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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 Arkansas Fruit Substation
Clarksville, Arkansas

July 22-23, 1986

Submitted by

C. E. Watson Jr., Secretary
S-9 Technical Committee 1985-86

AGENDA

S-9 Technical Committee
University of Arkansas
Clarksville, Arkansas
July 22 and 23, 1986

1. Call to Order, 8:00, July 22, 1986.
2. Introduction of Attendees.
3. Official Welcome - Dr. Dayton Steelman, Associate Director Arkansas Experiment Station and Acting S-9 Administrative Advisor.
4. Approval of Minutes, 1985 Meeting.
5. Additions to and Approval of Agenda, 1986 Meeting.
6. Appointment of Committees:
 - A. Nominations
 - B. Time and place of next meeting
 - C. Resolutions
7. Introduction and Remarks from the Administrative Advisor.
8. State Progress Reports and Research Plans.
9. Discussion on Revision of the S-9 Project.
10. Other Agency Reports and Research Plans.
11. National Program Staff Reports.
12. Plant Exploration Proposals.
13. Committee Reports and Acceptance:
 - A. Nominations
 - B. Time and place of next meeting
 - C. Resolutions
14. Unfinished or New Business.
15. Adjournment, Noon, July 23, 1986.
16. Tour, July 22, 1986.

1. CALL TO ORDER

The meeting of the S-9 Technical Committee was called to order by Chairman Jeff Pederson at 8:00 AM, July 22.

2. INTRODUCTION OF ATTENDEES

Name	Address	Phone
* David L. Coffey	Dept. of Plant & Soil Sciences Univ. of Tennessee 355 Ellington Plant Sci. Bldg. Knoxville, TN 37996	615-974-8829
H. W. Everett	USDA-SCS Fort Worth Federal Center P O Box 6567 Fort Worth, TX 76115	
* Bill Fike	Crop Science Dept. North Carolina State Univ. Raleigh, NC 27695-7620	919-737-3267
* Guillermo J. Fornaris	Dept. of Horticulture Agricultural Exp. Stn. Univ. of Puerto Rico P O Box 21360 Rio Piedras, Puerto Rico 00928	809-767-9705
* James S. Kirby	Dept. of Agronomy Oklahoma State Univ. Stillwater, OK 74078	405-624-6417
Dave Longer	Dept. of Agronomy Univ. of Arkansas Fayetteville, AR 72701	501-575-5731
Gil Lovell	S. Reg. Plant Intro. Station USDA-ARS Georgia Experiment Stn. Experiment, GA 30212	404-228-7255
* George G. McBee	Soil & Crop Sciences Dept. Texas A & M Univ. College Station, TX 77843	409-845-8796
* Teddy E. Morelock	Dept. of Horticulture Univ. of Arkansas 316 Plant Science Fayetteville, AR 72701	501-575-2603
* Jeff Pederson	Dept. of Agronomy & Soils Auburn University, AL 36849	205-826-4100

Jerrel B. Powell	USDA-ARS Russell Research Ctr. Athens, GA 30613	
* Gordon M. Prine	Agronomy Department Univ. of Florida 304 Newell Hall Gainesville, FL 32611	904-392-1811
Henry L. Shands	Bldg. 005, Rm. 140 BARC-W Beltsville, MD 20705	301-344-3311
* Oliver E. Smith	Soil & Crop Sciences Dept. Texas A & M Univ. College Station, TX 77843	409-845-5389
Mac Stewart	Dept. of Agronomy Univ. of Arkansas Fayetteville, AR 72701	501-575-5722
* Ann Marie Thro	Agronomy Dept. Louisiana State Univ. Baton Rouge, LA 70803-2110	
Francisco Vasquez	USDA-ARS-TARS P O Box 70 Mayaguez, Puerto Rico 00709	809-834-2435
* Clarence Watson	Agronomy Dept. Mississippi State Univ. Box 5248 Mississippi State, MS 39762	601-325-2311
George A. White	Plant Introduction Officer Germplasm Introduction & Evaluation Lab USDA-ARS Beltsville, MD 20705	301-344-3328
S. C. Wiggans	USDA-CSRS 217 J. S. Morrill Hall Washington, DC 20251	202-447-4202
* Francis Zee	Univ. of Hawaii Dept. of Horticulture Beaumont Agric. Res. Stn. 461 W. Lanikaula St. Hilo, HI 96720	
* Members of the S-9 Technical Committee.		

3. WELCOME:

Dr. Dayton Steelman, Associate Director - Arkansas Agric. Exp. Stn. and Acting S-9 Administrative Advisor, welcomed the group to Arkansas and discussed the agricultural research programs of the Univ. of Arkansas.

4. APPROVAL OF MINUTES

Oliver Smith moved that the 1985 minutes be approved as circulated. The motion was seconded by Gordon Prine. Approved.

5. APPROVAL OF AGENDA

The 1986 agenda was approved as circulated.

6. APPOINTMENT OF COMMITTEES

Chairman Pederson appointed the following committees:

- | | |
|-----------------|------------------------------|
| a. Nominations | Oliver Smith
David Coffey |
| b. Time & Place | Gordon Prine
George McBee |
| c. Resolutions | Ann Marie Thro
Jim Kirby |

7. REMARKS FROM ADMINISTRATIVE ADVISORS

Dr. Steelman stated that Dr. Laughlin, S-9 Administrative Advisor, urged all committee members to make the S-9 project highly visible to their directors. This makes it much easier for Dr. Laughlin to justify requests for additional funding for S-9 from the Southern Directors.

Dr. Jerrell Powell reported for Dr. Ernest Corley, USDA Co-Administrative Advisor. He announced that some administrative changes were in order at Experiment. The new horticulturist for the S-9 project is now on board and is in the process of initiating his research program. The new steel building to house the sweet potato project has been completed.

Dr. S. C. Wiggans, USDA-CSRS, announced that the S-9 project was due to terminate in 1987. He urged the chairman to appoint a writing committee to insure timely revision of the project. He stated that the effects of the Gramm-Rudman bill on CSRS funding are still not known at this time. CSRS has money available for collaborative work with international centers and he urged individuals to apply. He also stated that CSRS needed success stories to use in budget justification. If anyone knows of any such examples they should send a 1-2 paragraph summary to Dr. Wiggans. Dr. Wiggans urged everyone to take the opportunity to participate as a member of a CSRS review team if asked to serve.

12. PLANT EXPLORATION PROPOSALS

Five plant exploration proposals were submitted to S-9 in 1986. These proposals are listed in Appendix II of the report of the Southern Regional Plant Introduction Station. The Plant Exploration Subcommittee (W. Fike, O. Smith, D. Bradshaw, and G. Prine) recommended the following priorities for the proposals:

<u>Priority</u>	<u>Proposal</u>
1	<u>Zea</u> spp. (teosinte) - Mexico
1	<u>Helianthus</u> spp. (sunflowers) - NW USA
2	<u>Cucumis</u> spp. (cucumber & melons) - India
3	<u>Artocarpus</u> spp. (breadfruit) - W Pacific
4	<u>Plantanus</u> spp. (sycamore) - Mexico

Bill Fike moved that the recommendation be accepted and Oliver Smith seconded the motion. Approved.

13. COMMITTEE REPORTS AND ACCEPTANCE

- a. Nominations - The Nominating Committee presented the following candidates for consideration: Clarence Watson (Mississippi) as Chairman and Ted Morelock (Arkansas) as Secretary for 1987. The candidates were elected by acclamation.
- b. Time and Place of Next Meeting - The Location Committee proposed that the 1987 S-9 Technical Committee meeting be held at Texas A & M Univ., College Station, Texas, on July 21-22, 1987. The proposal was accepted by acclamation.

The committee recommended that S-9 accept an invitation from Dr. Merle Niehaus, Administrative Advisor for W-6, to meet jointly with the other three regional technical committees at Fort Collins, CO in July or August of 1988. The motion was passed by acclamation.

The committee recommended that S-9 consider the possibility of a meeting in Puerto Rico in 1989. The motion was passed by acclamation.

- c. Resolutions - The following resolutions were presented by the Resolutions Committee and were accepted by acclamation:

Resolution I

Be it resolved that the S-9 Technical Committee express its appreciation to Dr. Dayton Steelman, Dr. Teddy Morelock, and Dr. John Clark of the University of Arkansas and the University of Arkansas Fruit Substation (Clarksville, AR) for their efforts in hosting our annual meeting. The interesting orchard and small fruits research at the beautifully situated Fruit Substation prompt our thanks to the organizers for arranging our meeting at Clarksville.

Resolution 2

Be it resolved that the S-9 Technical Committee express its appreciation to Dr. Eli Whiteley for his past work with S-9 and his continuing interest in this committee.

Resolution 3

Be it resolved that the S-9 Technical Committee acknowledge the passing of Dr. Louis N. Bass, Director of the National Seed Storage Laboratory at Fort Collins, CO. Dr. Bass spent many years of service dedicated to preservation of plant germplasm so that it might be available for use by future generations. Those of us still working in this area deeply appreciate the efforts of Dr. Bass and regret the loss of this member of our profession.

Resolution 4

Be it resolved that the S-9 Technical Committee acknowledge the recent retirements of Oscar Ramirez (Puerto Rico), Roy Sigafus (Kentucky), and Paul Solderholm (Subtropical Hort. Res. Stn.) and the impending retirement of Oliver Smith (Texas). These individuals have been faithful members of our committee and we take this opportunity to express appreciation for their efforts and to wish them a healthy and happy retirement.

14. UNFINISHED OR NEW BUSINESS

There was no unfinished or new business.

15. ADJOURNMENT

The meeting was adjourned by Chairman Jeff Pederson at 11:00 AM, July 23.

16. TOUR

A tour of the ongoing research at the University of Arkansas Fruit Substation was conducted on the afternoon of July 22.

APPENDIX I

STATE AND FEDERAL AGENCY REPORTS

Written progress reports are attached in the following order:

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

Germplasm Introduction and Evaluation Laboratory
National Program Staff
Soil Conservation Service
Southern Regional Plant Introduction Station
Subtropical Horticultural Research Station
Tropical Horticultural Research Station

S-9 Technical Committee Report
July 1986

AGENCY: Auburn University

SUBMITTED BY: J.F. Pedersen

ADDRESS: Department of Agronomy and Soils, Auburn University, AL 36849

ACCESSION USER: J.F. Pedersen

ADDRESS: Department of Agronomy and Soils, Auburn University, AL 36849

NATURE OF RESEARCH: Improved cultivar development from tall fescue P.I. accessions

PROGRESS TO DATE: Yield trials of improved populations from each of the following P.I. accessions: 283286, 265357, 283287, 283298, 297903, 297909, 315432, 316252, 321676, 422719, 422737, 422744, 422747, 422749, 422750, 422765, 423049, 423050, 325322, 388897, 388898, 418601, 418604, 418606, 418608, 419532, 422621, 422697, 422704, 422705, 422706, 422707, 422714, 423054, 423107, 442117, 442120, and 449300 were established in the fall of 1985.

