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**MINUTES OF THE MEETING OF THE S-9
TECHNICAL COMMITTEE ON THE
INTRODUCTION, MULTIPLICATION, AND
EVALUATION OF NEW PLANTS FOR
AGRICULTURAL AND INDUSTRIAL USES
AND THE PRESERVATION OF
VALUABLE GERMPLASM**

**UNIVERSITY OF GEORGIA
AGRICULTURAL EXPERIMENT STATIONS
GRIFFIN, GEORGIA**

JUNE 9-10, 1992

**SUBMITTED BY
JORGE A. MOSJIDIS, SECRETARY
S-9 TECHNICAL COMMITTEE 1992**

AGENDA

S-9 Regional Technical Advisory Committee Meeting

June 9-10, 1992

HOST: University of Georgia, Agricultural Experiment Stations

LOCATION: Redding Building Conference Room, Georgia Station,
Griffin, GA

June 9, 1992

- 8:00 AM 1. Call to Order
- 8:10 AM 2. Introduction of Attendees
- 8:20 AM 3. Official Welcome by Dr. Gerald Arkin, Resident
Director
- 8:30 AM 4. Approval of Minutes - 1991 Meeting
- 8:40 AM 5. Approval/Additions to Agenda for 1992 Meeting
- 8:55 AM 6. Appointment of Committees
A. Nominations
B. Time and Location of Next Meeting
C. Resolutions
- 9:15 AM 7. National Program Staff Reports - Dr. George White
- 9:45 AM 8. National Seed Storage Lab Report -
Dr. Steve Eberhart
- 10:00 AM Coffee Break
- 10:15 AM 9. Staff Review of P.I. Station Activities
(1) Overview of Research - Dr. Graves Gillaspie
Research Leader
(2) Virus Elimination in Cowpeas - Mark Hopkins
Support Scientist
(3) Arachis Tissue Culture for Virus Elimination and
Germplasm Storage - Dr. Kerry B. Dunbar
Research Associate (Post Doc).
(4) Virus Detection in Peanuts and Sweet Potatoes
David Pinnow, Support Scientist
(5) Wild Peanut Germplasm Program - Dr. Brad Morris
Support Scientist

- (6) Biotechnological Approaches to Resistance in Peanuts - Jim Demski, Research Leader
Dept. of Plant Pathology, UGA
- (7) Genetics Research - Dr. Bob Jarret
Research Horticulturist
- (8) Germplasm Maintenance and Distribution -
Gil Lovell, Germplasm Coordinator

12:00 Noon Lunch (Catered)

- 1:00 PM 10. Summary and Discussion of the S-9 Program Review
Dr. Gerald Arkin, Administrative Advisor
- 2:00 PM 11. Field Trip to View New Acreage for Field Plots
- 2:45 PM 12. Return to Main Campus to Tour Labs, Greenhouses,
and Seed Storage Units.
- 5:00 PM Return to Motel - Dinner on your own.

June 10, 1992

- 8:00 AM 13. Call to Order
- 8:10 AM 14. S-9 Committee Members - Questions, Problems,
Highlights
- 9:00 AM 15. Old Business - Gil Lovell
 - (1) Publication of Germplasm Utilization 1972 -
1992
 - (2) Germplasm Leaders of 1890 Universities
 - (3) Participation of Curators of National
Germplasm Collections - i.e. Cotton,
Pennisetum, Pecan
16. New Business
 - a. S-9 Project, 5-year Revision, Gil Lovell
- 10:00 AM Coffee Break
- 10:20 AM 17. Plant Explorations - Gil Lovell
- 11:00 AM 18. Committee Reports and Acceptance
 - a. Nominations
 - b. Time & Location of Next Meeting
 - c. Resolutions
- 11:30 AM 19. Adjournment

1. CALL TO ORDER

The S-9 Technical Committee meeting was called to order in the Redding Building Conference Room, Georgia Station, Griffin, Georgia, by chairman Gordon Prine at 8:00 AM, June 9, 1992.

2. INTRODUCTION OF ATTENDEES

<u>NAME</u>	<u>ADDRESS</u>	<u>PHONE</u>
*Dr. Don LaBonte	LSU, Dept. of Hort. 131 J.C. Miller Hall Baton Rouge, LA 70803	(504) 388-1024 (FAX) 388-1068
*Dr. Clarence Watson	Dept. of Experimental Statistics, Box NZ Mississippi State, MS 39762	(601) 325-2061
*Dr. David Coffey	Dept. of Plant & Soil Science University of Tennessee P.O. Box 1071 Knoxville, TN 37901-1071	(615) 974-8829
*Dr. Bill Fike	North Carolina State University Dept. of Crop Science Raleigh, NC 27695-7620	(919) 515-3331
Mr. Francisco Vazquez	Tropical Agri. Res. Sta. P.O. Box 70 Mayaguez, PR 00681	(809) 831-3435 (FAX) 832-1025
*Dr. Frank Hons	Texas A & M University Dept. of Soil & Crop Science College Station, TX 77843	(409) 845-3041 (FAX) 845-0456
*Dr. Norman Taylor	University of Kentucky Dept. of Agronomy Lexington, KY 40546-0019	(606) 257-5785 (FAX) 258-1952
Dr. Steve Eberhart	Laboratory Director National Seed Storage Lab Colorado State University Fort Collins, CO 80523	(303) 484-0402 (FAX) 221-1427
Dr. George White	Plant Introd. Officer Germplasm Resources Lab Bldg. 003, Rm. 409, BARC-West Beltsville, MD 20705	(301) 504-5328 (FAX) 504-6305

*Dr. Bill Rhodes	Clemson University Horticulture Dept. E-147 Poole Ctr. Clemson, SC 29634-0375	(803) 656-0410 (FAX) 656-4949
*Dr. William Branch	University of Georgia Coastal Plain Exp. Sta. Tifton, GA 31793-0748	(912) 386-3561
Dr. Graves Gillaspie	Plant Introduction Sta. 1109 Experiment St. Griffin, GA 30223-1797	(404) 228-7207
Mr. Gil Lovell	Plant Introduction Sta. 1109 Experiment St. Griffin, GA 30223-1797	(404) 228-7255 (FAX) 229-3323
*Dr. Gordon Prine	University of Florida Dept. of Agronomy 304 Newell Hall Gainesville, FL 32611	(904) 392-1811 (FAX) 392-1840
Mr. Mike Owsley	Americus PMC SCS Rt. 6 Box 417 Morris Dr. Americus, GA	(912) 924-2286
*Dr. Jorge Mosjidis	Dept. of Agronomy & Soils Auburn University Auburn, AL 36849-5412	(205) 844-3976 (FAX) 844-3945
Dr. Gerald Arkin	Adm. Advisor Dir., Ga. Experiment Sta. 1109 Experiment Street Griffin, GA 30223-1797	(404) 228-7263 (FAX) 228-7270

* Members of the S-9 Technical Committee.

3. WELCOME

Dr. Gerald Arkin, Resident Director, Georgia Agriculture Experiment Station, welcomed the committee. He highlighted the many changes that have taken place at the Southern Regional Plant Introduction Station located at Griffin, GA. He indicated that the dramatic increase in monetary resources to the Plant Germplasm System allowed the station to increase personnel, acquire equipment, and built laboratory space, so that it can better serve the public. He indicated that the South Atlantic Regional Plant Introduction Station had been subjected to a review by the Directors of the Southern Agricultural Experiment Stations and by the ARS.

4. APPROVAL OF MINUTES

The minutes of the 1991 meeting were approved as circulated.

5. APPROVAL OF AGENDA

The 1992 agenda was approved as circulated.

6. APPOINTMENT OF COMMITTEES

- a. Nominations: N. Taylor, chairman, F. Hons, and C. Watson.
- b. Time and Place of Next Meeting: W. Fike, chairman, G. Lovell, and D. LaBonte.
- c. Resolutions: D. Coffey, chairman, W. Branch, and G. White.

7. NATIONAL PROGRAM STAFF REPORTS

a. NATIONAL PROGRAM STAFF REPORT. Dr. H. Shands could not attend the meeting so Dr. G. White presented his report. Dr. White indicated that the FY 1992 budget had no increases for plant germplasm. He also reported that Dr. Henry Shands had been named Director of the National Genetic Resources Program. The full report will be included in the Appendix to the Minutes.

b. NATIONAL GERMPLASM RESOURCES LABORATORY. Dr. G. White stated that it is getting difficult to meet the requests from other countries because of the difficulties in getting import permits from them. He suggested to send the requests (but not the seeds) to his office where his personnel will help to obtain the import permit. Dr. White presented also the complete report of the National Germplasm Resources Laboratory which will be included in the Appendix to the Minutes.

8. NATIONAL SEED STORAGE LABORATORY REPORT

Dr. Steve Eberhart gave a report for the National Seed Storage Laboratory. He highlighted that the laboratory moved to new facility. The report will be attached in the Appendix to the Minutes.

Chairman Prine asked the representatives of the Soil Conservation Service and the USDA Tropical Agriculture Research Station to give their reports at this point in time.

Mr. Francisco Vasquez presented the USDA Tropical Agriculture Research Station Report. Mr. Mike Owsley presented the Soil Conservation Service Report in behalf of Mr. Wayne Everett who could not attend the meeting. Said reports will be attached to the Minutes.

9. STAFF REVIEW OF P.I. STATION ACTIVITIES

1. Dr. Graves Gillaspie, Research Leader, gave a brief view

1. Dr. Graves Gillaspie, Research Leader, gave a brief view of the research being conducted.

2. Mr. Mark Hopkins presented the work being done to detect virus using a portion of *Vigna* seeds aimed at eliminate those virus from the seed collection.

3. Dr. Kerry B. Dunbar described the work he is conducting on elimination of virus in the *Arachis* seed collection. He uses tissue culture techniques to regenerate virus-free plants from apical meristems. He has also regenerated accessions from seed that did not germinate by rescuing the embryos from the mature seeds.

Dr. Branch pointed out that care must be taken to insure that genetic diversity of each accession be preserved. Dr. Branch also indicated that there is no need to eliminate wide spread virus because during the elimination process some genetic variability of the accessions may be lost. Dr. Arkin stated that the Peanut CAC should review and advise the procedures used to make the program more efficient.

4. Mr. David Pinnow described the work being done on detection of virus of peanut and sweet potatoes.

5. Dr. Brad Morris presented the work being done on wild peanut germplasm. He pointed out that research on the use of interspecific crosses is being conducted to transfer disease resistance.

6. Dr. Jim Demski described the biotechnological approaches being used to regenerate peanut in vitro. He indicated that whole plant regeneration has not been possible up to now in peanut. A new approach that uses immature cotyledons to obtain protoplasts which are grown in a nursing media to start cellular division and callus is promising. He expects to have the procedure to regenerate transformed plants in about four months.

7. Dr. Bob Jarret could not give his presentation because he was sick.

8. Mr. Gil Lovell presented the work being done in germplasm maintenance and distribution. He indicated that the S-9 Collection includes 254 genera and 1,328 species from 170 countries. Mr. Lovell highlighted that new funding will allow to hire new personnel to test seed germination. Seed driers have been changed from a high temperature system to drying at 70 °F and 20% relative humidity.

10. SUMMARY AND DISCUSSION OF THE S-9 PROGRAM REVIEW

Advisor Arkin gave a brief summary of the 1987 review of the S-9 Project. He discussed the special reports on the S-9 Project

prepared for the Directors of the Southern Agricultural Experiment Stations and the ARS review. He underscored the importance of discussing how often the S-9 Committee should meet and how to interact with CACs to obtain more support for the S-9 Project.

Dr. Arkin pointed out that both reports emphasized the need to inform the agricultural community about the role of S-9. He suggested that the curators could give seminars or presentations to make the S-9 Project better known among plant scientists in the southern region.

Dr. Gillaspie indicated that improved communication between S-9 and CACs could be achieved by having each curator send a report to each CAC meeting. He also indicated that some major problems that were affecting S-9 such as greenhouse space, fences, well, have been taken care of.

Dr. Taylor suggested that the S-9 Committee could meet every two years being that CACs are quite active and more efficient than TACs in assisting S-9. Dr. Watson replied that TACs need to meet as frequently as is currently done to moderate the requests from CACs to S-9. Dr. Arkin expressed that frequent meetings are needed to have the Directors approve the monies needed in the budget.

Drs. Coffey and Rhodes express their interest in being members of their respective CACs. Dr. Arkin said that he will try to help them. Drs. Taylor and Mosjidis pointed out that anybody interested in CAC activities can and should participate in CAC meetings which are open to the public. Mr. Lovell offered to provide members with schedules of CACs meetings.

Dr. Branch pointed out that the report prepared for the Directors of the Southern Agricultural Experiment Stations recommended to have scientists do regeneration at no cost which is unrealistic. He thought that S-9 has more monies to support regeneration now that it has finished with all the physical improvements. Another point that he raised was that we need a new policy regarding the use of accessions. Many customers request several times the same accessions. Dr. Branch suggested that those people should make their own seed increases to avoid overloading the system.

An additional problem that S-9 is facing is the increase in request from home gardeners who want to get free seed. Mr. Lovell indicated that they have been sending about five seeds when requests are not for research purposes.

11. FIELD TRIP

Dr. Gillaspie and Mr. Lovell hosted a tour to the new facilities that Southern Regional Plant Introduction Station has at Griffin. A new field that will be fenced to prevent deer damage to research plots and seed increases was visited. This

field will also have a well that will provide the water needed to irrigate the plots when needed.

New seed processing and cold storage facilities as well as the old facilities were visited. The new facilities are expected to be available for use in the near future.

The tissue culture laboratory used for virus elimination and germplasm storage of *Arachis* were shown to the S-9 Committee members by Dr. Kerry Dunbar. The greenhouse facilities were also visited.

12. TOUR OF LABS

Return to main campus to tour labs, greenhouses, and seed storage units.

13. CALL TO ORDER

The S-9 Technical Committee meeting was called to order in the Redding Building Conference Room, Georgia Station, Griffin, Georgia, by chairman Gordon Prine at 8:00 AM, June 10, 1992.

14. HIGHLIGHTS OF STATE REPORTS

No representatives of Arkansas, Hawaii, Oklahoma, Puerto Rico, and Virginia were present. However, written reports from Arkansas and Puerto Rico were sent to the committee. The Louisiana State representative did not have a report to present.

The following state representatives gave brief oral reports:

<u>Representative</u>	<u>State</u>
Jorge Mosjidis	Alabama
Gordon Prine	Florida
William Branch	Georgia
Norman Taylor	Kentucky
Clarence Watson	Mississippi
Bill Fike	North Carolina
Bill Rhodes	South Carolina
David Coffey	Tennessee
Frank Hons	Texas

15. OLD BUSINESS

1. Publication of Germplasm Utilization 1972-1992. Mr. Lovell informed the State Representatives that they will be receiving a letter requesting a list of cultivars and germplasm released for an S-9 publication.

2. Germplasm Leaders of 1890 Universities. Mr. Lovell wants to receive the names of scientists interested in plant germplasm. Then, he will write to the respective Deans to invite

those scientists to participate in the S-9 meetings. Mr. Lovell distributed a Directory of the National Plant Germplasm System.

3. Participation of Curators of National Germplasm Collections. Mr. Lovell indicated that they could not participate this year in current meeting because of date conflict.

4. Dr. Gordon Prine reminded the committee that he had proposed in the past meeting to re-initiate a research program on lupines. Mr. Lovell indicated that the committee or Dr. Prine write a document stating the reasons to support the ARS involvement in lupine research. Dr. Prine accepted to write such a proposal.

16. NEW BUSINESS

1. Mr. Lovell reported that Advisor Arkin received information indicating that the S-9 Southern Regional Research Project was up for review. Present project expires September, 1994. Procedures to renew the project are different from the past.

Chairman Prine nominated the following committee to work on the renewal of the S-9 Project: B. Fike, chairman, G. Lovell, J. Mosjidis, B. Branch, and G. Prine.

2. G. Prine requested support to grow perennial peanut in the Griffin area to screen material for cold tolerance.

17. PLANT EXPLORATIONS

Mr. Lovell gave a report on the plant explorations trips conducted in FY 91 and 92. The following plant exploration proposals were processed through the S-9 sub-committee. The proposals were forwarded to the Plant Exploration Officer for priority ranking and funding in FY 93:

a. Festuca spp. exploration in Morocco, Spain, and southwest France; \$14,379; Dr. C. P. West, Department of Agronomy, University of Arkansas and Dr. D. A. Sleper, Department of Agronomy, University of Missouri.

b. Ipomea spp. (sweetpotato and related wild species); Papua, New Guinea; \$14,800; Dr. R. L. Jarret, USDA-ARS, Griffin, GA and Dr. R. LaBonte, Louisiana State University.

c. Trifolium spp.; Bulgaria; \$13,300; Dr. K. H. Quesenberry, Department of Agronomy, University of Florida and Dr. G. A. Pederson, USDA-ARS, Mississippi State, MS.

d. Trifolium, Lotus, Medicago spp; Republic of Georgia; \$11,900; Dr. C. S. Hoveland, Department of Agronomy, University of Georgia and Dr. G. R. Smith, Texas A&M University, Overton, TX.

18. COMMITTEE REPORTS AND ACCEPTANCE

a. Nominating Committee nominated William Branch, Georgia member, to be the next secretary. His nomination was seconded and passed by all present. Chairman Prine indicated that Jorge Mosjidis, current secretary, will be the next chairman.

b. Time and location of next meeting. Mr. Lovell will check if the 1993 will be a national meeting of all the regions in which case we will meet in Fort Collins, Colorado. If we do not have a national meeting, we will consider the invitation from Puerto Rico for 1993 and the invitation extended by B. Fike to meet in North Carolina in 1994.

c. Resolutions. The following resolutions presented by the committee were duly passed by the S-9 Committee:

BE IT RESOLVED THAT:

1. We express our appreciation to Dr. Gerald Arkin for his contributions as Administrative Advisor and for his support and awareness of the needs of the S-9 project.
2. We give special thanks to Graves Gillaspie and Gil Lovell and staff for hosting the meeting, making appropriate presentations and showing us the new facilities. We also thank Jim Demski of the Georgia Experiment Station for his presentation.
3. We recognize the many contributions made to the NPGS by Henry L. Shands and congratulate him on his appointment as Associate Deputy Administrator of ARS and Director of the National Genetic Resources Program.

19. ADJOURNMENT

The meeting was adjourn by Chairman Gordon Prine at 11:00 a.m., June 10, 1992.

APPENDIX I

STATE AND FEDERAL REPORTS

Written progress reports are attached in the following order:

Alabama

Arkansas

Florida

Georgia

Hawaii

Kentucky

Louisiana

Mississippi

North Carolina

Oklahoma

Puerto Rico

South Carolina

Tennessee

Texas

Virginia

National Program Staff

Soil Conservation Service

Southern Regional Plant Introduction Station

Tropical Agricultural Research Station
Mayaguez, PR

S-9 Technical Committee Report
December 1992

Agency: Auburn University and Alabama Agricultural
Experiment Station

Submitted by: J. A. Mosjidis

Address: Department of Agronomy
Auburn University
Auburn, AL 36849-5412

Page 1 of 5

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Accession User: J. A. Mosjidis and X. Zhang

Address: Department of Agronomy, Auburn University, Auburn, AL 36849-5412

Nature of Research: Breeding System of Several *Vicia* Species.

Progress to Date: Lack of or limited knowledge on the breeding system of most of the *Vicia* species stored at the National Plant Germplasm System (USA) causes problems for regeneration of the accessions as well as the maintenance of their genetic variability. Response to manipulations of pollination was studied by isolating in cages plants of three species (*V. ervilia*, *V. narbonensis* and *V. pannonica*) including eight accessions (three each of the first two and two of the last species) in 1990-91. Two accessions of *V. ervilia* and all three accessions of *V. narbonensis* died from low temperature in the field on February, 1991. In PI 426021 (*V. ervilia*), there was no significant difference between outside and inside cages in terms of percentage fruit setting (PFS) and other yield traits. Within the cage no significant differences existed among 'isolated', 'tripped', and 'crossed' flowers. In *V. pannonica*, the difference in PFS between plants outside and inside cages did not reach significant level, but yield traits showed differences. Those inside had greater values than counterparts outside cages. Within cages no traits showed significant differences among the flower manipulations. It was concluded that *V. ervilia* and *V. pannonica* are self-pollinated species.

Publications:

Beuselinck, P.R. and J.A. Mosjidis. 1991. Genetic nomenclature in clover and special-purpose legumes III. Lotus, Lespedeza, Kummerowia and Vicia. Crop Science 31:871-874.

Zhang, X. and J.A. Mosjidis. 1991. Breeding system of four *Vicia* spp. Agronomy Abstracts. Madison, WI. p.210

Mosjidis, J.A. 1990. Research on special purpose legumes. Progress Report - Clovers and Special Purpose Legumes 23:1-3.

Cultivar releases: None

Accession User: J. A. Mosjidis and X. Zhang

Address: Department of Agronomy, Auburn University, Auburn, AL 36849-5412

Nature of Research: Seed Germination of Seventeen Accessions of Several *Vicia* spp. at Different Temperatures

Progress to Date: Little is known on the optimum temperature range for seed germination in *Vicia* spp. Germination of the seeds of 17 *Vicia* accessions of eight species was studied at five constant temperatures (10, 15, 20, 25 and 30°C) in the dark. Total germination percentage (TGP), germination rate index (GRI) and hard seed percentage (HSP) differed among and within species. Temperature-accession interaction was significant. The highest TGP of 11 accessions occurred

between 15 and 20°C. PI 426021 had the highest TGP at 10°C whereas PI 250797 had it at 25°C. TGP of four accessions was not affected by temperature changes from 10 to 30°C, therefore, these accessions were deemed temperature-insensitive. The highest GRI of 16 accessions was at 20°C. GRI of PI 201994 did not respond to temperature change. Thus, the optimal temperature range of germination was from 15 to 20°C in most species. HSP decreased with temperatures in five accessions whereas it was not affected in the others. There was significant correlation between seed weight and TGP in only 5 accessions. Seed weight was correlated with GRI in only four accessions. Base temperatures of the accessions differed among and within species. Ceiling temperatures and optimum temperatures differed among species. Those accessions insensitive to temperature, or with lower base temperatures or a wider range of germination temperature may be considered to have a wide range of adaptation for sowing. Selection for large seeds may not affect either TGP or GRI in most of the accessions studied.

