez-Santiago and Luis B. Ortiz.

Taniers (*Colocasia* sp.), yams (*Dioscorea* sp.) and cassava (*Manihot utilissima*) constitute a very important part of the puertorrican diet. Local production is not enough for our local consumption and has to be supplemented with imports from the Dominican Republic. Research work is of almost importance for the improvement of varieties and development of better cultural practices. Thus introduction and evaluation of new varieties in variety trials at various substations is in progress.

Taniers (*Colocasia* sp.). A tanier field trial with four varieties (Choubuton, Blanca del País, Kelly, Rascana) at 4 planting distances, 2'x2', 2'x3', 1½'x2', and 1½'x3' under irrigation and non-irrigation management was conducted at Gurabo. The data recorded is being processed for statistical analysis.

The variety collection is maintained at Corozal Substation.

Yams (*Dioscorea* sp.). At Río Piedras preliminary yield data of seven varieties was obtained as follows:

Variety	Average plot yield, lbs.	Estimated yield/cda., cwts.
Guinea Amarillo	23.54	553.26
Farm Lisbon	17.83	419.06
Oriental	16.25	381.92
Barbados	12.22	287.21
Seal Top	11.68	274.52
Florido	11.10	260.88
Smooth Statia	7.29	171.34

These data indicates that Oriental, Barbados and Seal Top are high yielders, and the tubers are smooth and of a desirsble shape (ovoid).

Also a field trial for evaluation of these varieties as to yield, disease resistance and quality of the yams was planted at Corozal substation in March 1972.

The results of the preliminary evaluation of 11 yam introductions (received from the Federal Experiment Station at Mayaguez) are presented as follows:

P.I. No.	No. of Plants	Yield lb.	Susceptible to candelilla
D. alata 15325	5	31	x
D. " 15083	2	13	x
D. esculenta 15214	5	35	

(D. alata 15089, 15205, 15209, 15210, 15212, 15340, and D. esculenta 15213 and 15215 yielded very low. All alata introductions showed susceptibility to anthracnose.

Cassava (Manihot utilissima) At Corozal and Isabela Substation variety collections are maintained for evaluation purposes.

These collection were harvested at 8 and 9 months of age after planting. The ten higher yielders were included in a variety yield trial planted at Isabela Substation. These were as follows:

Variety	Yield, lbs./plant at 8 and 9 mos. of age			
	Isabela		Corozal	
	8	9	8	9
Jamaica 57 (P.I. 9581)	6.00	3.72		
Pana (P.I. 9568)	5.00	7.00	2.20	2.91
Tremensina (P.I. 9566)	1.65	7.34	3.03	3.32
Jamaica 4C (P.I. 9607)	3.00	4.00	3.70	4.65
Ceiba	4.70	4.25	1.60	2.91
Llanera			3.90	2.00
Brazil	1.84	4.68	3.08	2.00
SD-2	4.35	7.16		
Compadre Marques	3.33	4.00	2.60	2.50
Pana Monacillo	2.75	6.25	1.60	2.58

On the basis of the data obtained from the variety collection at Corozal and Isabela it seems that P.I. 9566, 9607 and Llanera are very promising for the Corozal area, while P.I. 9568, SD-2, Trinidad 12-56 and Pana Monacillo seem very promising for Isabela.

Plantains and Bananas - G. Colom-Covas, A. Sotomayor-Ríos, J. J. Green and F. Ortiz.

The introductions from the Philippines, still on quarantine at Río Piedras started to bloom and bunches, from two of them Pitogo and Veinte Cohol, were harvested. The ones harvested are exotic specimens and do not have, apparently, any commercial value. Their pulp is pinkish in color with very acid flavor.

At Fortuna the variety collection is being replanted after 4-6 year old (the roots are above or too close to the soil surface). The data obtained for characterization of the clones is being analized.

At Corozal, the variety collection is growing well and is starting to bloom. Sulpomag at the rate of 200 gr per tree was applied, as most of the planting was showing magnesium defficiency. The data is being collected in a modified Simmonds scheme. It is being used to record more data so that the description of the clones might be more easily determined.

The collection and selection of locally grown plantains is still in progress. Selection is aimed towards developing clones with 40-50-60 plantains per bunch.

It has been proposed the use of intensive propagation methods to reproduce the best material as soon as posible.

Vegetables - G. Colom-Covas

New vegetable introductions such as vegetable spagheti, vegetable gourd, and others, received from Yokohama, Japan. Dwarf corn and San Jose corn from Canary Islands, and another corn from Argentine were planted at Rio Piedras for observation.

Vegetable spagheti and vegetable gourd did not perform well under humid conditions. During the dry season, however, the second planting yields were promising under irrigation. Further studies should be conducted with the vegetable spagheti. This may be used as low calorie food and also as a candy; the vegetable gourd has a very special texture, most agreable, and could be studied further. Other introductions are currently underway.

Ornamentals - O. D. Ramírez and A. Santiago.

During the year various ornamentals have been introduced and are being evaluated to determine their potential as useful ornamentals. If so, further increase for distribution to growers will be started. Some of the most promissing are 23 varieties of Impatiens (P.I. 349582-349584, 349586, 349588, 349629, 354251-354267), Mussaenda double pink and double white, and *Dracaena marginata*.

Publications

Mattern, F., William Pennock and Santos Valle-Lamboy; Supplying the New York Market With High Quality Puerto Rican Mangoes, J. Agr. Univ. P.R. 56(1), 1-10, 1972.

Annual Report
New Crops Research in South Carolina
J. A. Martin
July 1971 to June 1972

S-9 Technical Committee Meeting at Auburn University, Auburn, Alabama, July 6-7, 1972.

There were 1160 accessions of seeds and plants distributed to cooperators in South Carolina since July 1, 1971. 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 or as is.

Reports from cooperators are presented as follows:

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

We released Gy 14 pickle cucumber line which has 197087, 196289 and 220860 in its parentage. Also SC 38A (Sumter) with 197087 and 196289. The hybrid 14 x 38A has been named Carolina. These cucumbers have moderate to good resistance to downy and powdery mildews, anthracnose, scab, angular leafspot, cucumber and watermelon mosaic viruses. The first small increase will go on sale in 1973.

Prof. Thomas A. Burch, Assistant Agricultural Economist, Agricultural Economics Department, Clemson University, Clemson, S. C., 29631.

Cuttings of C. sinensis accessions PI 304404 and PI 304405 rooted easily in 90 days under a continuous mist propagator in full sunlight. Rooted cuttings were overwintered in an outdoor nursery.

Experience is too limited with other C. sinensis accessions to make a statement relative to evaluation at this time.

Dr. George Fassuliotis, Nematologist, U. S. Vegetable Breeding Laboratory, P. O. Box 3348, Charleston, S. C., 29407.

1970 Test:

Experiment Title: Evaluation of eggplant, *Solanum melongena*, for resistance to root-knot nematode.

Nematode species: *Meloidogyne incognita*

Plant species and variety: Plant Introduction of Solanum melongena

Experimental design: Seeds planted in rows 7 inches long and 2.5 inches apart. Each row inoculated with 5,000 larvae when plants were in the 2-leaf stage.

Progress: A total of 122 plant introductions of Solanum melongena and one variety 'Florida Market' was evaluated. Only one line, P.I. 164294, was rated as resistant with a root-knot index of 2. However, this consisted of only two plants and will be retested along with 124 additional P.I.'s that have not yet been screened.

1971 Test:

Experiment Title: Evaluation of eggplant, Solanum melongena for resistance to root-knot nematode.

Work Unit No.: 0720-05-18

Location: Charleston, South Carolina

Nematode species: Meloidogyne incognita

Plant species and varieties: Solanum melongena

Experimental design: Seeds planted in rows 7 inches long and 2.5 inches apart. Each row inoculated with approximately 10,000 larvae when plants were in the true 2-leaf stage.

Progress: This project is a continuation of the screening program begun in 1970. In the 1970 annual report 122 PI's were evaluated. PI 164294 was rated as resistant. Further testing in 1971 showed it as very susceptible. This year 218 more PI's were evaluated one month after inoculation. Almost all of the plants were rated 3 or more. Plants rated 1 or 2 were transplanted into a greenhouse bench containing a heavy infestation of root-knot nematode and rated again 60 days later. None of the plants selected as resistant in the initial test was considered resistant in the later test. However, selections from PI 181921, 271412, 302807, and 320507 had a light galling response (R. K. index = 3) and are considered to be tolerant to M. incognita. These plants were replanted in the field and fruit were collected during the summer. Progeny from these plants is currently being evaluated in the greenhouse.

1970 Test:

Experiment Title: Evaluation of squash, *Cucurbita spp*. for resistance to root-knot nematodes.

Nematode species: *Meloidogyne incognita*

Plant species and variety: Plant Introduction of *Cucurbita pepo*, *C. maxima* and *C. moschata*.

Experimental design: Seeds planted in rows 7 inches long and 2.5 inches apart and inoculated with approximately 10,000 larvae when plants were in the 2-leaf stage.

Progress: A total of 542 plant introductions of *Cucurbita* species, including 237 identified as *C. pepo*, 147 identified as *C. maxima*, and 158 identified as *C. moschata* were evaluated. All of the P.I. lines were susceptible to *M. incognita*. The roots from any one line were indexed as a population since there appeared to be no variation within a P.I.

Dr. Richard L. Fery, Research Horticulturist, U. S. Vegetable Breeding Laboratory, P. O. Box 3348, Charleston, S. C., 29407.

Although I have obtained a large number of *Vigna* and *Lycopersicon* accessions in the past several months, I have little in the way of results to report at the present time. We are presently in the process of screening all of *Vigna* lines for cowpea curculio resistance. A large number of the *Lycopersicon* lines will be screened this fall for fruitworm and hornworm resistance.

Some of our preliminary work with P.I.'s of various *Lycopersicon* species indicates that plants of a *L. hirsutum* v. *glabratum* introduction (P.I. 126449) contain an ethanol soluble factor that is highly detrimental to developing fruitworm larvae.

Mr. John Alex Floyd, Jr., Research Assistant, Department of Horticulture, Clemson University, Clemson, S. C., 29631.

Through the S-9 project and Clemson University, Clemson has on its records some 350 plus plant introductions which are classified as ornamentals -- those plants used to enhance the environment and not used for a food source; strictly shrubs, trees, and vines. Many of the ornamentals do not merit attention and others are not yet old enough for proper analysis, but the ones below rate as good to excellent and should be introduced to the nursery trade. Basically these plants are divided into 3 groups.

I. Azaleas and Rhododendrons
II. Deciduous Plants
III. Evergreen Plants

I. Azalea and Rhododendrons:

Rhododendron 'Ben Morrison' - P.I. 337618. This unusual pink and white variegated azalea will be made available to nurserymen this year at Clemson. It has obtained a height of nearly 4' in two years. Its bloom period is late April in Piedmont, South Carolina and is outstanding.

Rhododendron 'Mrs. L. B. J.' - P.I. 337169. This is one of the cleanest white hose-in-hose azaleas that has been observed here. Another good trait is the spreading habit of growth. At present it has a height of around 3' and is about as broad. Also noticed is the blending of the foliage and the flower which is a good quality in any azalea from a landscape viewpoint. It is apparently insect free and cold hardy to Piedmont, S. C., and blooms at Clemson in mid-April.

Rhododendron tschonoski - P.I. 228004. A later bloomer here at Clemson, this coppery orange azalea was in full flower around June 1 this year. This precedes the flowering dates of Swashbuckler and Copperman, two other coppery colored azaleas, by 15 days in our area. Also noticed was how the flowers open after the new foliage appears; a good trait landscape wise because the litter of the dead blooms that remains is unnoticeable. Arrived at Clemson, Department of Horticulture, in February of 1969, it is approximately 3'4" tall at present. It is an excellent variety to extend the flowering period of the coppery orange colored flowering evergreen azaleas.

II. Deciduous Plants:

Callicarpa japonica - P.I. 317359. This upright irregular shrub since its planting in 1969 has obtained a height of approximately 7' and has a very excellent lavender bloom which comes in early June in Piedmont, South Carolina. To date this shrub has not fruited, but landscape wise it will make a good filler shrub.

Cletastrus sp. - P.I. 326963. This very vigorous vine's major characteristic that set it apart from the native bittersweets is the black stems. Foliage wise it is larger also and not as rampant a growth even though it has'runners up to 20'. One point of major interest is the plant has not fruited since its introduction in 1969 to the ornamental grounds. This may be due to the fact that there is no pollinator in the area.

Stachyurus praecox - P.I. 296026. One of the finest new unusual deciduous plants sent to Clemson in the last few years. At present it has a height of around 5' and was planted at Clemson in 1965. The flowers are yellow panicles and have a feel much like paper. The fruit is green and quite large. This really has an unusual appearance both in summer and winter, and would be an excellent plant for accent points in landscape work.

III. Evergreen Plants:

Osmanthus heterophyllus - P.I. 236241. This plant has foliage very similar in size and spines to Osmanthus heterophyllus ilicifolius, but has a yellowish cast which gives it a very subdued yellow, light green appearance. At present it is at a height of about 2 1/2' and about as broad. It was planted at Clemson Ornamental Grounds in September 1963.

Osmanthus heterophyllus 'Purpureus' - P.I. 242291. This Osmanthus has foliage in the range close to Osmanthus x fortunei and merits distribution due to its yellow variegation along the margin of the leaves and purplish cast in the fall. This plant would make a fine accent plant in almost any landscape setting. Planted at Clemson in 1963 it is approximately 4' tall and has an irregular growth habit.

Osmanthus heterophyllus 'Variegatus' - P.I. 235973. An excellent plant with white to silvery variegation along the margins of the leaves. An excellent irregular habit of growth, it at present has a height of about 3' and was planted at Clemson in 1963. Many people think this is the most striking of the collection of osmanthus in the Clemson Ornamental Grounds.

X Osmarea burkwoodii - P.I. 242241. A very dwarf plant that since 1963 has obtained only a height of 2 1/2'. It has white blooms from mid to late March in our area and is extremely striking. Also the foliage is good year round, and would make a fine foundation plant. It appears to be cold hardy and likes part shade.

Ilex 'William Cowgill' - P.I. 331203. Ilex 'Howard Dorsett'- P.I. 311204. Both of these hollies show promise in our area due to the fact that they are fairly heat, drought, and cold tolerant. They also exhibit good foliage characteristics. Planted in 1969 they have not produced fruit to date.