PUBLICATIONS: None

CULTIVAR RELEASES: None

ACCESSION USER: J.F. Pedersen

ADDRESS: Department of Agronomy and Soils, Auburn University, AL 36849

NATURE OF RESEARCH: Development of a southeasterly adapted birdsfoot trefoil cultivar from P.I. accessions.

PROGRESS TO DATE: Seed of AU Dewey birdsfoot trefoil (selected from P.I. 188556 and 251558) was increased and foundation nurseries were established.

PUBLICATIONS: None

CULTIVAR RELEASES: None

ACCESSION USER: Tony A. Glover

ADDRESS: The Alabama Cooperative Extension Service
Jefferson County Office
Courthouse/Rm. 409
Birmingham, AL 35263

NATURE OF RESEARCH: Screening of Amaranthus spp. for vegetable and seed production in the Southern Region.

PROGRESS TO DATE: Seeds were planted and lines were grown for observation.

CULTIVAR RELEASE: None

PUBLICATIONS: None

ACCESSION USER: Mike Davis

ADDRESS: Route 1, Box 196, Ashford, AL 36312

NATURE OF RESEARCH: Screening tall fescue for adaption to the Southern Coastal Plain Region.

PROGRESS TO DATE: Seed of tall fescue accessions have been established for evaluation.

PUBLICATIONS: None

CULTIVAR RELEASES: None

ACCESSION USER: Dr. Jorge Mosjidis

ADDRESS: Department of Agronomy and Soils, Auburn University, AL 36849

NATURE OF RESEARCH: Screening Vicia spp. and Lespedeza spp. for adaptation to conditions found in Alabama.

PROGRESS TO DATE: Accessions have been planted and are undergoing evaluation.

PUBLICATIONS: None

CULTIVAR RELEASES: None

ACCESSION USER: Dr. C.C. King, Jr.

ADDRESS: Department of Agronomy and Soils, Auburn University, AL 36849

NATURE OF RESEARCH: Evaluation of several species for biomass production. Sweet sorghum M 81 E and 71-1 are included in the above.

PROGRESS TO DATE: Evaluation is continuing.

PUBLICATIONS: None

CULTIVAR RELEASES: None

ACCESSION USER: Phillip Strniste

ADDRESS: Department of Horticulture, Auburn University, AL 36849

NATURE OF RESEARCH: Screening Vigna unguiculata accessions for resistance to Blackeye Cowpea Mosaic Virus using ELISA.

PROGRESS TO DATE: Fifteen lines have been identified as being resistant to the virus.

PUBLICATIONS: None

CULTIVAR RELEASES: None

ACCESSION USER: Gene Hunter

ADDRESS: Department of Horticulture, Auburn University, AL 36849

NATURE OF RESEARCH: Screening of Lycopersicon esculentum accessions for heat tolerance.

PROGRESS TO DATE: Accessions are currently being evaluated in the greenhouse.

PUBLICATIONS: None

CULTIVAR RELEASES: None

ACCESSION USER: Dr. J. D. Norton

ADDRESS: Department of Horticulture, Auburn University, AL 36849

NATURE OF RESEARCH: Determining descriptors, increasing seed, and enhancing the germplasm of Citrullus spp. and Cucumis spp. accessions.

PROGRESS TO DATE: Seed increase and plant descriptor is underway. Advanced lines with Gummy Stem Blight, Alternaria, Anthracnose, and Root Knot Nematode Resistance have been developed.

PUBLICATIONS: None

CULTIVAR RELEASES: None

ACCESSION USER: Ken M. Rogers

ADDRESS: P. O. Box 311, Auburn, AL 36830

NATURE OF RESEARCH: Display in Auburn University crops garden.

PROGRESS TO DATE: Two accessions established

PUBLICATIONS: None

CULTIVAR RELEASES: None

1986

S-9 Technical Committee Report

Agency: Arkansas Agricultural Experiment Station
Submitted by: T.E. Morelock
Address: Department of Horticulture and Forestry, 316 Plant Science
Building, University of Arkansas, Fayetteville, AR 72701
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Accession User: T.E. Morelock
Address: Department of Horticulture and Forestry, 316 Plant Science
Building, University of Arkansas, Fayetteville, AR 72701
Nature of Research: Breeding for Rhizoctonia root rot resistance in
green bean Phaseolus vulgaris L.
Progress to Date: High levels of resistance have been fixed in white
seeded bush type plants by crossing PI 165426 and Venezuela 54
with commercial white seed cultivars.
Publications: None
Cultivar Releases: None

Accession User: S.J. Scott
Address: Department of Horticulture and Forestry, University of
Arkansas, Fayetteville, AR 72701
Nature of Research: Variety development, tomatoes
Progress to Date: Initiated screening for resistance to Arkansas strains
of spotted wilt virus.
Publications: None
Cultivar Releases: None

Accession User: S.J. Scott
Address: Department of Horticulture and Forestry, University of
Arkansas, Fayetteville, Arkansas 72701
Nature of Research: Variety development, okra
Progress to Date: Established data base for 25 traits on 628 PI's
grown at Fayetteville
Publications: None
Cultivar Releases: None

Accession User: D.E. Longer

Address: University of Arkansas, Agronomy Department, Fayetteville, AR 72701

Nature of Research: Evaluation of grain amaranth (Amaranthus spp) as a potential row crop in Arkansas.

Progress to Date: The third year of field work is being completed in which strains, row width, population and nitrogen interactions have been investigated. Greenhouse studies involving herbicide tolerance or susceptibility have also been conducted.

Publications: Waldroup, P.W., H.M. Helwig, D.E. Longer and C.S. Endres. 1985. The utilization of grain amaranth by broiler chickens. Poultry Sci. 64:759-762.

Master's Thesis: Influence of Production Practices on Yield and Morphology of Amaranthus cruentus and Amaranthus hyp-
hondriacus.

Cultivar Releases: None

Accession User: James McD. Stewart

Address: Agronomy Department, University of Arkansas, Fayetteville, AR 72701

Nature of Research: Acquisition, evaluation and enhancement of Gossypium germplasm

Progress to Date: The 1985 collections of Gossypium seed and voucher specimens from Australia are currently being studied. Three new species have been identified, and other variants may be given species rank before the work is completed. Also, a new species of Glycine was collected in 1985. Introgression of G. barbadense nuclear genes into the cytoplasms of 8 wild Gossypium species was continued. Transfer of caducous bract and red anther from G. amourianum to upland cotton was advanced one generation. Cytogenetic study of the Australian Gossypium was begun.

Publications: Stewart, J.M. 1986. Cytogenetic observations on the Australian Gossypium. Proc. Beltwide Cotton Prod. Res. Conf. p. 102 (Abstr.).

Stewart, J.M., L.A. Craven, and P.A. Fryxell. 1986. Report on 1985 Gossypium collection in Australia. Proc. Beltwide Cotton Prod. Res. Conf. p. 102 (Abstr.)

Umbeck, P.F., and J.M. Stewart. 1985. Substitution of cotton cytoplasms from wild diploid species for cotton germplasm improvement. Crop Sci. 25:1015-1019.

Cultivar Releases: None

1986 S-9 TECHNICAL COMMITTEE REPORT

Agency: Florida Agricultural Experiment Stations

Submitted by: G. M. Prine

Address: Department of Agronomy
304 Newell Hall, University of Florida
Gainesville, FL 32611

Accession User: B. Tjia

Address: Department of Ornamental Horticulture
1545 Fifield Hall, University of Florida
Gainesville, FL 32611

Nature of Research: Evaluation of crossandra, musaenda, calla lilies, lisianthus, justicia and heliconia for suitability of new alternative crops for use by commercial ornamental plant growers in the state of Florida. Heliconia and other tropical herbaceous flowering plants to be evaluated for cut crop and to develop production practices of these crops.

Progress to Date: Calla lilies, crossandra, justicia have been evaluated and production practices developed. Calla lilies, tuber storage, postharvest life, etc., have been evaluated.

Publications: Tjia, B. 1985. Introducing the calla lily, exciting new crop, a novelty in U.S. Greenhouse Manager 4(6): 122-124.

Tjia, B. 1985. Hybrid calla lilies. A potential new crop for Florida, Proc. Florida Hort. Soc. (in press).

Tjia, B. 1985. Postharvest studies of the white calla lily Zantedeschia aethiopica. In. Proc. Tropical Region Amer. Soc. Hort. Sci.

Tjia, B. and T. J. Sheehan. 1986. Chemical height control of Lisianthus russellianus. Hort Science 21(1) 147-148.

Tjia, B. and B. McKay. 1986. Growth regulators effect on growth and flowering of Zantedeschia rehmannii. Hort Science (submitted).

Tjia, B. and T. J. Sheehan. 1984. Longevity, quality studies help prolong life of Heliconia. Greenhouse Manager 2(#11) 94-100.

Cultivar Releases: None

Accession User: P. Mislevy
Address: AREC, Ona, FL
Nature of Research: Compare new genotypes of Hemarthria and bahia to standard cultivars for yield and quality.
Progress to date: A mob grazing experiment was initiated to study the yield, quality, persistence and stubble carbohydrate level of Argentine bahiagrass PI 306279, and two Hemarthria grasses PI 364869 and PI 364871 when harvested at 2, 4, 6 and 8 weekly intervals. These introductions are being compared with known released cultivars. No data is presently available.

Publications: None

Cultivar Releases: None

Accession User: L. S. Dunavin
Address: Agricultural Research and Education Center
Route 3, Box 575
Jay, Florida 32565-9524

Nature of Research: Evaluation of forage and biomass crops for utilization in the panhandle of Florida.

Progress to Date: The introductions P.I.432425, P.I.432426, P.I.432427, and P.I.432432 Arundo donax (Giant Reed) were set at AREC, Jay on 13 May 1985 for observation as to biomass potential. In December, 1985, these rated 3rd, 10th, 4th, and 6th, respectively, among their test group of twelve as to yield potential observed. P.I.432426 was removed from the observation on 15 April 86 since only one small plant remained. It was reset and has since died.

Publications: None

Cultivar Releases: None

Accession User: D. W. Gorbet

Address: Agricultural Research Center, Marianna
Route 3, Box 493
Marianna, FL 32446

Nature of
Research: Peanut Breeding

Progress to Date: The following PIs are being evaluated in field and greenhouse tests for leafspot resistance by a M.S. graduate student, along with numerous breeding lines that have these and other PIs in their pedigree.

PI 415880	PI 196731	PI 145046	PI 268657
PI 196628	PI 196832	PI 145681	PI 268863
PI 196640	PI 200432	PI 203395	PI 268883
PI 196647	PI 277197	PI 203396	PI 268894
PI 196649	PI 338339	PI 259641	PI 268913
PI 196655	PI 365553	PI 259812	PI 268931
PI 196656	PI 372263	PI 259822	PI 274191
PI 196657	PI 272303	PI 259849	PI 300243
PI 196684	PI 384498	PI 261893	PI 300946
PI 196695	PI 415881	PI 261706	PI 300947
PI 196716	PI 121067	PI 264168	

Selections and evaluations are continuing in segregating populations and advanced lines are in yield trials from crosses with various PIs. PIs that have contributed the greatest number of promising breeding lines with leafspot resistance include PI 203396, 145681, 259785, 268894, 262090, 261911, 306230, 383424, and others.