Publications:

Mosjidis, J.A. and X. Zhang. 1992. Seed germination of seventeen accessions of *Vicia* spp. at different temperatures. Abstracts Annual Meeting of the Southern Branch of American Society of Agronomy, Lexington, Kentucky, 2-5 February 1992. p. 5.

Cultivar releases: None

Accession User: R. Rodriguez-Kabana and J. A. Mosjidis

Address: Departments of Agronomy and Plant Pathology, Auburn University, Auburn, AL 36849-5412

Nature of Research: Reaction of Three Cool-Season Annual Legume Species to *Meloidogyne arenaria* and *Heterodera glycines*.

Progress to Date: Breeding lines and accessions of *Vicia villosa* Roth, *Vicia sativa* L., and *Lathyrus hirsutus* L. were evaluated for resistance to *Meloidogyne arenaria* and *Heterodera glycines* in the greenhouse. *Vicia villosa* accessions were susceptible to *Meloidogyne arenaria* whereas some *Vicia sativa* accessions were completely resistant. All *Lathyrus hirsutus* accessions were sensitive to *Meloidogyne arenaria*, however, the levels of infestation were significantly lower than the hairy vetch check. None of three cool-season legumes were susceptible to *Heterodera glycines*.

Publications: None

Cultivar releases: None

Accession User: C. M. Owsley and J. A. Mosjidis

Address: SCS Plant Materials Center, Americus, Georgia and Department of Agronomy, Auburn University, Auburn, AL 36849-5412

Nature of Research: Selection in caley pea germplasm.

Progress to Date: Caley pea (*Lathyrus hirsutus* L.) is a legume introduced from the Mediterranean region. In the Southeastern United States, caley pea has been utilized as a cattle forage as well as a cool season cover crop. Caley pea is mostly grown on wet clays of the lower Mississippi Delta area and on calcareous clays of the Alabama and Mississippi Black Belt. Twenty-three caley pea accessions were tested. These are ecotypes collected from fields and roadsides in central and north Alabama by the Soil Conservation Service, Plant Materials Center, Americus, Georgia. No significant differences in biomass yield among the

lines were detected. Three composites that include the best lines will be tested at six locations in 1992.

Publications:

Mosjidis, J.A., C.M. Owsley, and M. Kirkland. 1991. Development of caley pea for cover crop use. p. 135-136. In: Hargrove, W.L. (ed.) Proceedings of the International Conference on Cover Crops for Clean Water, Soil and Water Conservation Society, Jackson, Tennessee, April 9-11, 1991.

Cultivar releases: None

Accession User: C. M. Owsley and J. A. Mosjidis

Address: SCS Plant Materials Center, Americus, Georgia and Department of Agronomy, Auburn University, Auburn, AL 36849-5412

Nature of Research: Selection in hairy vetch germplasm.

Progress to Date: Among the many cool-season forage legumes that have been tested for adaptation and productivity in the southeastern United States hairy vetch (*Vicia villosa* Roth) is well known and widely accepted. Three hairy vetch selections (lines 8, 12, and 26) from plant introduction (PI) PI 9053961, collected in South Alabama, and PI 383803, from the National Plant Materials Center, Beltsville, Maryland, were tested in six locations in Alabama and Georgia. Lines 8, 12, and 26 were found to have the same, or higher biomass and nitrogen yield as common hairy vetch when harvested by the end of March. These selections flowered 20 to 36 days earlier than commercial hairy vetch. A synthetic made up of the three lines will be tested at six locations in 1992-1993.

Publications: None

Cultivar releases: None

Accession User: Edzard van Santen

Address: Department of Agronomy and Soils, Auburn University, AL 36849-5412

Nature of Research: Define Population Density Selection in Crimson Clover

Progress to Date: A selection experiment was started in October, 1991 using a crimson clover ecotype from Autauga county, which may be a derivative of the old Auburn University cultivar Autauga and PI 255892 from Poland. A preliminary experiment identified PI 255892 as promising for Alabama. This germplasm broadens the genetic base of crimson clover; all existing cultivars derive from a single Italian PI. The objectives of this research are: a) to study the effect of selection at a defined plant density on genetic variances and covariances at different intra- and interspecific competitive structures; and b) determine effect of selection on yield.

Publications:

van Santen, Edzard. 1990. Evaluation of the early-maturing crimson clover selection 'AU-ROBIN'. Progress Report - Clovers and Special Purpose Legumes 23:4.

van Santen, E., J.F. Pedersen, and J.T. Touchton. 1992. Registration of 'AU Robin' crimson clover. Crop Sciences 32:1071-1072.

Cultivar Releases: AU Robin crimson clover

Accession User: J.D. Norton and G.E. Boyhan

Address: Department of Horticulture, 101 Funchess Hall, Auburn, AL 36849-5408

Nature of Research: Watermelon and Cantaloupe Germplasm

Progress to Date: Plant introductions 189225, 189778, 189779 and 362515 were utilized to develop multiple disease resistant watermelon lines with high yields and excellent quality fruit. Two of these lines AW-83-1001-CS and AW-82-50-CS were released as 'AU-Golden Producer' and 'AU-Sweet Scarlet', respectively.

Plants with resistance to Zucchini Yellow Mosaic Virus (ZYMV) and Anthracnose were identified in disease screening tests. PI 494528 was identified as having resistance to ZYMV. Also C. colocynthis PIs 386025 and 386026 have ZYMV resistance.

PI 140471 and Cucumis metuliferus species PI 262190 and others have been used to incorporate multiple disease resistance into cantaloupe.

Publications:

J.D. Norton, G.E. Boyhan, B.R. Abrahams, J.S. Bannon, M.H. Hollingsworth, and J.T. Eason. 1992. New disease-resistant watermelon produced in AAES research. Al. Agric. Expt. Sta., Auburn Univ., Highlights of Agric. Res. Vol. 38 No. 4.

J.D. Norton, G.E. Boyhan, D.A. Smith and B.R. Abrahams. 1992. 'AU-Golden Producer' watermelon. HortScience (accepted for publication).

J.D. Norton, G.E. Boyhan, D.A. Smith, and B.R. Abrahams. 1992. 'AU-Golden Producer': A high quality, disease resistant watermelon for the South. Al. Agric. Expt. Sta. Cir. (at printers).

J.D. Norton, G.E. Boyhan, D.A. Smith and B.R. Abrahams. 1992. 'AU-Sweet Scarlet' watermelon. HortScience (submitted for publication).

J.D. Norton, G.E. Boyhan, D.A. Smith, and B.R. Abrahams. 1992. 'AU-Sweet Scarlet': combines disease resistance with high yield and excellent quality. Al. Agric. Expt. Sta. Cir. (submitted for publication).

G.E. Boyhan, J.D. Norton, B.J. Jacobs, and B.R. Abrahams. 1992. Evaluation of watermelon and related germ plasm for resistance to zucchini yellow mosaic virus. Plant Disease 76(3):251-252.

G.E. Boyhan and J.D. Norton. 1992. Inheritance of resistance to alternaria leaf blight in muskmelons. HortScience 27(10):114-115.

Cultivar Releases: 'AU-Golden Producer' watermelon and 'AU-Sweet Scarlet' watermelon

1993 S-9 TECHNICAL COMMITTEE REPORT FOR ARKANSAS

AGENCY: Arkansas Agricultural Experiment Station
SUBMITTED BY: T.E. Morelock
ADDRESS: 316 Plant Science Building
University of Arkansas
Fayetteville, AR 72701

ACCESSION USER: W.A. Wasilwa, J.C. Correll and T.E. Morelock
Departments of Plant Pathology and Horticulture
and Forestry
217 and 316 Plant Sciences Building,
respectively, University of Arkansas
Fayetteville, AR 72701

NATURE OF RESEARCH: Anthracnose race identification

PROGRESS TO DATE: Cucurbit anthracnose, caused by Colletotrichum orbiculare is a very destructive disease of cucumber and watermelon but it can also cause damage to other cucurbit species. Anthracnose is relatively common in warm humid regions worldwide, and in the United States it is particularly destructive in the south, southeast, northeast and midwest.

A considerable amount of virulence diversity apparently exists among isolates within the anthracnose pathogen population. Up to 7 races of the pathogen have been described based on host differentials. The race situation is being reexamined using vegetative compatibility and host differentials including PI 197087 and PI 163213.

Although isolates of C. orbiculare had been previously characterized into 7 physiological races, our data do not support the existence of 7 races. Our data indicate that 2 physiological races were evident and for the most part isolates within a Vegetative Compatibility Group (VCG) has a statistically similar virulence phenotype. For example, all watermelon isolates in VCG tested, has a similar virulence phenotype of all of the cucurbit differentials used ($p=0.05$).

PUBLICATIONS: NONE

CULTIVAR RELEASES: NONE

ACCESSION USERS: L.P. Brandenburger, J.C. Correll and T.E. Morelock

ADDRESS: Departments of Plant Pathology and Horticulture & Forestry
217 and 316 Plant Sciences Building,
respectively
University of Arkansas
Fayetteville, AR 72701

NATURE OF RESEARCH: Spinach breeding

PROGRESS TO DATE: Spinach germplasm (707 accessions) from collections from six countries were screened for resistance to race 4 of the downy mildew pathogen, Peronospora farinosa f. sp. spinaciae. These collections contained germplasm which originated from 41 different countries. The predominate

species examined was Spinacia oleracea, however, eight accessions of S. turkestanica and two accession of S. tetrandra were also tested. Approximately forty seedlings of each accession were inoculated. The cultivar 'St. Helens' was included as a susceptible control in each test. Plants ere inoculated when the first set of true leaves were 2 cm in length. Disease incidence (DI) was recorded as the percentage of cotyledons and true leaves exhibiting evidence of sporulation. The majority of accessions tested (>98%) were susceptible to race 4. None accession exhibited some resistance to race 4, (9-38% of the seedlings within an accession ere resistant) and two accessions CGNO 9546 and SPI 82/87, exhibited a high level of resistance (60 and 80% resistant, useful for breeding for race 4 resistance. Resistant plant introductions were 182246, 211632, 220686 and 200891. Crosses have been made between resistant accession and Arkansas breeding lines. Inheritance studies are underway and resistance of being backcrossed into Arkansas breeding lines. Cage increases of resistant accession and PI's have been made and seed will be made available to other researchers.

PUBLICATIONS: NONE
CULTIVAR RELEASES: NONE

ACCESSION USER: James McD. Stewart
ADDRESS: Agronomy Department
University of Arkansas
Fayetteville, AR 72701

NATURE OF RESEARCH: Collection, evaluation and enhancement of cotton germplasm

PROGRESS TO DATE: In previous years apparent resistance was detected among Asiatic accessions to Heliothine pests based on in vitro square feeding test. In collaboration with Dr. J.N Jenkins (USDA), ten Gossypium arboreum accession with apparent resistance and two susceptible were field-tested in Starkville, MS for resistance under artificial infestation with tobacco budworm (TBW). G. hirsutum 'DES 119' an upland cultivar with some resistance, was included as a reference. The design was a split-plot, RCB with six replications (50'rows). The whole plots were (i) artificial infestation with TBW with other insects controlled (Malathion, weekly), and (ii) complete pest control (Malathion +Karate, weekly). For artificial infestation, 1st instar larvae were applied at weekly intervals for 5 weeks at the rate of 8-10/row ft beginning 6-23-92. When yields of w/TBW plots were compared to wo/TBW plots on a percentage basis, DES 119 was 36%. Three of the Asiatic accessions were below 20%, 5 ranged between 35-50, and 4 exceeded 70%. The best accession among these yielded 90% as much 'in the w/TBW as in the wo/TBW plots. Two of the good performers had red plant color while the other two were green, and some red accessions had poor performance. Thus, red plant color is probably not the resistance factor. Also resistance did not appear to be related to the amount of

pubescence of the accessions.

In collaboration with Dr. Bob Robbins, seventy-eight accessions of Asiatic cotton were tested for resistance to the reniform nematode. Within this group thirteen accessions of G. arboreum appear to have very good resistance to the reniform nematode. Numerous other Asiatic accessions exceeded the two G. hirsutum reference cultivars but were less resistant than the 13 selected. A previous screen determined that G. longicalyx (F₁ genome) is immune to the nematode. This species has now been crossed with G. armourianum (D genome) in both directions, seeds obtained, and seedlings growing. Successful doubling of the chromosome number of these hybrids should result in allotetraploids [2(FD)] that are sexually compatible with the 2(AD) genome of upland cotton. (The F genome is very close to the A genome in chromosome homology).

In collaboration with Dr. Craig Rothrock, screens for resistance to the seedling disease pathogens, Pythium ultimum and Rhizoctonia solani, were completed for over 200 accessions of Asiatic cottons. Also, progeny from individual plants with apparent resistance in previous tests were tested. Unfortunately, no usable resistance was detected for wither organism in the original accessions or in the progeny of "escapes" in earlier tests.

Additional hexaploid genetic stocks were developed that contain the genomic constituents 2(ADD). One stock consists of G. barbadense x G. armourianum and another of G. trilobum x G. hirsutum. When crossed with A-genome cottons (Asiatics) the result is a tetraploid triple hybrid that is compatible with cotton. This approach speeds the transfer of traits from the A-genome species to the cultivated tetraploids. Thus far, four different Asiatic accessions with resistance to Heliothis, thrips (2), and root-knot nematode have been hybridized via ovule culture with the hexaploid involving G. armourianum, and triple hybrid plants have been obtained.

Revision of Gossypium sect. Grandicalyx, including description of six new species was completed and published. New cytoplasmic male sterile and restorer lines of cotton have been developed by introgressing the cytoplasm of G. trilobum into the nuclear background of G. hirsutum. The R line fully restores fertility and the F₂ and F₃ progeny remain fertile upon self pollination. All pollen developed normally in the F₁ of MSxMF.

The gene(s) conditioning the expression of red pigmentation in the anthers was introgressed from G. armourianum into G. hirsutum. F₂ and backcross populations with the multiple marker lines, T582 and T586, were examined. Intensity of the trait is influenced by several modifiers. but expression appears to be controlled by a single gene allelic to R₁ in the D subgenome of G. hirsutum. Linkage between the c₁₂ locus and the red anther was confirmed by strong repulsion.

PUBLICATIONS: Fryxell, P.A., Craven, L.N. and Stewart, J.McD. 1992. A revision of Gossypium sect. Grandicalyx (Malvaceae),

including the description of six new species. Systematic Botany
17:91-114

Stanton, M.A., Stewart, J.McD. and Tugwell, N.P. 1992. Evaluation
of gossypium arboreum L. Germplasm for resistance to thrips.
GRACE: (In press).

Stewart, J.McD. 1992. Germplasm resources and enhancement
strategies for disease resistance. Proc. Beltwide Cotton Conf. Pp.
1323-25.

Stewart, J.McD. 1992. A new cytoplasmic male sterile and restorer
for cotton. Proc. Cotton Research Meeting. AAES Special Report.
(In press).

Stewart, J.McD. and Felton, G. 1992. Host plant resistance - the
first line of defense. Ark. Farm Res. 41(4):8-9.

1992 S-9 TECHNICAL COMMITTEE REPORT FOR FLORIDA

University of Florida
Institute of Food and Agricultural Sciences
Florida Agricultural Experiment Stations
and USDA Cooperators

Submitted by: G. M. Prine
Agronomy Department
University of Florida
304 Newell Hall
Gainesville, FL 32611-0500
904-392-1811 or FAX 904-392-1840

Accession User: P. L. Pfahler
Agronomy Department
304 Newell Hall
University of Florida
Gainesville, FL 32611-0500
904-392-6186 or 904-392-1811

Nature of Research: Crop: Sesame (Sesamum indicum L.). To examine the nature and extent of genetic variability in this crop for potential basic research involving all aspects of pollen formation, germination, and transmission studies.

Progress to Date: In August 1988, I received 984 sesame accessions from the Plant Introduction Station at Experiment, Georgia. These accessions were planted in the field in June 1989 and evaluated for genetic variability and useful genetic characters. Seeds from single plants or rows were harvested from 28 accessions whose PI numbers (country of origin) were included in the 1990 report. In June, 1990 these 28 accessions were planted in the field and single plant selections were made. In 1991, these single plant selections underwent date of planting field tests to determine their photoperiod response and suitability for genetic studies. In 1992, additional field, greenhouse and growth chamber tests to determine their suitability for pollen transmission studies were conducted.

Accession User: L. S. Dunavin
Agricultural Research and Education Center
Route 3, Box 575
Jay, FL 32565-9524
904-994-7373 or FAX 904-994-9589

Nature of Research: Evaluation of forage and biomass crops for Northwest Florida.

Progress to Date: Twenty-four introductions of Alsike clover (*Trifolium hybridum*) were planted in the fall of 1991 and are still under observation. As of mid-May, 1992, PI 383779, PI 315502, and PI 315501 appeared best from an observational standpoint. The introduction, PI 300086 Napiergrass (*Pennisetum purpureum*), unfertilized since 1989 produced 21.1 mg ha⁻¹ of dry biomass in 1991. Seed from crosses of a white-flowered rose clover (*Trifolium hirtum*) with PI 120131, PI 120135, PI 121232, PI 206761, PI 311483, and PI 311484 were planted in 1991.

Accession User: D. A. Knauft
Department of Agronomy
University of Florida
304 Newell Hall
Gainesville, FL 32611-0500
904-392-1811 or FAX 904-392-1840

Nature of Research: Peanut (*Arachis hypogaea* L.) breeding and genetics, as well as molecular genetic work, are being conducted to understand and improve yield, quality, and pest resistance. PIs continue to be used in our program.

Progress to Date: PIs 221068, 268882, 315624, 315630, and 343365 were used in a series of crosses for home-garden peanut type, with upright plant growth habit, large seed, and early maturity. These materials are now in the F₆ generation and several selections will be yield tested this summer. Crosses with PI 476835, which has some resistance to late leafspot [*Cercosporidium personatum* (Berk. & Curt.) Deighton], are in the F₄ generation.

Publications:

Ro, O.G., R.L. Smith, and D.A. Knauft. 1991. Restriction fragment length polymorphism evaluation of six peanut species within the *Arachis* section. Theor. and Appl. Gen. (accepted for publication).

Knauft, D.A., G.W. Gorbet, and F.M. Shokes. 1991. The role of breeding for development of environmentally sound peanut product. Proc. Environmentally Sound Agriculture Conference. Univ. of Florida. Vol. 2:611-617.

Accession User: Russell T. Nagata
Everglades Research and Education Center
P.O. Box 8003
Belle Glade, FL 33430-8003
407-996-3062 or FAX 407-996-0339

Nature of Research: Lettuce, *Lactuca sativa*
Genetics, germplasm and cultivar development

Progress to Date: I am working with lettuce accession PI 251245 to study the genetics of seed thermotolerance during germination. To date we have been able to stabilize the expression of thermotolerance for seed produced in Florida. Progeny from these plants are now flowering and crosses will be made.

Accession User: J. W. Scott
Gulf Coast Research & Education Center
5007 60th Street East
Bradenton, FL 34203-9324
813-751-7636

Nature of Research: Breeding and genetics of fresh market tomatoes (*Lycopersicon esculentum* Mill). Projects include disease, nematode and insect resistance, heat tolerance, and improved fruit quality.

Progress to Date: Approximately 200 PIs were screened in a Gainesville greenhouse for resistance to the S. American race of bacterial spot (*Xanthomonas campestris* pv. *vesicatoria*). The following PIs showed some resistance: 79532, 155372, 271385, 127807, 126932, 262173, 126428, 273445, 99782, 114490, 244672, 324707, 128216, and 340905. These will be tested in Argentina next year. We recently tested them for hypersensitivity to a new Florida strain which is virulent on our resistance source. PI 126932 was hypersensitive and will be field tested this summer.

Heat stable nematode resistance has now been introgressed from *L. peruvianum* accession PI 129152.

Publications:

Scott, J.W., C.L. Emmons, A.J. Overman, and G.C. Somodi. 1991. Introgression and genetics of heat stable nematode resistance from *Lycopersicon peruvianum*. Rept. Tomato Genetics Cooperative 41:46.

Accession User: Christopher W. Deren
Everglades Research and Education Center
Box 8003
Belle Glade, FL 33430
407-996-3062 or FAX 407-924-5227

Nature of Research: Plant Breeding Sugarcane (*Saccharum* spp.)
Rice (*Oryza sativa*)

Cultivar development of cane cultivars with improved tillering, cold tolerance, and flood tolerance. Evaluation of rice for adaptability to Everglades and high-value aromatic cooking character.

Progress to Date: Some cane genotypes have gone through several stages of selection. Rice is under evaluation.

Publications:

Deren, C.W., G.H. Snyder, J.D. Miller, and P.S. Porter. 1991. Biomass production and biochemical methane potential of seasonally flooded inter-generic and inter-specific *Saccharum* hybrids. *Bioresource Tech.* 36:179-184.

Deren, C.W., G.H. Snyder, J.D. Miller, and P.S. Porter. 1991. Screening for and heritability of flood-tolerance in the Florida (CP) sugarcane breeding population. *Euphytica* 56:155-160.

Accession User: G. M. Prine
Agronomy Department
University of Florida
304 Newell Hall
Gainesville, FL 32611-0500
904-392-6181 or 904-392-1811
FAX: 904-392-1840

Nature of Research: Developing new crops from plant introductions; research includes energy, forage, fiber, and grain crops.

Progress to Date: Elephantgrass (*Pennisetum purpureum*) accessions, PI 300086, N51, and Merkeron, and L79-1002 energycane (*Saccharum* sp.) have been shown to be effective high biomass-producing energy crops in Lower South USA. US 72-1153 energycane and CP 72-1210 sugarcane have been very high biomass producers in peninsular Florida. The high production of these crops (over 40 Mg/ha annually) is due to their long linear growth period, 140 to 196 days at Gainesville, FL.

The commercial acreage of perennial rhizoma peanuts (*Arachis glabrata*) continue to climb at a rate of about 40% per year. The acreage of Florigraze is estimated to be in excess of 5800 acres and Arbrook (PI 262817) at about 300 acres. PIs 262839 and 262840 are being increased for possible future release for ornamental purposes. Drs. Quesenberry and French have taken the on task of further evaluation and development of perennial peanut beyond the accessions named above.