Through the cooperation of the Department of Horticulture at Clemson University we are evaluating the following plants and deem these as superior plant introductions:

Camellia Japonica - Moshio - received 4/6/65. An excellent foliage producer, very cold hardy, profuse flowers which are rose, height of 6'. P.I. 231689

Osmarea burkwoodi - planted 10/63. An excellent low growing shrub with very fragrant white flowers which bloom in early March, excellent evergreen, at present is 2 1/2' tall and 4' wide. P.I. 242241

Rhododendron - Mrs. L. B. J. - an excellent hose-and-hose white azalea which blooms in mid-April, excellent green foliage and extremely cold hardy, one of the best whites you have ever seen here at Clemson. P.I. 337169

Stachyurus praecox - an excellent deciduous shrub which has obtained a height of about 5', separate sexes are very distinct and very interesting panicles which are pendulous and produce unusual yellow flowers in early March before foliage appears, foliage lush green, one of the most unusual plants received here at Clemson. P.I. 296026

Rhododendron - Ben Morrison - excellent pink bi-color azalea which is a prolific bloomer with excellent foliage characteristics, rather an upright grower and very interesting variegation in the flowers, most unusual azalea we have seen in Clemson in years. P.I. 337618

Ilex latifolia - pyramidal plant with very lustrous green foliage, at present has a height of about 10' and was planted 3/64 and rated superior as a foliage producer but has not produced fruit to date. I do, however, recommend it for its foliage characteristics. P.I. 274838

Metasequoia glyptostrovoides - National - extremely good upright plant which has not produced cones to date but has very nice fall color and is a very good sturdy tree, present height is about 15', planted 10/63. P.I. 286608

Firmiana simplex - an excellent tree for large foliage and coarse texture, planted 2/68, at present height is about 10', to date trunk has not branched and to date has not produced any flowers. P.I. 317365

Trachelospermum asiaticum var. oblanceolatum - an excellent creeping vine, one of the few trachelospermum which is cold hardy in Piedmont, S. C., delicate foliage and stems. I strongly recommend this plant for a good evergreen vine, planted 4/66. P.I. 235331

The following is a list of plants which at the present time have not been evaluated due to size or time of planting.

Ilex cassine	P.I. 254592
Ilex 'Albert Close'	P.I. 331202
Ilex 'William Cowgill'	P.I. 331203
Ilex 'Howard Dorsett'	P.I. 331204
Ilex 'Edward Goucher'	P.I. 331205
Ilex 'Harry Gunning'	P.I. 331206
Rhododendron brachycarpum var. rosaeflorum	P.I. 316982
Viburnum sargentii	P.I. 296029
Ilex crenata subsp radicans	P.I. 275788
" " " "	P.I. 275789
" " " "	P.I. 275790
" " " "	P.I. 275793
" " " "	P.I. 275794
" " " "	P.I. 275856
Weigela hortensis	P.I. 286570
Liriope spicata	P.I. 285374
Buxus sempervirens	P.I. 236013
Mahonia lomariaefolia	P.I. 239376
Rhamnus alaternus	P.I. 241910
Skimmia japonica	P.I. 237902
Eurya japonica	P.I. 237871
Itea japonica	P.I. 226131

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

Peppers: Approximately 250 accessions of peppers were planted in 1971 for further observation to acquaint agricultural engineers and processors with pod and plant characters with the ultimate objective of initiating mechanical harvesting studies. From the concensus of opinion among engineers and processors, it appears that the mechanical harvesting of pepper pods can be accomplished by the use and modifications of the present bean picker. The long-podded hot peppers are preferred and are now in high demand as a dried product. The market value of dried hot pepper pods has reached a high of $1200 per ton. Based on our present knowledge of varieties and machinery we feel that hot pepper production could easily have a potential crop value of over two million dollars in South Carolina. Some mechanical harvesting tests will be made later in the season with hopes that this cooperative program can be successful.

Since there are many promising pepper accessions they will be available for further testing and evaluating as needed.

Kenaf-Roselle Rotation Test: This test was designed to be conducted for a period of four years on the same soil plots which were heavily infested with *Meloidogyne incognita*. The varietal treatments are as follows:

1. Kenaf followed by kenaf
2. Kenaf the first year alternated with roselle in subsequent years
3. Roselle the first year alternated with roselle in subsequent years
4. Roselle followed by roselle

Excellent stands were obtained in 1971 and 1972. Yield and other data obtained will be available from Dr. W. C. Adamson who is compiling the data from similar experiments at other locations.

Jerusalem Artichokes: The following accessions of Jerusalem artichokes were tested in the field at the Simpson Experiment Station near Clemson in 1971:

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

All accessions produced abundant top growth. At harvest time (October to February) P.I. 357304, P.I. 357299, and an unknown commercial variety in S. C. were judged to be of value in making artichoke relish and pickles. Although no yield data were obtained most of the accessions were heavy producers. P.I. 357297 (Hybrid 120) had the poorest yield. Nubbiness of tubers continues to be the big problem. There is still much interest in Jerusalem artichoke production in South Carolina for the processing of relish and pickles as well as in mixtures with other products.

Sunflowers: Results of 1971 Regional Sunflower Yield Test conducted at the Edisto Experiment Station, Blackville, S. C., are presented in Table 1.

Table 1. 1971 U. S. Regional Sunflower Yield Test
Location No. 30 - Edisto Experiment Station, Blackville, S.C.
Cooperator: J. A. Martin

1971 Entry No.	Identity	Seed yield, lbs./A.	Oil content, %		
			Rep 2	Rep 4	Mean
3001	P-21 ms x HA 60	1106	32.3	35.3	33.8
3001A	P-21 ms x HA 60	1248	34.0	36.3	35.2
3002	(P-21 VR1 x P-21 VR2) x HA 60	1739	35.1	32.8	34.0
3003	P-21 VR2 x HA 60	1356	28.4	33.3	30.8
3004	P-21 ms x HA 61	857	34.5	35.4	35.0
3005	Romania-52	790	31.1	27.9	29.5
3006	Romania-53	789	33.9	34.4	34.2
3007	Peredovik (66)	913	36.6	36.7	36.6
3008	VNIIMK 8931 (66)	1133	36.7	38.1	37.4
3009	Majak	856	35.2	36.7	36.0
3010	Record	672	32.6	36.8	34.7
3011	GOR 101	772	34.1	38.0	36.0
3012	Krasnodarets	763	37.8	36.4	37.1

Test Mean = 999

Analysis of variance, seed yield in pounds per acre

Source of variation	D/F	SS	MS	F
Total	51	4,744,543		
Replications	3	91,768	30,589	6.01**
Entries	12	4,469,437	372,453	73.13**
Error	36	183,338	5,093	

Coefficient of variation = 7.1%

L.S.D. = 102 lbs./A @ 5%
= 137 lbs./A @ 1%

Limnanthes: The following accessions of Limnanthes were planted on replicated plots on October 27, 1971:

P.I. 283701 L. alba
P.I. 283704 L. alba var. alba
P.I. 283705 L. alba var. versicolor
P.I. 283724 L. gracilis var. parislii
P.I. 278170 L. douglasii
B 55689 L. alba var. alba

An excellent stand was obtained and all accessions came through the mild winter in good condition. However, no yield data could be obtained due to heavy winds and rains at time of maturity. B-55689 held its seed best of all.

Stokesia laevis: We are now learning how to grow this crop. The next step will be to learn something about harvesting the seed. At this time we have the following accessions planted in the field:

1. P.I. 258718, 32 plants from 1971 plants, blooming profusely in June.

2. P.I. 354065 (1190 plants), P.I. 347645 (48 plants), P.I. 355044 (127 plants), and P.I. 366021 (184 plants) planted to field on May 1, 1972.

Direct-field seedage has not yet been successful, but more work is needed on this problem. Lack of seed stock is the main reason little has been done along this line.

Germinating in seed flats in early January, transplanting seedlings to 2 1/2" peat pots in mid-February, and transplanted to field as soon as possible in April or early May seems to be a good method as excellent stands are assured.

Dr. E. F. McClain, Assistant Professor, Department of Agronomy and Soils, Clemson University, Clemson, S. C., 29631.

There has not been sufficient time to evaluate or utilize any of the accessions of grass species which were received in the fall of 1971. However, ratings of cold damage were made on spaced plants following sharp temperature drops last winter. The top growth of some accessions of Phaloris arundinacea, P. aquatica, P. coerulescens, and Festuca arundinacea appeared to have a degree of resistance to cold damage under these conditions.

Dr. Melvin K. Richardson, Associate Professor, Mechanical Engineering, Clemson University, Clemson, S. C., 29631.

Mechanical okra harvesting: An adequate basic cutting element for mechanical okra harvesting has been developed. A simulation device has been built and tested in order to measure the effectiveness of the cutter element design, and to indicate adjustment latitudes which will permit effective harvest. In addition, a one row tractor mounted harvesting unit has been built and tested at operating speeds of one to three miles per hour. The major problem in operating this machine consists of setting the height of the cutting mechanism as the tractor progresses along the row. Current efforts in machine development are being directed toward the design of an automatic height control mechanism.

Throughout the work on mechanical okra harvesting, responsibility for growing the crops has been assumed by the Clemson University Horticulture Department. In addition, Horticultural Department personnel have grown a large number of different varieties of okra for observation and selection of desirable plant characteristics. Breeding work is also underway for developing pod and plant types which may be more adapted than present varieties.

Dr. R. E. Schoenike, Associate Professor, Forestry Department, 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*

The plantation is doing nicely although no fruiting has yet been observed. Details were given in the 1971 report.

Accession P.I.M. 19451 *Eucalyptus cinerea*

Only four of eight plants remain after being top killed for the third time last winter. Remaining plants are weak.

Accession P.I. 293810 *Pinus stankewiczii*

Two plants remaining; one suffered severe insect (Nantucket tipmoth) attack last summer and is weak. The other plant is healthy although growing slowly.

Accession P.I. 293809 _Pinus nigra pallasiana_

The one remaining plant is vigorous; about 2 1/2' **tall.**

Accession NA 26310 _Pinus pinaster maghrebiana_

The one plant received is hardy and growing slowly - about 25" tall.

Accession NA 29211 _Viburnum obovatum_

One plant remains and is only mildly vigorous.

Accession P.I. 307591 _Sambucus sieboldiana_

These plants succumbed last summer.

Accession NA 29285 _Acer grosseri_

The one plant died back last winter, but since has resprouted.

Accession NA 827-S _Quercus chenii_

All five plants received are growing well. The tallest plant is 4' tall going into its fourth growing season.

Accession NA 31291 _Glyptostrobus lineatus_

The one plant received winter-killed last winter.

Accession P.I. 320525 _Larix gmelini var. olgensis_

The one plant received recovered last year after being mowed off and is currently doing well.

Accession NA 23214-C _Ilex x koehneana_

All three plants are surviving but showed effects of summer heat with some dieback last summer.

Accession P.I. 316679 _Viburnum lantana_

Two plants received died in the nursery bed over last winter.

Accession P.I. 316681 _Viburnum sargentii_

Two plants received and planted in the arboretum in February 1972. They are doing well.

Accession P.I. 324940 Abies kawakami

Two plants received and field planted in December 1971. Both are living although one showed signs of transplant injury.

Accession P.I. 317188 Abies koreana

Two plants received and field planted in December 1971. Both are living and are healthy.

Accession NA 30158 Abies bornmuellariana

One plant received and field planted in December 1971. Condition healthy.

Accession NA 30050 Abies holophylla

One plant received, succumbed in summer 1971.

Accession NA 30051 Abies koreana

One plant received and field planted in December 1971. Condition healthy.

Accession NA 31120 Acer distylum

The label was lost on this plant and records of it disappeared. Probably succumbed in container during summer 1971.

Accession NA 30030 Arbutus texana

Six plants received. Four plants succumbed in the past winter, two were damaged but have recovered and are now healthy.

Accession NA 31452 Gardenia spatulifolia

Three plants received. All succumbed in the past winter.

Accession NA 31688 Alnus hirsuta siberica

Two plants received. They were field planted in March 1971 and both were dead by late September.

Accession NA 31689 Alnus pendula

Two plants received and field planted in March 1971. Although alive last fall, they did not resprout in 1972.

Accession NA 31687 Alnus sieboldiana

One plant received and field planted in March 1971. It was dead in September.

The following items were received in March 1971 and are currently in containers to be planted at a later date.

NA 32233	Abies pinsapo	(3 plants)
NA 14089-C	Chrononthus retusus	(3 plants)
NA 35758	Clethra barbinervis	(3 plants)
NA 33031	Pinus brutia	(3 plants)
NA 31740	Pinus koraiensis	(3 plants)

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

Presently I have 4 tall fescue (Festuca arundinacea) and 2 Kentucky bluegrass (Poa pratensis) introductions under study.

From each seed sample received 15 plants were grown in the greenhouse and brought to the field in 1971. They were set in a space plant nursery for morphological evaluation and seed increase. Plants are producing open pollinated seed now.

A. Tall Fescue

1. P.I. 234747 - Some variability in leaf texture, color, time of flowering. Leaf texture is medium to coarse; color is light to medium. Not particularly leafy, therefore not a good turf type.

2. P.I. 234890 - Considerable variability; medium to tall. Some plants only sparsely reproducing, texture medium to coarse; a leafy type; some low growing types may have turf adaptation.

3. P.I. 234892 - Highly variable, low and tall plants, wide variation in flowering; some plants non-heading at this date (5/30); some fine leaved types, leafspot susceptible. Low types, if seed can be produced, appear to have turf promise.

4. P.I. 237559 - Considerable variability in height, time of flowering, leaf texture, color. Some types are low growing but not reproducing; one very leafy type present appears to have good forage potential. Questionable as turfgrass.

B. Kentucky bluegrass

1. P.I. 303660 - Poorly adapted cultivar, low growing, medium texture, highly rust susceptible.

2. P.I. 303665 - Attractive, leafy, bright green foliage; some stem rust, only fair seed producer, medium height, vigorously rhizomatous. Appears to have turf promise in South Carolina.

TENNESSEE REPORT ON S-9 "NEW PLANTS" TO TECHNICAL COMMITTEE

July 1971 to July 1972

M. J. Constantin

Approximately 125 accessions were received by collaborators in Tennessee during the past year.