The new leafspot resistant cultivar 'Southern Runner' (released in 1985) has PI 203396 as a parent. Seed should be available in 1987.

Publications: Gorbet, D. W., A. J. Norden, F. M. Shokes, and D. A. Knauft. 1985. Southern Runner - A new leafspot resistant peanut variety. Univ. of Fla. - IFAS Circular (in press).

Coffelt, T. A., W. D. Branch, D. W. Gorbet, J. S. Kirby, R. e. Lynch, A. J. Norden, C. E. Simpson, O. D. Smith, and J. C. Wynne. 1985. 1985 Uniform Peanut Performance Tests. USDA, ARS, and Va. Poly. Inst. and State Univ. Tidewater Research Center Information Series No. 137, 19 p.

Tappan, William B., and Daniel W. Gorbet. 1985. Peanut Insect Management in 1985. Univ. of Fla., Quincy NFREC Res. Rpt. NF 85-5, 19 p.

Pixley, Kevin V. 1985. Physiological and epidemiological characteristics of leafspot resistance in four peanut genotypes. M.S. Thesis (138 p.) Univ. of Fla. (Agronomy).

Cultivar Release: 'Southern Runner' peanut in 1985.

Accession User: Dr. O. C. Ruelke

Address: Dept. of Agronomy, IFAS
University of Florida
Gainesville, FL 32611

Nature of Research: Forage improvement from new germplasm under varied management.

Progress to Date: Two limpgrass cultivars, developed from PI 399993 and PI 364888 grown in association with four tropical summer legumes (aeschynomene, alycelover, carpon desmodium and hairy indigo) persisted without any nitrogen fertilizer added and produced grass yields compareable to limpgrass which got 168 kg ha⁻¹ of N annually.

Forage grown from associations of three tropical grasses grown in association with 'Florigraze' rhizoma peanut a seedling from PI 118457 rhizoma peanut, obtained sufficient nitrogen from the peanuts to exceed the minimum requirements of beef cattle without any addition of nitrogen fertilizer.

Publications: Valentin, J. F., O. C. Ruelke, and G. M. Prine. 1986. Yield and quality of tropical grasses, a legume and grass-legume association as affected by fertilizer nitrogen. Soil Crop Sci. Soc. Fla. Proc 45: In press.

Accession User: F. P. Gardner

Address: Department of Agronomy
304 Newell Hall, Univ. of Florida
Gainesville, FL 32611

Nature of Research: For ground cover and turf, PI 262840 (Arachis glabrata) was planted as rhizomes in 12"-rows in a well prepared seedbed on 5-9-83. Prior to planting sawdust was incorporated ca. 100t/A to improve soil physical conditions and to discourage weed competition by nitrogen immobilization. Survival and establishment was good to excellent despite several weeks of moisture deficiency immediately following planting. Grassy weed

to over 1000 acres. New plantings of both Arbrook and Florigraze suffered severe plant loss during the dry winter.

PI 300086, N-43, N-51, and Merkeron elephantgrasses (Pennisetum purpureum) are leading the elephantgrass trials in biomass yields.

Pigeonpea cultivar development remain static over 1984 and 1985 seasons from a quarantine on legumes due to the peanut strip virus. No strip virus has been found in pigeonpea yet. Plans are to go ahead with release of one of these lines: 81W, 76W and 99W.

The fourth cycle of recurrent selection of a Marshall-maturity annual ryegrass population for crown rust resistance was conducted at Gainesville during the 1985-86 winter season. Testing of plants from the second and third cycle of selection indicated a high level of crown rust resistance has already been obtained in ryegrass population.

A recurrent selection nursery of fababeans (Vicia faba) was conducted during the winter of 1985-86. Only a few plants survived to make seed for next generation.

A 5-acre planting of K-8 leucaena (Leucaena leucocephala) was established in cooperation with the USDA at Brooksville in July 1985. Initial seedling emergence was good. We used Cole planters with small kernel corn plates to plant the leucaena seed directly in the field. The plates usually planted 2 or 3 leucaena seed per hill. We scarified seed by placing in boiling water, then applied fungicide plus Nitragin "peligel" and used lime to dry up moisture and form a coating over seed. Seed were then allowed to dry. Two hours prior to seeding, inoculant and peligel were applied to coated seed and allowed to dry before beginning planting operations. This planting winter killed in winter of 1985-86 and has been replanted in June, 1986 using same techniques.

Cultivar Release: Arbrook Rhizoma Peanut, release Circular being processed for publication.

Accession User: D. D. Baltensperger

Address: Agronomy Department
304 Newell Hall, University of Florida
Gainesville, FL 32611

Nature of Research: Forage legume breeding

Progress to Date: Many plant introduction accessions are being used in development of ladino clover, crimson clover, sub clover, arrowleaf clover, alyceclover and hairy indigo cultivars. Primary emphasis is on development of rootknot nematode resistance in the crops. The release of a population of early maturing crimson clover (FL-XPC-B) as a new cultivar is being processed at present time.

Accession User: S. C. Schank

Address: Agronomy Department
304 Newell Hall, University of Florida
Gainesville, FL 32611

Nature of Research: Pennisetum breeding

Progress to Date: Over 12,000 pearl millet x elephantgrass hybrids have been made and are under evaluation for both forage and biomass.

Accession User: K. H. Quesenberry

Address: Agronomy Department
University of Florida
Gainesville, FL 32611

Nature of Research: Evaluation of tropical forage germplasm for yield, persistence, and pest resistance.

Progress to Date: Research has continued on grazing management variables, which will enhance establishment of the tropical legume aeschynomene in 'Floralta' limpgrass (formerly PI 364888). Animal average daily gains on Floralta + aeschynomene averaged over two seasons were 85% greater than on Floralta alone.

Research with Aeschynomene americana germplasm continued in 1985-86. A study was conducted to evaluate inheritance of photoperiod response which indicated high heritability and that effective selection for intermediate plant type with mid season flowering should be possible. The genetics of resistance to root-knot nematode in A. americana are also being investigated.

Over 75 accessions of various Desmodium spp. were evaluated for root-knot nematode response. New introductions of D. ovalifolium, and D. strigolosum from CIAT had variable responses with some having good resistance compared to the susceptible 'Florida' carpon desmodium. D. intortum and D. uncinatum lines were usually resistant while D. barbatum was variable in its response. Two F₁ hybrid plants of D. ovalifolium PI 234414 X D. heterocarpon ['Florida' (PI 217910)] were obtained in 1985. F₂ seed were produced in the fall and winter of 1985-86 and populations are undergoing evaluation in the field in 1986. Additional Desmodium species hybrids were attempted in spring 1986 and putative F₁ plants are currently being evaluated.

Publications: Quesenberry, K. H., S. R. Hardy, and R. H. Dunn. 1986. Evaluating Aeschynomene americana L. germplasm for response to Meloidogyne spp. Proc. XV International Grassland Congress. In press.

Sollenberger, Lynn E., Kenneth H. Quesenberry and John E. Moore. 1986. Establishment and management of Aeschynomene in Timpogras pastures. Proc. 35th Beef Cattle Shortcourse. IFAS. Univ. of Florida, Gainesville, FL.

Cultivars released: None

Accession User: L. E. Sollenberger

Address: Agronomy Department
University of Florida
Gainesville, FL 32611

Nature of Research: Forage grass and legume management

Progress to date: Conducting grazing trials on bahiagrass, hemartharia, Aeschynomene, N-75 dwarf elephantgrass and Florigraze perennial peanut at BRU, Gainesville.

Release of N-75 dwarf elephantgrass as a cultivar is anticipated in the next year.

Accession User: Emil A. Wolf

Address: Everglades Research and Education Center
IFAS, University of Florida
P.O. Drawer A
Belle Glade, FL 33430

Nature of Research: Development of celery cultivars resistant to early blight caused by Cercospora apii Fres. and Bacterial leaf blight caused by Pseudomonas chicorii Stapp.

Progress to Date: Continuing to work with several lines in various stages of development containing resistance genes obtained from PI's 171499 and 196831. Having difficulty eliminating strong flavor associated with the resistances.

Accession User: J. M. Crall

Address: AREC Leesburg
Institute of Food and Agricultural Sciences
University of Florida
Leesburg, FL 32748

Nature of Research: Development of disease resistance in watermelon (Citrullus lanatus [Thunb.] Matson & Nakai).

Progress to Date: P.I. 189225, with purported resistance to gummy stem blight (Plant Disease Repr. 46:883-885, 1962), was used in crosses with various breeding lines in 1981. Progenies in the BC₄ in 1986 are segregating for resistance (not immunity) to gummy stem blight.

029G:Report

1986 GEORGIA S-9 TECHNICAL COMMITTEE REPORT

Agency: University of Georgia Agricultural Experiment Station
Submitted by: Carl S. Hoveland
Address: Department of Agronomy, University of Georgia, Athens, Georgia
30602
Page 1 of 4

Accession User: Richard B. Chalfant
Address: Dept. of Entomology, Coastal Plain Exp. Sta., Tifton, GA
31793-0748
Nature of Research: Eighty-five lines of southern pea were evaluated for resistance to the cowpea curculio as part of a M.S. thesis. Results will be available next year.
Publication: None

Accession User: Joseph Bouton
Address: Agronomy Dept., Univ. of Georgia, Athens, GA 30602
Nature of Research: Breeding grazing-tolerant alfalfa
Progress to date: Have used the following PI's as part of our program to select a grazing-tolerant alfalfa - 325390, 234443, 260247, 325416, 247006, and 383693.

Accession User: John Cardina
Address: USDA-ARS, Coastal Plain Exp. Sta., P. O. Box 748, Tifton, GA
31793
Progress to date: We are screening numerous species for susceptibility to a fungal plant pathogen in order to determine the host range of the organism. We have completed our preliminary host range study and have determined that our isolate of Collectotrichum truncatum is pathogenic only to certain species of Desmodium and particularly to D. tortuosum, an important weed in the Southeast.
Publications: None

Accession User: Doyle A. Smittle
Address: Dept. of Horticulture, Coastal Plain Exp. Sta., Tifton, GA 31793
Nature of Research: Melon breeding
Progress to Date: Crosses were made in the greenhouse between a bush type and 266930 and between Amarelo and 183047. Progeny of these crosses and 166 PI lines are planted in the field for further screening.
Publications: None

Accession User: John D. Miller, Research Agronomist
Address: USDA-ARS, P. O. Box 748, Tifton, GA 31793
Nature of Research: Finding P.I.s which are useful, as is, for forage purposes or to identify germplasm which can be hybridized with adapted genotypes to give agronomically useful cultivars or germplasms.
Progress to Date: Six cowpea lines were selected from among a much larger group for possible forage use. These include P.I. Nos. 163142, 186386, 292911, 293581, 339709 and 353050. Eight P.I.s of Trifolium echinatum were evaluated. Among the most useful P.I.s are No. 120122, 238159 and 238363.
Publications: None
Cultivar Releases: None
Need for Foreign or Domestic P.I. Explorations: More hardy strains of Lupinus albus and L. angustifolius are needed to breed more winterhardy lupins.