Progress continues on developing a pigeonpea (*Cajanus cajan*) cultivar from random mating of numerous pigeonpea PIs evaluated over the years. Freeze damage from early frosts have been a problem in North Florida. Different growth habits under different environments have made it difficult to get stable and uniform growth. Lines 99 WW, 76WW and DOW are being increased for release of one or more of the lines as named cultivars.

Devastating freezes in the 1980's killed plantings of white and blue lupines (*Lupinus* spp.) until we are no longer seriously looking at lupines as a crop. This is a needed crop in southeast and it can be successful if greater cold tolerance is introduced and incorporated into the crop. There is need for a plant breeder on this crop in southeast to develop lupine for grain, forage, and green manure.

I have made several cycles of selection on a late-maturing giant *Crotalaria spectabilis* to be grown as a green manure crop. This *spectabilis* has a large seed and when mechanically scarified will either germinate or rot. Because of the lateness of this selection it is possible to turn under the crop as green manure before it matures to seed.

I am continuing my annual ryegrass breeding program using both introductions and existing cultivars. By selecting for crown rust resistance in Florida and stem rust resistance in Oregon, we hope to develop cultivars with resistance to both diseases.

Publications:

Prine, G.M. 1991. Evaluation of crown rust susceptibility and breeding of annual ryegrass at University of Florida. Soil and Crop Sci. Soc. Fla. Proc. 50:31-36.

Accession User:

L. E. Sollenberger
Agronomy Department
University of Florida
304 Newell Hall
Gainesville, FL 32611-0900
904-392-1924 or FAX 904-392-1840

Nature of Research: Forage grass (*Cynodon*, *Pennisetum*, *Hemarthria*, and *Paspalum*) and legume (*Aeschynomene*, *Arachis*, and *Stylosanthes*) management and utilization.

Progress to Date: Nutritive value responses of 'Florigraze' rhizoma peanut (*Arachis glabrata* Benth.) to shade were evaluated in 1989 and 1990. Florigraze was clipped every 5 to 6 wk and grown under 34, 54, 78, and 100% of incident sunlight (LIGHT). Peanut leaf percentage in herbage dry matter decreased linearly from 63 to 55% as LIGHT decreased from 100 to 34%. Leaf CP generally decreased with decreasing LIGHT, but other leaf responses were small or nonsignificant. In stem by comparison, as LIGHT decreased from 100 to 34%, NDF (468 to 529 g kg⁻¹), ADF (402 to 449), and LIG (103 to 118) increased linearly, and stem CP

(115 to 105) and IVDOM (639 to 582) decreased linearly. Nutritive value of RP grown in shade is lower than in full sun, primarily because of lower leaf/stem ratio and lower stem nutritive value.

Effect of grazing management on Florigrass establishment was evaluated in 1990 and 1991 by planting rhizomes dug from pastures previously subjected to severe (S), intermediate (I), and lenient (L) grazing stress. At 60 and 165 d after planting, L shoot counts were 2- and 8-fold greater than for I and S, while season-end forage DM was 2- and 6-fold greater. Season-end coverage for L, I, and S was 61, 32, and 13%. Performance of L rhizomes equalled or exceeded that of rhizomes dug from nongrazed nursery pastures due in part to higher carbohydrate concentration in L rhizomes.

In 1991, seeded *Pennisetum glaucum* by *P. purpureum* hybrids (10 hexaploid genotypes) were planted and evaluated under clipping management. Responses of the hybrids were compared to 'Mott' dwarf elephantgrass (*P. purpureum*). Hybrid yields exceeded those of Mott under most managements, but hybrid stands were depleted by an average of 50 to 80% during the first winter after clipping was imposed, while Mott stands showed no plant loss.

Publications:

Chaparro, C.J. and L.E. Sollenberger. 1991. Productivity and persistence of Mott elephantgrass under clipping management. *Agron. Abst.* p. 140.

Chaparro, C.J., L.E. Sollenberger, and S.B. Linda. 1991. Grazing management effects on *aeschynomene* seed production. *Crop Sci.* 31:197-201.

Chaparro, C.J., L.E. Sollenberger, and C.S. Jones, Jr. 1992. Limpograss sod management and *aeschynomene* seed reserve effects on legume reestablishment. *Agron. J.* 84:195-200.

Flores, J.A., J.E. Moore, and L.E. Sollenberger. 1991. Forage quality characteristics of Mott dwarf elephantgrass and Pensacola bahiagrass. *J. Anim. Sci. (Suppl. 1)* 69:274.

Holderbaum, J.F., L.E. Sollenberger, J.E. Moore, D.B. Bates, W.E. Kunkle, and A.C. Hammond. 1991. Protein supplementation of steers grazing limpograss pasture. *J. Prod. Agric.* 4:437-441.

Holderbaum, J.F., L.E. Sollenberger, J.E. Moore, D.B. Bates, W.E. Kunkle, and A.C. Hammond. 1991. Protein supplementation of steers grazing limpograss pasture. p. 41-44. *In Fla. Beef Cattle Res. Rep., Inst. Food Agric. Sci., Univ. of Fla., Gainesville, FL.*

Holderbaum, J.F., L.E. Sollenberger, K.H. Quesenberry, J.E. Moore, and C.S. Jones, Jr. 1992. Canopy structure and nutritive value of rotationally-grazed limpograss pastures during mid-summer to early autumn. *Agron. J.* 84:11-16.

Johnson, S.E., L.E. Sollenberger, J.M. Bennett, and C.S. Jones, Jr. 1991. Nutritive value of rhizoma peanut grown under four levels of irradiance. *Agron. Abst.* p. 188.

Knettle, J.R., G.M. Prine, O.C. Ruelke, L.E. Sollenberger, and C.R. Staples. 1991. Forage potential of Mott dwarf elephantgrass evaluated under intensive management in northern Florida. *Soil Crop Sci. Soc. Fla. Proc.* 50:51-54.

Macon, B., L.E. Sollenberger, J.E. Moore, S.C. Schank, and P.E. Hildebrand. 1991. Defoliation effects on yield, persistence, and quality-related characteristics of *Pennisetum* forage genotypes. *Agron. Abst.* p. 152.

Mathews, B.W., L.E. Sollenberger, and C.R. Staples. 1991. Plant-animal-soil interrelationships under different grazing management systems. *Agron. Abst.* p. 189.

Ortega-S., J.A., L.E. Sollenberger, J.M. Bennett, and J.A. Cornell. 1992. Rhizome characteristics and canopy light interception of grazed rhizoma peanut pastures. *Agron. J.* (in press).

Ortega-S., J.A., L.E. Sollenberger, K.H. Quesenberry, J.A. Cornell, and C.S. Jones, Jr. 1992. Productivity and persistence of rhizoma peanut pastures under different grazing managements. *Agron. J.* (in press).

Rice, R.W., G.M. Prine, E.C. French, L.E. Sollenberger, and K.H. Quesenberry. 1991. Rhizome characteristics and establishment performance of rhizoma peanut as influenced by grazing management. *Agron. Abst.* p. 158-159.

Ruiz, T.M., W.K. Sanchez, C.R. Staples, and L.E. Sollenberger. 1992. Evaluation of 'Mott' dwarf elephantgrass as a dietary forage for lactating dairy cows. *J. Dairy Sci.* 75:533-543.

Sollenberger, L.E., M.J. Williams, and C.S. Jones, Jr. 1991. Vegetative establishment of dwarf elephantgrass: Effect of planting date, density, and location. *Soil Crop Sci. Soc. Fla. Proc.* 50:47-51.

Accession User:

K. H. Quesenberry
Agronomy Department
University of Florida
2183 McCarty Hall
Gainesville, FL 32611-0300
904-392-1823 or FAX 904-392-1840

Nature of Research: · Breeding and genetics of clovers and special purpose legumes with emphasis on the species red clover (*Trifolium pratense*), aeschynomene (*Aeschynomene americana*), carpon desmodium (*Desmodium heterocarpon*), and rhizoma peanut (*Arachis glabrata*).

Progress to Date: Evaluation of over 100 plant introductions of red clover (*Trifolium pratense*) and a group of other *Trifolium* species native to Africa for response to four root-knot nematode species (*Meloidogyne arenaria* race 1, *M. hapla*, *M. incognita* race 3 and *M. javanica*) was conducted in 1991-92. In general red clover is susceptible to all root-knot species, but response of the other *Trifolium* spp was variable. Root gall and egg mass scores were usually lower in response to *M. hapla* than to other root-knot spp. The cultivar 'Cherokee', which was first marketed in fall 1991, had significantly lower root galling and nematode reproduction in response to these root-knot nematodes than any other released cultivars of red clover. Additional research has confirmed that *T. carolinianum* (PI 516273) a *Trifolium* species native to the U.S. Southeastern Coastal Plains is highly resistant to root-knot nematodes and had significantly lower root galling and nematode reproduction than any introduced clover species tested to date. Results of these evaluations have been submitted to the National Plant Germplasm System for inclusion in GRIN.

Field and greenhouse evaluation of *Trifolium* spp. from a germplasm collection expedition to Bulgaria in July 1990 was conducted in 1991-92. To date over 35 different species have been identified from this trip (with 4 to 5 other potential species as yet unidentified). The collection was funded by the U.S. National Plant Germplasm System and was conducted in cooperation with the Institute of Introduction and Plant Genetic Resources at Sadovo, Bulgaria.

Seed increases of 12 *Trifolium* spp. native to Africa have been attempted in cooperation with the S-9 Regional Plant Introduction Station. Contrary to previous experience with annual *Trifolium* spp. from Europe, growth and seed production on these introductions have been acceptable. Most line flowered on short days in winter and spring rather than fall may be a better time for planting and seed production on these species.

Evaluations of four *Aeschynomene americana* selections from crosses between PI 421680 (Florida common) and other PIs were conducted in 1991. Preliminary results suggest that some lines have a better yield distribution than the common ecotype, but not greater total annual yield. Twenty pedigree selections from hybrids of *Desmodium heterocarpon* PI 217910 ('Florida' carpon desmodium) and plant introductions from CIAT were evaluated for seed and forage yield in 1991. Additional evaluations will be conducted in 1992. Tissue culture procedures for plant regeneration from callus cultures have been developed for *Alysicarpus vaginalis* and *D. heterocarpon*.

The second year of an evaluation of forage production and establishment of a group of perennial *Arachis* plant introductions was completed in 1991. Fifteen selections from an original group of over 100 plant introductions are being harvested for forage yield. Additional selections from the larger collection were also made at Isabela, Puerto Rico in cooperation with Dr. A. Sotomayor-Rios at the Tropical Agricultural Research Station. These selections are being propagated for advanced evaluation in Puerto Rico.

Publications:

Quesenberry, K.H., R.R. Smith, N.L. Taylor, D.D. Baltensperger, and W.A. Parrott. 1991. Genetic nomenclature in Clovers and Special Purpose Legumes. I. Red and White Clover. *Crop Sci.* 31:861-867.

Quesenberry, K.H., and G.R. Smith. 1990. Exploration for *Trifolium* germplasm in Bulgaria in July 1990. *Progress Report Clovers and Special Purpose Legumes Research* 23:50-54.

Wofford, D.S., D.D. Baltensperger, and K.H. Quesenberry. 1992. In vitro culture response of alyceclover genotypes on four media systems. *Crop Sci.* 32:261-265.

Wofford, D.S., K.H. Quesenberry, and D.D. Baltensperger. 1992. Tissue culture regeneration of *Desmodium*. *Crop Sci.* 32:265-268.

Accession User:

Daniel W. Gorbet
North Florida Research and Education Center
3925 Highway 71
Marianna, FL 32446
904-482-9904

Nature of Research: Peanut (*A. hypogaea* L.) breeding and genetics, with emphasis on yield, quality, and pest resistance (especially diseases), continue to be the main effort of our program.

We have a limited breeding program on sorghum, with emphasis on disease and insect resistance.

Progress to Date: We are growing seed of ten new peanut PIs in greenhouse to evaluate for disease and nematode resistance:

PI 196736	PI 270974
PI 210833	PI 476823
PI 242100	PI 476824
PI 259572	PI 476837
PI 259639	PI 476843

No new crosses were made in 1991-92 with PIs. Seed increases of 16 peanut PIs were made in 1991 to generate fresh seed. We have had several requests for seed of PI 203396, which is a parent of 'Southern Runner' and has multiple pest resistance.

We continue to select in material mentioned in previous reports, including progeny from PI 203396 crosses and selections from crosses with Southern Runner and related material and UF 81206, both of which have PI 203396 as a parent.

No new releases were made in 1991-92 of material with PIs in their pedigree.

We will plant a large (200+) group of sorghum PIs in June-July for disease assessments.

Publications:

Knauft, D.A., D.W. Gorbet, and F.M. Shokes. 1991. The role of breeding for development of environmentally sound peanut product. Proc. Environmentally Sound Agric. Conf. U. Fla. Vol. 2:611-617.

Mohanty, B., S.M. Basha, D.W. Gorbet, R.J. Cole, and J. W. Dorner. 1991. Variation in phytoalexin production by peanut seed from several peanut genotypes. Peanut Sci. 18:19-22.

Accession User:

D. S. Wofford and K. H. Quesenberry
Agronomy Department
University of Florida
2183 McCarty Hall
Gainesville, FL 32611-0300
904-392-1823 or FAX 904-392-1840

Nature of Research: Two hundred plant introduction lines of *Trifolium pratense* and *repens* species were evaluated for resistance to *Cylindrocladium crotalariae*. This fungus attacks several species of clover in addition to common peanut, alfalfa and other leguminous crops. A screening technique has been developed which allows for seedling evaluation for resistance to this soil-borne pathogen. Seventy-five individuals of each introduction line were inoculated with the fungus and an equal size group grown as a control treatment. The results were tabulated and reported in terms of resistance as a percentage of the control within each entry. The results were similar to previous tests in that *T. repens* entries had higher levels of resistance than did entries of *T. pratense*. Means for *T. repens* lines ranged from 2 to 51 percent resistance, whereas the range for *T. pratense* lines was from 0 to 31 percent resistance. Overall means were 4 and 25 percent resistance for *T. pratense* and *repens*, respectively. Further evaluations will be necessary to identify sources of resistance, particularly for *T. pratense*.

Publications:

Wofford, D.S., and K.H. Quesenberry. Screening *Trifolium repens* and *T. pratense* germplasm for resistance to *Cylindrocladium crotalariae* (Loos) Bell and Sobers. 1993. Proc. XVII International Grassland Congress. (SUBMITTED).

Accession User:

P. Mislevy
Agricultural Research & Education Center
Box 62
Ona, FL 33865
813-735-1314

Nature of Research: Compare 5 Pennisetum entries for dry matter yield, leaf-stem ration and quality of plant components when harvested at 4, 8, and 12 ft heights.

Progress to Date: Pennisetum plants harvested frequently (4-ft plant height) including PI 300086 tend to lose vigor and decrease in stand persistence. Most entries harvested at the 8-ft height show good persistence except the seeded entry 142-B. Harvesting plants at 7.5 cm stubble, followed by flooding and temporary inundation, results in death of all entries.

Publications:

Mislevy, P., W.G. Blue, and C.E. Roessler. 1991. Phosphate clay-ponds prove to be productive agricultural lands. *Florida Cattlemen* 56(2):48-49.

Prine, G.M., P. Mislevy, R.L. Stanley, Jr., L.S. Dunavin, and D.I. Bransby. 1991. Field production of energycane, elephantgrass, and sorghum in southeastern United States. *Proceedings Energy from Biomass and Waste XV*. Washington, D.C. March 25-29, 1991.

Mislevy, P., W.G. Blue, C.E. Roessler, and F.G. Martin. 1991. Productivity of clay tailings from phosphate mining III. *Grain Crops. J. Environ. Qual.* 20:788-794.

Mislevy, P., M.B. Adjei, G.M. Prine, and F. G. Martin. 1991. Energycane response to harvest management. p. 154. *In Agronomy Abstracts*. ASA Madison, WI.

Alcordero, I.S., P. Mislevy, and J.E. Rechcigl. 1991. Effect of defoliation on root development of stargrass under greenhouse conditions. *Commun. in Soil Sci. Plant Anal.* 22(5&6):493-504.

Mislevy, P., G. W. Burton, and P. Busey. 1991. Bahiagrass response to grazing frequency. *Soil and Crop Sci. Soc. Fla. Proc.* 50:58-64.

Mislevy, P., W.G. Blue, and C.E. Roessler. 1991. Crop production on clay tailings from phosphate mining. p. 295-309. *In Wendall Oaks and Joe Bowden (ed.) Proc. Reclamation 2000: Technologies for Success*. Durango, CO. 14-17 May 1991. ASSMR Princeton, WV.

Mislevy, P., and W. F. Brown. 1991. Management and utilization of complementary forages: stargrass. *Proc. Fortieth Annual Beef Cattle Short Course*. Univ. of Fla., IFAS. 1-3 May 1991.

Mislevy, P., C.E. Roessler, and W.G. Blue. 1991. Radium-226 uptake and dry matter yield for selected field, forage, and biomass crops grown on a phosphatic clay settling area. p. 90-114. In E. A. Hanlon (ed.) Symp. Proc. Naturally Occurring Radionuclides in Agricultural Products. 24-25 Jan. 1991. Univ. of Fla. Institute of Food and Agric. Sci., Gainesville, FL.

Accession User: A. E. Kretschmer
Agricultural Research and Education Center
Box 248
Fort Pierce, FL 34954-0248
407-468-3922

Nature of Research: Forage crop introductions

Progress to Date: Recently several hundred accessions of *Aeschynomene* spp. were submitted and accepted for PI registration through the SRPIS, Experiment, GA. Ninety-six *A. americana* accessions (primarily from Costa Rica) were field grown in 1991 with two replications. Included in the evaluation was seed weight, plant height, plant color (a large number of entry plants were red colored), crown area development, number of leaf finders (*Evippe* sp.), number of leaves per tallest stem, flower color, and initial fall flowering date. There were large differences among many of the attributes among Costa Rican entries. These data will be entered in GRIN. Another test, completing the *A. americana* collection, will be completed in 1992 and a core collection of 20 to 30 entries will be compiled to form a core sample of divergent types.

Accession User: S. C. Schank
Department of Agronomy
University of Florida
2183 McCarty Hall
Gainesville, FL 32611
904-392-1823

Nature of Research: Breeding and evaluation of *Pennisetum* spp. for biomass yield and forage yield quality

Progress to Date: A manuscript regarding the laboratory and field evaluations of the hybrids of Kinggrass, PI 300086 and Mott, PI 517947 was prepared for presentation at the 1993 XVII International Grassland Congress. Yield and forage nutritive value of the two parents and selected progeny were compared. Dry matter production was measured at 6 week regrowth and 12 week regrowth during 1990. Samples collected were analyzed for *in vitro* digestible organic matter (IVDOM) and crude protein (CP). At 6 week harvest, leaf blade made up 62% of the yield and stems 20%. At 12 weeks, the stem component averaged 51% of the plant and leaf blades 36%. None of the genotypes were significantly different in IVDOM or CP at the 6 week

harvest date, but at 12 weeks, Mott was higher than all of the other genotypes (589 g/kg IVOMD, 94 g/kg CP). In comparison, at 12 weeks, Kinggrass had 539 g/kg IVDOM and 66 g/kg CP.

Publications:

Schank, S.C., D. Diz, and R.L. Smith. 1992. Genetic hybridization and manipulation in the tropical grass genus *Pennisetum* (hybrids between *Pennisetum glaucum* and *P. purpureum*). Proc. 1992 Miami Bio/Tech Winter Symp. 1:43.

Diz, D.A., and S.C. Schank. 1991. Seed and seedling characterization of pearl millet X napiergrass hexaploid hybrids. Proc. Soil Crop Sci. Soc. Fla. 50:69-75.

Schank, S.C., and D.A. Diz. 1991. A seeded type of hybrid hexaploid elephantgrass with a potential for livestock production in the tropics and subtropics. Int. Conf. Livestock in the Tropics. IFAS, Univ. of Fla. Sec. A, pp. 7-13.

Schank, S.C., Rex L. Smith and Jeff Seib. 1991. Evaluation of triploid and hexaploid derivatives form *Pennisetum glaucum* X *P. purpureum* crosses at the beef research unit, University of Florida. Proc. Caribbean Food Crops Soc. 26:354-363.

Smith, Rex L., S.C. Schank, J.C. Seib, M.K.U. Chowdhury, and R.A. Wheeler. 1991. Development and application of RFLP genetic markers in breeding a biomass species. In. Energy from biomass and wastes XIV. Ed. D. Klass. pp. 433-446. Institute of Gas Technology, Chicago, IL.

1992 GEORGIA S-9 TECHNICAL COMMITTEE REPORT

Agency: Georgia Agricultural Experiment Stations

Submitted by: Wm. D. Branch

Address: University of Georgia
Dept. of Crop & Soil Sciences
Coastal Plain Experiment Station
Tifton, GA 31793-0748

Nature of Research: Peanut Breeding and Genetics

Progress to Date: Significant progress has been made in the Georgia Peanut Breeding Program towards the development of a drought resistance cultivar. The advance Georgia breeding line, GA T-2842, was found to have a 10-20% yield advantage over Florunner when grown under drought stress during 1990 and 1991. GA T-2842 resulted from a cross made between GA T-2465 x Tifton-8. Tifton-8 is a multipest-resistant germplasm line (Reg. no. GP39) with drought tolerance that traces back to an off-type plant found in the peanut introduction, PI 261976.

Arachis spenosperma Greg. et Greg. nom. nud. (HLK 410, PI 338280) has been used as a pollen parent in testcrosses with six A. hypogaea L. cultivars. Approximately half of these interspecific crosses resulted in aborted F₁ embryos. However rescue of hybrid embryos was accomplished in vitro, and fertile hexaploid derivatives have subsequently been developed to introgress disease resistance into the cultigen.

Albino peanut seedlings have been recently found to be cytoplasmically inherited in addition to and independent from three other recessive nuclear genes. This is possibly the first report of cytoplasmic genes controlling albinism in peanut. A variegated-leaf genetic stock (Reg. no. GS-2) was released in 1992 that can be utilized to maintain the above mentioned cytoplasmic albino genes for future studies.

Selected Publications:

Branch, W. D. and C. K. Kvien. 1992. Peanut breeding for drought resistance. *Peanut Sci.* 19:44-46.

Branch, W. D. and C. K. Kvien. 1992. Cytoplasmically inherited albinism in peanut seedlings. *J. Hered.* 83:455-457.