The reports will be presented under three broad categories as follows:

CROPS

A. Zea mays. L. M. Josephson of the Plant and Soil Science Department, University of Tennessee at Knoxville reports that of the numerous P.I. selections tested, only Zapalote Chico P.I. 217413 is currently being grown. Zapalote Chico has a fine, brown silk that is low in moisture on which the corn earworm larvae are unable to survive. The ear has a very tight, tough husk which is incompatible with commercial production. A number of synthetic lines are being developed in an effort to incorporate earworm resistance from Zapalote Chico into inbred lines that are used in Tennessee hybrids. Some progress is being made in combining silk characteristics and a moderately tight, tough husk, but there are no indications as yet concerning resistance to corn earworm.

B. Cynodon sp. B. N. Duck of the School of Agriculture, University of Tennessee at Martin reports that the evaluation of many bermudagrass introductions is continuing. Approximately 130 introductions appear to have potential for use in a breeding program. These introductions are in a maintenance program and efforts are being concentrated on a few introductions. In addition, 80 turf-type bermudagrass introductions are being maintained under lawn treatment conditions for observation relative to adaptation and longevity.

C. Fragaria. W. E. Roever of the Plant and Soil Science Department, University of Tennessee at Knoxville reports that the German strawberry variety, Senga Sengana, was obtained from Dr. Dolan at Geneva in 1970. It was used as the male parent in five crosses producing 365 hills of plants that fruited in the spring of 1972. The following characteristics predominated in all five crosses and were obviously brought in by Senga Sengana: 1) dense, vigorous, matted rows resulting from bunchy growth of offsets, 2) uniformly abundant plant making, 3) long petioles, 4) late ripening (the latest in the plots), 5) mostly small berries, 6) predominantly soft berries, 7) predominantly sunken achenes, and 8) high, fruity flavors (even more so than Suwanee). The last characteristic was especially noteworthy.

D. Forage Crop. **W. D. Barber of the** Plant and Soil Science Department, University of Tennessee at Knoxville reports that seed has been obtained from a number of the diploid Medicago introductions. These seeds have been treated with ionizing radiation and chemical mutagens. The first generation plants from the treated seed are being grown in the greenhouse and they will be selfed under controlled-environmental conditions. Second generation plants will be grown under field conditions and scored for resistance to the alfalfa weevil and prevalent diseases. A forage crop observation garden in which a number of P.I. accessions will be evaluated will be established this fall.

ORNAMENTALS

Ornamental Plants. H. Van de Werken of the Ornamental Horticulture and Landscaping Department, University of Tennessee at Knoxville reports that he will continue the study of all P.I. species at the Knoxville Campus for adaptation and performance. The material is distributed at the "P.I. Plot" on Morgan Hill, in the greenhouse, and at various other locations on the campus. A card file system and a walking list of all material in the P.I. Plot have been established. He reports further, that Ilex X altaclarensis 'Wilsoni' P.I. 241325 is now 10 ft. tall and sufficiently hardy for this part of Tennessee. Cornus paucinervis P.I. 294095 lost over 90% of its flower buds and 75% of its leaf buds and apical shoots due to lack of winter hardiness. Ilex hybrids 'John T. Morris' P.I. 267825 and 'Lidia Morris' P.I. 267824 are excellent plants. Pinus thunbergi P.I. 317258 is quite vigorous and forms cones on the tips of the new shoots at early age. Cryptomeria japonica augustata P.I. 279746 is somewhat dwarf, compact, and shows resistance to heat, drought, and cold.

WILDLIFE DEVELOPMENT

Wildlife Habitat Development. This is a Tennessee Valley Authority program conducted by David H. Scanlon, Division of Forestry, Fisheries, and Wildlife Development. The program involves the evaluation of shrub-type plants to be grown on electrical power line right-of-ways that would serve as a source of food for wildlife. Members of seven genera, viz., Quercus, Prunus, Vitis, Lespedeza, Cornus, Lonicera, and Eleagnus are being collected to be screened at different geographic locations for improved genetic types. This program is just getting started and Scanlon would welcome suggestions and additional plant material to be screened.

ANNUAL REPORT ON NEW CROPS RESEARCH IN TEXAS

Hatch 2091 - Contributing to Regional Project S-9

Auburn, Alabama, July 6 and 7, 1972

Prepared by Eli L. Whiteley

The 1971-72 crop year was characterized by extremes in weather. Rainfall was low during the summer months when plants needed it most. Temperatures were well below normal in the early spring with cool nights and mild days. Rainfall was very scattered over the state and many sections of the state received no rainfall for several months.

Researchers in Texas received 716 plant introduction in 1971-72. These plants represent 17 genera and 27 species. The major genera were Capsium, Sorghum, and Cucumis. Most of these materials are presently being grown in the field for evaluation.

Ornamentals

Dr. George Tereshkovich said that during 1971-72 about 250 plants, representing 33 species, have been planted in a nursery at Texas Tech University, Lubbock, Texas for evaluation. These plants were obtained from the U. S. National Arboretum, U. S. Plant Introduction Station, and Soil Conservation Service. At the present time data are being compiled to determine the cause of differential response of new ornamental species to varied climatic conditions, landscape usage, and various cultural practices.

Field Crops

Dr. R. A. Frederiksen reports that 781 sorghum introductions were planted at Beeville, Texas in April, 1972 for evaluation as sources of resistance for several diseases of sorghum.

Dr. J. W. Johnson reports that evaluation of several hundred sorghum breeding lines for greenbug resistance has been completed. Improved agronomic types that have seedling resistance to greenbugs were selected from crosses with a late forage type from Spain (PI 264453) and a selection from Tunis grass (SA 7536-1). The later resistant source resulted from a cross made at the Lubbock station in 1951.

J. Roy Quinby reports that several accessions are in breeding blocks; these materials have resistance to anthracnose, head smut and downy mildew. He reports that Pioneer Hi-Bred Company has one hybrid in commercial production with a converted tropical variety as a male parent.

Dr. C. E. Simpson reports that numerous accessions have been used in peanut crosses at Stephenville. Several wild species of *Arachis* and numerous cultivated peanuts have been used in the breeding program. The following plant introductions have been yield tested:

336954	268771	330646
337295	262048	336940
330646	248757	330647
336983	337419	330643
337399	318738	331316
330648	318741	337290
330649	337292	336931

The above plant introductions are all *Arachis hypogaea*, Spanish type, and have been tested for two years. None of these exceeded the check varieties in yield.

Dr. R. D. Brigham reports that PI 227555 and PI 200503 (*Glycine max*) are resistant to soybean mosaic virus. These two accessions have been used as parents in crosses and he hopes to select resistant lines from segregating populations. Soybean mosaic is the number two disease problem on the High Plains of Texas.

Sugar Crops

Yields of the sweet sorghum variety test and nursery at College Station, Texas are presented in Table 1. Only the pounds of sugar per ton of stalks is presented in Table 1. Yields of stalks per acre were lower than desired due to the extremely dry weather in July and August of 1971. However, the calculated pounds of sugar per acre was over 2,200 pounds per acre for the variety test.

Vegetables

A proposal for the release of a *Brassica carinata* selected from P. I. No. 243913 has been submitted. The new leafy greens variety has been named TAMU TexSel. Yields have been good and the processing groups like the product.

Dr. Ben Villalon has screened a large number of peppers at Weslaco, Texas. The results of these tests are presented in Table 2.

Kenaf

Production studies on kenaf are being continued and yields continue to look good. The studies in the Brazos river valley are being irrigated this year; this will give us results from both dryland and irrigated studies. The breeding program on kenaf is progressing slowly, however, several hybrids have been obtained from

from the program. Many of the hybrids are sterile and some difficulty in obtaining fertile plants has been experienced. Work with these materials will be continued.

Work Planned for Next Year

Work on kenaf production will be continued next year. The breeding program will be expanded as greenhouse space becomes available. Sweet sorghum and sugarcane tests will be continued.

Table 1. Estimated Recoverable Sugar Per Ton Stalks (From Average Pol and Purity Values)

Variety	Variety Tests lbs. sugar/ton stalks
Rio	144.1
Roma	116.7
Mer 65-2	137.2
Mer 69-12	165.2
Mer 69-15	143.9
	Nursery
Mer 68-4	93.6
Mer 68-8	110.1
Mer 68-9	113.2
Mer 69-3	123.9
Mer 69-8	89.9
Mer 69-10	143.6
Mer 69-12	170.2
Mer 70-6	89.3
Mer 70-7	174.3
Mer 70-9	148.7
Mer 70-10	176.5
Mer 70-11	135.7
Mer 70-14	100.3
Mer 70-15	193.2
Rio	140.8

Table 2. PEPPER PLANT INTRODUCTIONS SCREENED FOR RESISTANCE TO VALLEY MOSAIC COMPLEX. 1971-1972 TAREC Weslaco, Texas, Dr. Ben Villalon.

	P.I. No.	Genus	Species	Source	VMC[a]	B.S.[b]	Phyt.[c]
1.	109469	Capsicum	annuum	Turkey	S[d]	S	
2.	127445	"	"	Afghan	S	S	
3.	131352	"	"	Hungary	S	S	
4.	142833	"	"	Iran	S	S	
5.	159278	"	"	USA.	S	S	
6.	162608	"	"	China	S	S	
7.	164561	"	"	Spain	S	S	
8.	164562	"	"	"	S	S	
9.	164565	"	"	"	S	S	
10.	164678	"	"	India	S	S	
11.	164961	"	"	Turkey	S	S	
12.	167062	"	"	"	S	S	
13.	167100	"	"	"	S	S	
14.	176888	"	"	"	S	S	
15.	184037	"	"	Yugo	S	S	
16.	204687	"	"	Turkey	S	S	
17.	205167	"	"	"	S	S	
18.	205171	"	"	"	S	S	
19.	205174	"	"	"	S	S	
20.	206947	"	"	"	S	S	
21.	206949	"	"	"	S	S	
22.	206950	"	"	"	S	S	
23.	219896	"	"	Spain	S	S	
24.	222974	"	"	Iran	S	S	
25.	223034	"	"	Spain	S	S	
26.	249907	"	"	Portugal	S	S	
27.	251622	"	"	Yugo	S	S	
28.	257049	"	"	Colorado	S	S	
29.	257187	"	"	--------	S	S	
30.	263106	"	"	USSR	S	S	
31.	263108	"	"	"	S	S	
32.	263110	"	"	"	S	S	
33.	264662	"	"	Germany	S	S	
34.	270455	"	"	Mexico	S	S	
35.	288939	"	"	Hungary	S	S	
36.	288952	"	"	"	S	S	
37.	288965	"	"	"	S	S	
38.	288966	"	"	"	S	S	
39.	288974	"	"	"	S	S	
40.	288976	"	"	"	S	S	
41.	288979	"	"	"	S	S	
42.	289762	"	"	"	S	S	
43.	291999	"	"	Israel	S	S	
44.	297455	"	"	Spain	S	S	
45.	297456	"	"	"	S	S	
46.	297457	"	"	"	S	S	

Table 2 (con'td)

47.	297460	"	"	Spain	S	S	
48.	297469	"	"	Hungary	S	S	
49.	297474	"	"	"	S	S	
50.	298650	"	"	Spain	S	S	
51.	298651	"	"	"	S	S	
52.	152222	Capsicum	chinense	Peru	S	S	
53.	152225	"	"	"	S	S	
54.	257283	Capsicum	annuum	Spain	S	S	
55.	159241	Capsicum	chinense	Georgia	S	S	
56.	263106	Capsicum	annuum	USSR	S	S	
57.	264662	"	"	Germany	S	S	
58.	273428	"	"	Georgia	S	S	
59.	123469	"	"	India	S	S	R
60.	163201	"	"	"	S	S	R
61.	183441	"	"	"	S	S	R
62.	187331	"	"	Guatemala	S	S	R
63.	201232	"	"	Mexico	S	S	R
64.	188476	"	"	"	S	S	R
65.	201234	"	"	"	S	S	R
66.	163192	"	"	India	S	R	
67.	164471	"	"	"	S	R	
68.	164677	"	"	"	S	R	
69.	173877	"	"	"	S	R	
70.	182646	"	"	Guatemala	S	R	
71.	183439	"	"	India	S	R	
72.	163184	"	"	"	S	R	
73.	183440	"	"	"	S	R	
74.	183441	"	"	"	S	R	
75.	183922	"	"	"	S	R	
76.	244669	"	"	"	S	R	
77.	244670	"	"	"	S	R	
78.	246331	"	"	Ceylon	S	R	

a/ Valley Mosaic Complex = Definitely involves Tobacco Etch Virus, Potato Virus Y, Tobacco Mosaic Virus, and possible Cucumber Mosaic Virus and Tobacco Ringspot Virus - any of these in various combinations - artificial and natural inoculations.

b/ Bacterial Spot - under natural field conditions.

c/ *Phytophthora sp* - Proper conditions not available.

d/ S = susceptible
R = resistant

Virginia S-9 Technical Committee Report

July 6-7, 1972

Plant introductions obtained in 1971 were restricted to crown vetch, alfalfa and spinach.

Approximately 40 crown vetch (Coronilla varia) introductions were obtained by Dr. J. D. Miller, ARS cooperator, primarily for investigation of variability present in the species. Difficulty was experienced in establishing plants and limited notes did not indicate any particularly outstanding and/or desirable characteristics. Additional information will be obtained in 1972.

Dr. Glenn R. Buss, alfalfa breeder, has collected several diploid alfalfa introductions for use in basic research studies.

Approximately 188 spinach introductions were received by E. A. Borchers, plant breeder at the Virginia Truck and Ornamentals Station at Norfolk. No report on this material has been received.

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

Fort Worth, Texas

The Soil Conservation Service Report on S-9 New Crops for 1971 in Its South RTSC Area

July 6-7, 1972 Auburn, Alabama

By
W. C. Young, Plant Materials Specialist, South RTSC

The Soil Conservation Service continues to be a big user of plant introduction material. Eventually it may be that all our material will carry P.I. numbers.

This year I have tried to emphasize the narrative portion and only summarized by count the number of items we have under test. Reports come from the four nursery managers for the materials on the four southern centers. These men are

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

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

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

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

Work with field plantings in the States come from T. A. Bown, PMS headquartered in Jackson, Mississippi, serving Mississippi, Arkansas, and Louisiana; H. J. Haynsworth, PMS headquartered in Athens, Georgia, serving Georgia and Tennessee; Karl E. Graetz, PMS headquartered in Raleigh, North Carolina, serving North and South Carolina; and Arnold G. Davis, PMS headquartered in Temple, Texas, serving Texas. I have added a note about one species in Florida.