Accession User: B. R. Wiseman
Address: USDA Insect Biology Research, P. O. Box 748, Tifton, GA
31793-0748
Nature of Research: Plant Resistance to the Fall Armyworm
Progress to Date: An additional 3400 PI lines from Yemen and Ethiopia were screened during 1985. None were found with a level of resistance higher than our resistant check.
Publications: None
Cultivar Releases: None

Accession User: R. P. Lane
Address: Dept. of Horticulture, Georgia Exp. Sta., Experiment, GA
30212-5099
Nature of Research: Breeding for disease resistance in Capsicum
Progress to Date: PI 163192 and PI 264281 were crossed with "bell type" peppers to develop breeding lines with resistance to Xanthomonas vesicatoria and Tobacco Etch Virus. A backcross program will follow to recover "bell type" fruiting.
Publication: None
Cultivar Releases: None

Accession User: Dr. Jim Demski and Mr. David Pinnow

Address: Dept. of Plant Pathology, Georgia Station, Experiment, GA 30212

Nature of Research: Two stages - (1) In the summer of 1982, Dr. Grover Sowell, ARS, Research Plant Pathologist, observed striping and mosaic symptoms in the leaves of some new peanut (Arachis hypogaea L.) introductions in the S-9 P.I. Station seed increase plots. Symptoms differed from those normally produced by the endemic peanut mottle virus (PMV). On the basis of serology, electron microscopy, aphid transmission, physical properties, and polypeptide molecular weight, a potyvirus was identified as a virus that had not been previously described. Early infected groundnut leaflets invariably showed vein-banding along the lateral veins. Thus the virus was named peanut stripe virus (PSTV). (2) All peanut introductions in the P.I. Station collections were placed under an "in-house" quarantine. All peanut introductions from Peoples Republic of China, Philippines, Indonesia, Thailand, and Taiwan have been scheduled to be checked by serological tests for the presence of PSTV.

Progress to Date: Of the total peanut collection (7,526 PI's) at the S-9 P.I. Station, 3,566 have been identified as having been exposed to contamination with PSTV through insect vectors in seed increase fields in the years 1976-1985. As of June 20, 1986, 428 PI's have been checked and contamination by PSTV was verified in 26% (111) of the PI's. The clearance rate will increase after September 14, 1986, once the new S-9 Research Pathologist is in place and technical assistants are trained.

Publications:

DEMSKI, J. W., D.V.R. REDDY, G. SOWELL, JR., and D. BAYS. 1984. Peanut stripe virus - a new seed-borne potyvirus from China infecting groundnut (Arachis hypogaea). Ann. Appl. Biol. 105:495-501.

DEMSKI, J. W. and G. R. LOVELL. 1985. Peanut strip virus and the distribution of peanut seed. Pl. Dis. 69:734-738.

Accession User: James H. Chalkley

Address: Georgia Station, Dept. of Plant Pathology, Experiment, GA 30212

Nature of Research: Screening of P.I. peanut (Arachis hypogaea L. collection for resistance to peanut strip virus (PStV). All P.I. lines will be planted, inoculated with peanut stripe, evaluated for resistance and grown to maturity to check for seed transmission of peanut strip virus (PStV) using ELISA techniques.

Progress: Of the total peanut collections (7,526 PI's) at the S-9 P.I. Station, 150 have been tested. We have observed already what seems to be some resistance or at least some partial resistance to peanut strip virus (PStV). This research will continue as time and greenhouse space permits in order to test the entire collection.

Publications: None

Cultivar Releases: None

1986

S-9 Technical Committee Report

Agency: Hawaii Institute of Tropical Agriculture & Human Resources

Submitted by: P. J. Ito

Address: 461 W. Lanikaula Street, Hilo, Hawaii 96720

Page 1 of 3.

* * * * *

Accession User: Phil Parvin

Address: P.O. Box 269, Kula, Hawaii 96790

Nature of Research: Selection of ornamental species of Proteaceae for use as cut flowers and cut foliages.

Progress to Date: Plant "introduced" last year from my project were 7 selections from a total of over 50 cultivars of the Genus Leucospermum, a member of the Protea family from South Africa. These 7 were selected by a joint committee of protea growers and myself, after evaluating for vase life, color, productivity and disease resistance.

1. T-73-9-4. Dark red L. cordifolium selection from the Protea Heights Estate in the Cape Province of South Africa.
2. L. "Coral." An open pollinated hybrid of L. tottum x L. cordifolium from Harry Wood, Cape, South Africa. Exhibited apparent resistance to rootknot nematode. Large flowering, pink.
3. L. "Caroline." Another tottum x cordifolium hybrid from the Horticultural Research Institute, Tygerhoek Experimental Farm, South Africa. Lighter in color than coral and slightly smaller. Also good resistance to rootknot nematode.
4. L. "Red Sunset." A hybrid between L. lineare and L. tottum," from Protea Heights Estate. Profuse flowering, small flowers, bi-color, red-tipped yellow styles.
5. L. "Gold Dust." A large flowering, orange styled L. cordifolium selection with yellow tips on the styles from Protea Heights.
6. L. "Champagne." Our name given to #75-4-22-1 from Protea Heights. L. cordifolium x L. tottum. Nematode resistance.
7. L. "Carnival." Our name given to #75-10-14-1 from Protea Heights. L. cordifolium x L. conocarpodendron. Changes color from light yellow through orange as it matures to a deep red.

Approximately 1000 unrooted cuttings were distributed of each selection to protea growers throughout the state.

Publications: None

Accession User: Richard M. Manshardt and C. Diane Ragone

Address: Department of Horticulture, University of Hawaii, Honolulu, Hawaii 96822

Nature of Research: Collection of breadfruit / Artocarpus altilis (Park.)

Fosb. / from the Western Pacific region for horticultural evaluation and bio-systematic studies.

Progress to Date: During the latter half of 1985, Diane Ragone, Ph.D. candidate in the Department of Horticulture, collected breadfruit seeds, stem cuttings, and root cuttings from the Western Pacific region, including Western Samoa, Tonga, the Cook Islands, and Tokelau. Her work was funded in part by a grant from Pacific Tropical Botanic Garden, Kauai, Hawaii. Altogether, 333 seeds, 149 stem cuttings, and 28 root cuttings were collected, representing 70 individual trees and about

25 named types, including both seeded and seedless variants. Propagation by seeds and root cuttings was mostly successful, and the majority of these propagules produced plants after shipment to Hawaii. Stem cuttings failed completely to root, even though the bases were treated with IBA and precautions were taken against desiccation and fungal pathogens. Currently, the collection consists of root cuttings of 9 types: 'Sina' and 'Momolega' (Western Samoa); 'Tahiti', 'Niue', 'Pae'a', and 'Atu' (Cook Islands); 'Karawa' and 'Ulu Fiti' (Fiji); and 'Paia' (French Polynesia). In addition, there are seedlings of 10 types: 'Aveloloa', 'Mase'e', 'Manua', 'Ma'afala', and 'Ulu e'a' (Western Samoa); 'Toro' (Solomon Islands); 'Ulu Hamoa', 'Ulu Elise', and 'Ulu Afa' (Tokelau); and Artocarpus mariannensis Trec. (Kiribati). Root tip chromosome squashes and an electrophoretic survey of isozyme variation is planned for this material during the remainder of 1986. A Plant Exploration Proposal to fund further breadfruit collection in the Western Pacific during 1987 has been submitted to the USDA.

Publications: None

Cultivar Releases: None

Accession User: Richard M. Manshardt

Address: Department of Horticulture, University of Hawaii, Honolulu, Hawaii 96822

Nature of Research: Evaluation of wild Carica species for resistance to papaya ringspot virus, and use of resistant germplasm in a papaya improvement program.

Progress to Date: Carica species in the germplasm collection of the Department of Horticulture, including some recently obtained babaco (C. x heilbornii Badillo nm. pentagona Heilborn) cuttings have been surveyed for resistance to papaya ringspot virus (PRV). A variety of techniques were employed to determine resistance/susceptibility to the Hawaiian 'A' strain of PRV, including observation of symptom development on inoculated plants, bioassay using extracts of inoculated plants on susceptible papayas, enzyme linked immunosorbant assays (ELISA), and a "spot blot" assay using a c-DNA probe specific for the viral RNA. By these tests, the following species were found to be susceptible: C. papaya L., C. monoica Desf., C. parviflora (A.DC.) Solms, C. goudotiana (Tr. et Planch.) Solms, and C. x heilbornii Badillo nm. pentagona Heilborn. An accession of Carica microcarpa Jacq. also proved susceptible, but the degree of morphological variation observed in our plants suggested contamination by outcrossing, so this result is somewhat suspect. Resistant species included C. pubescens Lenne et Koch, C. stipulata Badillo, C. quercifolia (St. Hil.) Hieron., and one accession of C. cauliflora Jacq. of Venezuelan provenance. Another C. cauliflora accession obtained from India seems to be segregating for this character, with the majority of plants being resistant. Interspecific hybrids have been produced between C. papaya and the 4 resistant wild species using embryo rescue techniques, and the hybrids have been confirmed by isozyme analyses. The C. papaya x C. quercifolia F1 is resistant to PRV, but it has considerable sterility problems. Surprisingly, crosses of papaya with C. pubescens have proven to be susceptible, indicating either a recessive mode of inheritance or some interaction of nuclear and cytoplasmic factors. Hybrids of papaya with C. stipulata and C. cauliflora are somewhat stunted, and their status with respect to PRV has not been conclusively determined. Attempts to back-cross all F1's to C. papaya are continuing.

Publications: None

Cultivar Releases: None

Accession User: J. J. Ito, C. L. Chia

Address: Department of Horticulture, 461 W. Lanikaula St., Hilo, Hawaii 96720

Nature of Research: Introduction and testing of tropical fruits and nuts.

Progress to Date: Thirty-five new introductions were added to the collection from Africa, Australia, Japan and Mexico. These included seeds of Annona, Diospyros and Passiflora species; scions of avocado and macadamia. Twenty-three selections of Mexican race avocado and 6 hybrid cultivars (list 1) were collected from 5 states in Mexico by Richard Hamilton. The objective was to select good summer ripening types (May to August) for Hawaii. Basalua, Criollo #5, Azul, Veracruz #48 and Josefina were promising selections with fruit size averaging between 300 to 450g and ripening from July to September. A summer and early fall ripening Guatemalan race avocado R11T14 was selected from "Murashige" seedlings in Hawaii. Anthesis occurred in February and March at 1,500 to 1,800 ft elevation and fruits ripened 16 to 18 months after. Two carambolas, one mango, one dessert and a processing guava will be released as cultivars. Three additional crops, acerola cherry, breadfruit and cashew nuts, were assigned to the National Clonal Germplasm Repository in Waikeala, Hawaii. Francis Zee is on board as curator of the repository since June 2, 1986.