Ozias-Akins, P., C. Singsit, and W. D. Branch. 1992. Interspecific hybrid inviability in crosses of Arachis hypogaea x A. stenosperma can be overcome by in vitro embryo maturation or somatic embryogenesis. *J. Plant Physiol.* 140:207-212.

Cultivar Releases: None

Genetic Stock Releases: Variegated-Leaf (PI 561736)

Accession User: James W. Demski
University of Georgia
Department of Plant Pathology
Georgia Experiment Station
Griffin, GA 30223

Nature of Research: Transformation of peanut plants with virus resistance.

Progress to Date: Several Arachis species have been identified with very high levels of resistance (immunity) to PMV and PStV. Some may also have resistance to TSWV, since symptoms do not develop for 30 days after grafting.

Selected Publications:

Demski, J. W., R. Pittman, J. Todd, and A. Culbreath. 1991. Identification of field resistance to tomato spotted wilt virus in groundnuts. International Arachis Newsletter 10:23-24.

Cultivar Releases: None

Germplasm Releases: None

Accession User: James W. Todd
University of Georgia
Department of Entomology
Coastal Plain Experiment Station
Tifton, GA 31793

Nature of Research: Field screening peanut introductions and wild Arachis species for multiple insect and virus resistance.

Progress to Date: 157 accessions were evaluated in 1992 at two Georgia locations (Tifton and Attapulcus). Most resistant accessions were saved and will be further evaluated in 1993.

Selected Publications: None

Cultivar Releases: None

Germplasm Releases: None

Accession User: Robert E. Lynch
USDA-ARS Insect Biol. & Popn.
Management Res. Laboratory
Coastal Plain Experiment Station
Tifton, GA 31793

Nature of Research: Peanut plant resistance to insects.

Progress to Date: Several PI's have been identified with resistance to thrips, potato leafhopper, and lepidopterous defoliators.

Selected Publications: None

Cultivar Releases: None

Germplasm Releases: None

Accession User: Ronny R. Duncan
University of Georgia
Dept. of Crop & Soil Sciences
Georgia Experiment Station
Griffin, GA 30223

Nature of Research: Acid soil tolerance evaluation of exotic sorghum germplasm.

Progress to Date: During 1992, 1685 accessions were evaluated for Al toxicity tolerance and 1481 for Mn toxicity tolerance. Nineteen photoperiod-sensitive exotics with best acid soil tolerance have been placed in the TAMU-USDA Cooperative Sorghum Conversion Program.

Selected Publications:

Duncan, R. R. 1991. Acid soil tolerance breeding in sorghum. Adv. Agron. (India) 1:71-79.

Cultivar Releases: None

Germplasm Releases: None

Accession User: Billy R. Wiseman
USDA-ARS Insect Biol. & Popn.
Management Res. Laboratory
Coastal Plain Experiment Station
Tifton, GA 31793

Nature of Research: Maize plant resistance to corn earworm.

Progress to Date: Approximately 100 PI's were evaluated for silk resistance to corn earworm. This includes both biological antibiotic effects on corn earworm larvae and chemical determination of maize content.

Selected Publications:

Wiseman, B. R., M. E. Snook, R. L. Wilson, and D. J. Isenhour. 1992. Allelochemical content of selected popcorn silks: Effects on growth of corn earworm larvae (Lep.: Noct.). J. Econ. Entomol. 85:2500-2504.

Cultivar Releases: None

Germplasm Releases: None

Accession User: Sharad C. Phatak
University of Georgia
Horticulture Department
Coastal Plain Experiment Station
Tifton, GA 31793

Nature of Research: Identify new plant material adapted to south Georgia and southeastern U.S., and evaluate the most adapted plant introductions in sustainable crop production systems.

Progress to Date: Five PI's of Crotolaria juncea, seven PI's of Lablab purpureus, and 18 PI's of Mucuna species have been evaluated. A few of these plant introductions looked promising in 1992, however further evaluations are planned for 1993.

Selected Publications:

Jaworski, C. A. and S. C. Phatak. 1991. 'Purple Passion' and 'Lavender Lei' flowering ornamental Cuphea glutinosa. Hort Science 27(8):940.

Cultivar Releases: Purple Passion and Lavender Lei

Germplasm Releases: None

S-9 Technical Committee Report
For Hawaii - December 1992

AGENCY: Hawaii Institute of Tropical Agriculture
and Human Resource

SUBMITTED BY: P. J. Ito

ADDRESS: 461 W. Lanikaula Street
Hilo, Hawaii 96720

ACCESSION USER: Richard W. Hartmann

ADDRESS: Department of Horticulture
3190 Maile Way, Room 102
University of Hawaii
Honolulu, Hawaii 96822

NATURE OF RESEARCH: Investigation of daylength reaction and root
and plant characteristics of segregants of
Pachyrrhizus erosus x ahipa

PROGRESS TO DATE:

F₄ selections of this interspecific hybrid were grown in two plantings, one on March 7, 1990 to grow during long days and one on October 3, 1990, the normal planting time. The March 7 planting was harvested monthly starting July 18 until March 28 and showed high variability for flowering, plant habit, plant size, root size, root quality, even viability. The October 3 planting was harvested on March 27. In this planting, all plants appeared to be bushes and only some plants produced any flowers at all. Presently the lines which performed the best in 1991 are being selected for bush plant habit and day neutrality for flowering. Plants selected will be tested for root production in a winter planting.

ACCESSION USER: Patrick J. O'Malley and Richard W. Hartmann

NATURE OF RESEARCH: Interspecific hybridization and inheritance
studies in the genus Lactuca.

PROGRESS TO DATE:

Intra- and inter-specific crosses of Lactuca have been made to determine species relationships and to record inheritance of novel morphological characteristics. Data has been collected on hybrids and parents in relation to fertility. Large F₂ populations are being grown at the Poamoho Experiment Station for character segregation. In addition, an isozyme system has been developed that classifies accessions to correct species.

PUBLICATION:

Hartmann, R.W. 1991. Breeding lettuce for resistance to tomato spotted wilt virus in Hawaii. College of Tropical Agriculture and Human Resources, University of Hawaii. Research Extension Series 125, 7 pp.

ACCESSION USER: P. J. Ito and L. Chia

ADDRESS: 461 W. Lanikaula Street
Hilo, Hawaii 96720

NATURE OF RESEARCH: Introduction, Maintenance and
Evaluation of Germplasm

PROGRESS TO DATE:

Only eleven new introductions were made from Brazil and Chile. All of the cherimoya scionwood were in poor condition and were not successfully propagated. Two pulasan selections at Waiakea produced good quality fruits and are being propagated for testing. At Poamoho two sapodilla selections producing good quality fruits will be propagated for testing and four avocado selections have been propagated. The following have been named, released and sent for publication: 'Kaimana', An Improved New Lychee Cultivar for Hawaii; 'Exel', A High Quality Desser Mango; 'Malama', An Early Fall Avocado; 'Puma', Grapefruit; 'Kary', An Improved Carambola for Commercial Planting.

PUBLICATIONS:

Ito, P.J. 1990. Guava. World Book Encyclopedia Vol. 8, p. 442.

Ito, P.J. 1989. Litchi. World Book Encyclopedia Vol. 12, p. 350.

1992 S-9 TECHNICAL COMMITTEE REPORT FOR KENTUCKY

Submitted by: N.L. Taylor
Agronomy Department
University of Kentucky
N222 Agricultural Science Center North
Lexington, Kentucky 40546-0091

Accession User: N.L. Taylor
Agronomy Department
University of Kentucky
N222 Agricultural Science Center North
Lexington, Kentucky 40546-0091

Nature of Research: Introduction, Maintenance, Increase and Distribution of
Trifolium Germplasm

Progress to Date:

Seed of 40 *Trifolium* accessions were added in 1992. Most were from K.H. Quesenberry's Bulgaria collection trip in 1990. Nineteen of these accessions were unidentified, 2 were *T. echinatum*, and one each were *T. diffusum*, *T. subterraneanum*, *T. resupinatum*, *T. patens*, *T. heldreichianum*, *T. leucanthum*, *T. nigrescens*, *T. arvense*, and *T. michelianum*. All accessions from Bulgaria have limited numbers of seeds and will be increased in 1993. Other accessions received by overseas requests and exploration consisted of two accessions of *T. smyrnaeum* and one each of *T. repens*, *T. apertum*, *T. setiferum*, *T. shimperi*, and *T. somalense*. Added by domestic exploration were one accession each of *T. reflexum* (Alabama), *T. virginicum* (West Virginia), *T. stoloniferum* (Kentucky). Seeds of 23 accessions were increased in Kentucky and 12 of these were forwarded to the Geneva Plant Introduction Station for storage and assignment of P.I. numbers. Seeds of 43 accessions and experimental material derived from P.I.'s were distributed world wide in 1992.

Publications:

Taylor, N.L. 1992. Registration of seven self-fertile trisomic red clover genetic stocks. *Crop Sci.* In press.

Phillips, G.C., J.W. Grosser, S. Berger, N.L. Taylor and G.B. Collins. 1992. Interspecific hybridization between red clover and *Trifolium alpestre* using *in vitro* embryo rescue. *Crop Sci.* 32:1113-1115.

Cultivar Releases: None

Louisiana S-9 Technical Report

Agency: Louisiana Agricultural Experiment Station
Louisiana State University Agricultural Center

Submitted by: Don R. La Bonte

Address: Horticulture Department
Louisiana State University
Baton Rouge, LA 70803

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1. Accession user: Lowell L. Black, Vidal Rivelli, and Mark Jones
Dept. of Plant Pathology and Crop Physiology
302 Life Sciences Building
Louisiana State University
Baton Rouge, Louisiana 70803
 2. Nature of Research: Currently, plant introduction accessions (PIAs) and advanced inbred lines of Capsicum spp. are being screened to identify sources of resistance to Fusarium oxysporum f. sp. capsici, the causal agent of Fusarium wilt of pepper.
 3. Progress to date: Fusarium wilt of Capsicum frutescens 'Tabasco' was first observed in 1978 on Avery Island, Louisiana, and has been observed since then during growing seasons with high rainfall. Six species of Capsicum have been represented in greenhouse screenings. Nearly all cultivars and PIAs of C. annum, C. frutescens, and C. chinense were susceptible to the isolates used. Most accessions from C. baccatum and C. chacoense were resistant or segregating for resistance to the isolates used. A single accession of C. pubescens was found to be susceptible to the isolates. Accessions from the Asian Vegetable Research and Development Center (AVRDC) Capsicum germplasm collection, and the 1991, accessions from the International Hot Pepper Trial Network (INTHOPE) have also been screened.
 4. Publications:

Black, L.L., and Rivelli, V. 1991. Fusarium oxysporum f. sp. capsici forma specialis nov. identified as the causal agent of a wilt in pepper. Plant Disease 75:0000-0000 (In Press).

Rivelli, V., and Black, L.L. 1991. Pathogenicity of Fusarium oxysporum f. sp. capsici to Capsicum spp. and the effect of temperature and seedling age on disease severity. Plant Disease 75:0000-0000 (In Press).

Rivelli, V. 1989. A wilt of pepper incited by Fusarium oxysporum f. sp. capsici forma specialis nova. M.S. Thesis. Louisiana State University. Baton Rouge. 71 pp.

1. Accession User: William A. Young
Horticulture Department
Julian C. Miller Hall
Louisiana State University
Baton Rouge, LA 70803
2. Nature of Research: Okra breeding and production
3. Progress to date: Seventy new lines derived from plant introductions are being used as parents to confer desirable horticulture traits including spinelessness, good culinary quality, and very green pod color; disease, nematode, and drought resistance, high yield, improved pod shipping and storage quality.
4. Publications: None

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1. Accession User: William A. Young
Horticulture Department
Julian C. Miller Hall
Louisiana State University
Baton Rouge, LA 70803
 2. Nature of Research: Pepper (Capsicum) breeding and production.
 3. Progress to date: Plant introduction materials are being used to confer early maturity, high yield, ease of abscission, improved fruit shape, color, cooking quality; shipping and storage quality; and disease, insect, and stress resistance. Twenty-two Chinese plant introductions and 35 frutescens introductions were evaluated in 1990 and 71 new PI's are being researched in 1991.
 4. Publications: None

-
1. Accession User: William A. Young
Horticulture Department
Julian C. Miller Hall
Louisiana State University
Baton Rouge, LA 70803
 2. Nature of Research: Potato breeding
 3. Progress to date: Plant introduction materials are being evaluated for wide adaptability, high yield, tolerance to drought, air pollution, heat, and frost; for disease and insect resistance, high solids, and improve culinary quality. Sixty-one new plant introductions were evaluated in 1990 and 40 in 1991.
 4. Publications: Fontenot, J.F., et al 'Fontenot: a widely adapted red-skinned potato cultivar. La. Agr. In Press.
 5. Cultivar Releases: Fontenot

1. Accession User: Don R. LaBonte
Horticulture Department
Louisiana State University
Baton Rouge, LA 70803
 2. Nature of Research: Sweetpotato breeding and genetics
 3. Progress to date: Plant introductions are currently being evaluated for reaction to several insect pests (Cylas formicarus elegantulus, Phyllophaga ephilida, and Dibrotica balteata) and to the reniform nematode, Rotylenchulus reniformis. Resistant plant introductions will be incorporated into the breeding program.
 4. Publications: None
 5. Cultivar Releases: None
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1. Accession User: William J. Blackmon
Horticulture Department
Louisiana State University
Baton Rouge, LA 70803
2. Nature of Research: Domestication of Apios americana
3. Progress to date: In vitro systems have been developed for clonal propagation of A. americana. Positive evidence for transformation of A. americana has been obtained. Accessions have been identified for use as breeding lines and considerable progress has been made in the quality of germplasm identified.

4. Publications:

Articles

Reynolds, B.D., W.J. Blackmon, E. Wickremesinhe, M.H. Wells, and R.J. Constantin. 1990. Domestication of Apios americana. p. 436-442. In: J. Janick and H. Shands (eds.) Advances in new crops. Timber Press. Portland, Oregon.

Abstracts and proceedings:

Blackmon, W.J. and B.D. Reynolds. 1990. Broad-based strategy for domestication of Apios americana - five years of progress. Abstract of XXIII International Horticultural Congress. 1:1202.

5. Cultivar Releases: None
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1. Accession User: Stephen A. Harrison
Agronomy Department
Louisiana State University
Baton Rouge, LA 70803
 2. Nature of Research: Wheat breeding
 3. Progress to date: The program has about 30,000 lines representing over 1,300 crosses made since 1985. The lines are all in segregating generations (F1-F6). Sources of parents include: 1) USDA regional nurseries, 2) CIMMYT nurseries, and 3) germplasm obtained in cooperative exchanges with other breeders.
 4. Publications: None relevant to germplasm.
 5. Cultivar Releases: None
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1. Accession User: Galen D. Mooso
Rosepine Research Station
Louisiana Agricultural Experiment Station
P.O. Box 26
Rosepine, LA 70659
2. Nature of Research: The goal of this project is to evaluate available Trifolium pratense L. cultivars for adaptation, persistence and yielding ability when no-till seeded into permanent Cynodon dactylon (L.) Pers. pastures.
3. Progress to Date: Twelve red clover and nine white clover varieties were sodseeded into a closely mowed bermudagrass sod in the fall of 1990. A potassium based fertilizer containing sulfur, magnesium and boron was applied to two reps and the equivalent amount of potassium as potash was applied to the other two reps. Fertilizer source had no effect on clover stand and yield of bermudagrass-clover mixtures indicating that sulfur, magnesium and boron are not limiting factors for clover or bermudagrass production on this soil type. Red clover varieties made a greater contribution in terms of percent of forage harvested than did white clover varieties. Red clover made its greatest contribution on the June 14 harvest averaging 31% of forage harvested. The contribution of white clover was disappointing averaging less than 10% on the May 14 harvest than decreasing to less than 5% in June. No red or white clover varieties persisted to August. None of these red or white clover varieties reseeded themselves or perenniated and were not observed to be present in this plot area in the spring of 1992.
4. Publications: 1992 Rosepine Research Station Annual Progress Report.
5. Cultivar Releases: None

1. Accession User: H. Y. Hanna
Red River Research Station
P.O. Box 8550
Bossier City, LA 71113
 2. Nature of Research: Tomato breeding
 3. Progress to date: In 1992, thirty-five inbred lines and crosses developed at LSU were evaluated for fruit set, size, shape and disease resistance under heat stress in July, August and September. LHT24 and LHT43 inbred lines and the cross LHT 29 outperformed the other entries.
 4. Publications: Hanna H.Y., A.J. Adams, and L.L. Black. 1991. LHT24: a new heat-tolerant tomato. Louisiana Agriculture. 35:20.
 5. Cultivar Releases: 'LHT24' is a heat tolerant tomato germplasm that was released in 1991.
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1. Accession User: Mark Elkins, Research Associate
Agronomy Department
Louisiana State University
Baton Rouge, LA 70803
2. Nature of Research: A replacement project for 2606 "Evaluation of Forage Germplasm for Louisiana" is scheduled to be submitted in January and will focus on Arachis glabrata. Cooperation with The Southern Regional Plant Introduction Station in Griffin, Georgia is vital to this endeavor since it houses the germplasm collection of Arachis. This project is designed to determine the adaptability of Plant Introductions to the Louisiana Environment. Adapted lines will then be hybridized for desirable agronomic traits and to introduce hybrid vigor. Twelve plant introductions are currently being used for breeding. Evaluation of 350 seedlings produced in 1990 and 230 seedlings produced in 1991 is underway. Seed from crosses made in 1992 are being dug now.
3. Publications: Caldwell, A.G., D. R. Morris, R.E. Joost, W.M. Elkins, and D.L. Frieser. Perennial peanut, a summer legume for Louisiana. Louisiana Agriculture, Winter 1990.

1. Accession User: D. Steven Calhoun
Agronomy Department
Louisiana State University
Baton Rouge, LA 70803
2. Nature of Research: Cotton breeding and genetics
3. Progress to date: Numerous cotton strains possessing detectable levels of insect resistance were yield tested in Bossier City without bollworm/tobacco budworm control. The best of these strains produced yields over 60% higher than the commercial check cultivars, Deltapine 41 (DPL41) and DES 119. Selected root-knot nematode (RKN) resistant strains from the LAES and USDA breeding programs were yield tested in a field heavily infested with RKN. In plots without nematicide, resistant strains produced yields 26 to 56% higher than DPL41. Nematode reproduction under resistant strains was less than 20% of that under DPL41. A series of strains was less than 20% of that under DPL41. A series of stocks derived from monosomic additions, each possessing a chromosome from Gossypium longicalyx, are currently being evaluated for resistance to the reniform nematode (RN) in the hope of locating genes that confer immunity to RN observed in G. longicalyx.
4. Publications:

Barfield, M.E., D.S. Calhoun, C. Overstreet, and W.D. Caldwell. 1993. Field performance of selected root-knot nematode resistant cotton genotypes. In press, In Beltwide Cotton Prod. Res., Conf., New Orleans, LA. 11-14 Jan. 1993. Nat. Cotton Coun., Memphis, TN.

Robertson, C.A., D.S. Calhoun, B.R. Leonard, and S.H. Moore. 1993. Bollworm/tobacco budworm management in insect resistant cotton genotypes. In press. In Beltwide Cotton Prod. Res., Conf., New Orleans, LA. 11-14 Jan. 1993. Nat. Cotton Coun., Memphis, TN.

White, C.A., B.R. Leonard, J.B. Graves, S. Calhoun, and E. Burris. 1993. Biocontrol strategies for cotton insect pest management in northeast Louisiana. In press. In Beltwide Cotton Prod. Res., Conf., New Orleans, LA. 11-14 Jan. 1993. Nat. Cotton Coun., Memphis, TN.
5. Cultivar Releases: None
6. Need for additional germplasm collections: Tolerant to acid soils, resistant to reniform nematode.

1992
MISSISSIPPI
S-9 TECHNICAL COMMITTEE REPORT

AGENCY: Mississippi Agricultural & Forestry Experiment Station
SUBMITTED BY: C. E. Watson, Jr.
ADDRESS: Department of Experimental Statistics, P. O. Box NZ,
Mississippi State, MS 39762

* * * * *

ACCESSION USER: C. E. Watson, L. R. M'Ragwa, and L. M. Gourley
ADDRESS: Department of Agronomy, Mississippi State University, Mississippi
State, MS 39762

NATURE OF RESEARCH: Evaluation of pearl millet germplasm selected for
seedling root and coleoptile development.

PROGRESS TO DATE: Divergent selection for seedling root development and
coleoptile length was practiced on two populations of pearl millet.
The objective is to see if these traits can be used to improve
seedling vigor, rate of establishment, and subsequent agronomic
performance. One of these populations, Tift S-1, is a composite of
S₁ seed from 700 PIs mainly of African origin. These selections
were evaluated for stand establishment, seedling vigor, and yield
components under field conditions at Mississippi State, MS in 1991
and 1992. Similar tests were also carried out at two locations in
Kenya during the long rainy season of 1991 and the short rainy
season of 1992. Direct response to selection was also evaluated in
the greenhouse and laboratory at Mississippi State University in
1991.

PUBLICATIONS: M'Ragwa, L. R. F., and C. E. Watson, Jr. 1992. Selection
for seedling root length in pearl millet. American Society of
Agronomy Annual Meeting. Minneapolis, MN. 1-6 Nov. 1992. Agron.
Abstr. p.108.

CULTIVAR RELEASES: None

ACCESSION USER: T. P. Wallace

ADDRESS: Agronomy Department, P. O. Box 5248, Mississippi State, MS 39762

NATURE OF RESEARCH: Evaluation of Gossypium hirsutum L. germplasm for use
in a cotton breeding program designed to develop high quality cotton
adapted to narrow row production practices.

PROGRESS TO DATE: Four cotton germplasm lines from Argentina were obtained
through the Plant Introduction Office. The four lines will be
planted in field observation plots in 1993. Notes on growth
characteristics and yield potential will be collected throughout
the growing season. Fiber samples will be collected at the end of
the season for fiber analysis.