4-31,900 6-72
USDA-SCS-FT. WORTH, TEXAS 1972

The following comments have been made by the plant materials center managers concerning outstanding plants growing on their centers. The initials of the managers--J. D. Powell, Americus, Ga.; R. D. Roush, Brooksville, Fla.; B. B. Billingsley, Coffeeville, Miss.; and J. C. Garrison, Knox City, Tex.--follow their comments.

Agropyron elongatum - PI-297871
was one of the better accessions but was slow to establish and developed stolons up to a foot in length. Probably not tall wheatgrass even though it has the square glumes. JCG

Agropyron juncium - PI-281863
This was the best one of the four accessions observed at Knox City. It rusted badly late in the season 1971. Had been a candidate for increase to take the place of western wheatgrass on sandy soils. JCG

Agropyron tsukushiense - PI-283170
A low growing perennial with soft leaves and excellent seed producer. Forage production is low also. JCG

Andropogon caucasicus - PI-78758
was released on the market in 1932. Seed is being grown at Knox City to encourage its use in the commercial market. It is probably the most winter hardy introduced bluestem at Knox City. JCG

Arachis monticola - PI-263393
is a dependable reseeding annual which produces good quantities of forage and probably has value as a wildlife food. BBB

Atriplex canescens - PI-330657
Good stand and vigor, excellent seed. Is smaller type than T-1041, the native we have tried to increase at Knox City. Measures 40"x90". JCG

Atriplex rosa - PI-330667
Annual, good stand and vigor, reseeded at Knox City. Measures 16" x 48", leafy. Seed were collected. JCG

Brachypodium pinnatum - PI-172692
is one of the two best looking Brachypodium accessions. It produces good quantities of forage and seed heads and is rhizomatous. BBB

Calamagrostis pseudophragmites - PI-202584
spreads rapidly by means of long rhizomes. It shows great potential where a quick grass cover is needed. It makes good numbers of seed heads. BBB

Cotoneaster racemiflora - PI-297597
is a decidious shrub that produces clusters of whitish blossoms in the spring. The fruit reddens in the fall and hangs on plants well. BBB

Cynodon plectoslachys - PI-224693
winter hardy at Knox City. JCG

Desmostachys bipinnata - PI-268417
Perennial rhizomatous grass with potential for use in waterways or recreation traffic. Best one at Knox City. JCG

Echinochloa holubii - PI-207924
A perennial grass which spreads by rhizomes. It is probably capable of producing good quantities of warm-season forage on wet sites. BBB

Elymus giganteus - PI-108491
'Volga' wildrye does well at Knox City. JCG

Elymus sabulosus - BN-8367
Has been increased at Knox City as an erosion control plant. JCG

Eragrostis atherstonei - PI-276033
Acted as a short lived perennial. Plants there now are seedling. About equal to Lehmann lovegrass in production. JCG

Eragrostis curvula - PI-295689
has been increased. Has wider leaves than 'Ermelo' and was the earliest accession of 15 compared at Knox City. Dark green type with excellent seedling vigor has been field tested in Texas. JCG

13 PI-accessions (Eragrostis curvula--11, and Eragrostis robusta--2). An assembly made at Americus PMC in 1970 for a 3-year comparison study for selection of an accession that would not "clump out" over a period of time, thereby providing better ground cover on road cuts and other critical areas. Cumulative rating of the best five accessions for 1970 and 1971 are as follows: JDP

PI-208994	26.5 (E. curvula)
PI-299943	25.5 (E. curvula)
PI-232813	24.5 (E. curvula)
Commercial	21.0 (E. curvula)
PI-209385	22.0 (E. robusta)

Eragrostis superba - PI-299959
Perennial bunchgrass that was winter hardy at Knox City. The two PI numbers 295704 and 299959 seed were blended and increased at Knox City. Several other accessions winter killed leaving the above two accessions standing alone. Limited field trials are being done. JCG

Fingerhuthia sesleriaeformis - PI-203354
makes somewhat more growth than any of the other accessions of Fingerhuthia. Forage quality is only fair, but the plant has potential for erosion control. BBB

Glycine ussuriensis - PI-163453
An annual, viny type soybean with good reseeding qualities. Seed are smaller than commercial soybeans, brown-to-black in color, and shatter soon after maturity. They are readily taken by quail and doves make use of those falling in open areas. BBB

Hemarthria altissima - 24 PI accessions
These are outstanding in that they contain green vegetation most of the year, besides producing good amounts of forage. Comparisons have been initiated to select the most promising of the 24 accessions on hand. JDP

Indigofera pseudotinctoria - PI-197075
A vigorous, large rooted legume that can be grown from seed. It has a spreading type of growth and does well on light soils. It should be useful on dunes and road shoulders. JDP

Lespedeza virgata - PI-218004
A low growing perennial which forms dense cover. It is shorter than most varieties of sericea. It has value as a roadbank erosion control plant and possibly as a forage plant. BBB

This legume is finding favor with highway departments for planting on shoulders of roads as it is lower growing than sericea, thus not blocking the view on the inside of curves. Getting growers interested in producing seed has been a stumbling block but this is being overcome. JDP

Lotus creticus - PI-311429
Best one at Knox City. Fair stand, good vigor, poor seeder, 8"x40" excellent foliage cover. JCG

Malus hupehensis - PI-122586
A small tree, quite uniform in growth which produces good quantities of orange-red fruit. The fruit hangs on plants well and is used by wildlife in the winter. BBB

An excellent wildlife food that is reportedly easy to transplant with good survival. However, we have not been too successful in producing seedlings. JDP

Panicum miliaceum - PI-196292
This is becoming widely planted under the name 'Dove Proso.' It is mainly raised by sportsmen for attracting doves. JDP

Paspalum nicorae - PI-202044
The original intent for producing this accession was for use in waterways where its many rhizomes tie down the soil. However, some farmers are claiming that it is superior to bahia for grazing. We were near putting this accession up for certification but some later accessions appear to be superior so more testing is being done. JDP

Phalaris arundinacea - PI-236525
Was better than 'wintergreen' hardinggrass in rhizome development. Only produced limited seed heads. JCG

PI-316330. A cool-season plant which produces a good quantity of forage and adequate numbers of seed. BBB

Phyllostachys bissetii - PI-143540
Reaches a height of 25 feet or more. The foliage is seldom killed by cold at Coffeeville. It has value as a screen or windbreak plant. BBB

Phyllostachys meyerii - PI-116768
Reaches 25 feet or more, with yellowish stems. Value as windbreak or screen planting. BBB

Pistacia chinensis - PI-21970
Was planted in 1968 and 1970. The 1968 trees are 12 feet tall and 1972 was the first bloom year. They have a light seed set. There are three female and one male tree. The 1970 planting contains three trees eight feet tall. No bloom yet. Have good vigor but leaves are spaced farther apart than at Americus. JCG

The seed of this tree is eaten by birds. Its fall foliage in the South rivals the maples of New England for color. JDP

Sporobolus fimbriatus - PI-300123
Medium-sized bunch grass with extremely small seed. A good seed and forage producer. Has been initial increased at Knox City. .05 acre produced 13 pounds of seed. JCG

Tetrachne dregei - PI-15520
Medium size bunch grass at Knox City - good seeder and produces abundant seed. Two crops a year. JCG

Trifolium vesiculosum - PI-233782
An annual clover with good reseeding qualities. It reaches a height of three feet or more. It is a good forage and seed producer, and provides grazing several weeks later than does crimson clover. It has been released under the variety name 'Meechee' and seed are becoming commercially available. BBB

P. I. NUMBERED GRASSES UNDER OBSERVATION ON PLANT MATERIALS CENTERS IN THE SOUTH RTSC AREA

Genera	Name	Americus	Brooks-ville	Coffee-ville	Jas. E. Smith	Total
1	Acroceras macrum	4	3			7
2	Agropyron caninum			13		13
	Agropyron ciliare			1		1
	Agropyron ciliatiflorum			1		1
	Agropyron elongatum	1		19	3	23
	Agropyron juncium			1	4	5
	Agropyron pectiniforme			9		9
	Agropyron scabrifolium				1	1
	Agropyron striatum			4		4
	Agropyron tsukushiense				1	1
3	Andropogon caucasicus				1	1
	Andropogon scoparius	6				6
4	Arundinella hirta	1		2		3
	Arundinella nepalensis			1		1
5	Axonopus affinis		1			1
	Axonopus compressus	2	1			3
6	Brachiaria arrecta	1	1			2
	Brachiaria brizantha		3			3
	Brachiaria decumbens		2			2
	Brachiaria dictyoneura	1	3			4
	Brachiaria humidicola		3			3
	Brachiaria mutica	1	6			7
	Brachiaria nigropedata	1	1			2
	Brachiaria ruziziensis		7			7
7	Brachypodium phoenicoides	4				4
	Brachypodium pinnatum			23		23
	Brachypodium sylvaticum			13		13
8	Bromus inermis				1	1
	Bromus riparius			22		22
	Bromus unioloides	1		2		3
	Bromus willdenowii				1	1
9	Calamagrostis epigeious			3		3
	Calamagrostis pseudophragmites			6		6
10	Cenchrus ciliaris		3			3
11	Chloris castilloniana		1			1
	Chloris gayana		16			16

Genera	Name	Americus	Brooks-ville	Coffee-ville	Jas. E. Smith	Total
12	Chrysopogon fulvus				2	2
	Chrysopogon gayllus				1	1
13	Cymbopogon distans				1	1
14	Cynodon dactylon				1	1
	Cynodon plectostachyus		7		1	8
15	Dachyloctenium australe			1		1
16	Dactylis glomerata	1				1
17	Desmostachys bipinnata				2	2
18	Dichanthium annulatum	1				1
19	Digitaria decumbens		1			1
	Digitaria didactyla		1			1
	Digitaria eriantha			1		1
	Digitaria macroglossa		1			1
	Digitaria milanjiana		5			5
	Digitaria natalensis		1			1
	Digitaria pentzii	2	6			8
	Digitaria pentzii var. stolonifera		2			2
	Digitaria setivalva		1			1
	Digitaria smutsii		1			1
	Digitaria sp.		1			1
	Digitaria valida		8			8
	Digitaria vestita		1			1
20	Echinochloa crus-pavonis			1		1
	Echinochloa holubii	1		1		2
	Echinochloa polystachya		1			1
	Echinochloa pyramidalis	1	1	2		4
21	Eleusine coracana			17		17
22	Elymus arenarius				2	2
	Elymus giganteus				1	1
	Elymus hirsutus				2	2
	Elymus sabulosua				1	1
23	Elyonurus hirsutus			4		4
24	Eragrostis atherstonei				1	1
	Eragrostis chloromelas		2			2
	Eragrostis curvula	11	4	1	6	22
	Eragrostis ferruginea			1		1
	Eragrostis robusta	2	1	1		4
	Eragrostis superba				2	2

Genera	Name	Americus	Brooks-ville	Coffee-ville	Jas. E. Smith	Total
25	Eremopoa persica			2		2
26	Eriochloa borumensis	3	3			6
27	Festuca ampla	2				2
	Festuca arundinacea	2	1		1	4
	Festuca elatior				1	1
	Festuca gigantea			4		4
	Festuca pallescens			3		3
28	Fingerhuthia africana			1		1
	Fingerhuthia sesleriaformis			5		5
29	Hemarthria altissima	24	26	27	2	79
30	Horidum bulbosum				2	2
31	Ischaemum indicum		1			1
32	Leersia hexandra	1	1	1		3
33	Melinis minutiflora		1			1
34	Panicum amarulum				4	4
	Panicum antidotale	10		1	5	16
	Panicum coloratum	7	1	23		31
	Panicum coloratum var. makarikariense	2				2
	Panicum maximum		5	1		6
	Panicum miliaceum	1				1
	Panicum stapfianum	1		9		10
	Panicum virgatum	1			1	2
	Panicum virgatum var.cubense	1				1
35	Pappophorum sp.			1		1
36	Paspalum boscianum	3	2			5
	Paspalum commersonii	3	3	4		10
	Paspalum cromyorhizon	4	1	4	2	11
	Paspalum distichum	3	3	3		9
	Paspalum intermedium	1				1
	Paspalum nicorae	12				12
	Paspalum notatum	2			1	3
	Paspalum cf quadrifarium	1		2		3
	Paspalum vaginatum	2	2	2		6

Genera	Name	Americus	Brooks-ville	Coffee-ville	Jas. E. Smith	Total
37	Pennisetum clandestinum	2	2			4
	Pennisetum pedicellatum		1			1
	Pennisetum purpureum	1	2			3
	Pennisetum sp.	2		1	1	4
	Pennisetum unisetum	2				2
38	Phalaris arundinacea		1	3	3	7
	Phalaris aquatica			2		2
	Phalaris tuberosa x P. arundinacea	1				1
	Phalaris tuberosa var. hirtiglumis	1				1
39	Polypogon fugas			4		4
	Polypogon monspeliensis			7		7
40	Setaria flabellata	1			1	2
	Setaria longiseta		1			1
	Setaria magna				1	1
	Setaria palmifolia	1	1			2
	Setaria sphacelata	1	1			2
41	Sporobolus fimbriatus				1	1
	Sporobolus indicus			1		1
	Sporobolus ioclados v. usitatus			1		1
	Sporobolus tenacissimus			1		1
	Sporobolus virginicus			2		2
42	Stenoptera secundatum	2				2
43	Stenotaphrum secundatum		2			2
44	Stipa barbata			1	1	2
	Stipa capillata				2	2
	Stipa kirghisorum				1	1
	Stipa lagascae				1	1
	Stipa splendens	2		3		5
	Stipa tortillis				1	1
	Stipa ucrainica			1		1
45	Tetrachne dregei		1	1	1	3
46	Tetrapogon mossambicensis				1	1
47	Themeda anthera			1		1
	Themeda australis			1		1
	Themeda japonica	1				1
	Themeda triandra	3		2		5

Genera	Name	Americus	Brooks-ville	Coffee-ville	Jas. E. Smith	Total
48	Tridens brasiliensis			1		1
49	Urochloa mosambicensis	1	4		1	6
50	Zoysia japonica			3		3
	Zoysia matrelle			1		1