Publications: None

Cultivar Releases: None

Avocados Collected in Mexico

June 25 - July 9, 1985

1. Basalua (Gallitos), Celaya
2. Ver 48, Mich.
3. Azul, Mich.
4. Colin 33, Mich.
5. Josefina, Mich.
6. Com 78, Mich.
7. Tucutato 4, Mich.
8. Tingambato TG-2, Mich.
9. Criollo Desc. No. 5, Celaya
10. Pareo 8, Celaya
11. Tucuta, Tecario, Mich.
12. Vargas 12, Patzcuaro, Mich.
13. Criollo Negro, Rancho la Galera, Mich.
14. Criollo, UG-2, M. EJORADA, Uruapan la Galera, Mich.
15. Pie Franco VII-30, Celaya
16. Colinmex Verde, Atlixco, Puebla
17. R-1, Negro 250 G, Atlixco, Puebla
18. Tochimilco No. 1, Porqueria, Mich.
19. Epatlan, (Tortillas) Felicitos, Puebla
20. Epatlan CE-1, Papayas w/virus, Puebla
21. Like Fuerte, Sel by Galindo, Veracruz
22. San Antonio, 200 G. Mex., Puebla
23. Cosco, Alberto Olmos, for rootstock, Veracruz
24. Bonanza, Young tree, Edw. Chaves Nunez Tacambaro
25. Tingambato TG-1, Tacambaro, Mich.
26. Cictamex 40, Boyce punta B Ixtapan
27. Colin V-101 Sanchez Colin Ixtapan
28. Hass de semilla, Sanchez Colin, Ixtapan
29. Uruapan la Galera, UG-1 Mich.

S-9 Technical Committee Report

AGENCY: Louisiana Agricultural Experiment Station, Louisiana State University
Agricultural Center, and College of Agriculture, Louisiana State
University, Baton Rouge, LA.

SUBMITTED BY: Ann Marie Thro

ADDRESS: Department of Agronomy, Louisiana State University, Baton Rouge, LA
70803-2110

PART I. Introduction, Maintenance, Evaluation of Plant Germplasm and its use
in Crop Improvement/Crop Development.

ACCESSION USER: William J. Blackmon

ADDRESS: Dept. of Plant Pathology and Crop Physiology, Louisiana Agricultural
Experiment Station, LSU Agricultural Center, 302 Life Sciences Building,
Louisiana State University, Baton Rouge, LA 70803

NATURE OF RESEARCH: Development of crop potential of Apios americana.

PROGRESS TO DATE: A tremendous variability among A. americana germplasm has
been observed. A high yield of 3.7 kg of tubers per plant was observed
in field evaluations during the 1985 season.

PUBLICATIONS: Apios Tribune. A newsletter (Vol. 1, No. 1 - February 1985)
available from W. Blackmon.

Reed, M. J. and W. J. Blackmon. 1985. Observations on the potential of Apios
americana as a food crop. Hort Science. 20:557.

Reynolds, B. D. and W. J. Blackmon. 1985. Regeneration of plants from callus
of Apios americana Medik. Hort Science. 20:609.

Blackmon, W. J., B. D. Reynolds, and J. R. Ault. 1986. Variations among
plants of Aprio americana Medikus. Abstracts of Second International
Legume Conference, "Biology of the Leguminosae". Page 37.

Blackmon, W. J. and B. D. Reynolds. 1986. The crop potential of Apios
americana - preliminary evaluations. Hort Science (In Press).

Gorny, J. R., P. W. Wilson, W. J. Blackmon and B. D. Reynolds. 1986. Fatty
acid profiles in Apios americana. Supplement to Plant Physiol.
80(4):75.

Shrefter, J. W., E. C. McGawley, W. J. Blackmon, and B. D. Reynolds. 1986.
Effects of hot-water treatments on root knot nematodes in tubers of Apios
americana. (Abstract J. Nematol - In press).

Wilson, P. W., J. R. Gorny, W. J. Blackmon, and B. D. Reynolds. 1986. Fatty
acids in the American groundnut (Apios americana). (J. Food Sci.)

CITATION:

Vietmeyer, N. D. 1986. Lesser-known plants of potential use in agriculture
and forestry. Science 232: 1379-1384.

CULTIVARS RELEASED: Seed of wild germplasm available from W. Blackmon.

ACCESSION USER: J. F. Fontenot

ADDRESS: Department of Horticulture, Louisiana Agricultural Experiment
Station, LSU Agricultural Center, Baton Rouge, LA 70803

NATURE OF RESEARCH: Selection of superior peppers and okra.

PROGRESS TO DATE: Capsicum spp: trying to obtain "pure lines". Promising are a PI from Peru with easy abscission trait (desirable for harvesting); C. chinensis; a C. annum cayenne; looking for etch virus resistance in C. frutescens. Selections made for flooding tolerance after Hurricane Juan.

PUBLICATIONS: No publications reported.

CULTIVARS RELEASED: May release the cayenne type at a future date.

ACCESSION USER: R. Joost; G. Mooso and C. P. Bagley; R. Mitchell; R. Gates; S. DeRamus.

ADDRESS: Agronomy Department (Joost), Rosepine Research Station (Mooso and Bagley), Northeast Research Station (Mitchell), Iberia Research Station (Gates) (all Louisiana Agricultural Experiment Station, LSU Agricultural Center); and Agriculture Auxiliary Units, University of Southwestern Louisiana (DeRamus).

NATURE OF RESEARCH: Southern Forage Legume Variety Testing Program

PROGRESS TO DATE: Uniform tests are conducted to provide local variety performance information to farmers, agronomists and plant breeders. Species tested include Trifolium repens, T. pratense, T. alexandrinum, T. vesiculosum, T. nigrescens, T. incarnatum, T. subterraneum, T. resupinatum, T. fragiferum, Vicia sativa, Medicago sativa, Lespedeza cuneata, and Lotus corniculatus.

PUBLICATIONS: Annual Reports of each station of the Louisiana Agricultural Experiment Station and of the Agronomy Department

CULTIVARS RELEASED: None (material is already released).

NAME: E. M. Nowick

ADDRESS: LSU Rice Research Station, Louisiana Agricultural Experiment Station, LSU Agricultural Center, P. O. Box 1429, Crowley, LA 70520

NATURE OF RESEARCH: Development of enhanced germplasm for genetic improvement of rice through the use of wide interspecific crosses.

PROGRESS TO DATE: A number of Oryza species have been screened for resistance to the rice water weevil, the most serious insect pest of rice in the U.S. Some level of tolerance is present in several species and possible non-preference has been identified. Further research is needed to determine whether this type of resistance will be useful in breeding.

Research on the development of techniques to enable interspecific gene transfer has also been conducted. A possible promoter of non-homologous pairing similar to the 5B suppressor in wheat has been identified in a hybrid between O. latifolia and the cultivar 'Mars' produced through embryo culture. The use of tissue culture to induce aneuploidy and possible somatic crossing over in interspecific crosses is under investigation.

The primitive cultivar 'Tetep' is the best known source for sheath blight resistance. The heritability for resistance based on disease severity in field tests is low. However, by exploiting what is known about the cellular mechanisms of resistance it may be possible to speed transfer of this trait to a commercially acceptable variety.

The BC1 through BC4 generations of Tetep x Lemont have been screened in the greenhouse for number of infection structures observed in inoculated plants and also for lesion type. This summer field tests of progeny lines are being rated for resistance in replicated field tests to determine the success of the selection method.

PUBLICATIONS:

Chapters in books:

Rutger, J. N., E. M. Nowick, and R. Dilday. 1986. Distribution and origin of species, botany and genetics. In Rice in the United States: Varieties and Production. Revision of AH289, USDA Ag. Res. Service (in press).

Articles in refereed journals:

Nowick, E. M. 1986. Chromosome pairing in Oryza sativa L. x O. latifolia Desv. hybrids. Can. J. Genet. Cytol 28: 278-281.

Articles in non-refereed journals:

Nowick, E. M. 1985. Chromosome pairing in Oryza sativa L. x O. latifolia Desv. hybrids. 77th Ann. Prg. Rep. Rice Res. Sta. La. Ag. Exp. Sta. (in press).

Nowick, E. M. and J. F. Robinson. 1985. Screening of Oryza species for rice water weevil resistance. 77th Ann. Prg. Rep. Rice Res. Sta. La. Ag. Exp. Sta. (in press).

Nowick, E. 1984. Regeneration of Oryza sativa x O. latifolia triploid hybrids. 76th Ann. Prog. Rep. Rice Res. Sta. La. Ag. Exp. Sta. pgs. 46-47.

Robinson, J. F., E. M. Nowick, H. Hoffpauir, and G. B. Trahan. 1984. Screening of Oryza spp. for rice water weevil resistance. 76th Ann. Prog. Rep. Rice Res. Sta. La. Ag. Exp. Sta. pgs. 201-202.

Nowick, E. M. and H. Hoffpauir. 1983. Evaluation of interspecific crosses for use in rice improvement. 75th Ann. Prog. Rep. Rice Res. Sta. La. Ag. Exp. Sta. pgs. 38-39.

Nowick, E. M., J. F. Robinson, H. Hoffpauir, and G. Trahan. 1983. Screening of Oryza spp. for rice water weevil resistance. 75th Ann. Prog. Rep. Rice Res. Sta. La. Ag. Exp. Sta. pgs. 38-39.

ACCESSION USER: S. S. Quisenberry

ADDRESS: Department of Entomology, Louisiana Agricultural Experiment Station, LSU Agricultural Center, Baton Rouge, LA 70803

NATURE OF RESEARCH: Alfalfa resistance to 3-cornered alfalfa hopper.

PROGRESS TO DATE: Grant written to support this screening was not funded; research in management of alfalfa to reduce insect damage continues and eventual use of the collection remains in research plans. Seed received from PI station in short-term storage at LSU.

PUBLICATIONS: No publications.

CULTIVARS RELEASED: Cv. release is possible (long term).

ACCESSION USER: A. M. Thro

ADDRESS: Department of Agronomy, Louisiana Agricultural Experiment Station, LSU Agricultural Center, Baton Rouge, LA, 70803-2110
70803

NATURE OF RESEARCH: Development of warm-season forage legumes.