PUBLICATIONS: None

CULTIVAR RELEASES: None

ACCESSION USER: C. E. Watson and H. W. Philley
ADDRESS: Department of Agronomy, Mississippi State University, Mississippi State, MS 39762
NATURE OF RESEARCH: Evaluation of St. Augustinegrass plant introductions for cold tolerance.
PROGRESS TO DATE: Twenty eight PIs of St. Augustinegrass (Stenotaphrum secundatum) were planted in the field at Mississippi State, MS in the spring of 1991 and evaluated for turf characteristics and cold tolerance in 1992. These lines were also evaluated for cold tolerance in the laboratory to determine if laboratory measures of cold tolerance correlated with field observations. Accessions with the highest cold tolerance ratings were PI's 291594, 290088, 300129, and 300130; however, the cold tolerance ratings of these accessions were very low relative to the best local ecotypes and cultivars. The cold tolerance of these four PIs was similar to 'Floralawn', 'Bitterblue', and 'Floritam'. Many of the PIs had cold tolerance significantly lower than Florida common.
PUBLICATIONS: Philley, W., C. E. Watson, Jr. J. V. Krans, and J. M. Goatley, Jr. 1992. Differential thermal analysis of St. Augustinegrass. American Society of Agronomy Annual Meeting. Minneapolis, MN. 1-6 Nov. 1992. Agron. Abstr. p.174.
CULTIVAR RELEASES: None

ACCESSION USER: L. M. Gourley, and A. S. Goggi
ADDRESS: Technical Advisor, MIAC, Nairobi Kenya and Mississippi State University, P.O. Box 5248, Mississippi State, MS 39762
NATURE OF RESEARCH: Evaluation of sorghum for tolerance to infertile acid soils.
PROGRESS TO DATE: Evaluation of sorghum germplasm under acid soil conditions is continuing in Kenya and Columbia.
PUBLICATIONS: Adamou, M., L. M. Gourley, C. E. Watson, S. D. Mclean, and A. S. Goggi. 1992. Evaluation of combining ability of acid soil tolerant sorghum germplasm in Niger. American Society of Agronomy Annual Meeting, Minneapolis, MN 1-6 Nov. 1992. Agron. Abstr. p.88.
Montgomery, E., L. M. Gourley, C. E. Watson, and A. S. Goggi. 1992. Heritability estimates of tolerance to aluminum toxic soils in sorghum. American Society of Agronomy Annual Meeting. Minneapolis, MN, 1-6 Nov. 1992. Agron. Abstr. p.107.
Zake, V. M., C. E. Watson, Jr., and T. P. Wallace. 1992. Performance of grain sorghum hybrids on infertile acid soils in Kenya. American Society of Agronomy Annual Meeting. Minneapolis, MN. 1-6 Nov. 1992. Agron. Abstr. p.120.
CULTIVAR RELEASES: None

S-9 Technical Committee Report
1992

Agency: North Carolina State University

Submitted By: W. T. Fike
Crop Science Department
NSCU, Box 7620
Raleigh, NC 27695-7620
(919) 515-4063

1. Fourteen persons from a pool of 20 cooperators received 585 PI's from 24 species of 10 genera. Three of these recipients received ornamental peppers.

2. ACCESSION USER: Dr. Todd C. Wehner
Horticulture Department
NCSU, Box 7609
Raleigh, NC 27695-7609

Research: Improving cultivar development from cucumber PI accessions.

Progress: Many PI's are being screened.

Publications: Wehner, T. C., Alan Walters and K. R. Barker 1991
Resistance to Root-knot Nematodes in Cucumbers and
Horned Cucumber. Supplement to Journal of Nematology
23 (45) 611-614.

Waters, S. A., Todd C. Wehner, and K. R. Barker. 1992
Effects of Root Decay on the Relationship between
Meloidogyne spp. Gall Index and Egg Mass Numbers in
Cucumber and Horned Cucumber. Supplement to Journal of
Nematology 24 (45): 707-711.

3. ACCESSION USER: Dr. J. R. Ballington
Horticulture Department
NCSU, Box 7609
Raleigh, NC 27695-7609

Research: Collection and breeding of *Vaccinium*, *Rubus*, *Ribes* and
Fragaria species.

Collection Trip: A small fruit germplasm collection expedition was made
to Southern Chile by Drs. Ballington, Cameron and Munos,
Ing. Lavin, and Mr. Strawn from January 14 to February 18,
1992.

Summarized: Considering the range of variation observed, in particular for fruit size, fruit firmness and productivity, along with leaf diseases and (apparent) strawberry anthracnose, this germplasm appears extremely promising for use in strawberry cultivar development. Approximately 5000 seedlings from these accessions will be included for strawberry anthracnose in N. C.

Breeding Schemes: Highbush blueberries collected in the 60's from South Georgia (1), South Carolina (2), North Carolina (3), Virginia (1), New Jersey (1), and Southern Michigan (1), have been crossed with present day varieties to enhance the genepool for future variety development.

Cultivar Release: The parent of the Snowflake Rabbiteye Blueberry released by the University of Florida was PI 346603 collected by Dr. Gene Galletti in Swain Co., Appalachian Mountains, N.C.

4. ACCESSION USER: Dr. Bill Fike
Crop Science Department
NCSU, Box 7620
Raleigh, NC 27695-7620

Research: New Crop Evaluation and Adaptation

Progress: Seed of Brandes Sweet sorghum was planted for seed increase. Yields were low due to an early freeze.

5. ACCESSION USER: Dr. Tom Islieb
Crop Science Department
NCSU, Box 7620
Raleigh, NC 27695-7620
(919) 515-3281

Research: Peanut Breeding

Results: 'NC-V11' (Reg. no., CV-40, PI 540461) is a large-seeded Virginia-type peanut released by the North Carolina Research Service, the Virginia Agricultural Experiment Station and the USDA-ARS in 1989. Its major advantages are its high yield and value. NC-V11 was derived from a cross of two N.C. breeding lines. One parent was a pure line selection from the cross of cultivars 'Florigiant and NC 5'. The second parent was a pure line selection from the cross of Florigiant and PI 337396 a valencia - type (*A. hypogaea* spp. *fastigiata* var. *fastigiata*) introduction.

Publications: Wynne, J. C., T. A. Coffelt, R. W. Mazingo, and W. F. Anderson. 1991 Registration of "N.C.-V11" Peanut. *Crop Science* 31:484-485.

SUMMARY

Small Fruit Germplasm Collection Expedition to Southern Chile

Participants: Dr. J. Scott Cameron, Washington State University (Leader)
Dr. James R. Ballington, North Carolina State University
Ing. J. Arturo Lavin, A., INIA, Cauquenes
Dr. Carlos Munoz, S., INIA, Santiago
Mr. Jon Strawn, Portland, Oregon

A cooperative small fruit crop germplasm collection expedition involving the USA and Chile was conducted in southern Chile between January 14 and February 18, 1992. The expedition involved participation and/or resources from INIA in Chile, the USDA Plant Exploration Office, Washington State University and North Carolina State University. It included over 6000 kilometers travel in the region between Puerto Montt and Cochrane, including previously uncollected regions on the island of Chiloe. In addition, on the return trip to Santiago, a number of accessions of Rubus were collected along the roadside north of Puerto Montt.

The main emphasis of the expedition was collection of germplasm of Fragaria chiloensis, one of the parent species of the cultivated strawberry, F. x ananassa. However, accessions of 13 other species were also collected. Total collections included 43 seed and 63 plant accessions of F. chiloensis, one seed and two clonal accessions of F. x ananassa, eight accessions of Rubus procerus seeds, four accessions of seeds of Rubus geoides, three accessions of Ribes magellanicum seeds, two of Gaultheria phillyraefolia, one of Pernettya myrtilloides, one of Empetrum rubrum, six of Berberis buxifolia, three of Berberis darwinii, one of Berberis empetrifolia, one of Berberis linearifolia, and two of Aristotelia chilensis.

Approximately half the germplasm collected was left with INIA scientists in Chile, for evaluation and long term preservation. Fragaria and Rubus germplasm returned to the USA was divided among Washington State University, North Carolina State University (seeds only) and the National Clonal Germplasm Repository at Corvallis, OR. All other germplasm returned to the United States was deposited with the Clonal Repository.

The F. chiloensis accessions collected included both coastal and inland (pasture and woodland) forms, with a wide range of variation for all plant and fruit traits. It was also interesting that inland forms occasionally resembled F.

virginiana (from North America) more than F. chiloensis. In general, fruit firmness was acceptable to good, and much better than observed in either F. chiloensis or F. virginiana from North America. This in itself is a very significant finding because firm fruit appears to be recessive and difficult to incorporate from outcrosses involving parents with very soft fruit such as F. virginiana or North American F. chiloensis. Fruit size was extremely variable and a number of accessions were outstanding for large fruit size (for wild Fragaria). The largest berry collected weighed 5.5 g. The three accessions with the largest fruits were also quite productive and relatively free from disease in their native habitats. One of these accessions had a total of 55 flowers and fruits on one single crown. Flavor of fruits ranged from good to very good and aroma ranged from good to outstanding. Juice color was also deep red (compared to a typical orangey-red) with several accessions. Skin color of fruits ranged from light to dark red, and flesh color was mostly light red. No white-fruited germplasm was collected on this expedition.

Leaf scorch was a fairly common fungal pathogen on the leaves (as is the case in North Carolina), and leaf spot was also occasionally observed. In several instances the black sunken runner lesions characteristic of strawberry anthracnose (the most important disease in North Carolina) were also observed. Just prior to this trip, one seedling from a 1990 collecting trip to central Chile was shown to be highly resistant to anthracnose by Dr. Bob Milholland in Plant Pathology at North Carolina State University. So, this germplasm is also very promising as a potential source of genes for resistance to this disease which now threatens the strawberry industry throughout the southern United States.

As with F. chiloensis from the Pacific Coast of North America, plants of Chilean F. chiloensis appeared to be quite long-lived. The extremely productive accession noted above appeared to be 6-7 years old based on the length of the crown (approx. 35 cm).

Considering the range of variation observed, in particular for fruit size, fruit firmness and productivity, along with leaf diseases and (apparent) strawberry anthracnose, this germplasm appears extremely promising for use in strawberry cultivar improvement. Approximately 5000 seedlings from these accessions will be included in screening for strawberry anthracnose resistance in North Carolina this spring.

1992 S-9 TECHNICAL COMMITTEE REPORT

AGENCY: Oklahoma Agricultural Experiment Station
SUBMITTED BY: James S. Kirby
ADDRESS: Department of Agronomy, Oklahoma State University,
Stillwater, OK 74078

* * * * *

SUMMARY OF PI ACTIVITY:

At least 15 researchers/cooperators in Oklahoma requested and received germplasm samples from three of the Regional PI Stations during the year. The Southern Regional Station provided 430 samples involving 10 species to 11 cooperators in Oklahoma in 1992. The Western Regional Station provided 63 samples involving 3 species to 2 cooperators, and the North Central Regional Station provided 5 samples involving 2 species to 2 cooperators. Further attempts will be made to obtain reports on the utilization of these germplasm accessions and any significant findings. A hurried request, upon my return from two years in Morocco and learning that these reports were now on a calendar year basis, resulted in only two reports which follow.

ACCESSION USER: Darold L. Ketring
ADDRESS: USDA-ARS, Plant Science Research Laboratory, 1301 N.
Western, Stillwater, OK 74075

NATURE OF RESEARCH: Plant physiological traits to escape drought.

PROGRESS TO DATE: Peanut genotypes have been evaluated for root growth traits as a means to escape drought. UF 77318 with long taproot and high root volume was crossed with Robot 33-1. Robot 33-1 has root length and strong downward growing lateral roots similar to Tamnut 74. Robot 33-1 has rapid resumption of growth after relief from drought by water. Reciprocal crosses between UF 77318 and Robot 33-1 yielded potential F_1 hybrid embryos which were planted to obtain F_1 plants and F_2 embryos. The F_2 embryos will be planted in Spring 1993 for selection from the segregating population.

SELECTED PUBLICATIONS:

- Morris, J. B., Ketring, D. L. and Kirby, J. S. 1991. Diallel analysis of root length, root volume, and fruit weight of four peanut genotypes and their F_1 hybrids. Proc. Am. Peanut Res. Educ. Soc. 23:19.
- Ketring, D. L. and Reid, J. L. 1991. Peanut growth and development. Proc. Am. Peanut Res. Educ. Soc. 23:63.
- Ketring, D. L. 1992. Physiology of oil seeds. X. Seed quality of peanut genotypes as affected by storage time and temperature. Peanut Sci. 19:72-77.
- Ketring, D. L. and Reid, J. L. 1993. Growth of peanut roots. A field study. Agron. J. (Jan/Feb issue).

CULTIVAR RELEASES: None.

ACCESSION USER: James S. Kirby

ADDRESS: Department of Agronomy, Oklahoma State University,
Stillwater, OK 74078

NATURE OF RESEARCH: Peanut breeding and management.

PROGRESS TO DATE: Several peanut accessions possessing desirable agronomic traits were previously identified while increasing seed for the Regional PI Station. These accessions were placed in replicated yield trials for further evaluation. The 1992 data has not been fully analyzed, but none of the accessions appeared to yield as well as the currently grown varieties.

We are currently working with some lines that appear to have a fair level of resistance to Sclerotinia blight. These lines originated from a cross of Comet by Florunner, neither of which have appreciable resistance to Sclerotinia.

SELECTED PUBLICATIONS:

Melouk, H.A., K.E. Jackson, and J.S. Kirby. 1991. Peanut (Arachis hypogaea) Sclerotinia blight; Sclerotinia minor. Biological and Cultural Tests for Control of Plant Diseases 6:47.

Melouk, H.A., K.E. Jackson, J.P. Damicone, and J.S. Kirby. 1992. Peanut (Arachis hypogaea) Sclerotinia blight; Sclerotinia minor. Biological and Cultural Tests for Control of Plant Diseases 7:58.

CULTIVAR RELEASES: None.

University of Puerto Rico
College of Agricultural Sciences
AGRICULTURAL EXPERIMENT STATION
Río Piedras, Puerto Rico

S-9 Technical Committee
Report
Summer, 1992
Griffin, Georgia

Submitted by:
Rubén Vélez Colón
Fortuna Agricultural Experiment Substation
HC 02 Box 7115
Juana Díaz, PR 00795

PROJECT NUMBER : H-94-B

ACCESSION USERS : Sonia L. Martínez, Alvaro Acosta and Rubén Vélez

ADDRESS : Agricultural Experiment Station
Lajas Substation
University of Puerto Rico
Buzón HC-01, Box 11656
Lajas, PR 00667-9714

and

Fortuna Substation
HC-02 Box 7115
Juana Díaz, PR 00795

NATURE OF RESEARCH : To obtain through plant introduction, evaluation and preservation, better fruit crops, Avocado-(Persea americana) and Soursop - (Annona muricata), with high yielding ability, resistant to prevalent maladies and adapted to our climatic conditions.

PROGRESS TO DATE : During 1991 data of production per tree was recorded in the soursop experiment at the Fortuna Substation. This was the last year of data recording; we have now information about six years production. This data is being tabulated so a publication can be written. Fruit evaluation performed by personnel of the Food Technology Laboratory is going to be included in the publication.

Small trees of soursop planted last year to substitute the dead ones of Clon V-12 were grafted with material from Costa Rica. Observations are made about the development and general performance of these trees. New identification labels were placed in the soursop trees.

A work related to the scent and flavor components of the six soursop clones was conducted by a graduate student of the Chemistry Department. One of the most important results obtained in this work was that Clones VII-14 and IV-3 have the greatest quantity of organic acid esters, mainly responsible for the characteristic scent of soursop.

During this year, data recording in the avocado seven varieties experiment was affected by the problem of fruit robbery. New labels were placed for the identification of the avocado trees. Description of the introduced lacewing bug (Pseudacysta perseae Heidemann, Hemiptera - Tingidae) was conducted by Dr. Silverio Medina and collaborators.

PUBLICATIONS : Medina Gaud, S., A. E. Segarra Carmona and R. A. Franqui. 1991. The avocado lacewing bug, Pseudacysta perseae Heideman (Hemiptera - Tingidae) in Puerto Rico. J. Univ. P. R. Vol. 75 (2): 185-188.

Rivera González, S. 1991. Estudio de los componentes de olor y sabor en seis selecciones (clones) de guanábana, (Annona muricata L.). M. S. Thesis. University of Puerto Rico, Mayaguez Campus.

CULTIVAR RELEASES : None.

PROJECT NUMBER : H-94-C

ACCESSION USER : Chavarría-Carvajal, L. A.

ADDRESS : Corozal Agricultural Experiment Substation, College of Agricultural Sciences, Mayaguez Campus, University of Puerto Rico.

NATURE OF RESEARCH : Banana and plantain germoplasm, its introduction and evaluation.

PROGRESS TO DATE : Two collections consisting of 14 plantain cultivars and 45 banana cultivars were planted in November and December 1990, respectively, at the Corozal Agricultural Experiment Station.

Results of these collections are not available as yet. Completion of harvest of the banana collection is scheduled for April, 1992, while the harvest of the plantain collection is scheduled for June, 1992. The evaluation of the plant crop of three Manzano bananas and six Niño bananas, was completed. Significant differences were not found among Manzano cultivars, for cultural characteristics. Meanwhile, in yield, the Manzano cv. introduced from Orocovis, Puerto Rico, reached the highest yield, averaging 16 kg/bunch, in comparison with 15 and 14 kg/bunch for cvs. from Corozal and Lares, respectively. The Giant Niño cv. introduced from Orocovis showed the highest bunch weight with 12 kg/bunch. For the plan crop, no significant differences were found in yield among giant and dwarf Niño cultivars.

PUBLICATION : González Vélez, A., M. A. Santiago y L. A. Figueroa. 1990. Comportamiento hortícola de siete clones de plátanos. J. Agric. Univ. P. R. 74: 267-72.

CULTIVAR RELEASES : None.

PROJECT NUMBER : H-94-D

ACCESSION USER : Agenol González Vélez and Angel Bosques

ADDRESS : Corozal and Isabela Agricultural Experiment Substations
Box 10322
Corozal, PR 00783

NATURE OF RESEARCH : Root crops: Their introduction, multiplication, evaluation and preservation.

PROGRESS TO DATE : Thirty yam cultivars, 70 tanager cultivars, 30 cassava cultivars and 20 sweet potato cultivars are under preservation. Cultivars of yams Habanero and P. I. 15487, both of the specie D. rotundata, showed the lowest incidence of antracnose with an average yield of 14,432 and 8,068 kg/ha respectively, of marketable tubers. From the specie D. alata the yam cultivars Kinabayo and Gunung showed the lowest incidence of antracnose with an average yield in both of 19,204 kg/ha of marketable tubers.

Cassava roots of the Llanera cultivar stored individually in wrapped paper or in liquid wax and maintained in refrigeration showed no deterioration or minimum after 18 days of harvesting. On the other hand, roots not stored but maintained under refrigeration showed deterioration with a severity degree of 3 at 12 days of harvesting.

PUBLICATION : González, A., D. Ramos, I. Beauchamp y L. A. Figueroa, 1991. Comportamiento poscosecha de cuatro cultivares de yuca utilizando bolsas de polietileno y poda. J. Agric. Univ. of P. R. 75 (3): 269-280.

CULTIVAR RELEASES : None.

PROJECT NUMBER : H-94-Q

ACCESSION USER : Agenol González Vélez, Félix M. Román Pérez, Carlos A. Flores Ortega and Evelio Hernández López

ADDRESS : Corozal Agricultural Experiment Station
HC-02 Box 10322, Bo. Padilla
Corozal, PR 00783

and

Agricultural Experiment Station
Adjuntas Substation
HC-01 Box 4508
Adjuntas, PR 00601-9717

NATURE OF RESEARCH : Citrus—their introduction, multiplication, evaluation and preservation.

Evaluation of orange selections in terms of fruits productions, quality and rootstock influence on production and the evaluation of Valencia orange grafted in eight rootstock.

PROGRESS TO DATE : At Corozal, Troyer citrus rootstock shows the least mortality index compared with Rangpur lime, Naranja and Cleopatra Mandarin in the nursery stage. Also this rootstock shows the largest and thickest stem at 30 weeks evaluation. Rangpur lime shows the highest mortality index with 45% and Cleopatra Mandarin the poorest growth.

At Adjuntas, the evaluation of twelve orange selections was completed. The data indicate that tress grafted on Cleopatra mandarin rootstock produced significantly more number of fruits than those grafted on sour orange. The selections 374 Rico 1 and 78 Washington Navel produced the lowest number of fruits. The others were good producers. A considerable difference among canopy volume on both rootstocks could be observed on twelve orange selections. The efficiency showed a similar pattern between stocks, with the exception of selections 50 Rico 5 and 376 Rico 2, that were more efficient on Cleopatra mandarin than in sour orange stock. Also, selections 334 Pietri and 78 Washington Navel were more efficient on sour orange than Cleopatra mandarin. There were no significant differences in fruits quality parameters between stocks. Nevertheless, between selections, fruit quality factors were affected.

The evaluation of Valencia orange grafted on eight rootstocks showed that trees growing on 807 Rough lemon, Sun Chu Cha Kat mandarin, Sunki mandarin X Benecke, Pummelo X Trifoliolate orange and Cleopatra mandarin resulted at the present time the highest growing.

PUBLICATION : The evaluation of twelve orange selection on Cleopatra mandarin and sour orange rootstock. (In progress).

CULTIVAR RELEASES : None.

PROJECT NUMBER : H-94-R

ACCESSION USERS : Sonia L. Martínez Garrastazú, Elvin Román Paoli and Octavio Colberg

ADDRESS : Agricultural Experiment Station
Lajas Substation
University of Puerto Rico
Buzón HC-01, Box 11656
Lajas, PR 00667-9714

NATURE OF RESEARCH : Introduction and evaluation of cucurbits germplasm that can be useful in agriculture and to maintain and publish data of their performance.

PROGRESS TO DATE : A watermelon (Citrullus lanatus) varieties trial was conducted at Lajas Agricultural Substation during 1991. Yield, number of fruits and marketable yield was determined. The highest yield was obtained in the Mirage, Sangria and Jubilation varieties, with 120 kg/plot, 116 kg/plot and 109 kg/plot respectively. Jubilation variety produced the highest marketable yield with 108 kg/plot; this variety also presented the highest percent of marketable fruits (99%). Crimson Sweet variety showed the highest number of fruits produced by plot (28 fruits). During fiscal year 1991-92 a preliminary experiment for the evaluation of 12 honeydew type melon (Cucumis melo) was established at Lajas and Fortuna Substations. The plants are now 6 weeks old. Data of yield, brix and general performance will be recorded for all the varieties.

PUBLICATIONS : None.

CULTIVAR RELEASES : None.