P. I. NUMBERED LEGUMES UNDER OBSERVATION ON PLANT MATERIALS CENTERS IN THE SOUTH RTSC AREA

Genera	Name	Americus	Brooks-ville	Coffee-ville	Jas. E. Smith	Total
1	Arachis benthamii		1			1
	Arachis burkartii	1	2			3
	Arachis diogoi		1			1
	Arachis duranensis	1				1
	Arachis glabrata	5	17	1		23
	Var. hagenbeckii	2				2
	Arachis martii		1			1
	Arachis monticola			1		1
	Arachis oteroi		1			1
	Arachis paraguariensis		1			1
	Arachis pseudoangustifolia		1			1
	Arachis repens		2			2
	Arachis sp.	7	24			31
	Arachis villosa		6			6
2	Argyrolobium limaeanum			1		1
3	Centrosema kermesi		1			1
	Centrosema pubescens		10			10
	Centrosema virginiana		4			4
	Centrosema sp.		6			6
4	Clitoria laurifolia		1			1
	Clitoria rubiginosa				1	1
	Clitoria ternatea		4		3	7
5	Coronilla c. varia			9		9
	Coronilla c. sp.			2		2
6	Crotalaria anagyroides		1			1
	Crotalaria balansae		1			1
	Crotalaria eriocarpa		1			1
7	Desmanthus virgatus		1			1
8	Desmodium adscendens				1	1
	Desmodium angustifolium				1	1
	Desmodium axillare				2	2
	Desmodium cinerascens		2		1	3
	Desmodium cinereum				2	2
	Desmodium heterocarpon		2			2
	Desmodium intortum				2	2
	Desmodium neomexicanum		1			1
	Desmodium nicaraguense		1			1
	Desmodium sp.				3	3

Genera	Name	Americus	Brooks-ville	Coffee-ville	Jas. E. Smith	Total
9	Dolichos axillaris		1			1
	Dolichos lablab		3			3
10	Galactia acapulcensis		1			1
	Galactia jussiaeana		1			1
11	Glycine ussuriensis			1		1
	Glycine wightii		14			14
12	Helianthemum variable				1	1
13	Indigofera pseudotinctoria	1	1		1	3
	Indigofera sp.	1				1
14	Lathyrus sylvestris	1				1
15	Lespedeza cuneata		3	2	1	6
	Lespedeza x divaricata			2	1	3
	Lespedeza inshanica			2		2
	Lespedeza intermixta			1		1
	Lespedeza japonica		1	1		2
	Lespedeza pilosa		1	1	2	4
	Lespedeza serpens	1	1	1	1	4
	Lespedeza tomentosa			3	4	7
	Lespedeza virgata	1	1	1	1	4
16	Lotus caucasicus		2			2
	Lotus chihuahuanus			1		1
	Lotus corniculatus			11		11
	Lotus creticus				3	3
	Lotus edulis			3		3
	Lotus hispidus				1	1
	Lotus ornithopodioides				2	2
	Lotus palustris				1	1
17	Lupinus alba	1				1
18	Medicago arborea			1		1
	Medicago ciliaris		1			1
19	Ornithopus compressus		1			1
20	Phaseolus atropurpureus		6			6
21	Psoralea bituminosa			1		1
22	Rhynchosia minima		3			3
	Rhynchosia phaseoloides		2			2
23	Sanguisorba minor				3	3

Genera	Name	Americus	Brooks-ville	Coffee-ville	Jas. E. Smith	Total
24	Sesbania punicea		1			1
25	Stylosanthes gracilis		2			2
	Stylosanthes humilis		1			1
	Stylosanthes montevidensis			1		1
26	Teramnus uncinatus		1			1
27	Trifolium africanum	1				1
	Trifolium clypeatum		1			1
	Trifolium incarnatum			1		1
	Trifolium repens		2			2
	Trifolium vesiculosum	1		1		2
28	Vicia humilis		1			1
	Vicia lutea				1	1
	Vicia pisiformia			4		4
	Vicia sativa		2			2
	Vicia tenuifolia			2		2

P. I. NUMBERED LEGUMES UNDER OBSERVATION ON PLANT MATERIALS CENTERS IN THE SOUTH RTSC AREA

Crassula sp.			1		1

P. I. NUMBERED WOODY PLANTS UNDER OBSERVATION ON PLANT MATERIALS CENTERS IN THE SOUTH RTSC AREA

Genera	Name	Americus	Brooks-ville	Coffee-ville	Jas. E. Smith	Total
1	Abies kawakamii			1		1
	Abies koreana			1		1
2	Alnus mayrii			1		1
3	Amorpha fruticosa			1		1
4	Atriplex canescens				2	2
	Atriplex halimus				1	1
	Atriplex leniformis				1	1
	Atriplex leucoclada				2	2
	Atriplex mueller				1	1
	Atriplex nummularia				1	1
	Atriplex rosa				1	1
	Atriplex sp.				2	2
5	Brachylaena uniflora		1			1
6	Buxus harlandii			1		1
7	Callicarpa formosa	1	2			3
	Callicarpa japonica	1	2			3
8	Cassia alata		1			1
	Cassia angulata		1			1
	Cassia bicapsularis		1			1
	Cassia flexuosa		1			1
	Cassia sp.		2			2
9	Castanea mollissima	1	2			3
10	Castanopsis sclerophylla	1	1	1	1	4
11	Celastrus sp.	1				1
12	Chamaecyparis obtusa	1				1
	Chamaecyparis pisifera plumosa			1		1
13	x Citrangequat		1	1		2
14	Cotoneaster racemiflora		1	1	1	3
15	Cryptomeria japonica	1				1
16	Cytisus mollis			1		1

Genera	Name	Americus	Brooks-ville	Coffee-ville	Jas. E. Smith	Total
17	Elaeagnus umbellata	1				1
18	Eriosema floribundum		2			2
	Eriosema sp.		1			1
19	Euonymus fortunei			1		1
20	Eurya crenatifolia			1		1
	Eurya ochnacea	1				1
21	Hydrangea integrifolia			1		1
22	Hypericum sp.			1		1
23	Ilex cassine	1				1
	Ilex latifolia	1		1		2
	Ilex montana var. macropoda			1		1
	Ilex rotunda	1		1		2
24	Jasmine mesnezi	1				1
	Jasmine mesnyi		1			1
25	Juglans regia	3				3
26	Juniperus ashei				1	1
	Juniperus chinensis var. sargentii			1		1
	Juniperus silicicola				1	1
27	Lagerstromea indica	2				2
28	Leucaena leucocephala		2			2
29	Lithocarpus henryii	1	1	1	1	4
30	Malus baccata	1		1		2
	Malus hupehensis	1		1		2
31	Metasequoia glyptostroboides			1		1
32	Oleo europea		1			1
33	Osmanthus heterophyllus purpureus	1				1
	Osmanthus heterophyllus x O. fortunei	1				1
	Osmanthus x Osmarea burkwoodi	1				1

Genera	Name	Americus	Brooks-ville	Coffee-ville	Jas. E. Smith	Total
34	Phyllostachys bambusoides	1				1
	Phyllostachys bissettii	1		1		2
	Phyllostachys meyerii			1		1
35	Picea koyamai		1	1		2
36	Pinus koraiensis			3		3
	Pinus sylvestris			4		4
37	Pistacia atlantica	5	5			10
	Pistacia chinensis	1	1		2	4
	Pistacia terebinthus	3	3			6
	Pistacia vera	3	2			5
38	Pterocarya stenoptera	1	1	1		3
39	Pyracantha coccinea			1		1
40	Pyrus calleryana			1		1
41	Quercus acutissima	1	2	2	1	6
	Quercus myrsinaefolia	2	1	2		5
42	Rhododendron kanchirai		1			1
	Rhododendron oldhamii		1			1
	Rhododendron sp.		2			2
43	Robinia pseudacacia			1		1
44	Rosa wichuraiana				1	1
45	Salix purpurea			1		1
	Salix repens v. rosmarinifolia			1		1
	Salix x chrysostala			1		1
46	Sasa pygmaea			1		1
47	Senecio tamoides		1			1
48	Ulmus pumila pilosa	1				1
49	Viburnum japonicum		1	1		2
	Viburnum lantana	1		2		3
	Viburnum x burkwoodi x V. carlesii	1				1
	Viburnum dilatatum x lobophyllum			1		1
	Viburnum x rhytidophylloides			1		1
	Viburnum sargentii			2		2
50	Vitex harveyana		1			1

Field Plantings in Mississippi

T. A. Bown

Plant Name	P.I.Number	Number of Test	Purpose of Test	Relative Performance
Echinochloa frumentacea	196293	11	Reseeding, growth and use by birds	Good
Glycine ussuriensis	163453	22	Growth and use by birds for food and cover	Good
Lespedeza virgata	218004	1	Growth and ground cover	Good
Malus hupehensis	122586	60	Growth and use by wildlife	Excellent
Paspalum nicorae	202044	2	Ground cover and forage production	Excellent
Photinia villosa sinica MS 2426		1	Evaluate for climatic adaptation	Fair
Phyllostachys meyerii	116768	11	Growth and as a screen planting	Fair
Phyllostachys bissetti	143540	5	Growth and as a screen planting	Fair
Pistacia chinensis	21970	54	Growth and use of seeds by birds and squirrels	Fair
Quercus acutissima	142294?		Survival and growth as a wildlife plant	Good

Plant Name	P.I. Number	Number Test	Purpose of Test	Relative Performance
Echinochloa frumentacea (Chiwapa)	196293	1	Growth and use by Waterfowl	Good
Glycine ussuriensis	163453	8	Growth and use by quail	Good
Lespedeza virgata	218004	4	Growth and forage production and ground cover	Fair to good
Malus hupehensis	122586	30	Growth and use by wildlife	Growth excellent
Paspalum nicorae	202044	4	Climatic adaptation and forage yield	Fair
Phyllostachys meyerii	116768	6	Growth for screen plantings	Poor--hard to establish and slow grow
Phyllostachys bissetti	143540	2	Growth for screen plantings	Poor-hard to establish and slow grow
Pistacia chinensis	21970	31	Growth and use of nuts by wildlife	Fair growth

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Field Plantings in Louisiana

T. A. Bown

Plant Name	P.I.Number	Number of Tests	Purpose of Test	Relative Performance
Arachis monticola	263393	2	Reseeding and forage production	Poor--both counts
Echinochloa frumentacea (Chiwapa)	196293	10	Growth and seed production	Good
Eragrostis robusta	209385	1	Ground cover--critical area	Good
Glycine ussuriensis	163453	9	Stand establishment from reseeding	Fair
Lespedeza virgata	218004	1	Growth and ground cover	Good
Malus hupehensis	122586	23	Growth and use by wildlife	Growth--good
Paspalum nicorae	202044	8	Growth and production	Excellent
Phyllostachys mayerii	116768	5	Growth for plant screens	Poor
Pistacia chinensis	21970	27	Growth and use of nuts by birds	Growth--good

Plant Name	P.I.Number	Number of Tests	Purpose of Test	Relative Performance
Arachis monticola	263393	2	Adaptation and use by wildlife	Good
Castanopsis sclerophylla	95630	4	Adaptation, wildlife food, ornamental qualities	Fair (1st yr)
Lespedeza virgata	218004	11	Erosion control, adaptation to sandy soils on roadbank	Good
Malus hupehensis	122586	37	Wildlife food production, ornamental qualities	Very good
Paspalum nicorae	202044	8	Erosion control:(1)waterways, (2) roadbanks	(1) Fair (2) Good
Pistacia chinensis	21970	15	Ornamental qualities, Wildlife food production	Very good
Pterocarya stenoptera	61938	11	Ornamental qualities and adaptation	Good (1st yr)
Quercus myrsinaefolia	74222	9	Ornamental qualities and adaptation	Poor (1st yr)

Field Plantings in Tennessee H. J. Haynsworth

Plant Name	P.I.Number	Number of Tests	Purpose of Test	Relative Performance
Castanopsis sclerophylla	95630	12	Adaptation, wildlife food, ornamental qualities	Fair (1st yr)
Hemarthria altissima	299993 and 299994	2	Winter hardiness, forage production	Very good
Lespedeza virgata	218004	17	Erosion control. Adaptation on critical areas	Good
Malus hupehensis	122586	21	Adaptation, wildlife food production, ornamental qualities	Very good
Pistacia chinensis	21970	19	Ornamental qualities, wildlife food production	Very good
Pterocarya stenoptera	61938	8	Ornamental qualities, wildlife food production, adaptation	Good (1st yr)
Quercus myrsinaefolia	74222	14	Ornamental qualities and adaptation	Fair

Georgia and Tennessee (continued)

Arachis monticola, PI-263393
Planted on Coastal Plain and Piedmont soils in 1970. Good volunteer stands emerged in the spring of 1971.

Castanopsis sclerophylla, PI-95630
Results of 1971 plantings indicate this plant may not transplant easily as bare-root stock. Growth of transplants in Georgia and Tennessee was very limited.

Hemarthria altissima, PI-299993 and 299994
Both accessions planted in 1970 in Tennessee endured adverse conditions to form a good stand. There was no evidence of winter kill. It grew to a height of about 2 feet in 1971 and formed a good sod.

Lespedeza virgata, PI-218004
This legume has proven adapted in Georgia and most of Tennessee. When seed are available, it will be used on a wide variety of critical areas for erosion control.

Malus hupehensis, PI-122586
This crabapple has proven well adapted to Georgia and Tennessee soils. It produces an abundance of small apples that provide food for wildlife.

Paspalum nicorae, PI-202044
This grass has shown good adaptation on sandy soils of the Coastal Plain in Georgia. Its major potential is for vegetating highway rights-of-way. It has good potential for use on grassed waterways.

Pistacia chinensis, PI-21970
Results of numerous plantings indicate this attractive tree is well adapted throughout Georgia and Tennessee. It gives best results when planted on fertile, well drained soils.

Pterocarya stenoptera, PI-61938
Planted in 1971 these plants have given good survival and showed good vigor in Georgia and Tennessee.

Quercus myrsinaefolia, PI-74222
First year reports indicate this oak will be hard to transplant as bare-root stock. Growth was very limited for the first year.

H. J. Haynsworth

Field Plantings in Texas

Plant Name	PI Number	No. in Test	Purpose of Test	Relative Performance
Eragrostis curvula	208994	24	Pasture	Good
	232813	24	Pasture	Good
	295689	8	Pasture	Good
	295703	14	Pasture	Fair
Eragrostis lehmanniana	295698	14	Pasture and range	Good

Eragrostis curvula, PI-295689
is one of the earliest to make spring recovery. It is a good forage producer that matures earlier than common lovegrass. Problems with seed production have been solved.

Eragrostis curvula, PI-295703
is readily grazed and is more attractive to livestock. Spring recovery is slow and unpredictable.