PROGRESS TO DATE: Over 90 species of legumes evaluated for persistence and summer vigor in Louisiana. Seed of many of these species was obtained from the USDA/PI network. Outstanding persistent legume species were Aeschynomene americana, a freely reseeding annual; Desmodium canum (incanum), D. intortum and D. uncinatum, hardy perennials; and Arachis glabrata, also a hardy perennial. Quality analyses confirmed Florida reports of high protein-content in A. americana. Stylosanthes spp. were outstanding for adaptation to summer conditions but only the small native North American species, S. biflora (a perennial), was

persistant. Lotononis bainesii, a very palatable S. African legume species with high protein content, high digestibility, and high grazing tolerance, unfortunately proved unadapted to Louisiana summer conditions. One Lotononis PI has persisted since 1983 (Australia commercial cultivar 'Miles' and all other PI's persisted to 1984 only in the same experiment), but due to the habit of this stoloniferous species to abandon its original crown and "wander in the sward", the identity of the PI was lost (now designated LSU #163).

Louisiana germplasm of A. americana was collected in 1985. The species was found only in disturbed sites in the southern alluvial area of the state, suggesting that it may have been introduced through agriculture. Sixty-three Louisiana A. americana accessions are being characterized in a replicated experiment at two locations.

PUBLICATIONS: Primary data are published in LSU Agronomy Dept. Annual Reports.

Thro, A. M. 1986. Collection of germplasm of Aeschynomene americana L. in Louisiana. Proc. Second International Legume Conf. Mo. Bot. Garden, St. Louis, MO., June, 1986.

Thro, A. M. and C. C. Shock. In press. Forage legume introduction in Louisiana, USA. Proceedings of the 15th International Grassland Congress, Aug. 24-31, 1985; Kyoto, Japan.

Thro, A. M., C. C. Shock, F. J. Peterson, B. D. Nelson, A. B. Coco, L. P. Brown, and A. T. Wier. 1985. Experimental summer annual legumes for Louisiana pasture systems. Louisiana Cattleman Vol. 18 No. 4 (April) pp. 9, 39, 47. (Popular publication).

CULTIVARS RELEASED: None

ACCESSION USER: Hector E. Flores

ADDRESS: Dept. of Plant Pathology and Crop Physiology, College of Agriculture, Louisiana State University, Baton Rouge, LA 70803.

NATURE OF RESEARCH: (1) Use of cell and tissue culture of underdeveloped crops (amaranths, andean tuber crops (non-potato), forage legumes) for genetic transformation studies aimed at introducing resistance against bacterial and viral diseases, and improving protein quality. (2) Use of plant cell and organ (root) cultures to study the regulation of secondary metabolism. We are targeting compounds of pharmaceutical (alkaloids, antitumor cpds.) and agrichemical (nematicides, insecticides) potential.

PROGRESS TO DATE: (1) We have established the model system (tobacco) for transformation with a sequence that may confer resistance against viroidal infection (PSTV cDNA), and a synthetic gene that codes for a protein with high levels of essential amino acids (Lys, Met). This sets the background to start the transformation experiments with: a) Grain and vegetable amaranth lines collected from Mexico, Peru, and Southeast Asia; and b) Andean tuber crops such as Tropaeolum tuberosum and Oxalis tuberosa. (2) We are developing a seed collection obtained from botanical gardens from Europe, U.S.A., Canada and Japan. From this germplasm, we are focusing on two families, Solanaceae and Compositae (Asteraceae), which are known to produce interesting compounds in their roots. By means of a natural genetic engineer, Agrobacterium rhizogenes, we have obtained root cultures from about 8 different species which grow very fast and produce the compounds characteristic of this organ. In the Solanaceae root cultures, we are studying the production of the tropane alkaloids hyoscyamine and scopolamine. In the Compositae root cultures,

we are screening for production of polyacetylenes and thiophenes, which are known to be biologically active against nematodes. Future study will concentrate on chemical characterization, determination of optimal conditions for production of particular metabolites, assay of biological activity, and scaling up the organ cultures. The search for new germplasm providing interesting compounds will also continue.

PUBLICATIONS:

- Flores, H. E., and P. Filner. 1985. Metabolic relationships of putrescine, GABA and alkaloids in cell and root of Solanaceae. In Primary and Secondary Metabolism of Plant Cell Cultures (K.-H. Neumann, W. Barz, and E. Reinhard, eds.), Springer-Verlag, Berlin, pp. 568-578.
- Flores, H. E., and R. A. Teutonico. 1986. Amaranths (Amaranthus spp.) - Potential grain and vegetable crops. In Biotechnology in Agriculture and Forestry (Y.P.S. Bajaj, ed.) Vol. 2, Springer-Verlag, Berlin, pp. 568-578.
- Flores, H. E. 1986. Use of plant cell and organ culture in the production of biological chemicals. In Applications of Biotechnology to Agricultural Chemistry (H. Lebaron, R. O. Mumma, R. C. Honeycutt, and J. H. Duesing, eds.), American Society Symposium Series, in press.
- Flores, H. E., J. Jaynes, J. Kim, M. Yang, and J. Pickard. 1986. Introduction and expression of viroid cDNAs and of a synthetic gene sequence into crop plants. ASPP Meeting (abstract).
- CULTIVARS RELEASED: None.

Part II. Additional research uses of plant germplasm obtained from foreign and domestic plant explorations.

ACCESSION USER: N. Murai, A. Liska

ADDRESS: Department of Plant Pathology and Crop Physiology, College of Agriculture, Louisiana State University, Baton Rouge, LA 70803

NATURE OF RESEARCH: Genetic transformation of Helianthus spp. (Sunflowers)

PROGRESS TO DATE: Preliminary step is to obtain cell cultures of sunflower accessions (in progress).

PUBLICATIONS: No publications (planned).

CULTIVARS RELEASED: cv. release not planned.

ACCESSION USER: E. Zimmer and E. Jupe

ADDRESS: Department of Biochemistry, Louisiana Agricultural Experiment Station, LSU Agricultural Center, Baton Rouge, LA 70803

NATURE OF RESEARCH: Restriction mapping of corn (Zea mays).

PROGRESS TO DATE: DNA has been extracted from eight PI's.

PUBLICATIONS: Publications anticipated this fall.

CULTIVARS RELEASED: cv. release not an objective.

1986

S-9 TECHNICAL COMMITTEE REPORT

AGENCY: Mississippi Agricultural & Forestry Experiment Station
SUBMITTED BY: C. E. Watson, Jr.
ADDRESS: Department of Agronomy, Box 5248, Mississippi State, MS 39762
Page 1 of 2

* * * * *

ACCESSION USER: C. E. Watson, Jr.
ADDRESS: Department of Agronomy, Box 5248, Mississippi State, MS 39762
NATURE OF RESEARCH: Evaluation of tall fescue (Festuca arundinacea Schreb.) for rust resistance
PROGRESS TO DATE: Evaluation of several tall fescue cultivars for stem rust (Puccinia graminis) and crown rust (P. coronata) resistance revealed that mediterranean types were sources of high levels of resistance to both rusts. These included 'Fortune' (derived from PI 231563 & PI 231564) and 'Oregon 1000' (derived from several Algerian introductions). These two lines along with six other cultivars were subjected to two cycles of selection for improved crown rust resistance and a single cycle of selection for stem rust resistance. Selected plants were increased for seed during the 1985-86 season. The resulting populations will be evaluated in 1986 and possibly be subjected to an additional cycle(s) of selection.
PUBLICATIONS: Smith, M. A., C. E. Watson, Jr., and L. E. Trevathan. 1986. Stem rust resistance in tall fescue. S. Branch Amer. Soc. Agron. Abstr. 13:8.
CULTIVAR RELEASES: None

ACCESSION USER: P. G. Thompson
ADDRESS: Department of Horticulture, P. O. Drawer T, Mississippi State, MS 39762
NATURE OF RESEARCH: Breeding watermelons for improved quality, yield and disease resistance
PROGRESS TO DATE: PI accessions 189225, 270550, 271775, 271778, 271779, and 299379 with reported resistance to the diseases gummy stem blight and anthracnose were crossed to 6 commercial watermelon varieties with high levels of resistance to Fusarium wilt. F₄ progenies were screened for resistance to the 3 diseases and resistant progenies were selected for high yield and quality. Breeding lines were identified with high levels of disease resistance, high yield and quality. Intermating and selection will continue to maximize these traits in homozygous lines.
PUBLICATIONS: None
CULTIVAR RELEASES: None

ACCESSION USER: L. M. Gourley and C. I. Flores
ADDRESS: Department of Agronomy, Box 5248, Mississippi State, MS 39762
NATURE OF RESEARCH: Evaluation of sorghum [Sorghum bicolor (L.) Moench]
germplasm for tolerance to aluminum toxicity in Colombia
PROGRESS TO DATE: Sorghum germplasm (1000 PI accessions from the
Ethiopian collection) is being increased in Colombia and will be
screened for tolerance to 65% aluminum saturated soil in field
trials in Colombia.
PUBLICATIONS: None
CULTIVAR RELEASES: None

ACCESSION USER: L. M. Gourley and C. I. Flores
ADDRESS: Department of Agronomy, Box 5248, Mississippi State, MS 97362
NATURE OF RESEARCH: Evaluation of pearl millet [Pennisetum americanum
(L.) Leeke] germplasm for tolerance to aluminum toxicity in Colom-
bia
PROGRESS TO DATE: Pearl millet germplasm (270 PI accessions) was
increased at Mississippi State University in 1985 and is currently
being screened for tolerance to 65% aluminum saturated soil in field
trials in Colombia
PUBLICATIONS: None
CULTIVAR RELEASES: None

ACCESSION USER: W. P. Williams and F. M. Davis
ADDRESS: USDA-ARS Crop Science Research Laboratory, P. O. Box 5248,
Mississippi State, MS 39762
NATURE OF RESEARCH: Evaluation of corn (Zea mays L.) germplasm for
resistance to southwestern corn borer and fall armyworm
PROGRESS TO DATE: In a cooperative effort with the International Center
for Maize and Wheat Improvement (CIMMYT) and other U. S. institu-
tions, corn germplasm (200 families) from CIMMYT was evaluated in
1986 for reaction to southwestern corn borer and fall armyworm.
Selected plants from the best families were self-pollinated. Seed
from the best families will be returned to CIMMYT for recombination
and further evaluation.
PUBLICATIONS: None
CULTIVAR RELEASES: None

S-9 TECHNICAL COMMITTEE REPORT

Agency: North Carolina State University
Submitted by: W. T. Fike
Address: Crop Science Department, North Carolina State University,
Raleigh, NC 27695-7620

Six cooperators from a pool of 30± cooperators received 240 PI's from fourteen species of five genera. A few of these accessions are being used for genetical work and others are divided between the Cucumber Breeding Program and the Air Quality Program.

Accession User: Dr. J. R. Ballington
Address: Horticulture Department, North Carolina State University,
Raleigh, NC 27695

Nature of Research: Collection of Vaccinium and Rubus species

Progress to Ddate: Four blueberry varieties were released but none contained PIs. Blueberry clones collected in 1985 are having a hard time in our hot dry weather. Many are being revived and others have been replaced from the Oregon area where originally collected. All the West Coast collections have been checked for anthocyanins and the data will be published shortly. The color pigments are useful in defining taxonomic groupings of the blueberries. A high bush breeding line will be released shortly.