PROJECT NUMBER : H-94-T

ACCESSION USE : Lucas V. Ramírez, Alvaro Acosta and Jaime Escudero

ADDRESS : Agricultural Experiment Station
Box 306
Gurabo, PR 00778

and

Agricultural Experiment Station
HC-02 Box 7115
Juana Díaz, PR 00665-9601

NATURE OF RESEARCH : To obtain through introduction, increase, evaluation, documentation and maintenance of the papaya plant, better papaya trees of Cariflora cultivars (Carica papaya L.) and Cariflora hibrids with high yielding ability, tolerant to papaya viruses and diseases, and adapted to local climatic conditions.

PROGRESS TO DATE : Two cultivars of Carica papaya L.: Cariflora and Sunrise Solo, were evaluated in terms of tolerance to papaya ring-spot virus (PRV) at the substations of Gurabo and Juana Díaz (Fortuna).

At the Gurabo Substation, Cariflora papaya demonstrated to be very tolerant to PRV; it rapidly recovered to the infection and produced flowers and fruits, contrary to the Sunrise Solo variety which produced few flowers and fruits, mostly deformed.

At Juana Díaz Substation (Fortuna) a similar tendency was observed, where the Cariflora variety presented a tolerance and fast recuperation to the virus infection.

PUBLICATIONS : Tolerance of Cariflora and the Hybrids Cariflora x Sunrise Fl to Papaya Ringspot virus in Puerto Rico. Escudero J., A. Acosta, L. V. Ramírez and I. B. Caloni. (Peer review).

CULTIVAR RELEASES : None.

PROJECT NUMBER : H-94-X

ACCESSION USER : Luis Reinaldo Santiago Santos

ADDRESS : Agricultural Experiment Station
University of Puerto Rico
Department of Horticulture
P. O. Box 21360
Río Piedras, PR 00928

NATURE OF RESEARCH : Planting materials of major herbs and spices and evaluating their growth habits and production potential in Puerto Rico.

PROGRESS TO DATE : Herbs have economic potential in Puerto Rico, especially as a commodity for the export market to U.S.A. during the winter season. Little information is available on herbs and spice production in Puerto Rico. The principal objective of this project is to introduce planting materials of major herbs spices and evaluate their plant growth habits and production potential in Puerto Rico. Seed and Vegetative planting material from herbs was planted in pots under greenhouse conditions. Maintenance and evaluation of the germplasm collection of these herbs continue.

PROGRESS TO DATE : Most of the herbs evaluated have a good adaption to
(cont.) container culture. Most herbs have shown satisfactory growth under greenhouse conditions. The most outstanding herbs were Rosemary, Basil, Thyme, Lemon Grass, Sage, Mints, Dill, Spanish Marjoram, Spiny Coriander and Oregano of Puerto Rico.

PUBLICATIONS : None.

CULTIVAR RELEASES : None.

1992 S-9 Technical Committee Report
South Carolina

Agency: Clemson University
Submitted By: Bill Rhodes
Address: Horticulture Dept., E-147 Poole Ctr.
Clemson, SC 29634-4949

Three *Capsicum* sp., 5 *Abelmoschus esculentus*, and 2 *Vigna unguiculara* plant introductions were shipped to South Carolina cooperators in 1992.

In 1991, sixty-six watermelon PI's were obtained for Depei Lin of August 1st Agricultural College (PRC). Five of these PI's did not germinate. Self-pollinations of 61 PI's were made for selection and breeding. Lin and Rhodes proposed increase of an additional 100 watermelon PI's, but this proposal was disapproved by the CCAC Committee. These PI's are being observed this year in Xingjiang. Lin shipped the 61 PI's received in 1991 back to the USDA Regional PI Station in 1993 to demonstrate that they were intact and free of pathogens.

Zhang and Rhodes report on the inheritance of resistance to races 0, 1, and 2 of *Fusarium oxysporum* f. sp. *niveum* in watermelon PI 296341 in a cross with the susceptible cv. 'New Hampshire Midget'. Preliminary F₁, F₂, and BC data suggest that resistance to race 2 is inherited in a more complex fashion than resistance to races 0 and 1.

1992

S-9 TECHNICAL COMMITTEE REPORT

AGENCY: Tennessee Agricultural Experiment Station
SUBMITTED BY: D. L. Coffey
ADDRESS: Department of Plant and Soil Science, University of Tennessee,
P. O. Box 1071, Knoxville, Tennessee 37901-1071

Page 1 of 1

* * * * *

ACCESSION USER: D. R. West

ADDRESS: Department of Plant and Soil Science, University of Tennessee,
P. O. Box 1071, Knoxville, Tennessee 37901-1071

NATURE OF RESEARCH: Breeding and improvement of corn (Zea mays)

PROGRESS TO DATE: Field studies were completed at the University of Tennessee Agriculture Experiment Station comparing S1 lines from populations of Pororo x Stiff Stalk and Pororo x Jellicorse. Ninety-six lines from populations containing 0, 25, 50, and 75% Pororo germplasm were grown at two locations in two years to estimate means and genetic variances for grain yield. The 10 highest performing lines from the best populations are to be intermated to from populations for further evaluation.

PUBLICATIONS: None.

CULTIVAR RELEASES: None.

* * * * *

ACCESSION USER: J. H. Reynolds

ADDRESS: Department of Plant and Soil Science, University of Tennessee, P. O.
Box 1071, Knoxville, Tennessee 37901-1071

NATURE OF RESEARCH: Biofuel crop variety selection

PROGRESS TO DATE: Switchgrass (Panicum virgatum) selections were included in biomass studies at two locations in 1992 and Flaccidgrass (Pennisetum flaccidum) was included at one location in 1991.

PUBLICATIONS: None

CULTIVAR RELEASES: None

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Seeds of Capsicum spp. were requested and freely distributed by the Southern Regional PI Station, to one person in the private sector. Seeds of Capsicum annuum PI194881 cv. 'Black Negro', PI 201233 cv. 'Mulatto Negro', and PI201238 cv. 'Chilencho' and seeds of Capsicum baccatum PI 238061 var. baccatum, PI159235 var pendulum and Capsicum pubescens PI 235047 were distributed to Mr. Larry Schweizer of Memphis, TN.

1992
S-9 Technical Committee Report

AGENCY: The Texas Agricultural Experiment Station

SUBMITTED BY: Frank M. Hons

ADDRESS: Soil and Crop Sciences Department
Texas A&M University
College Station, Texas 77843-2474

PHONE: (409)845-4620

FAX#: (409)845-0456

ACCESSION USER: Carol Rubino

ADDRESS: Route 1, Box 628-A
Rockdale, TX 76567

NATURE OF RESEARCH: Capsicum baccatum var. pendulum
Capsicum baccatum var. baccatum
Capsicum pubescens

PROGRESS TO DATE: Use in home garden

PUBLICATIONS: None reported

CULTIVAR RELEASE: None reported

ACCESSION USER: Kevin Phillips

ADDRESS: 1463 Martin
Houston, TX 77018

NATURE OF RESEARCH: Capsicum annuum cultivar Ancho
C. annuum cultivar Chiltapin
C. chinense
C. chinense cultivar No. 378 Misquiicho
C. frutescens

PROGRESS TO DATE: Testing in home garden

PUBLICATIONS: None reported

CULTIVAR RELEASES: None reported

ACCESSION USER: Joyce Everett
ADDRESS: 600 Dogwood Ln.
Marble Falls, TX 78654
NATURE OF RESEARCH: Capsicum baccatum var. pendulum
C. baccatum var. baccatum
C. pubescens

PROGRESS TO DATE: Use in home garden

PUBLICATIONS: None reported

CULTIVAR RELEASES: None reported

ACCESSION USER: Ed Lozano
ADDRESS: 2313 S. 26th
McAllen, TX 78503

NATURE OF RESEARCH: Capsicum baccatum var. pendulum
C. baccatum var. baccatum
C. chinense
C. pubescens

PROGRESS TO DATE: Pendulum grew well and fruited throughout the mild valley winter. Baccatum did poorly, while C. chinense grew well but yielded few peppers. C. pubescens did not germinate.

PUBLICATIONS: None reported

CULTIVAR RELEASES: None reported

ACCESSION USER: Richard Eikenburg
ADDRESS: 1222 Green Mountain Cove
Round Rock, TX 78664-6972

NATURE OF RESEARCH: Capsicum baccatum var. pendulum
C. baccatum var. baccatum

PROGRESS TO DATE: Testing in various potting mixes and home garden

PUBLICATIONS: None reported

CULTIVAR RELEASES: None reported

ACCESSION USER: Gwennie Brunka
ADDRESS: 835 W. 43rd St.
Houston, TX 77018
NATURE OF RESEARCH: Capsicum baccatum var. pendulum
C. baccatum var. baccatum
C. pubescens

PROGRESS TO DATE: Plant collection and gardening

PUBLICATIONS: None reported

CULTIVAR RELEASES: None reported

ACCESSION USER: Richard Penn
ADDRESS: Sunset Farms
P.O. Box 4866
Lago Vista, TX 78645

NATURE OF RESEARCH: Capsicum baccatum var. pendulum
C. baccatum var. baccatum

PROGRESS TO DATE: Both introductions grew and yielded well. Currently have
> 140 lines of peppers for fresh and dried markets.

PUBLICATIONS: None reported

CULTIVAR RELEASES: None reported

ACCESSION USER: Jerry L. Morgan
ADDRESS: 3333 Lee Parkway
P.O. Box 19000
Dallas, TX 75219

NATURE OF RESEARCH: Capsicum baccatum var. pendulum
C. baccatum var. baccatum
C. pubescens

PROGRESS TO DATE: Pendulum and baccatum yielded well in home garden, but
C. pubescens didn't emerge.

PUBLICATIONS: None reported

CULTIVAR RELEASES: None reported

ACCESSION USER: Carol Poye
ADDRESS: 406 E. Palo Pinto
Weatherford, TX 76086
NATURE OF RESEARCH: Capsicum baccatum var. pendulum
C. baccatum var. baccatum
C. pubescens
PROGRESS TO DATE: First two introductions above grew and yielded well.
Only one plant of C. pubescens emerged, but did not grow
or produce well.

PUBLICATIONS: None reported
CULTIVAR RELEASES: None reported

ACCESSION USER: Terri Trevino
ADDRESS: 11409 Woodway Creek
Corpus Christi, TX 78410

NATURE OF RESEARCH: Capsicum baccatum var. pendulum
C. baccatum var. baccatum
C. pubescens

PROGRESS TO DATE: Poor emergence and growth

PUBLICATIONS: None reported
CULTIVAR RELEASES: None reported

ACCESSION USER: Gary C. Peterson
ADDRESS: Texas A&M University Agric. Res. and Ext. Center
Rt. 3, Box 219
Lubbock, TX 79401-9757

NATURE OF RESEARCH: Sorghum bicolor (L.) Moench.

PROGRESS TO DATE: IS8179C, IS6919C, IS3693C, and IS2655C showed possible
resistance to sorghum midge in preliminary studies.
PI457709 and PI453951 showed resistance to yellow
sugarcane aphid.

PUBLICATIONS: Peterson, G.C., and A.B. Onken. 1992. Relationship
between chlorophyll concentration and iron chlorosis in
grain sorghum. Crop Sci. (in press).

CULTIVAR RELEASES: Cooperator on release of 60 and 50 converted exotic
cultivars from the Sorghum Conversion Program in
February and April, 1992.

ACCESSION USER:

Fred R. Miller

ADDRESS:

Department of Soil & Crop Sciences
Texas A&M University
College Station, TX 77843-2474

NATURE OF RESEARCH:

Sorghum bicolor (L.) Moench

PROGRESS TO DATE:

Continuing work on converting exotic lines to useful breeding materials in temperate environments through the Sorghum Conversion Program. A significant number of cultivars released this year have origins in plant introductions.

PUBLICATIONS:

Duncan, R.R., P.J. Bramel-Cox, and F.R. Miller. 1991. Contribution of introduced sorghum germplasm to hybrid development in the USA. In Use of Plant Introductions in Cultivar Development, Part. 1 CSSA Special Publication No. 17.

CULTIVAR RELEASES:

A/B Tx635 - exceptional foliar disease resistance, food quality grain, and immunity to head smut caused by Sporisorium holci-sorghii (Rivolta) K. Vanky.

A/B TxARG-1 female line - elite line with white, translucent grain.

A₂/B₂ Tx636 and A₂/B₂ Tx 637 - inbred parental lines with excellent cytoplasmic male sterility; neither has kafir germplasm in their backgrounds which increases potential diversity of germplasm used in hybrids.

RTx436 - inbred restorer line and is an elite white grain, disease resistant, high yield parental stock.

Release of 110 converted IS sorghums.

ACCESSION USER: A. Bruce Maunder
ADDRESS: DEKALB Plant Genetics
Rt. 2, Box 56
Lubbock, TX 79415
NATURE OF RESEARCH: Sorghum bicolor (L.) Moench.
PROGRESS TO DATE: Conducting introgression project for drought resistance using 75 PI's. Using 59 sudangrasses, most with PI numbers, for screening for resistance to Helminthosporium turcicum. Using 12 PI's from Russia, Syria, and China and 1 PI from South Africa for potential biotype "I" greenbug resistance.
PUBLICATIONS: Maunder, A.B. 1992. Identification of useful germplasm for practical plant breeding programs. In Plant Breeding in the 1990's. Stalker and Murphy eds.
CULTIVAR RELEASES: DK-38y for use in U.S.
DA-49 for use in Argentina
DA-52 for use in Argentina

ACCESSION USER: Charles E. Simpson
ADDRESS: Texas A&M Univ. Agric. Res. and Ext. Center
Rt. 2, Box 00
Stephenville, TX 76401
NATURE OF RESEARCH: Arachis spp.
PROGRESS TO DATE: Continue screening introductions for disease, insect, and nematode resistance, yield potential, and quality. Materials with further potential as identified by this work: A. cardenasii (PI 262141), A. chacoensis (PI 276235), A. batizocoi (PI 298639), A. ipaensis (PI 468322), A. stenosperma (PI 338280), A. hypogaea (PI 365553).
PUBLICATIONS: Simpson, C.E. 1991. Pathways for introgression of pest resistance into Arachis hypogaea L. Peanut Science 18:22-26.
Simpson, C.E. 1991. Global collaborations find and conserve the irreplaceable genetic resources of wild peanut in South America. Diversity 7:59-61.
Starr, J.L., Schuster, G.L., and Simpson, C.E. 1990. Characterization of the resistance to Meloidogyne arenaria in an interspecific Arachis spp. hybrid. Peanut Science 17:106-108.

Smith, O.D., Simpson, C.E., Grichar, W.J., and Melouk, H.A. 1991. Registration of 'Tamsan 90' peanut. Crop Science 31:1711.

Kochert, G., Halward, T., Branch, W.D., and Simpson, C.E. 1991. RFLP variability in peanut (Arachis hypogaea L.) cultivars and wild species. Theor. Appl. Genet. 81:565-570.

CULTIVAR RELEASES: Tamsan 90 peanut.

ACCESSION USER: W.R. Ocumpaugh

ADDRESS: Texas A&M Univ. Agric. Res. Stn.
HCR-2, Box 43-C
Beeville, TX 78102-9410

NATURE OF RESEARCH: Arachis glabrata

PROGRESS TO DATE: Evaluation of 69 PI's first planted in 1987 showed PI's 262819, 262821, 262828, and C-9618 to be better adapted to calcareous soils than Florigrade and Arbrook. An additional 140 accessions have been recently received but PI's 338267 and 262851 look good in initial field nurseries.

PUBLICATIONS: R.L. Reed and W.R. Ocumpaugh. 1991. Screening Rhizoma peanut for adaptation to calcareous soils. J. Plant Nutr. 14:163-174.

CULTIVAR RELEASES: None reported

ACCESSION USER: Charles G. Cook

ADDRESS: USDA-ARS Conservation & Production Systems Research Unit
2413 East Highway 83
Weslaco, TX 78596

NATURE OF RESEARCH: Hibiscus cannabinus
H. sabdariffa
Crotalaria juncea

PROGRESS TO DATE: PI numbers 532873, 532874, 532872, 207883, 468075, 468076, and 468077 of H. cannabinus show promise for production. Fifty other kenaf PI's are being evaluated for yield, fiber, and disease resistance in the USDA-ARS kenaf breeding program. Research utilizing 40 roselle and 20 crotalaria PI's is also underway.

PUBLICATIONS:

Sugden, E.A., W.T. Wilson, and C.G. Cook. Value of extrafloral nectar to honey bees (Apis mellifera L.) and other Hymenoptera in kenaf [Hibiscus cannabinus L. (Malvaceae)]. (Bee Science 00:000; Accepted for publication).

Cook, C.G., J.A. Veech, and B. Mullin. Kenaf growth and stem yield as affected by the root-knot nematode/soil-borne disease complex. Proceedings, International Kenaf Association Conference 4:(in press).

Cook, C.G. and R.V. Cantu. Kenaf performance on soils infested with Macrophomina phaseolina. Proceedings, International Kenaf Association Conference 4:(in press).
Scott, A.W., C.G. Cook, and L.N. Namken. Effects of kenaf in crop rotations. Proceedings, International Kenaf Association Conference 4: (in press).

Veech, J.A., C.G. Cook, R.V. Cantu, and A.W. Scott. Kenaf (Hibiscus cannabinus) yield on land heavily infested with root-knot nematode (Meloidogyne incognita) and on identical land where the nematode population was eliminated. Proceedings, International Kenaf Association Conference 4: (in press).

Bhangoo, M.S. and C.G. Cook. Kenaf variety performance in the San Joaquin Valley, California. Proceedings, International Kenaf Association Conference 4: (in press).

Bhangoo, M.S., F.G. Fernandez, and C.G. Cook. Kenaf production on a saline soil irrigated with saline and non-saline water. Proceedings, International Kenaf Association Conference 4:(in press).

Cook, C.G. and A.W. Scott. Utilization of methanol stress for evaluating kenaf quality. Proceedings, Second National Symposium on New Crops (in press).

Cook, C.G., W.D. Caldwell, and J. Rabb. 1991. Kenaf: A potential new crop for Louisiana. Proceedings, Louisiana Association of Agronomists (in press).

Cook, C.G. 1991. Evaluation of ten kenaf genotypes for resistance to charcoal rot. (Abstr.) Proceedings, International Kenaf Association Conference 3:17.

Cook, C.G. and M.V. Hickman. 1991. 1990 Kenaf variety evaluations in the Lower Rio Grande Valley of Texas. (Abstr.) Proceedings, International Kenaf Association Conference 3:3.

Bhangoo, M.S., T.A. Jacobson, and C.G. Cook. 1991. Regional Uniform Kenaf Variety Trial in the San Joaquin Valley, California (1990). (Abstr.) Proceedings, International Kenaf Association Conference 3:5.

CULTIVAR RELEASES: None reported

ACCESSION USER: Charles M. Rush

ADDRESS: Texas A&M Univ. Agric. Res. & Ext. Center
6500 Amarillo Blvd. West
Amarillo, TX 79012

NATURE OF RESEARCH: Beta spp.

PROGRESS TO DATE: Evaluated large number of PI's for resistance to soil borne fungus Aphanomyces cochlioides. No entries were resistant to this pathogen.

PUBLICATIONS: None reported

CULTIVAR RELEASES: None reported

ACCESSION USER: G.R. Smith

ADDRESS: Texas A&M Univ. Agric. Res. & Ext. Center
P.O. Box E
Overton, TX 75684-0290

NATURE OF RESEARCH: Trifolium spp.

PROGRESS TO DATE: Seed increases of T. vesiculosum and T. hirtum from the Bulgaria collection trip has continued. Fifty PI's of T. subterraneum have been evaluated over the past year for hard seed production and reseeding potential. Six PI's of T. purpureum have been evaluated for ground cover and forage potential at Overton.

PUBLICATIONS: Gildersleeve, R.R., G.R. Smith, I.J. Pemberton, and C.L. Gilbert. 1991. Screening rose and subterranean clover germplasm for isoflavones. Crop Sci. 31:889-892.

Quesenberry, K.H. and G.R. Smith. 1991. Trifolium collection in Bulgaria. Proceedings of the 1991 Southern Pasture and Forage Crop Improvement Conference.

CULTIVAR RELEASES: None reported

ACCESSION USER: M.A. Hussey

ADDRESS: Department of Soil and Crop Sciences
Texas A&M University
College Station, TX 77843-2474

NATURE OF RESEARCH: Cenchrus, Pennisetum, Bothrhichloa, and Dictranthium spp.

PROGRESS TO DATE: Highly apomictic hybrids between C. ciliaris and C. setigerus combine both winter hardiness and seed production. Six hybrids are being increased for further testing. More than 400 fertile interspecific hybrids have been recovered between P. flaccidum (PI's 220606 and 315868) and P. mezianum (PI214061). Several of the most apomictic lines have been selected for seed increase and advanced evaluation. One hundred vigorous interspecific hybrids were recovered from crosses of P. flaccidum (PI315868) and P. orientale (PI269961). Most progeny are more vigorous than parents, but have reduced seed set. Method of reproduction and seed set were investigated for all P. flaccidum and P. orientale accessions in the P.I. collection. Most accessions reproduced by facultative apomixis. Since the sexual potential is often > 20%, isolation procedures used for sexual species is recommended for seed increase. A genotype of P. flaccidum (271602) was confirmed to reproduce sexually. Although it has poor pollen fertility, etc. it may be used in subsequent hybridization studies in this species. All Bothrhichloa and Dichanthium species in the PI system have been evaluated in space plant nurseries. Thirty accessions were selected from these for forage production and quality. Seed of 10 introductions (B. intermedia and D. annulatum) are being increased for multiple location forage evaluations.

PUBLICATIONS: None reported

CULTIVAR RELEASES: None reported

1992

S-9 TECHNICAL COMMITTEE REPORT

Agency: Virginia Agricultural Experiment Station
Submitted by: Richard E. Veilleux
Address: Department of Horticulture, VPI & SU, Blacksburg, VA 24061

Accession User: Terry A. Coffelt
Address: Tidewater Agricultural Experiment Station
Suffolk, VA 23437

Nature of Research: Peanut breeding

Progress to Date: Peanut accessions (250) have been increased under contract. An additional 50 lines were evaluated for resistance to *Sclerotinia* blight and leaf spot.

Publications: Coffelt, T. A. and D. M. Porter. 1992. Preliminary evaluation of peanut plant introductions for minimum descriptors and resistance to two diseases. Amer. Peanut Res. and Education Soc., Inc. 1991. Proceedings 23:21 (Abstr.)