Eragrostis lehmanniana, PI-295698
has consistantly outproduced common Lehman lovegrass in both forage and seed.

Arnold G. Davis

Field Plantings in North and South Carolina

Paspalum nicorae, PI-202044
hangs on in the coastal and southern counties of South Carolina but is not yet proven.

Lespedeza japonica, PI-90664
is replacing *L. bicolor* in South Carolina as it has done in North Carolina and other areas. There is a need for better methods of producing and harvesting seed of this crop.

Karl E. Graetz

Field Plantings in Florida

Due to changes in personnel, no report was received on field plantings in Florida. However, a considerable acreage of three *Hemarthria altissima* accessions--PI-299993, 299994, and 299995--have gone in. One of them is being farmer increased to the extent that more than a thousand acres are probably in it now.

One of them has shown some promise as a filter for overland reduction of sewage effluent.

W. C. Young

Seed Production of Outstanding and Accepted Materials

Amclo clover, Trifolium vesiculosum, PI-234310, has been slow to reach parts of the South. Graetz reports that six cooperators produced 6,200 pounds of seed on 27 acres in that state. Similarly, he reports 'Dove' proso millet, Panicum miliaceum, PI-196292, originating as a crop in Georgia, has been increased by four cooperators producing 19,600 pounds of seed on 25 acres. At the same time, two cooperators in North Carolina produced 22,360 pounds on 31 acres. He also reports two cooperators producing 4.80 pounds of 'Chiwapa' japanesemillet, Echinochloa frumentacea, PI-196293, on six acres. Also, the North Carolina Game and Fish Commission continue to be the major source of the production of VA-70 Lespedeza japonica, PI-90664.

Lespedeza virgata, PI-218004, is beginning to reach the commercial market. One cooperator reported by Haynsworth in Georgia produced 1,300 pounds on two acres.

In Texas, Davis reports that kleingrass, Panicum coloratum, PI-166400, production was approximately 60,000 pounds as reported by 20 cooperators with an aggregate of approximately 500 acres in production. About 60 percent of the seed produced in 1971 was certified.

Articles Published Relating to P. I. Numbered Materials

Wilbourn, Ed. "Meechee"- Two Month's Extra Grazing. Progressive Farmer, Miss. & W. Tenn. 86 (10:36) 1971.

Cooper, J. Francis. New Grass is Popular. Progressive Farmer, Fla. June 1972.

THE PROGRESSIVE FARMER
JUNE 1972

New Grass Is Popular

A relatively new perennial grass from Southern Rhodesia, *Hemarthria altissima,* is proving popular with Florida farmers and ranchers. District Conservationist John B. Reed says Polk County farmers expect to plant more than 1,000 acres this summer.

Hemarthria grass grows to 4 feet tall on fertile soil. Its stolons or runners spread from 5 to 9 feet in one growing season. It will produce rooted shoots at the joints of either stolons or planted upright stems.

High yielding and palatable, it withstands trampling. It may be used for grazing or hay. Growth period is from the last frost in spring to first frost of winter, but in central and southern Florida a fair amount of growth occurs during the winter months.

Plantings are made in well prepared, moist soil. Irrigation is desirable for spring plantings. Sprigs or tillers from rooted joints, well developed top parts consisting of leaves and stems, or of mature stems, may be planted. Sprigs are preferred for winter plantings and top materials from early July through September. SCS workers have mimeographed planting instructions.

George Hancock, Alturas, received his first planting material in August 1969. It consisted of 600 pounds of mowed cuttings. He had applied 3 tons of lime and 300 pounds of 8-8-8 fertilizer per acre. Cuttings were about 12 inches long. He set them 6 inches deep 1 foot apart in 42-inch rows, then covered them and ran a tractor wheel over them to pack them.

From his original planting of 4 acres, he cut enough to plant 150 more acres from June to August the following year. He says he left probably an equal amount on the ground.

H. D. Boyd, Lakeland, furnished 13 ranchers with 1,000 pounds each from half of his 1-acre planting in 1971. He baled 140 bales of high quality hay from the other ½ acre, and his cows liked it extremely well.

Marcus Buchanan, Lakeland, made about 7,800 pounds of excellent hay from a ½-acre plot last year, also. His horses and cows eat the hay well. He cautions, however, that the grass should be mowed for hay before it becomes too woody.

J. Francis Cooper.

Report for 1972 Meetings of Regional Technical Committees on New Crops

W. H. Tallent
Northern Regional Research Laboratory

Crambe. Most advanced of several promising new products from crambe and other high-erucic oilseeds is nylon 1313. Pilot-scale production and evaluation studies under contract at the Southern Research Institute (SRI), Birmingham, Alabama having been completed, arrangements were made for a formal introduction of the new polymer via a special meeting at Peoria to bring together representatives of the plastics industry, crambe growers and processors, and the chemists and engineers of NRRL and SRI. In addition to fulfilling product yield and quality expectations based on laboratory studies, pilot-level synthesis has demonstrated that certain purification steps thought necessary in the laboratory can be eliminated or performed in-line to simplify the overall nylon 1313 process and make it more economical. Similarly, more efficient reaction conditions that ensure uniformly high yields of intermediates on a large scale have been identified.

As of January 3 Vincennes University, Vincennes, Indiana, formally obtained possession of an oilseed extraction-refining plant in Cleveland, Ohio, for processing crambe. So after many years without the middle link, the crambe commercialization chain (growers, processor, industrial users) now appears to be intact. Approximately 5,000 acres are being grown in Indiana, Illinois, and Ohio under contract to Crambe Enterprises, Inc., and at least two major industrial firms are interested in purchasing the oil. To buttress these promising developments, efforts are underway to allow an economic outlet for the byproduct meal. A conference was held March 30 with officials of the Food and Drug Administration regarding requirements for obtaining approval to use crambe meal as a protein supplement in beef cattle feed. In cooperation with Professor T. Wayne Perry, Department of Animal Sciences, Purdue University, feeding trials are planned for the late summer or early fall to provide information requested by FDA.

Sperm oil replacements. Industrial interest in sperm whale oil replacements continues high even though several products intended to fulfill this need have been announced by commercial suppliers. Authorities active in the sperm oil trade report that certain commercial replacements are unsatisfactory, that most others perform adequately only in specific tasks, and that the industry still is without a universal replacement. Initial knowledge of commercial replacements suggests that radical departures from the wax ester structure of sperm oil are to be avoided as are oils high in polyunsaturation. Among new crops seed oil products, the liquid waxes which can be made from crambe and *Limnanthes* fatty acids are best suited as potential sperm oil replacements. Arrangements have been made whereby these waxes and analogous products from vegetable and animal fats may be rigorously evaluated as sperm oil replacements by experts familiar with the derivatization and major applications of sperm oil.

Antitumor agents. At a February 28 meeting of the Chemotherapy Program Staff, Drug Research and Development, National Cancer Institute, a decision was made to proceed with preclinical testing of homoharringtonine in lieu of harringtonine. Reasons for this decision were that the former *Cephalotaxus harringtonia* alkaloid is generally more abundant in extracts of the plant and shows slightly higher antileukemic activity. Meanwhile, we are attempting to develop feasible synthetic methods to convert cephalotaxine, the most abundant (but inactive in anti-tumor tests) *Cephalotaxus* alkaloid, to one of its active esters--harringtonine, isoharringtonine, homoharringtonine, or deoxyharringtonine. This conversion gains in significance as a result of recent progress in other laboratories toward the total synthesis of cephalotaxine.

Two new plant extracts have shown antileukemic activity in mice. These are from *Sesbania punicea* and *S. vesicaria*. *Astragalus calycenus* (P.I. 314357) previously showed activity that was not confirmed with a second sample (young plants). Recent work by A. M. Davis, Agronomist at WRPIS, indicates that alkaloid formation takes place in the floral structures of this species. Assuming the antitumor principle is an alkaloid, Dr. Davis' results would explain the lack of activity in extracts from young plants collected before flowering.

Kenaf. In September 1971 *Chem 26*, a journal of the pulp and paper industry, issued a challenge to technologists to come forth with paper produced from new fibers. Kenaf was mentioned specifically. Acceptance of this challenge has brought about changes in our pilot plant pulping and papermaking contract with The Herty Foundation. Representatives of Herty and NRRL met in May to work out details for production of a ton of publication-grade paper on which to print articles about kenaf for an insert in *Chem 26*. We hope to incorporate as much as 60 percent of kenaf pulp in the fiber blend for the final product. The necessary kenaf for this pulp is being grown at the U.S. Plant Introduction Station, Savannah, Georgia, under the supervision of Dr. Charles Adamson. For environmental reasons, the pulping technique has been shifted from the sulfate to the soda process. This change avoids the malodorous sulfur-bearing byproducts of the familiar kraft pulping operation. Emphasis has also been placed on use of field-dried material rather than the green crop. Until satisfactory storage and preservation practices have been established for the latter, it is the less likely of the two to be used commercially.

The storage study of field-dried kenaf underway at Savannah is also in cooperation with Dr. Adamson. As mentioned last year, a principal variable is moisture level in the material at the time of storage. Zero-time bales have been pulped and the pulps evaluated for future comparison with ones from the bales to be taken this summer from ricks covered for 18 months with plastic, canvas, or an extra layer of kenaf.

As a guide for large-scale (60-ton) green kenaf storage studies to be set up in the fall of 1972, a laboratory-scale, near-anaerobic storage test was established in October 1971. Materials included shredded, unfractionated green stalks (with and without foliage), bark, core and partially dejuiced stalks. In some instances propionic acid or borax was added as a preservative.

To permit production of kenaf pulps of consistent quality irrespective of harvesting schedules, NRRL developed techniques for pretreating both green and field-dried stalks before pulping. Equipment commonly employed in the pulping industry was used. The technique provides for removal of foliage, pith, epidermis, dirt, trash and solubles in aqueous suspensions of chopped or shredded kenaf by a combination of centrifugal and screening operations. These principles are being incorporated into the pilot-scale work at The Herty Foundation.

Various physical measurements and response to mechanical treatments of pulps from separated bark (bast fibers) and woody core fractions of kenaf and of these components reblended in the original proportions indicate that the whole is the sum of its parts with respect to most but not all properties. A few instances of dominance of one fiber type over another or of synergistic interaction in governing physical characteristics need further investigation. These studies are continuing to provide information relevant to optimum preparation, handling, and use of kenaf pulps.

A precise, fast, ultraviolet technique was developed for determining lignin. The procedure is amenable to micro samples (5 to 35 mg.) and correlates well (0.97) with the 80 percent sulfuric acid digestion method we have been using for many years.

Screening. Samples (79) received for the screening program included representatives of 19 new species. Other samples received included 178 from Glenn Dale, 240 (200 Tephrosia and 39 Vernonia) from Mayaguez, one from SRPIS, two from Clemson, 32 from WRPIS, 123 (110 Brassica) from Corvallis, 34 from Chico, two from Bozeman and 500 crambe from Lafayette. Seeds analyzed included a few new accessions and all our remaining samples of Limnanthes (mostly seed from agronomic evaluation of material previously analyzed). L. douglasii var. rosea oil is again richest in 22:1 (cis-5-eicosenoic acid), but it has only 62-66 percent instead of the 72 and 77 percent in the two earlier samples. L. alba ranges from 10.9-23.6 percent of 22:2 (mostly cis-5,cis-13-docosadienoic acid) and is the only species to have more than 21 percent of this acid. All but one sample contained m-methoxybenzylglucosinolate as the major thioglucoside in the defatted meal, and some samples of L. alba also had small amounts of a progoitrin-like component similar to the one in crambe.

Several new sources of unusual fatty acids have been found. The seed oil of Dioscoreophyllum cumminsii (miracle fruit) contains 87 percent of cis-5-octadecenoic acid, by far the highest concentration yet encountered. Four Chenopodiaceae--Kochia prostrata, K. scoparia, Bassia hyssopifolia, and Suaeda setigera--produce oils with 4.6-12 percent cis-5-hexadecenoic acid. Oils from two species of Ribes contained γ-linolenic acid (GLC identification) and 6,9,12,15-C_{18} acid and were much like some of the borage oils. The level of 8.9 percent in R. alpinum suggests other species should be tested in search of a practical source of γ-linolenic acid for prostaglandin synthesis. In 39 samples from nine species of Vernonia grown at Mayaguez, oil content ranged from 7.8 to 33.3 percent, and vernolic acid varied from 50 to 79 percent. Free (i.e., unbound) fatty acid contents in the oils from the samples ranged from 1.3 to 11.0 percent. The reasons for the variation are unknown, but many samples of V. anthelmintica have exhibited a high FFA-low epoxy relationship. Similarly, a sample of Vernonia oil prepared in Thailand for evaluation for industrial use contained 24 percent FFA, 17 percent dihydroxy acid and only 56 percent vernolic acid. The condition may be related to maturity at harvest or to climate during maturation, but the specific reasons should be established. Stokesia laevis may present a similar problem, but all samples analyzed are high in FFA, and no correlation with vernolic acid is obvious in the few samples yet run.

High-erucic oilseed breeding program. Analyses for glucosinolates were continued on the 1,500 samples of Indian crucifers, mostly Brassica campestris and B. juncea, that were analyzed for oil and erucic acid last year. In the first 650 samples, glucosinolates ranged from 3.0 to 8.4 percent, and no more than traces of progoitrin were found. It is hoped that some of the high-erucic lines will be found also low in glucosinolates. Currently the only established source of low-glucosinolate germ plasm is the Polish B. napus variety Bronowski. In a Dwarf Essex x Bronowski cross made in the breeding program at Corvallis, 25 F_2 plants gave seed with total glucosinolates 2.9- 6.6 percent, progoitrin 1.7-4.7, and C_{22} acids 17-44 percent; there was no obvious correlation between glucosinolates and C_{22} acids. In 54 single plants of one B. campestris accession, glucosinolates were 1.6-6.3 percent, with only one below 3 percent and one above 5.6 percent. In this group, erucic acid ranged from 38-58 percent, and all but six plants were above 50 percent. The structure of glycerides in 104 of the Indian Brassica samples, selected from the high-oil, high-erucic list, was explored to see if some oils might have significant amounts of erucic acid in the center position on the glycerol and thus permit more than 67 mole percent (70 weight percent) of erucic acid in the oil. None was found to have more than 1 percent in the 2-position, and this quantity is well within the experimental error of the method.