Some jet black blueberries were collected here in Arkansas this spring and they also provide an aromatic flavor to the fruit. Bramble variety improvement is being revived in North Carolina due to the demand for the berries. The breeding program was abandoned in the early sixties on the retirement of Dr. Carlos Williams. We did however distribute his breeding material to interested breeders throughout the United States. Some of this material went into 'Dormore Red' released from Mississippi and 'Southland' from Southern Illinois. The variety 'Mandrin' was found in some material maintained by one of the horticulture professors. This potential loss of material shows the value of the new vegetative repositories in the PI system.

Accession User: Dr. Wanda Collins
Address: Horticulture Department, North Carolina State University,
Raleigh, NC 27695.

Nature of Research: Breeding sweet potatoes for high dry matter and disease resistance

Progress to Date: The sweet potatoes from the repository at Experiment are being classified for growth characteristics and carbohydrates and sugar in the lab. The PI's obtained in Peru will be out of quarantine shortly. Wanda will be at the International Potatoe Station in Peru for six months. This station will now be working with sweet potatoes which should definitely provide much needed PI's for use in the state.

Accession User: Richard A. Reinert and John Dunning

Address: Department of Botany, North Carolina State University,
Raleigh, NC 27695

Nature of Research: Screening beans for ozone tolerance

Progress to Date: Have been screening beans for ozone tolerance in the growth chambers in cooperation with Virginia State University. During a 5-year period, 2200 PI's were screened at random. Many were duplicates. The two cooperators are now screening the green snap beans on a uniform basis. The plants are exposed for two hours in a growth chamber with an ozone level of 600 ppb. If any have greater than 30% injury, they are further evaluated in open topped field chambers at six levels of ozone: filtered air, ambient air and 20, 40, 60 and 80 ppb ozone. Virginia State University has the 9,700 entries of the bean collection duplicated and under their control.

Accession User: Dr. Todd Wehner

Address: Horticulture Department, North Carolina State University,
Raleigh, NC 27695

Nature of Research: Improved cultivar development from cucumber PI accessions

Progress to Date: Dr. Wehner is spending a few months in Wisconsin and has submitted a request for help in collecting cucumber, muskmelon and watermelon in India.

Accession User: Dr. Randy Gardner

Address: Mountain Horticultural Crops Research Station and Extension
Center, 2016 Funning Bridge Road, Fletcher, NC 28732-9628

Nature of Research: Breeding tomato cultivars for North Carolina

Progress to Date: Two new tomato breeding lines were released by the North Carolina Agricultural Research Service. Data are attached.

NC EBR-1 is an inbred line in the F₁ generation. It was derived from PI 126445, a selection of Lycopersicon hirsutum previously reported resistant to early blight (Alternaria solani) and identified in field plots at Fletcher, NC in 1976 as highly resistant to early blight.

The second breeding line, EBR-2, also carries resistance to early blight. This line does not, however, have a PI background.

NORTH CAROLINA AGRICULTURAL RESEARCH SERVICE
NORTH CAROLINA STATE UNIVERSITY
RALEIGH, NORTH CAROLINA

NOTICE OF RELEASE OF NC EBR-1 EARLY BLIGHT RESISTANT TOMATO

The North Carolina Agricultural Research Service announces the release of a new fresh market tomato breeding line, NC EBR-1.

NC EBR-1 is an inbred line in the F₆ generation (Fig. 1). It was derived from PI 126445, a selection of *Lycopersicon hirsutum* previously reported resistant to early blight (*Alternaria solani*) and identified in field plots at Fletcher, N.C. in 1976 as highly resistant to early blight. The F₁ of 'Walter' x PI 126445, inoculated in the greenhouse, was highly resistant to early blight. Three backcrosses were made to NC 50-7 and resistant selections saved from progeny inoculated in the greenhouse after each backcross. An F₄ line identified as early blight resistant in a combination of field and greenhouse tests was crossed to 'Piedmont'. Advancement was made to the F₆ generation with selection in field plots for early blight resistance and improved horticultural characteristics.

The early blight resistance level of NC EBR-1, although less than PI 126445 and early generation lines, appears sufficient to be useful in additional breeding. NC EBR-1 had foliar resistance to early blight similar to C1943 and 71B2 in field studies in 1983, 1984, and 1985. In F₁ hybrids of NC EBR-1 crossed with early blight susceptible lines, resistance was intermediate to NC EBR-1 and the susceptible parents. Expression of resistance in the F₁ of NC EBR-1 offers an advantage over C1943 and 71B2, which have foliar resistance controlled by recessive genes. In addition to early blight resistance, NC EBR-1 has the 1 and 1-2 genes for resistance to races 1 and 2 of *Fusarium oxysporum* f. sp. *lycopersici* (fusarium wilt) and the Ve gene for resistance to race 1 of *Verticillium dahliae* (verticillium wilt).

Vine type of NC EBR-1 is very strong determinate. Foliage is heavy, similar to NC 50-7 and 'Piedmont', but darker green in color. Maturity is later than 'Flora-Dade' and similar to 'Piedmont'.

Fruit of NC EBR-1 are deep oblate to globe in shape, are symmetrical, and have very smooth shoulders. Fruit pedicels are jointed. Shoulder color of green fruit is uniform (u gene). Fruit have very smooth blossom scars and excellent crack resistance. Fruit size is slightly smaller than 'Flora-Dade'. Fruit are firm and have shown good external and internal color. Total fruit yield of NC EBR-1 was lower than 'Flora-Dade' in a replicated trial in 1984. Percent of fruit in U.S. Combination Grade for NC EBR-1 was much higher than for 'Flora-Dade' resulting in higher yield of U.S. Combination Grade fruit for NC EBR-1 than for 'Flora-Dade'.

NC EBR-1 is being released as an early blight resistant breeding line which may offer advantages over the resistance sources C1943 and 71B2. NC EBR-1 is not sufficiently advanced in horticultural characteristics to be used as a variety.

Breeder seed will be maintained by the North Carolina Agricultural Research Service. Small samples can be obtained from Dr. R.G. Gardner, Mountain Horticultural Crops Research Station and Extension Center, 2016 Fanning Bridge Road, Fletcher, NC 28732-9628. Proposed release date is June 30, 1986.

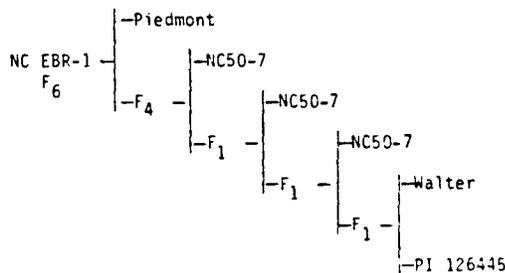


Fig. 1. Pedigree of NC EBR-1 early blight resistant tomato breeding line.

D. L. Bateman

Director, North Carolina Agricultural
Research Service, Raleigh, N.C.

6/3/86

Date

NOTICE OF RELEASE OF THE NC EBR-2 EARLY BLIGHT RESISTANT TOMATO

The North Carolina Agricultural Research Service announces the release of a new fresh market tomato breeding line, NC EBR-2.

NC EBR-2 is an inbred line in the F₆ generation (Fig. 1). C1943, a line released by the Campbell Agricultural Research Institute, was used as the source of early blight (*Alternaria solani*) resistance in developing NC EBR-2. C1943 has a high level of resistance to the stem lesion (collar rot) phase of early blight and moderate resistance to the foliar phase of early blight. Lines developed in the pedigree breeding system were selected for early blight resistance in replicated field plots.

In field trials at Fletcher, NC in 1983, 1984, and 1985, NC EBR-2 had early blight resistance similar to C1943 and had much less defoliation than the susceptible check, 'Flora-Dade'. Inoculation tests in the greenhouse have shown NC EBR-2 to have a high level of stem lesion resistance, similar to C1943. In addition to early blight resistance, NC EBR-2 has the 1 and 1-2 genes for resistance to races 1 and 2 of *Fusarium oxysporum* f. sp. *lycopersici* (fusarium wilt) and the Ve gene for resistance to race 1 of *Verticillium dahliae* (verticillium wilt). C1943 has neither the 1-2 nor Ve gene.

Vine type of NC EBR-2 is strong determinate, taller growing than 'Flora-Dade' when staked and pruned. Foliage cover is heavy, providing good fruit protection. Maturity is slightly later than 'Flora-Dade'.

Fruit of NC EBR-2 vary in shape from deep oblate to globe and have uniform green shoulder color (u gene). Fruit pedicels are jointless (j-2 gene). Fruit size has been equal to or larger than 'Flora-Dade'. Fruit are very firm and have shown good external and internal color and resistance to fruit cracking and rain check. Total fruit yields of NC EBR-2 were similar to 'Mountain Pride' and 'Flora-Dade' when sprayed on a 5-day schedule so that early blight was not a factor in reducing yield. When sprayed on a 7- or 10-day schedule, NC EBR-2 showed no reduction in total or marketable grade fruit yields compared to a 5-day schedule. 'Mountain Pride' yields were significantly reduced by both the 7- and 10-day spray intervals. Marketable and U.S. Combination Grade (U.S. No. 1 + U.S. No. 2) yields of NC EBR-2 have generally been lower than those of 'Flora-Dade' and 'Mountain Pride'. The primary cull factor of NC EBR-2 has been rough blossom scar, which has been severe, particularly in early season, in some trials.

NC EBR-2 is being released as a breeding line with early blight resistance comparable to C1943, but having much better horticultural characteristics and additional disease resistances. The primary reason for releasing NC EBR-2 as a breeding line rather than a named variety is the tendency for rough blossom scar, which would limit its use as a variety.

Breeder seed will be maintained by the North Carolina Agricultural Research Service. Small samples can be obtained from Dr. R.G. Gardner, Mountain Horticultural Crops Research Station and Extension Center, 2016 Fanning Bridge Road, Fletcher, NC 28732-9628. Proposed release date is June 30, 1986.

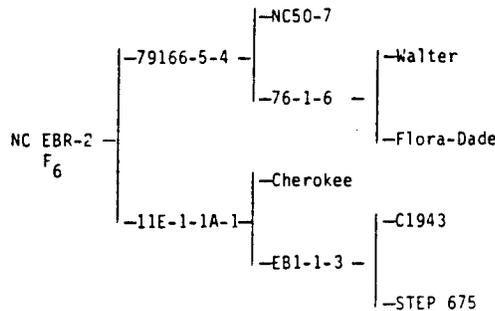


Fig. 1. Pedigree of NC EBR-2 early blight resistant tomato breeding line.