Cultivar Releases: none

Accession User: Khidir W. Hilu
Address: Biology Department
Virginia Polytechnic Institute and State University
Blacksburg, VA 24061

Nature of Research: Studies of evolutionary relationships among grass species.

Progress to Date: Species in the Aristideae and Arundinoideae subfamilies of Poaceae have been characterized by prolamine analysis.

Publications: Hilu, K. W. and J. L. Johnson. 1992. Ribosomal DNA variation in finger millet and wild species of Eleusine (Poaceae). Theor. Appl. Genet. 83:895-902.

Cultivar Releases: none

Accession User: Paul M. Ressler

Address: Virginia Wesleyan College
Norfolk, VA 23502

Nature of Research: *Capsicum* accessions used in teaching.

Progress to Date: Fifteen *Capsicum* accessions were used to demonstrate diversity in horticultural crops.

Publications: none

Cultivar Releases: none

Accession User: Harbans Bhjrdwaj

Address: Virginia State University
Petersburg, VA 23806

Nature of Research: Agronomic evaluations of *Brassica rapa*.

Progress to Date: Six accessions have been multiplied at Petersburg for future agronomic evaluation.

Publications: none

Cultivar Releases: none

Accession User: Edison Fowlks

Address: Hampton University
Hampton, VA 23668

Nature of Research: Peanut biotechnology/genetic engineering for virus resistance.

Progress to Date: Tissue culture experiments are in progress to determine regeneration potential of various peanut accessions.

Publications: none

Cultivar Releases: none

National Program Staff Report

June 5, 1992

Henry L. Shands

Budget. The FY 1992 budget had no increase for plant germplasm. The FY 1993 budget contains a budget request for \$1.2 million for plant germplasm programs. Conference committee will act on the bill in the near future. The FY 1994 budget process is moving along at an accelerated rate this year. FY 1994 will be the first year of requests under the National Genetic Resources Program (NGRP).

Germplasm Funding:

<u>Activity</u>	<u>FY 1990</u>	<u>FY 1991</u>	<u>FY 1992</u>
Acquisition	\$ 3,861,000	\$ 4,205,200	\$ 4,510,900
Preservation	<u>11,369,200</u>	<u>12,703,700</u>	<u>12,157,100</u>
SUB-TOTALS: ^{1/}	15,230,200	16,908,900	16,668,000
Characterization	—	--	3,740,000
New Crops	--	--	134,300
Evaluation	6,980,000	6,992,600	to breeding
Enhancement	<u>5,849,100</u>	<u>5,602,700</u> ^{5,653,000}	<u>to breeding</u>
TOTALS:	\$28,059,300	\$29,504,200	\$20,542,300

^{1/} Funding level most consistent with activities relating to National Genetic Resources Program.

National Genetic Resources Program. The 1990 Farm Bill (P.L. 101-624) authorized the establishment of the National Genetic Resources Program (NGRP) to be established under the leadership of the Agricultural Research Service. (The Director of the NGRP will be an Associate Deputy Administrator for Genetic Resources. Four Acting Directors (Roger Gerrits, Neil Rutger, Henry Shands, and Robert Faust) served until ARS named Henry L. Shands to be the Director effective May 17, 1992.)

Expert Committees assembled the information necessary to produce the Initial Report which is still in Department clearance. Both the Initial Report and the ad hoc Expert Committee reports will be published following the release of the Initial Report.

The Charter establishing the Advisory Council was issued March 10, 1992. Nominees for the Advisory Council for the National Genetic Resources Program (NGRAC) have been provided to the Secretary. The National Plant Genetic Resources Board (NPGRB) and the National Plant Germplasm Committee (NPGC) no longer exist.

United Nations Conference on Environment and Development (UNCED). PrepCom, the UNCED process committee, prepared a plan of action for the 21st century, Agenda 21, of over 800 pages of document for approval at UNCED's "Earth Summit" in Rio de Janeiro. Projects covering sustainable agriculture offer an opportunity for support of genetic resources conservation activities on plant and animal species. Seemingly neglected are the microbial species but those associated with plants and animals could presumably be incorporated in those plans as they develop. The amount of funding in the Global Environment Facility at the World Banks is of concern and will determine whether there will be any action initiated in this area.

Convention on Biological Diversity. The United Nations Conference on Environment and Development (UNCED) being held in Rio de Janeiro, Brazil from June 1-12, 1992 has opened the Convention on Biological Diversity for signature. One hundred nations participated in the negotiating process concluded May 22, 1992 in Nairobi at the United Nations Environment Programme headquarters. The United States worked hard to help develop an

acceptable convention but language regarding intellectual property, biotechnology, and the financial mechanism was too convoluted to be completely acceptable. Article 15 deals with access to genetic resources and may turn out to be the most difficult for the years ahead. The restrictions and controls that are likely to be initiated on ownership of, regulation of, and access to genetic resources may prove to be more threatening to the world's food security than any of the obvious problem areas. Phrases regarding "national sovereignty" and "mutually agreed terms" are now commonplace. The responsibility of scientists to preserve unique genetic diversity now becomes more important than ever.

FAO Commission on Plant Genetic Resources and the International Technical Conference on PGR. The FAO Conference accepted the recommendation of the Fourth Session of the FAO Commission on PGR to hold a Fourth International Technical Conference (ITC) on Plant Genetic Resources. Dr. R. L. Clark was asked to serve as consultant from May to July to arrange the terms of reference for the conference. Germany has offered to host the conference in summer 1995. This delay from the original proposal of late 1993 places it farther removed from relevancy to the UNCED process to impact Agenda 21 actions on plant genetic resources.

Also of interest to all should be the proposed (revised) Code of Conduct for Germplasm Collecting and Transfer. The proposed Code will be provided by the Plant Exploration Office to those preparing proposals for possible USDA funding. It is important to understand the concerns on ownership of germplasm which have emerged during the FAO debates, Keystone Dialogues and most recently, the negotiating sessions for a Convention on Biological Diversity.

Cooperative Research with the SADCC Genebank. Last year we provided the Nordic country consortium which sponsored the establishment of the ten-country regional genebank in Zimbabwe with a number of potential cooperative projects on plant genetic resources of interest to the region. Those included corn, cotton, cowpea, sorghum, millets, peanut and minor crops. Representatives from the group will be attending the International Crop Science Congress at Ames, Iowa during July 13-22 when we will learn of their interests. Dr. Åke Wellving was seriously injured in a traffic accident early this year and is still recuperating in Sweden.

Foundation on Economic Trends (FOET) Lawsuit on Germplasm. The District (of Washington, DC) Appeals Court ruled in favor of the defense against Jeremy Rifkin who charged the USDA with mismanagement of plant germplasm under NEPA statutes. The three judge panel's report was handed down in September 1991.

National Academy of Science/ Board on Agriculture Reports on Managing Global Genetic Resources. Following the report on the National Plant Germplasm System released in September of 1990, the report on Forest Trees was released in July 1991. The animal, aquatic, and general reports are expected to be released by the end of 1992.

New Publications. The Crop Science Society of America published Use of Plant Introductions in Cultivar Development, Part 2 in February as CSSA Special Publication Number 20. Crops featured in Part 2 are: bean, cool season food legumes, peanut, sugarbeet, sugarcane, sunflower and industrial crops. Part 1 covered: rice, oat, wheat, barley, sorghum, cotton, soybean, forage legume and grasses.

Personnel. ARS will be recruiting for the position of National Program Leader for Plant Germplasm at Beltsville, Maryland. The advertisement will be issued during June and applications accepted for 60 days. Contact Henry Shands (301-504-5311) for the position description.

1991 S-9 TECHNICAL COMMITTEE REPORT FROM THE SOIL CONSERVATION SERVICE

Accession user: East Texas Plant Materials Center
Address: P. O. Box 13000 SFA Station Nacogdoches, Tx. 75962
Nature of research: Adaptational information on plant materials for eastern Texas and western Louisiana.
Progress to date: A portion of 9054943 *Vetiveria zizanioides*, vetivergrass was vegetatively increased for in 1991 for use in filter strip trial plantings (associated with animal waste systems) in 1992. Winter freeze damage was severe during the 1989-90 and 1990-91 winters. All field plants were winterized for the 1991-92 winter by placing grass residue around the vetivergrass bases. Freeze damage was lower, however the 1991-92 winter was milder than the two prior winters.
An increase block of PI-299993 *Hemarthria altissima* 'Redalta' limpoggrass was made in 1991. This block will be used to supply planting material for 1992 field plantings.
An adaption block of PI-364888 'Floralta' limpoggrass was planted in 1991 for comparison with 'Redalta'.

Publications: 1
Cultivar releases: 0

Accession user: AMERICUS PLANT MATERIALS CENTER
Address: ROUTE 6 BOX 417 MORRIS DRIVE, AMERICUS, GEORGIA 31709
Nature of research: DEVELOPMENT OF NEW CONSERVATION PLANTS FOR GEORGIA, ALABAMA, SOUTH CAROLINA, NORTH CAROLINA WITH EMPHASIS ON CROPLAND EROSION CONTROL.
Progress to date: THE AMERICUS PMC IS INCREASING 4 ACCESSIONS OF *VETIVERIA ZIZANOIDES*, PI-196257, PI- 271633, PI-537061 AND PI-302300. THIS GRASS HAS RECEIVED MUCH INTEREST FOR USE IN EROSION CONTROL ON CROPLAND. THE AMERICUS PMC IS ALSO CONDUCTING AN ADAPTATION STUDY INVOLVING PI'S 271633, 302300, 196257 AND 213903 FROM INDIA AND 9054943 FROM SUNSHINE, LA.
BIO TERRACING STUDY
PI-302300 AND PI-196257, VETIVER GRASS WAS ESTABLISHED IN A FIELD PLANTING AT ALABAMA A&M UNIVERSITY RESEARCH STATION TO EVALUATE IT FOR EROSION CONTROL ON CROPLAND. CONVENTIONAL TERRACES AND BUFFER STRIPS ARE ALSO INCLUDED IN THE COMPARISON. VETIVER GRASS WAS PLANTED ALONG A TERRACE INTERVAL WHERE A TERRACE WOULD NORMALLY BE CONSTRUCTED FOR EROSION CONTROL.

PI-383803, VICIA VILLOSA, HAIRY VETCH WAS ESTABLISHED IN A FIELD PLANTING IN THE FALL OF 1988 IN GEORGIA TO COMPARE THIS ACCESSION WITH TWO COMMERCIAL VETCH VARIETIES FOR ABUNDANCE OF WINTER COVER. SELECTED FOR NITROGEN PRODUCTION AND GROUND COVER, PI-383803 MAY BE RELEASED IF RESULTS REMAIN PROMISING. PI-383803 HAS BEEN TESTED COOPERATIVELY WITH UNIVERSITY OF GEORGIA AT PLAINS, GRIFFIN AND TIFTON, AND IS BEING INCREASED AT AMERICUS.

PI-490363, PI-490364, PI-310131 AND PI-202044 PASPALUM NICORAE, BRUNSWICKGRASS, CONTINUE TO BE EVALUATED FOR GRASSED WATERWAY STABILIZATION AND FOR FORAGE PURPOSES. THEY ESTABLISH MORE QUICKLY THAN BAHIAGRASS FROM SEED.

PI-199258 AND PI-289311, MEDICAGO ORBICULARIS ARE BEING EVALUATED IN FIELD PLANTINGS FOR WINTER COVER WHERE NOTILL SEEDLINGS OF ROWCROPS WILL BE USED IN THE SPRING. ALSO, PI-199258 AND PI-289311 HAVE BEEN EVALUATED COOPERATIVELY AT THE PLAINS, GRIFFIN AND TIFTON, GEORGIA TESTS.

IN 1987, PI-490362, 'AMQUAIL' THUNBERG LESPEDEZA WAS RELEASED FOR USE IN ESTABLISHING QUAIL FOOD PATCHES IN HEAVILY POPULATED DEER COUNTRY. AMQUAIL DISPLAYS A RESISTANCE TO DEER BROWSE; THE DEER MAY ACTUALLY AVOID IT, WHEREAS DEER HEAVILY BROWSE BICOLOR LESPEDEZA. AMQUAIL PROVIDES EXCELLENT FOOD AND COVER FOR BOBWHITE QUAIL.

ARUNDO DONAX, PI-421727, 'ALAMO' PANICUM VIRGATUM, PI-422006, AND 'QUAIL HAVEN' GLYCINE SOJA, PI-163453 ARE BEING ESTABLISHED IN ALABAMA AND GEORGIA TO DETERMINE THEIR RANGE OF ADAPTATION AND PERFORMANCE FOR WILDLIFE.

THE FOLLOWING ACCESSIONS ARE BEING EVALUATED FOR USE IN IMPROVING WATER QUALITY ON:

CONSTRUCTED WETLANDS:

PHRAGMITES AUSTRALIS, COMMON REED, PI-434204 AND 434213

SPARTINA PECTINATA, PRAIRIE CORDGRASS, PI-421603

SPARTINA ALTERNIFLORA, 'VERMILION' SMOOTH CORDGRASS, 9054025

PANICUM HEMITOMON, MAIDENCANE, PI-434171

ELEOCHARIS DULCIS, PI-276260, 276261, 276263, 276264, 276273, 276274

ANIMAL WASTE DISPOSAL:

TRIPSACUM DACTYLOIDES, EASTERN GAMAGRASS, PI-421612, 434493

PANICUM VIRGATUM, SWITCHGRASS, PI-422006

PASPALUM NICORAE, BRUNSWICKGRASS, PI-310131

Publications:

4 POPULAR
2 TECHNICAL

Cultivar releases:

GA-5 FESCUE AND 'BIG O' CRABAPPLE IN PROGRESS

Accession user: Jamie L. Whitten Plant Materials Center
Address: Route 3, Box 215-A, Coffeenville, Mississippi 38922
Progress to date: No new accessions of foreign origin were selected for advanced evaluation in 1991.
Publications: 2
Cultivar release: 0

Accession user: USDA-SCS HAWAII PLANT MATERIALS CENTER
Address: P.O. BOX 236 HOOLEHUA, HAWAII 96729 (On the island of Molokai)

Nature of research: Development and testing of new and improved conservation plants for Hawaii and the Pacific Basin (includes GUAM, the NORTHERN MARIANAS ISLANDS, the FEDERATED STATES OF MICRONESIA, the REPUBLIC OF PALAU, the REPUBLIC OF THE MARSHALL ISLANDS and AMERICAN SAMOA).

Progress to date: PI-440790 phaseolus (*P. acutifolius*), PI-195245 phaseolus (*P. lunatus*), PI-385126 lupine (*L. hispanicus*), PI-201389 phaseolus (*P. coccineus*), PI-293015 lesquerella (*L. fendleri*), PI-432526 proboscidea (*P. parviflora*), PI-251800 jojoba (*S. chinensis*), PI-422199 Cucurbita (*C. foetidissima*), PI-478649 Parthenium (*P. argentatum*), PI-464692 Medicago (*M. marina*), PI-249937 Medicago (*M. arborea*), PI-269867 Aristida (*A. adscensionis*), PI-422242 Guizotia (*G. abyssinica*), PI-208985 Ehrharta (*E. calycina*), PI-364326 Aristida (*A. congesta*), PI-XXXXXX Sporobulus (*S. fimbriatus*), PI-201475 Cucurbita (*C. pepo*), PI-312852 Vernonia (*V. galamensis*), PI-306132 Cucumis *C. melo*), PI-212896 Cucumis (*C. sativus*), PI-441933 Zea (*Z. luxurians*), PI-478411 Chenopodium (*C. quinoa*), and PI-435608 Helianthus (*H. annuus*) are all part of a cooperative project between the USDA-ARS Western Regional Plant Introduction Station and the USDA-SCS Hawaii Plant Materials Center for seed increase of selected germplasm. Many accessions presently maintained at the WRPIS are photoperiod sensitive and a reliable short-day seed increase site was vital to the successful maintenance of this valuable germplasm. In the summer of 1991 the above accessions were planted to initial evaluation plots at the Hawaii Plant Materials Center with good success and germplasm of of producing accessions were sent back to PI stations. ARS and SCS has agreed to continue the germplasm increase with funding appropriated by ARS.

PI-224980 glycine (*G. wightii*) is a drought tolerant, trailing and twining perennial legume. PI-224980 continues to perform well in field plantings throughout Hawaii's low rainfall zones for forage and erosion control. It is currently being tested at the Molokai PMC under replicated irrigated and non-irrigated clipping trials with three other commercially available cultivars. PI-224980 is scheduled for release in 1992.

PI-213903 and PI-271633 vetivergrass (*V. zizanioides*) is a long lived, deeply rooted perennial bunch grass. Vetiver is currently being tested for potential use in filter strip and contour hedgerow applications. Continued screening and evaluations of vetiver is on going to select those accessions that produce non-viable seeds. Vetiver shows promise in applications for the natural formation of terraces using vegetation.

Publications: Joy, R.J., and P.P. Rotar, 1991. 'Tropic Shore' Seashore Paspalum: *Paspalum vaginatum* Sw. Hawaii Institute of Tropical Agriculture and Human Resources, University of Hawaii. Research Extension Service 122.

Cultivar releases: None

Accession User: Brooksville Plant Material Center

Address: 14119 Broad Street, Brooksville, Florida 34601

Nature of Research: Development of new conservation plants for MLRA 138, 151-155, and 270-273 with emphasis on water quality maintenance and cover crop erosion control.

Progress to Date: Three additional perennial peanut (*Arachis*) species are proving to be very effective as a cover crop in citrus groves because of their low maintenance and low water requirements. Perennial peanuts can be used as a biological supplier of nitrogen. These low growing perennial peanuts can also be used for roadside stabilization and beautification on sandy non-fertile sites. This species is being used in the effluent sprayfields in Ocala and Okeechobee because of the density of the rhizomes. They utilize and help filter some of the nutrients before they reach the aquifer.

Lanceleaf crotalaria is in advanced testing as a grove covercrop for erosion control. It is low maintenance, nitrogen fixing, and has potential for ground surface stabilization and interception of applied pesticides and fertilizers before they reach surrounding surface waters.

Studies of winter legumes and grains for cover cropping and use in effluent sprayfields are being made.

PI-415141 - *Spartina patens* is in advanced evaluation for use in effluent sprayfields. Over 30 species of plants are being studied and analyzed for nutrient uptake at these effluent sprayfields. Three locations are all climatically different.

Inter-Center seed production of three native Florida switchgrass selections is being studied because seed production by this species is low in Florida.

Materials native to Florida (gamagrass, switchgrass, sand cordgrass, lopsided indiagrass and wiregrass) are being evaluated for forage and pasture planting and soil erosion control.

Plantings are being made on highly erodible disturbed soils involving numerous grasses, lespedezas and other legumes.

Publications: 1

Cultivar releases: PI-421841 - Beach sunflower (*Helianthus debilis*) was released in 1991 as 'FloraSun', for dune stabilization and beautification.
Panicum amarum, PI-421957 and 9003324 will be released in early 1992 for dune stabilization purposes.

Accession User: Knox City Plant Materials Center

Address: Rt. 1, Box 155, Knox City, Texas 79529-9752

Nature of Research: Adaptational Information on Plant Materials for Texas and Southwest Oklahoma

Progress to Date: 9054943 *Vetiveria zizanioides*, vetiver grass was re-evaluated to further determine if it has enough cold tolerance to survive area winters. Previous plantings have not withstood cold temperatures. It is believed that possible management techniques may be used to increase survival.

Publications: 1

Cultivar Release: 'Overton R18' Rose clover

Accession user: Golden Meadow Plant Materials Center

Address: P O Box 2202, S. Lafourche Airport Rd., Galliano, La. 70354

Nature of research: Determine plants and techniques for soil conservation activities in the marsh soils of the Gulf Coast.

Progress to date: Several vetivergrass accessions with PI's are being tested as gully plugs on degrading and high water flow drainageways in Louisiana.

'Tropic Sun' sunn hemp, *Crotalaria juncea*, PI-468956, is being evaluated for adaptation and green manure uses in field plantings.

Publications: None

Cultivar releases: None

No report from Arkansas and South Texas Plant Materials Centers!

SOUTHERN REGIONAL PLANT INTRODUCTION STATION
Report to S-9 Technical Committee
January-December, 1992

This report covers the primary activities of this plant introduction station for the period of January 1-December 31, 1992.

Plant Introduction

Germplasm of 2,196 new Plant Introductions (PI's) were added to the S-9 Project plant germplasm collections. The major crop groups received were sorghums, sweetpotatoes, peanuts, and squash. The total collection is now 68,817 and is composed of 261 genera and 1,359 species from 160 countries.

An additional 80 accessions of I. batatas were introduced into the in vitro collection for maintenance. These materials represent accessions from Latin America and the South Pacific. Twenty four accessions of tetraploid I. batatas were collected as botanical seed in Ecuador in collaboration with the International Potato Center (CIP) and INIAP (Ecuadorian government). Four Ipomoea species were collected in Hawaii. Seed of all species collected in 1992 is scheduled for increase in 1993. Propagules of sweetpotato have been distributed in response to requests nationally and internationally. Forty accessions of Ipomoea representing 5 species were increased in the greenhouse during 1992. Funding was obtained for a plant collecting trip to Papua, New Guinea in '93.

A plant exploration trip into Brazil resulted in the collection of 17 accessions of 10 species of wild peanuts from 5 sections of the genus Arachis. In addition 90 accessions of wild peanuts and 82 accessions of the cultivated species (A. hypogaeae) were brought back that has been collected in earlier explorations and increased by a Brazilian cooperater.

Seed Distribution

A total of 32,333 seed samples or vegetative clones were shipped in all categories of distribution. In direct response to 709 requests, 18,211 were shipped within the S-9 Region; 11,523 to the other three regions (NC-7, NE-9, and W-6); 1,479 to 62 foreign countries; 1,120 forage legume cultivars for field trails in the southern states.

Shipments in other categories of distribution were 3,902 PI's sent to the National Seed Storage Laboratory (NSSL) for long-term storage.

Seed Increase

A total of 1,573 were included in the 1992 increase plantings. The major crop groups involved are sorghum, cowpeas, peanuts, grasses, clovers, okra, and peppers. The P.I. Station increased 613 new and

old PI's and cooperators in Alabama, Arizona, California, Florida, New Mexico, Texas, Puerto Rico, and St. Croix, VI increased 960.