Insect control. The increase in rotenone and deguelin in leaves of Tephrosia vogelii in maturing plants reported last year was confirmed in the 1971 season. Individual leaves, however, do not change in rotenoid content, and the overall increase occurs because the later-developing leaves are progressively richer in both rotenoids. Leaflets from 200 plants of a "rotenone-free" line grown at Mayaguez were tested and about 20 percent were found to contain rotenone. Seed were collected from the truly rotenone-free plants for future production of pure deguelin.

At Kentucky, crucifer seeds among 31 samples containing gums were found to trap mosquito larvae and hold them for several days. Forty-six additional samples are now undergoing tests.

New Crops Research Branch

Report to

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

July 1, 1971 - June 30, 1972

Fiscal Year 1972 turned out to be a memorable one for the Branch in more ways than one. The Cancer program tripled in size, a large new program on Narcotic Plants was launched, more Plant Introductions were inventoried than in any other year in the history of the Branch - and all this was accomplished with a smaller staff than we had in FY 1971. We said last year in the preface to our report that we were looking forward to a challenging year. It was that.

Dr. Jones was a member of Secretary Hardin's Mission to Turkey to advise the Turks on alternate agricultural enterprises to opium poppy production. This team received the Department's Unit Distinguished Service Award.

After a successful plant collecting trip in Siberian U.S.S.R., Dr. Creech was detailed to the Division Office as Acting Assistant Director.

The 20-year report which Dr. Creech spearheaded with much appreciated help from the Coordinators, has turned out to be a "best seller." Everyone that had a part in bringing this publication into existence can feel justifiably proud. Special credit is due the Georgia AES for putting the report together in such an attractive, professional manner.

FY 1973 looks as if it will be at least as challenging as the one covered by this report. We will be working within an entirely different framework, the details of which have not as yet been put in order. Our mission isn't changing. The importance of plant germ plasm collection, evaluation, and preservation is not diminishing - quite to the contrary, there is a growing awareness of our dependence upon genetic variability. The change will be in how ARS and its constituent units are structured to carry out their missions.

This will be the last report from the New Crops Research Branch.

Investigations: Plant Introduction

CRIS Research Projects Covered: 1010-01-01, 02, 03, and 08

Progress:

The 12,340 plant and seed accessions placed under inventory during calendar year 1971 represent an all-time annual high and reflects to some degree the increasing awareness of cooperators as to the value of P.I. numbers for convenient future reference. The general crop categories included 5,681 vegetables, 3,823 cereals, 1,647 forages, 358 oilseeds, 252 fruit and nuts, 204 special, 196 ornamentals, 119 cotton and fibers, 54 sugar, and 6 tobaccos. Two major explorations were completed but data not included in the above records. Dr. J. L. Creech collected 290 ornamentals from areas in Siberian U.S.S.R. explored for the first time by U.S. personnel. Under an agreement with the U.S. Agency for International Development (AID), F. W. Martin, Federal Experiment Station, Mayaguez, P.R., collected 240 samples of Dioscoreas from West African countries. These will be used for breeding and improvement of existing types for higher protein and other nutritional factors needed in tropical agriculture. PL 480 projects continued as good sources of germ plasm. Approximately 2,000 vegetables and 150 fruits have come from Yugoslavia, and 2,800 pulse crop samples from India. Exchanges continue with Soviet bloc countries on a satisfactory basis, especially where requests submitted from the United States are specific and well documented. The pace of international seed and plant exchange illustrates the importance of desirable germ plasm for agricultural improvement programs around the world. Two thousand shipments to 120 countries covered a total of 158,409 items. An additional 146 shipments sent to 20 countries included 5,550 samples for servicing AID programs. Plant Inventory 177 (1969) was published and No. 178 (1970) is with the printers.

There is little activity to report in relation to domestic exploration. NC-7 has continued the project for collecting native warm season grasses in the Dakotas. A few promising accessions have already been reported from the 1969 work. W-6 will complete the present phase of Ceanothus collections in 1972. No further action has been reported by the NE-9 Executive Committee on the proposal to collect salt tolerant roadside species. S-9 has no projects for domestic exploration on record.

The National Seed Storage Laboratory, Fort Collins, reported an increase of 2,393 items in 1971. The present total of 80,995 shows the following breakdown:

Small Grains	32,675	Corn	1,363
Vegetables	13,486	Tobacco	1,205
Oilseeds	10,983	Ornamentals	514
Sorghum	8,984	Legumes (Pulses)	436
Forage	5,041	Chemurgic	332
Genetic	4,102	Sugar Crops	114
Cotton and Fibers	1,749	Strategic	11

Seed disbursements for this reporting period were 1,539. Conversion of the records to an automatic data retrieval system is underway with the Data Systems Branch designing the necessary punch cards and outlining the data retrieval programs. Research related to protective packaging materials showed that those containing a foil layer continue to provide essentially complete moisture protection for crimson clover seeds while other materials under test do not. Cultivar differences in longevity of lettuce seed become more pronounced with increased time in storage. Germination tests were not due for the majority of other research tests during this period. A study on longevity of fungi in storage seeds has been initiated.

Publications:

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Clark, D. C. and L. N. Bass. Germination Experiments with Seeds of Indian Ricegrass, Oryzopsis hymenoides (Roem. and Schult.) Ricker. Proc. Assoc. Off. Seed Anal. 226-239. 1970.

Hyland, H. L. Plant Inventory No. 177. Sept. 1971.

Leppik, E. E. Assumed Gene Centers of Peanuts and Soybeans. Economic Botany 25:188-194. 1971.

Leppik, E. E. N. I. Vavilov's Worthy Life and Tragic Death. Farmers Federation Yearbook, Stockholm, Sweden. XII:49-53. 1971.

White, G. A. and L. N. Bass. Vernonia anthelmintica: A Potential Oil Source of Epoxy Acid. III. Effects of Line, Harvest Date, and Seed Storage on Germination. Agron. J. 63:439-441. 1971.

Future Plans:

During June-August 1972, D. R. Dewey, Crops Research Laboratory, Logan, Utah, and J. L. Schwendiman, Plant Materials Specialist, Soil Conservation Service, Pullman, Washington, will explore areas of eastern Turkey and northern Iran. Emphasis will be placed on *Agropyron*, *Elymus*, *Hordeum*, and other grasses for upgrading range lands in the western United States. The background and experience of this 2-man team will allow for additional collections of shrubs and forbs for wildlife management programs.

A domestic exploration proposal has been submitted by NC-7 for collecting native *Carya* species, to be implemented after July 1, 1972, pending approval of funds by New Crops.

Investigations: Plant Resources Investigations

CRIS Research Projects Covered: 1010-05-01 and 02

Progress:

Anticancer screening yielded 32 new active plants, 17 active against P-388 leukemia, and 15 active against KB cell culture. Over a period of six months the screening program was increased from the previous annual level of 1,000 new plant materials to the new level of 8,000 accessions per year. Active agents from three additional plants were selected for further evaluations that are expected to lead to clinical trials with human patients. These plants are the African trees, Fagara macrophylla and Maytenus ovatus, and the pan-tropical weed Heliotropium indicum.

Data from USDA chemical and biological screening programs was assembled to identify arid-land shrubs with greatest utilization potential as sources of seed oils, proteins, gums,plant alkaloids, and anticancer agents.

Detailed analysis of herbarium specimens representing genera of grasses related to rice has improved our understanding of intergeneric relationships in this economic group of grasses. Flower, fruit, and seed characteristics were shown to be of greater importance in recognizing true relationships than other characteristics previously emphasized by grass taxonomists.

Descriptions of the external and internal seed characteristics of 42 species of the potato family were assembled as a basis for identification of seed of this group of economic plants. This research will expedite identification of seed of all species of the family that are of importance to American agriculture including crop plants, ornamentals, and weeds.

Publications:

Gentry, H. S. The Agave Family in Sonora. USDA Agriculture Handbook No. 399. 1972.

Gunn, C. R. Seeds of Native and Naturalized Vetches of North America. Agriculture Handbook No. 392. 1971.

Terrell, E, E, Survey of occurrences of liquid or soft endosperm in grass genera. Bull. Torr. Bot. Club 98:264-268. 1971.

Total Other Publications: 3

Future Plans:

Procurement for the cancer program will include 8,000 small plant samples for initial antitumor screening and 300 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.

Fact sheets are being prepared on over 500 crops to facilitate selection of those most promising for countries which seek alternatives to opium and other narcotic crops. A multidisciplinary chemotaxonomic study of the *Papaver bracteatum* complex will be initiated to identify the most promising botanical sources of thebaine.

Seed characteristics of Papaveraceae will be investigated as a basis for preparation of keys for seed identification.

An annotated bibliography on *Papaver somniferum* and *Papaver bracteatum* complex will be prepared.

Investigations: Plant Materials Investigations - Horticultural Crops

CRIS Research Projects Covered: 1010-04-01, 02, 03, 04, 06.

Progress:

During late June and early July, 1971, the Investigations Leader reviewed four PL 480 projects in Yugoslavia for which he is sponsoring scientist. These projects are concerned with floristic surveys and collection of wild and locally grown fruits, woody ornamentals and vegetables. Each seed collection is shared with the United States and many new plant introductions have been received as a result. Field locations at Experiment, Ga., Geneva, N. Y., Glenn Dale, Md., Miami, Fla., and Mayaguez, P. R. were visited for conferences with research personnel. The Investigations Leader visited CIAT, Cali, Colombia, to confer with scientists about increasing USDA germ plasm collections of pulse crops for redistribution to Tropical countries.

The sterility barrier in fragrant-flowered F_1 interspecific hybrids involving *Camellia lutchuensis* has been broken at Glenn Dale. Colchicine treatment of semi-sterile 'Fragrant Pink' has resulted in a fertile cytochimera of 2-4-4 composition. It has been successfully used as both male and female parents in F_2 back crosses. Two preliminary selections from a segregating yellow-fruited *Ilex crenata* F_2 population look promising as semi-dwarf landscape plants. *Rhododendron japonica* selections were used in self- and sib-crosses in attempts toward true breeding lines for yellow and orange flower color. Six F_1 seedling populations are now under observation. Out of 70 deciduous fruit introductions indexed, 8 apple, 18 pear and 13 *Prunus* P.I's. were released as virus free. Another apple and 7 pears were released under special conditions because of infection with widespread latent virus. Virus was also detected in 1 *Lycianthes*, 2 canna, 1 maple and 1 dahlia. Antiserum was produced against chrysanthemum aspermy, peanut stunt and dogwood ringspot viruses. The etiology of Virginia crabapple decline disease was studied. Experiments were initiated on the effect of tetracycline on the apple diseases rubbery wood, spy decline and flat limb. The 2-component cherry leaf roll virus' infectivity was studied. A virus in *Dioscorea* was identified by serological technique as a strain of plum pox.

At Chico, Calif., *Actinidia* vines were defoliated by frost of 22° F. on Oct. 29, 3 weeks before fruit maturity. When harvested, soluble solids averaged 8%, half of normal. During storage at 40° F. solids increased to 11%. Although sour, the fruit sold for 80-90 cents per pound, wholesale. Flowers of two Turkish apricot seedlings survived air temperatures of 24° F. at 10 ft. above ground level the mornings of 3/2 and 3/5/71, without apparent injury. Another survey of almond introductions confirmed presence of the genetic disorder, noninfectious bud failure, in some seedling introductions.

Several Italian almond seedlings produced good crops following temperatures of 26, 25, and 28° F. Second generation English walnut introductions from Russia produced nuts that are superior for nut size, crackout percent and spur fruiting. The 'Kerman' pistachio on Pistacia terebinthus roots averaged 10 lbs. more dry weight nuts per tree than on P. atlantica. Seed germination trials indicated that use of peat in Pistacia seed germination mediums increased germination especially at temperatures above 75° F. Laboratory analysis of Camptotheca seedlings shows an 8-fold variation in camptothecin content. The 1971 Camptotheca field planting was killed by frost of 18° F. on March 5. Camptotheca tissue has been successfully grown in vitro. 'Bradford' pear seedlings have been selected that are superior to the parent tree for fall color at Chico.

Discovery of Hemileia vastatrix in Brazil renewed interest in the coffee germ plasm collections maintained at Miami, Fla. Cold tolerance studies showed artificial chilling correlated with field damage. Rust resistant Hibrido de Timor and H-17-1 are cold tolerant. Mango: Ten cultivar replicates gave data on early cropping, crop increase, alternate bearing. Five seedlings were selected for further testing from 174 seedlings evaluated. M 4329 transmits longer fruiting season, acceptable flavor, low fiber and less jelly seed than M 1007 which transmits more anthracnose resistance. Cumulative data, 1964-71, on 20 cultivars and 14 selections suggest release of M 13269, M 20220, M 21946 in Fla., and M 20222 in Calif. Avocado: Open pollinated Mexican race Brooksville, Fla., seedlings were better adapted to rocky alkaline soils than 'Arue' seedlings indicating rootstock potential. Flowering type of new introductions were determined as 14 A-type and 18 B-type. Of 10 introductions evaluated for fruit quality 'Borrego' and 'Il de France' have commercial potential. Ornamentals: Bauhinia variegata 'Limelight' released. Sansevieria cold damage experiments showed that pretreatment above freezing determines cold injury more than cold itself. Locally successful putative hybrids were defoliated after shipment north. Corypha elata bloomed after 45 years. First time in U.S.

At Savannah, Ga. seedling selection studies were continued with Ilex crenata, I. cornuta and Pistacia chinensis to determine adaptability to the lower Atlantic and Gulf Coast areas. Emphasis continued also on maintenance and distribution of propagation material of Phyllostachys species and other bamboo introductions. Phyllostachys bambusoides started to flower, a phenomenon which occurs only once in 50 or so years of the clone's life and is followed by widespread death of the culms. The testing, propagation and distribution of Chinese waterchestnuts (Eleocharis dulcis) and miscellaneous species of introduced ornamentals was also continued.

Publications:

Ackerman, W. L. Genetic and cytological studies with Camellia and related genera. USDA Tech. Bull. 1427, 115 pp. 1971.

Ackerman, W. L. Chromosomal translocation in a diploid Camellia. J. Heredity 62(2): 121-122. 1971.

Ackerman, W. L. Winter hardiness of Camellia lutchuensis interspecific hybrids. American Camellia Yearbook 1972:211-215. 1971.

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Knight, R. J., Jr. Breeding for cold hardiness in subtropical fruits. Am. Soc. for Hort. Sci. 6(2):157-160. 1970.

Knight, R. J., Jr. Edible fruited passionvines in Florida: The history and possibilities. Am. Soc. for Hort. Sci. 13:265-274. 1969.