A new 10 acre field on the UGA Westbrook Farm was fenced with a ten foot high deer fence at the cost of \$19,000. In 1993 approximately \$30,000 will be spent on a drip irrigation system.

Research and Screening

Progress Report

Watermelon accessions (347) were screened in the greenhouse for resistance to watermelon mosaic virus 2 and eight accessions were screened in field trials. Five and three resistant accessions were found in the greenhouse and field, respectively. Further testing is needed. Cowpea and mung bean accessions were screened for seedborne viruses in the greenhouse before being taken to the field for regeneration as was done last year. Reinfection rates were even higher in 1991. So a different approach for screening accessions from Botswana and then growing out healthy plants in the greenhouse was tested. Seed from the greenhouse will then be multiplied in St. Croix where reinfection is minimal. A NADP-amplified ELISA method to detect blackeye cowpea mosaic virus in seeds was developed. Tests were begun to locate B1CMV in seeds and preliminary results indicate the virus is mostly in seed coats and cotyledons. Preliminary results with heat treatment to eliminate *Clavibacter xyli* from bermudagrass have been successful with the limited number of accessions tested.

A post-doctoral scientist completed a two-year assignment of developing procedures for maintaining wild peanut accessions in-vitro. Four explant sources have been evaluated for use in regeneration of the wild species. Bacterial contamination has been a problem with the nodes, shoot tips, and meristems but not the leaf explants. Using leaf explants, shoots were regenerated from 5 of 16 species tested. Further experiments will be performed to improve this system of regeneration. For example, by changing the gelling agent alone, a 3x increase in the number of shoots per explant was observed for Arachis villosulicarpa.

Research has been initiated to transfer resistance to the Tomato Spotted Wild virus in the commercial peanuts through development of transgenic cultivars.

All sweetpotato (Ipomoea batatas) cultivars, breeding lines, and plant introductions (237 accessions) have been placed in tissue culture and are being maintained in vitro.

A total of 200 clones have been evaluated for their morphological characteristics and the data is being prepared for publication as a handbook.

Tissue culture techniques have been successful in maintaining sweetpotato nodes in vitro for 2+ years in a state of "no growth".

After transfer to hormone-free media, axillary bud development resumes and normal plantlets are obtained after three months. Construction of a genomic library for sweetpotato has been completed.

Publications

Austin, D., R.L. Jarret, and F. De La Puente. 1992. Collecting tetraploid sweetpotato (I. batatas L.) in Ecuador. Plant Genetic Resources Newsletter (in press).

Austin, D., R.L. Jarret, and J.A. MacDonald. 1992. Phylogenetic relationships among Ipomoea species littoralis and gracilis. Bull. Torrey Bot. Club. (in press).

Gillaspie, Jr., A.G. and M.S. Hopkins. 1991. Spread of peanut stripe virus from peanut to soybean and yield effects on soybean. Plant Disease 75:1157-1159.

Gillaspie, Jr., A.G. and M.S. Hopkins. 1991. Spread of peanut stripe virus (PStV) from peanut to soybean and yield effects on soybean and lima bean. Phytopathology Abstr. 81:811.

Plant Explorations

Four plant exploration proposals originated in the S-9 region. Following the review process the proposals were submitted to the Plant Exploration Officer of ARS, Beltsville, M.D. for national priority ranking and submission to ARS for funding in FY 93.

1. Festuca spp. exploration in Morocco, Spain, and southwest France; \$14,379, Dr. C. P. West, Department of Agronomy, University of Arkansas and Dr. D. A. Sleper, Department of Agronomy, University of Missouri. June 12-July 12, 1993.
2. Ipomoea spp. (sweetpotato and related wild species); Papua, New Guinea; \$14,800; Dr. R. L. Jarret, USDA-ARS, Griffin, GA and Dr. R. LaBonte, Louisiana State University. September, 1993.
3. Trifolium spp., Bulgaria; \$13,300, Dr. K. H. Quesenberry, Department of Agronomy, University of Florida and Dr. G. A. Pederson, USDA-ARS, Mississippi State, MS. August 3-18, 1993.
4. Trifolium, Lotus, Medicago spp; Republic of Georgia; \$11,900; Dr. C. S. Hoveland, Department of Agronomy, University of Georgia and Dr. G. R. Smith, Texas A&M University, Overton, TX. May-June, 1993 (5 weeks).

APPENDIX I

Southern Regional Plant Introduction Station Budget

<u>Sources of funds</u>	<u>FY-92</u>	<u>FY-93</u>
Regional Research Funds (Pooled)	\$239,425	\$220,315
RRF (Committee of Nine Allocations)	0	0
TOTAL	\$239,425	\$220,315

Expenditures

Personal Services - Salaries	\$132,321	\$119,345**
Personal Services - Benefits	34,639	41,529
Travel	500	500
Supplies & Operations	69,965*	56,941***
Equipment	2,000	2,000
TOTAL	\$239,425	\$220,315

* \$50,000 HVAC remodeling of S-9 laboratory building (\$36,000 from SAES Directors and \$14,000 from the S-9 operating budget).

** FY 93 salary and fringe benefits increases are \$4,993 and \$1,897 respectively (Total = \$6,890). The decrease of funds in personal services is due to resignation of Computer Programmer and the switch of the position to one at lower pay. Remainder of personal service funds returned to operating.

*** \$20,000 renovation of S-9 greenhouse (\$10,000 from SAES Directors and \$10,000 from the S-9 operating budget).

Sources of Funds

ARS Base (Recurring Funds)	\$1,471,627	\$1,513,841
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Expenditures

Personal Services	710,608 (18.85FTE)	828,296 (24.15FTE)
Travel of Persons	22,000	31,000
Rent	24,000	-
Printing & Reproduction	500	500
Contract & Other Services	172,614*	135,300**
Repair & Maintenance	44,000	-
Research Support Agreement	53,060	34,000
Supplies & Materials	109,968	71,437
Equipment	16,328	27,000
Land & Structure	50,000*	30,000**
Extramural	158,200	201,200
IRC	110,319	155,108
TOTAL	\$1,471,627	\$1,513,841

* Renovation of S-9 Greenhouse, \$42,085; Renovation of Screenhouse, \$18,000; Construction of 10 ft. Deerfence around 10 acres of new plot land, \$19,000.

** Irrigation system for new plot land, \$30,000; Utilities (connection and installation of water & electricity) to Butler building, \$16,112.

1992

S-9 TECHNICAL COMMITTEE REPORT

Agency: USDA, ARS
Tropical Agriculture Research Station
Submitted by: Francisco Vázquez, Agronomist
P.O. Box 70
Mayaguez, Puerto Rico 00681

Accession User: A. Sotomayor-Ríos and S. Torres-Cardona
Address: Tropical Agriculture Research Station, P.O. Box 70,
Mayaguez, Puerto Rico
Nature of Research: Evaluation of heterotic patterns among
Caribbean and tropical x temperate maize populations.
Progress to Date: The integration of tropical maize (Zea
mays) germplasm into temperate breeding programs has
been difficult and slow. More information on
performance of temperate x tropical populations and
their heterotic combinations is needed. This study
was conducted to compare heterotic patterns among
four populations. Two, a Caribbean flint (Mayorbela)
and a Caribbean dent (Diente de Caballo), are useful
in the tropics and have potential for temperate
areas; the other two are temperate x tropical
populations adapted to the tropics (OhS₉ and
OhS₁₀). The four populations, their diallel crosses
and reciprocals, and a commercial hybrid check were
grown at two locations during the winter season. The
best heterotic combination among the four populations
was the Caribbean flint and dent. The highest
yielding population per se was the temperate x
tropical population of the Reid (Group B) heterotic
pattern. The Caribbean flint population had highly
significant negative maternal effects on yield. Both
reciprocal crosses of the temperate x tropical
populations were low yielding. The results indicated
that, for temperate breeding programs, both Caribbean
populations should be useful for improving Corn Belt
maize.
Publications: Pollak, L.M., Torres-Cardona, S. and
Sotomayor-Ríos, A. Evaluation of heterotic patterns
among Caribbean and tropical x temperate maize
populations. Crop Sci. 31:1480-1483. 1991.

Accession User: A. Sotomayor-Ríos and S. Torres-Cardona
 Address: Tropical Agriculture Research Station, P.O. Box 70,
 Mayaguez, Puerto Rico

Nature of Research: Agronomic comparison of three Pennisetum interspecific hybrids and the forage sorghum Millo Blanco in Puerto Rico.

Progress to Date: Napiergrass, Pennisetum purpureum (2n=28), has proven to be an excellent male parent in crosses with cytoplasmic male-sterile lines of pearl millet P. glaucum (2n=14), for the development of superior interspecific Pennisetum forage hybrids (IPFH). These hybrids (3A=21) are sexually propagated and combine the leafiness and forage quality of pearl millet with the high dry matter content and perennial nature of napiergrass. Three IPFH (101, 102, and 103) developed by W. H. Hanna and the photoperiod-sensitive forage sorghum Millo Blanco, Sorghum bicolor, were compared at cutting intervals (CI) of 45, 55, and 85 days at two locations. Across locations, dry forage yields (DFY) of the Pennisetum interspecific hybrids were 6.0, 10.4 and 16.0 t/ha at the 45- (7 harvests), 65- (5 harvests), and 85- (4 harvests) day intervals, respectively, representing 119, 79 and 127% more yield than that of Millo Blanco. It appears that the optimum time for harvesting these grasses is 65 days. At this stage, the DFY were 5.8, 9.5, 11.4, and 10.3 t/ha for Millo Blanco and the three IPFH, respectively. The *in vitro* dry matter digestibility for the same cutting interval ranged from 43 to 52% and the crude protein content from 6 to 11%. The perennial nature of the interspecific hybrids plus their production of excellent quality forage attest to their potential as valuable new forage crops for the tropics.

Publications: Torres-Cardona, S., Sotomayor-Ríos, A. and Torres, C. Agronomic comparison of three Pennisetum interspecific hybrids and forage sorghum Millo Blanco in Puerto Rico. In: Proc. XXVIII Annual Meeting, Carib. Food Crops Soc., Santo Domingo, Dominican Republic. 1992.

Accession User: A. Sotomayor-Ríos and S. Torres-Cardona
 Address: Tropical Agriculture Research Station, P.O. Box 70,
 Mayaguez, Puerto Rico

Nature of Research: Qualitative and quantitative responses of dwarf and tall napiergrass selections in Puerto Rico.

Progress to Date: The agronomic performance of dwarf napiergrass selections N75, N114, N127, and N128 and Merkeron was compared with that of the merker variety. The experiment was conducted at two

locations at cutting intervals (CI) of 45, 65, and 85 days. The dry forage yields (DFY) of Merkeron were superior to those of the four dwarf selections and merker at all CI except that of 85 days, when merker was superior. Although the DFY of the dwarf napiergrasses compared favorably to those obtained from the best forages in Puerto Rico, more uniform and higher yearly yields could be obtained from them if they were converted from short-day to day-neutral plants. These grasses contain useful genes for dwarfness and leafiness and could be used for the development of superior Pennisetums for the tropics.

Publications: None.

Accession User: A. Sotomayor-Ríos and S. Torres-Cardona
Address: Tropical Agriculture Research Station, P.O. Box 70,
Mayaguez, Puerto Rico

Nature of Research: Response of non-converted and fully-converted selections of forage sorghum Millo Blanco to daylength in Puerto Rico.

Progress to Date: A field experiment was conducted at the Isabela USDA-ARS experiment farm (18° 28' N) to evaluate the effect of daylength on plant height (Pht), days to midbloom (DMB), and other agronomic traits of Millo Blanco Fully-Converted (MBFC), Millo Blanco Non-Converted (MBNC), and BTx406 (4-dwarf photoperiod insensitive). The MBFC selections were based on Pht of 0.50, 1.2 and 1.7 m. The trials were planted on the 21st day of each month starting in May, 1991, and ending in December. After an initial 30-day growth period, the plants were evaluated every 15 days until harvest. A split-plot design (5 genotypes x 5 treatments) was replicated four times. Daylength in Puerto Rico varies from 11.02 h (December 21) to 13.13 h (June 21-22). Days to midbloom of MBNC were 175, 144, 114, 83, 70, 61, 70 and 75 days when planted between May 21 (12.59 h) and December 21 (11.02 h), respectively. Pht of MBNC followed a similar trend to that of DMB, ranging from 5.16 m (May 21) to 1.70 m (December 21). The DMB of the three MBFC selections was similar throughout the year (61 days), while Pht was more stable in the 1.7 m and 1.2 m selections. This study demonstrated the reliability of the selection process for determining Pht and maturity of fully-converted sorghums and provides an opportunity for the utilization of height and maturity genes in the development of superior forage and grain sorghums for the tropics.

Publications: None.

Accession user: A. Sotomayor-Ríos and S. Torres-Cardona

Address: Tropical Agriculture Research Station, P.O. Box 70,
Mayaguez, Puerto Rico

Nature of Research: Establishment and adaptation of perennial
peanut on an Ultisol in Puerto Rico.

Progress to date: Perennial peanut species Arachis glabrata
(rhizomatous) and A. pintoii (stoloniferous) are
attributed with high nutritional quality,
palatability, persistence, and competitiveness with
grasses. Little is known of their agronomic value
outside of Florida and areas of South America. The
main liability of Arachis is its slow rate of
establishment, often more than one year. Studies
were conducted on an Ultisol during a nine-month
period to determine if the use of plant tops with
rhizome crowns (rhizomatous) and seedlings
(stoloniferous) could accelerate the rate of plant
spread and influence plant vigor and yield. In two
separate studies, evaluations were made of nine
selected accessions and cv. Arbrook of A. glabrata
species from Florida and six A. pintoii introductions
from CIAT. Four of the rhizomatous type established
successfully. Three had relatively slow growth in
the first 12-16 weeks, with an average of 35% plot
cover and a high incidence of weeds. UF 99, however,
had 75% soil coverage at 16 weeks and allowed little
weed development. The commercial cv. Arbrook failed
to establish. Three stoloniferous introductions,
CIAT 18744, 18747 and 18748, exhibited a high rate of
plant spread at 16 weeks (over 90% soil coverage)
with little weed growth. At nine months, UF 99 had
fully established (100% plot cover), and accessions
UF 3, UF 77 and UF 64 had a range of 75-90% coverage
with an average canopy height of 30 cm. No major
insect damage or disease was observed on the plant
material during the experiment. The highest dry
matter yield (DMY) was obtained from UF 99, which had
an average yield of 5,568 kg/ha at nine months. DMY
of the three other accessions averaged only 2,844
kg/ha. For the introductions, DMY averaged 4,670
kg/ha. Based on these preliminary studies, UF 99 and
the three CIAT introductions exhibit potential for a
faster rate of establishment and adaptation.

Publications: None

Accession User: A. Sotomayor-Ríos and S. Torres-Cardona
Address: Tropical Agriculture Research Station, P.O. Box 70,
Mayaguez, Puerto Rico
Nature of Research: Screening perennial peanut germplasm for
persistence and yield in Puerto Rico.
Progress to Date: Seventy-seven diverse genotypes of perennial
Arachis introductions in an Ultisol are being
evaluated for percent plot cover, percent weeds,
weight of rhizomes, and plant persistence. Twelve
selected accessions (highest plot cover) are also
being evaluated for dry matter yield and residual dry
matter. The introductions have exhibited a broad
range of variation in plant vigor and spread to
date. After two growing seasons, the introduction
plots were subjected to grazing using the
"mobgrazing" technique to determine its effect on
persistence and yield.
Publications: None

Accession User: A. Sotomayor-Ríos
Address: Tropical Agriculture Research Station, P.O. Box 70,
Mayaguez, Puerto Rico
Nature of Research: Increase and evaluation of sorghum
collection.
Progress to Date: Part of the world sorghum collection (500
accessions) was planted; individual plants were
selfed and classified. The selfed seed was returned
to the Coordinator of the South Atlantic Area
Regional Plant Introduction Station.
Publications: None

Accession User: A. Sotomayor-Ríos
Address: Tropical Agriculture Research Station, P.O. Box 70,
Mayaguez, Puerto Rico
Nature of Research: Increase and evaluation of corn collection.
Progress to Date: One hundred and ninety-three accessions were
planted (2 reps), increased and classified. The seed
will be returned to the Corn Curator of the Midwest
Regional Plant Introduction Station.
Publications: None.

Accession User: R. Goenaga
Address: Tropical Agriculture Research Station, P.O. Box 70,
Mayaguez, Puerto Rico
Nature of Research: Growth, nutrient uptake, and yield
performance of three tanier (Xanthosoma spp.)
cultivars grown under intensive management.

Progress to Date: A study was conducted to determine the growth, nutrient uptake, and yield performance of tanier cultivars Blanca del País, Kelly, and Morada under intensive management. Plants grown under field conditions were harvest for biomass production about every 30 days during the growing season. At each harvest, plants were separated into various plant parts to determine dry matter accumulation, N, P, K, Ca, Mg, and Zn uptake, and yield. Overall, there was no significant difference in total dry matter production between cultivars Blanca and Morada, whereas Kelly accumulated significantly less dry matter. Maximum uptake of nutrients was 307, 83, 417, 112, 68, and 1.4 kg/ha of N, P, K, Ca, Mg, and Zn, respectively, for cultivar Blanca. Nutrient uptake by Kelly was considerably less than that of Blanca and Morada. Maximum yield ranged from 11,316 kg/ha for Kelly to 34,068 kg/ha for Morada.

Publications: Goenaga, R., and Singh, U. 1991. Growth and development of tanier (Xanthosoma spp.). I. Accumulation and partition of dry matter. Proc., Workshop on taro and tanier modeling, Honolulu, HI.

Accession User: E. Rivera

Address: Tropical Agriculture Research Station, P.O. Box 70, Mayaguez, Puerto Rico

Nature of Research: Improving tanier (Xanthosoma spp.) through breeding and management.

Progress to Date: Treating tanier seeds with colchicine to double their chromosome number has continued. Plants originating from successfully treated seeds have been multiplied by tissue culture techniques and will be evaluated in the field for productivity and resistance to dry-root rot. Meristem tissue has also been treated with colchicine in the tissue culture laboratory. Several lines from the tanier collection have undergone isozyme analysis. The transference of the collection to tissue culture will be completed in the near future.

Publications: None

Accession User: F. Vázquez

Address: Tropical Agriculture Research Station, P.O. Box 70, Mayaguez, Puerto Rico

Nature of Research: Germplasm evaluation of yam and cassava has focused on evaluating varietal potential disease and pest resistance and germplasm enhancement.

Progress to Date:

Yam:

The yam (Dioscorea spp.) is a valuable root crop of the tropics. It's a good source of carbohydrates and a popular staple in the Caribbean. Ongoing systematic research is being conducted towards the improvement and management of this crop. Previous studies were conducted to evaluate yield and disease resistance in two cultivars of D. alata. In current research, 10 D. alata and five D. esculenta cultivars were evaluated with and without vine support to determine the effect of this aspect of management on yield. There were no significant differences in tuber yield response between trellised and non-trellised cultivars of both species. Binugas and Gunung cultivars had the highest total production, and the D. alata cultivars had higher production than those of D. esculenta.

Cassava:

During 1990-1991, 49 cassava (Manihot esculenta) accessions were evaluated for agronomic traits. Results of field and postharvest trials identified cultivars with good yield, high dry matter content, low HCN potential, and good culinary quality. Some of the cultivars were also found to be resistant to microbial and physiological damage. Treatment of store roots with fungicide (4,000 ppm of Mertect) was effective in slowing deterioration without affecting culinary quality. Results indicated that many of the cultivars tested have good potential for growers on the island and elsewhere in the tropics.

Publications: None

Accession User: F. Vázquez

Address: Tropical Agriculture Research Station, P.O. Box 70,
Mayaguez, Puerto Rico

Nature of Research: Maintenance, increase, and distribution of
germplasm collections.

Progress to Date:

Germplasm Collections:

Fruit trees, vines, and shrubs. Over 550 accessions of 416 species, representing nearly 190 genera of tropical and subtropical fruits and nuts, ornamental and medicinal trees and shrubs, and legumes and grasses are maintained on the TARS grounds.

Yam (Dioscorea spp.). Ten selections of Dioscorea alata, five of D. esculenta, three of D. rotundata and three of D. cayanensis were grown for evaluation in replicated plots. Requests for yam plant material were processed during the month of March, 1992.

Cacao (Theobroma cacao). In cooperation with the American Cocoa Research Institute (ACRI), TARS maintains a disease-free field collection of selected cacao clones, which serves as a permanent source of budwood for worldwide distribution. The collection consists of more than 380 clones, with three mature plants representing each clone. The cacao collection provides plant material for continuous breeding research, serving also as a source of moderate or large-scale distribution to scientists, cacao breeders, and institutions in the U.S. and throughout the world. New clones are added to the collection once they are grafted and achieve the proper size for transplanting.

Cassava (Manihot esculenta). A collection of 51 cultivars of cassava is under field evaluation at the Isabela farm. Vegetative material is available for distribution.

Germplasm Introductions:

The following plant introductions were received at TARS from June 1, 1991, to May 31, 1992:

<u>Taxonomic Name</u>	<u>Quantity</u>
<u>Litchi chinensis</u>	2
<u>Canna edulis</u>	2
<u>Bambusa</u> sp.	1
<u>Phyllostachis</u> sp.	7
<u>Arundinaria</u> sp.	2
<u>Pleioblastus</u> sp.	2
<u>Ziziphus mauritiana</u>	2
<u>Dioscorea</u> spp.	<u>25</u>
Total	43

Germplasm Distribution:

TARS is directed to fulfill local, national, and foreign needs for plant germplasm. Requests have been handled from Puerto Rico, the Virgin Islands, the continental United States, and foreign countries

for seeds, tubers, cuttings, leaves, seedlings, fruits, nuts, etc. A summary of these distributions during fiscal year 1991-1992 follows:

		<u>Entries</u>
<u>USA (including PR and VI):</u>		
Institutions		111
USDA		139
Individuals		<u>5</u>
	Total	255

<u>Foreign countries:</u>		
Institutions		155
Individuals		<u>5</u>
	Total	160

Publications: Telek, L. and Vázquez, F. Research programs and germplasm collections of the USDA-ARS Tropical Agriculture Research Station. Proc. Second Int'l Scientific Conf., Godolls, Hungary, pp. 329-332. 1992.

Cultivar Releases: None