Knight, R. J., Jr. Polyembryonic mangos: Their unrealized potential. Trop. Reg. Am. Soc. Hort. Sci. 14:145-155. 1970.

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Smith, R. L. Chinese gooseberry. A new host for Armillaria mellea. Plant Disease Reporter 55(12): 1099-1100. 1971.

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Waterworth, H. E. Physical properties and host ranges of viruses latent in and mechanically transmitted from Jasmine. Phytopathology 61:228-230. 1971.

Waterworth, H. E. Virginia crabapple as an indicator for a widespread latent virus of pear. Plant Disease Reporter 55(11): 983-985. 1971.

Winters, H. F. New germ plasm of ornamental plants from New Guinea. Trop Reg. Am. Soc. Hort. Sci. 14:280-284. 1970.

Winters, H. F. New plant introductions. Arboretum and Botanical Garden Bul. 4(1):29-32. 1970.

Future Plans:

Evaluation of horticultural crop introductions will be continued at the four Federal and four Regional Stations. A dwarf form of weeping hemlock, Tsuga canadensis, continues to appear promising as an ornamental. It will be released as soon as our stock can be increased. Rhododendrons collected in New Guinea are being propagated for distribution. Since each plant only gives a few cuttings per year progress is slow. Woody ornamentals collected in Yugoslavia, Siberia, and other areas in Russia during 1971 are being propagated at Glenn Dale for early distribution. Several selections of mango will be released from the Miami Station later this year, the exact number depending upon this year's evaluations. Evaluation of English walnut seedlings will continue with early releases anticipated.

Investigations: Plant Materials Investigations - Agronomic Crops

CRIS Research Projects Covered: 1010-03-01, 02, 03, 04, 05

Progress:

Plant explorations were made in Southern Africa by A. J. Oakes and in U.S.S.R. by J. L. Creech in 1971. The source by country of the 947 accessions included in the Southern African collection is as follows: Lesotho 27, Mozambique 23, South Africa 847, and Swaziland 50. Warm-season grasses comprised 759 accessions whereas legumes and ornamentals consisted of 188 accessions. Both seed and vegetative propagating stocks were included in the grass collection. The grasses of special significance in the collection include 311 Digitarias and 30 accessions of *Hemarthria altissima*. Certain cool-season grasses were included in the collection from U.S.S.R. Of particular significance is that of cold-tolerant germ plasm of *Festuca* and *Poa* species.

Liaison is being maintained with Data Systems Application Division at the national level in the placement of plant introduction data and information on magnetic tape for storage and utilization. The procedure assists in the preparation of the printed inventory. Information has now been accrued and recorded in this manner for two years, 1970-71. Special listings have been prepared as become appropriate at the national level and at each Regional Plant Introduction Station. Increased portions of annual seed lists and plant inventories are being produced by automated techniques at the Regional Plant Introduction Stations. Steady progress is being realized in the automation of plant accession data. Automated techniques have been initiated at the National Seed Storage Laboratory and codes have been developed for about 185 plant genera.

RPIS (NE-9) reports continued progress in its pathological screening program of red clover; over 500 introductions have been screened in the greenhouse for *Stemphylium sarcinaeforme*. Resistance is reported for 3 accessions whereas a lesser degree of resistance was found in other accessions. Disease ratings for the entire red clover collection, including 23 standard cultivars, are available upon request. Preliminary screening of birdsfoot trefoil for *Myrothecium* leafspot indicates differences in susceptibility exist among accessions. Resistance to mildew is reported from field screening of collections of *Festuca rubra* and *Poa pratensis* from Alaska. Mildew resistance is reported for 7 accessions of Kentucky bluegrass and 7 fescue accessions.

RPIS (NC-7) reports the identity of both male and female sterility from exotic corn germ plasm. This identified germ plasm will serve as a valuable asset in plant breeding programs aimed at developing corn hybrids resistant to corn leaf blight and other corn diseases. Exotic germ plasm served as the source of two newly-released cultivars of proso millet; i.e., 'Akron' and 'Leonard'. Continued field screening of corn resulted in the identification of germ plasm containing resistance to rust, smut, and the European corn borer. Considerable quantities of Festuca and Poa germ plasm were added to the collection from a domestic collection in Alaska. The continued utilization of germ plasm by State and Federal researchers during the interim of this report is reflected by the citation of 36 scientific papers from 10 States and other Federal agencies. Progress is reported from South Dakota in the continuing domestic collection of "warm-season" grasses; emphasis is being placed on Andropogon, Calamovilfa, Panicum, and Spartina. Resistance to rust and cold tolerance is reported among orchardgrass introductions utilized in Iowa. Bluegrass and bromegrass introductions are being screened in South Dakota for resistance to virus diseases.

RPIS (S-9) reports resistance in Digitaria decumbens, P.I. 299601, to sting nematode in Florida. This introduction is being used extensively as a ground cover and erosion control plant in highway construction in Hawaii and by the U.S. Navy on ammunition bunkers in Guam. It is under field evaluation as a pasture grass in Florida and in the Caribbean. Digitaria germ plasm is being screened for winter hardiness in Oklahoma; seeding forms of D. smutsii offer the most promise for cold tolerance. The production capacity of one Cynodon dactylon introduction, P.I. 290814, is equivalent to that of Coastal bermudagrass at all nitrogen levels in Mississippi. Introduced germ plasm of Bermuda, Centipede, St. Augustine, and Zoysia grasses is being evaluated for lawn and turf purposes in Puerto Rico. Additional information is reported on the winter hardiness of Hemarthria altissima throughout the southeastern United States. Introduced germ plasm contributed to the newly-released hybrid pearl-millet cultivar 'Millex 23'. A small number of tropical grasses was transferred to the Federal Experiment Station, Mayaguez, Puerto Rico, for maintenance. Exotic peanut germ plasm is being screened in Alabama for resistance to Aspergillus flavus and for resistance to foliage-feeding insects. Germ plasm of Medicago, Melilotus, Trifolium, and Trigonella is being used in entomological investigations in studying the feeding habits of the alfalfa weevil. Trifolium germ plasm is being used in South Carolina in cytogenetic investigations in the screening for root-knot nematode resistance.

Introduced Medicago germ plasm is aiding in the development of multiple-resistant alfalfa cultivars in North Carolina.

RPIS (W-6) reports the accrual of additional information on winter hardiness of many browse species. Protein analyses is reported on the collection of Artemisia, Atriplex, Astragalus, and Kochia. Additional quantities of domestic germ plasm were added to the collection of Lupinus, Festuca idahoensis, Festuca rubra, and Poa pratensis. A portion of the Atriplex collection was screened for selenium content. Atriplex semibaccata, P.I's. 299488-89, exhibits high potential as a beautification and ground cover plant in Arizona. California reports the successful performance of a succulent plant, Portulacaria afra, in the southern portion of the State. Resistance to Fusarium wilt has been identified in introduced safflower germ plasm. Stem nematode resistance is reported among alfalfa accessions in Washington. The legume Dolichos biflorus is serving as a source of plant agglutinin specifically reactive to blood group A_1 in addition to distinguishing between blood groups A_1 and A_2.

Publications:

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Harris, H. B., C. D. Fisher, and Grover Sowell, Jr. Head smut of sorghum in Georgia. Plant Disease Reporter 55:312-313. 1971.

Hudson, L. W., R. D. Dutton, Mary Massara Reynolds, and W. E. Walden. TAXIR - A biologically oriented information retrieval system as an aid to plant introduction. Ec. Bot. 25:401-406. 1971.

Oakes, A. J. Herbicidal control of Opuntia. Turrialba 21:18-21. 1971.

Oakes, A. J. and W. R. Langford. Drought tolerance in Digitaria. J. of Agr. Univ. Puerto Rico 55:63-69. 1971.

Oakes, A. J. and A. Sierra-Bracero. Resistance in Digitaria to yellow sugarcane aphid, Sipha flava (Forbes) as related to temperature and rainfall. J. of Agr. Univ. Puerto Rico 56:33-38. 1972.

Oakes, A. J., W. R. Langford, and S. C. Schank. Winter hardiness in Digitaria. Soil and Crop Sci. Soc. of Fla. Proc. 30:222-229. 1970.

Total Other Publications: 5

Future Plans:

Future plans at the national level include increased employment of automated techniques in the storage, retrieval, and utilization of plant introduction data. Provide leadership and assistance to the Regional Plant Introduction Stations in order to implement automated techniques in their field activities. Advise and assist in the development of crop codes for use in the agronomic, pathological, and entomological evaluation of germ plasm. Assist in the initiation of recording and storing all evaluation data for utilization by automated techniques. Collate and coordinate ADP activities among Regional Plant Introduction Station, National Seed Storage Laboratory, and Beltsville.

RPIS (NE-9) plans to continue screening major agronomic crops for fungi, bacteria, and virus diseases in field and greenhouse plantings. Particular emphasis will be placed on existing screening programs. Continue the development of crop codes for use in ADP procedures.

RPIS (NC-7) plans to continue screening corn germ plasm for multiple disease resistance. Work will be continued on the placement of major agronomic and horticultural crops in an automated system of records. Continue the development of crop codes for major agronomic and horticultural crops.

RPIS (S-9) plans the increased utilization of automated (ADP) techniques in the production of annual seed catalogs and special listings as become appropriate. Continue screening warm-season grasses for winter hardiness at certain locations throughout the southeastern United States. Screening Arachis germ plasm for diseases, with particular emphasis on viruses, will be continued.

Investigations: Chemurgic Crops

CRIS Research Projects Covered: 1010-02-01, 04, 06, 07, 08, 15, 17 18, 19, 20, 21, 22(C), and 23

Progress:

Kenaf -- Tainung No. 1 from Taiwan shows preliminary promise as a high-yielding cultivar but was more susceptible to Botrytis infection than Everglades 71. Infection, and in some instances extreme defoliation by Cristulariella pryamidalis, continues to occur at several locations. Yield response from plots that were chemically treated for nematode control was good, especially for ethylene dibromide, compared to the untreated control in Florida. A line derived from A63-529 (P.I. 292207) showed effective field resistance to Meloidogyne javanica at Savannah. Two introductions (J69163 and P.I. 189210 s_3) that produce resistant reactions in greenhouse tests showed no field resistance. The resistance or reaction in seedlings of these introductions is related to low soil temperature. High levels of nitrogen were required at Fleming, Ga., for high yields and split applications appear beneficial. Roselle yielded substantially more than kenaf when grown in areas infested with M. javanica and M. arenaria.

Crambe -- Results of crosses among smooth-stemmed and pubescent-stemmed plants of Crambe hispanica show that crambe is essentially a self-pollinated crop and that pure line selection would be an effective method for improvement. It appears that smoothness is controlled by a single dominant gene. Commercial plantings of about 6,000 acres of crambe are anticipated in 1972 in Indiana, Ohio, and Illinois. Work is under way to develop screening techniques for Alternaria resistance.

Limnanthes -- More than three acres of Limnanthes were established in Oregon for increase and for cultural studies. Considerable emphasis is being placed on selection and evaluation of previous selections. Dr. David L. Stamp is handling this work while Wheeler Calhoun is on assignment in Iran for two years. Winter rainfall in northern California was very sparse. Materials in the wild may as a result be limited and abnormally small. Winterkill was very high in Maryland. About two acres of wide-spaced plants for selection were lost. Combine yield of L. alba var. versicolor was 560 pounds per acre in eastern Maryland.

Lesquerella -- Progress continues to be slow. Winter survival varied at Central Ferry, Wash., and at Glenn Dale, Md. At Glenn Dale, Md.,

L. angustifolia overwintered well as did L. densipila. Some of the western species were complete killed out. Some species, particularly L. auriculata, started blooming before mid-April at a very small size. In ARizona, L. fendleri shows greater variability and yield potential than L. gordonii. P.I. 331165, L. fendleri, with a yield of 1,376 pounds per acre, looks particularly promising. It shows at least partial absence of seed dormancy.

Stokesia laevis -- P.I. 355044, a wild accession from near Bay St. Louis, Miss., is very variable and should prove to be a valuable accession for improvement. Fifteen selections from a small flowering population at Glenn Dale were made. Some of these winterkilled. Plants from seed of some selections will be transplanted and evaluated in 1972. A direct seedling in September emerged slowly. Heavy stand losses occurred. Sheet erosion caused root exposure. Clonal materials can be evaluated from parent plant separates. Seventeen separates were established from one white-flowered plant.

Other species -- Ecballium is very susceptible to the cucumber beetle. Plants failed to overwinter at Glenn Dale (roots rotted). Leavenwoethia, Selenia, and Synthlipsis show little agronomic promise.

Publications:

Gaskins, M. H., G. A. White, F. W. Martin, N. E. Delfel, E. G. Ruppel, and D. K. Barnes. Tephrosia vogelii: A source of rotenoids for insecticidal and piscicidal use. USDA, ARS. Tech. Bull. 1445, 44 pp. 1972.

Spiers, J. M. and C. W. Thurman. Kenaf trials in south Mississippi. Mississippi Farm Res. 34(11):4. 1971.

White, G. A. and L. N. Bass. Vernonia anthelmintica: A potential seed oil source of epoxy acid. III. Effects of line, harvest date, and seed storage on germination. Agron. J. 63(3):439-441. 1971.

White, G. A. and F. R. Earle. Vernonia anthelmintica: A potential seed oil source of epoxy acid. IV. Effects of line, harvest date, and seed storage on quantity and quality of oil. Agron. J. 63(3): 441-443. 1971.

White, G. A., W. C. Adamson, E. L. Whiteley, and J. H. Massey. Emergence of kenaf seedlings as affected by seed fungicides. Agron. J. 63(3): 484-486. 1971.

Total Other Publications: 5

Future Plans:

Large-scale harvesting and storage studies on kenaf are being arranged at Savannah. Another objective is to make an economic assessment of production and harvesting operations. In order to broaden the base of kenaf-roselle hybrids, the roselle parent of presently available hybrids will be crossed with the best roselle-fiber types that have high resistance to nematodes and progeny used as roselle parents in the interspecific cross. *Stokesia* will be centered at Southern University and at Glenn Dale. Emphasis will be on establishment, selection of superior plant, yield appraisal, and mode of pollination and hand-pollination techniques will be considered. Research on *Limnanthes* will emphasize improvement with selection from new accessions and unused original seed of earlier accessions. Crambe acreage is expected to expand. Screening for resistance to *Alternaria* has high priority. Implementation of germ plasm procurement will proceed.