D. F. Bateman
 Director, North Carolina Agricultural
 Research Service, Raleigh, N.C.

6/3/86
 Date

1986
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
Page 1 of 5

* * * * *

ACCESSION USER: D.E. Weibel
ADDRESS: Dep. of Agronomy, Okla. State Univ., Stillwater, OK 74078
NATURE OF RESEARCH: Sorghum breeding and genetics
PROGRESS TO DATE: Virtually all of our breeding lines can be classified as plant introduction material. Specifically it was determined that six lines from the Yemen collection (PI465901, PI465902, PI465904, PI474712, PI474713, and PI474714) all carry the same gene, $h_1 h_1$, for the sparse-bloom characteristic. As we understand it all of these collections came from arid areas.
PUBLICATIONS: Nukal, B.M. 1984. Inheritance of the bloomless or sparse-bloom character in some lines of sorghum. Masters Thesis, Okla. State Univ., Stillwater. p. 28.
CULTIVAR RELEASES: None

ACCESSION USERS: J.A. Webster, K.J. Starks, R.L. Burton, and O.G. Merkle, USDA-ARS
ADDRESS: USDA-ARS, Plant Science Laboratory, P.O. Box 1029, Stillwater, OK 74076

NATURE OF RESEARCH: 1. Evaluation of sorghum [Sorghum bicolor (L.) Moench], and sorghum relatives for resistance to greenbugs, yellow sugarcane aphid, chinchbugs, sorghum midge and fall armyworms.
2. Evaluation of New Introduction small grain lines and wheat relatives for insect resistance. Particular emphasis is being placed on greenbug and yellow sugarcane aphid resistance. More recently, evaluations of selected material for Russian wheat aphid resistance have been conducted.

PROGRESS TO DATE: The inheritance of a second source of greenbug resistance in barley was studied. The source, PI 426756, was found in New Introduction material from the Beltsville germplasm laboratory. An intensive effort is underway to evaluate Ethiopian sorghums for resistance to the yellow sugarcane aphid. A low level of resistance has been found in a few lines, but it is inferior to resistance levels found in the greenbug phase of the sorghum program.

SELECTED PUBLICATIONS: Inayatullah, C., J.A. Webster, and H.T. Nguyen. 1986. Greenbug (Homoptera: Aphididae) antibiosis tests in growth chambers: Design of experiments and optimum sample size. Environ. Entomol. 15:581-584.
Tyler, J.M. 1985. Greenbug resistance in wheat germplasm lines CI 17881-17886. Ph.D. Dissertation. Oklahoma State Univ., Stillwater.
Webster, J.A., C. Inayatullah, and O.G. Merkle. 1986. Susceptibility of 'Largo' wheat to biotype B greenbug (Homoptera: Aphididae). Environ. Entomol. 15:700-702.

Webster, J.A., C. Inayatullah, and W.S. Fargo. 1985. A mathematical model for evaluating insect resistance in plants. J. Kansas Entomol. Soc. 58:564 Abstract.

ACCESSION USER: Brett F. Carver, Richard C. Johnson, and A. Lane Rayburn
ADDRESS: Dept. of Agronomy, Oklahoma State Univ., Stillwater, OK 74078-0507
NATURE OF RESEARCH: Utilization of alien germplasm for improving photosynthesis of winter wheat.

PROGRESS TO DATE: We have identified accessions of the wild tetraploid species, Triticum dicoccoides, which differ from T. aestivum by ca. 30% in photosynthesis rate but with no apparent differences in leaf area. Transfer of the high photosynthesis trait from T. dicoccoides (AABB) to cultivated T. aestivum (AABBDD) may be feasible due to homologous chromosome pairing between the A and B genomes of each species. Research is underway to determine the nature and relative magnitude of genetic effects for photosynthetic rate in segregating populations of T. dicoccoides; to examine interrelationships between photosynthetic rate and morpho-physiological characters; and to determine the photosynthetic capacity of T. dicoccoides in combination with the D genome from several T. aestivum genetic backgrounds.

PUBLICATIONS: None

CULTIVAR RELEASES: None

ACCESSION USERS: R.M. Hunger and J.L. Sherwood
ADDRESS: Plant Pathology Department, Oklahoma State University, Stillwater, OK 74078.

NATURE OF RESEARCH: 1. Develop techniques to facilitate selection of wheat lines with resistance to virus diseases of wheat. 2. Develop disease resistant wheat lines adapted to production in Oklahoma.

PROGRESS TO DATE: The enzyme-linked immunosorbence assay (ELISA) has been identified as the method of choice to facilitate selection of wheat lines with resistance to virus diseases. Use of ELISA to select wheat lines resistant to wheat soilborne mosaic virus (WSBMV) will start this year. Crosses have been made between varieties adapted to production in Oklahoma and varieties with resistance to leaf rust and WSBMV. Backcrosses to the adapted parents and crosses between adapted parents and wheat lines with resistance to tan spot will begin this year.

SELECTED PUBLICATIONS: Hunger, R.M. and J.L. Sherwood. 1985. Use of symptomatology and virus concentration for evaluating resistance to wheat soilborne mosaic virus. Plant Disease 69:848-850.

Hunger, R.M. and J.L. Sherwood. 1985. Use of visual assessment and ELISA to evaluate wheat soilborne mosaic virus. Phytopathology 75:964.

Hunger, R.M. 1986. Breeding for disease resistance. Annual Wheat Newsletter 32:175.

CULTIVAR RELEASES: None

ACCESSION USER: James S. Kirby

ADDRESS: Dept. of Agronomy, Oklahoma State Univ., Stillwater, OK 74078

NATURE OF RESEARCH: Peanut Breeding

PROGRESS TO DATE: Continue to evaluate peanut breeding material for leaf-spot resistance (crosses with PI 109839) and for early maturity (utilizing Chico and other Spanish varieties as the source of earliness). Recent efforts toward the development of a runner peanut variety for Oklahoma have resulted in the release of 'Okrun'. Okrun is an F_{10} increase of a single plant selection made in F_3 from a 1973 cross of Florunner and Spanhoma cultivars. Plants, pods, and seeds of Okrun are similar in appearance to Florunner and maturity is essentially the same. Tests indicate Okrun has more resistance to leafspot and pod rots than current commercial runner varieties. Shelling data and end use quality tests show Okrun to be equal to or better than Florunner. Oklahoma tests indicate Okrun yields 3.5% more than Florunner (3546 vs 3427 lbs/A) and grades 2.2% better (70.6% vs 69.1% TSMK) resulting in a 5.7% greater gross return per acre (1000 vs 946\$/acre). The production costs for irrigated peanuts in Caddo County, Oklahoma were estimated to be \$659/acre in 1985. If one subtracts the \$659 production cost from the gross return figures, the 5.7% greater gross return translates to an 18.8% increase in profits of Okrun over Florunner. The field performance of Okrun in other peanut areas in the U.S. has generally been equal to or slightly better than Florunner.

PUBLICATIONS: None

CULTIVAR RELEASES: 'Okrun' peanut (Oklahoma AES and USDA-ARS)

ACCESSION USERS: D.J. Banks and R.N. Pittman

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

NATURE OF RESEARCH: Peanut Introduction, Increase, Maintenance and Evaluation

PROGRESS TO DATE: New germplasm materials from Peru were increased and evaluated in preliminary tests. Additional increases were made of earlier PI accessions from South America. All but one (PI 338266) of 76 accessions of Rhizomatosa section species of Arachis survived the harsh winter of 1984-85 in the field nursery at Weslaco, TX. Selections were made in crosses between large seeded Virginia types and Spanish breeding lines to advance the effort at developing earlier maturing large seeded peanut cultivars. The genetic behavior of an unusual yellow-flowered peanut genotype isolated from PI 468295, from Bolivia, was investigated. Hybrids from the cross Pronto (tan seed) by PI 497643 (purple seed) showed a dominant purple trait which was modified by seed maturity.

SELECTED PUBLICATIONS: Banks, D.J., R.N. Pittman, and J.O. Moffett. 1985. Honey bees increase outcrossing in peanuts (Arachis hypogaea L.). Am. J. Bot. 76:875 (Abstract).

Banks, D.J. 1985. An audible scarecrow for protecting harvested peanut plots. Trop. Grain Legume Bull. 30:34-36.

Banks, D.J. 1986. Origin, and characteristics of a primitive peanut (Arachis hypogaea L. var. hirsuta Kohler). Am. J. Bot. 73:750. (Abstract).

CULTIVAR RELEASES: 'Okrun' peanut (Oklahoma AES and USDA-ARS).

ACCESSION USER: D.L. Ketring, USDA-ARS

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

NATURE OF RESEARCH: Evaluation of peanut (Arachis hypogaea L.) for heat tolerance and traits to escape drought.

PROGRESS TO DATE: Peanut germplasm (plant introductions and breeding lines) are continuing to be evaluated for traits (root growth, soil moisture extraction, leaf water potential components, and stomatal resistance) to escape and/or tolerate drought. They are also being evaluated for heat tolerance. Estimates of root-effectiveness were made among peanut genotypes by measurement of apparent sap velocity (A_v) under well-watered and stress conditions in the greenhouse and field. Under well-watered conditions, A_v was similar among genotypes, but under stress, differences among genotypes occurred. Water relations among genotypes were compared under irrigated (IR) and rainfed (RF) conditions. Treatment, IR vs. RF, differences were found, but no significant differences occurred among genotypes. Yield reductions due to water deficit under RF ranged from 82.5 to 96.6%

PUBLICATIONS: Ketring, D.L., P.I. Erickson, and J.F. Stone. 1985. Apparent sap flow velocity in peanut. Proc. Amer. Peanut Res. and Educ. Soc., Inc. 17:68.

Huang, M.T. and D.L. Ketring. 1985. Studies on water relations of peanut under rainfed and irrigated conditions. Proc. Amer. Peanut Res. and Educ. Soc., Inc. 17:65.

CULTIVAR RELEASES: None

ACCESSION USERS: H.A. Melouk and D.L. Ketring

ADDRESS: USDA-ARS, Dept. of Plant Pathology and Dept. of Agronomy, Oklahoma State University, Stillwater, OK 74076.

NATURE OF RESEARCH: The apparent sap flow velocity in peanut genotypes inoculated with Verticillium dahliae and noninoculated peanut were measured to determine the feasibility of this procedure to detect differences in the peanut germplasm to Verticillium dahliae. This method was proven to provide rapid, accurate, and repeatable sap flow velocity measurements in intact peanut stems. This method uses a thermoelectric sensor that is nonintrusive and nondestructive for obtaining repeatable measurements. Throughout the experiment significant differences in sap flow velocity were found among two peanut genotypes: one susceptible and one resistant to Verticillium dahliae.

PUBLICATIONS: Erickson, P.I., H.A. Melouk, and D.L. Ketring. Apparent sap flow velocity in peanut genotypes susceptible and resistant to Verticillium dahliae.

CULTIVAR RELEASES: None

ACCESSION USER: H.H. Fagbenle

ADDRESS: Dept. of Plant Pathology, Oklahoma State University, Stillwater, OK 74078.

NATURE OF RESEARCH: Screening for resistance to the northern root-knot nematode.

PROGRESS TO DATE: Peanut germplasm is being evaluated for resistance to the northern root-knot nematode, Meloidogyne hapla. Some preliminary greenhouse studies have been completed. Some lines have been selected for determination of cytokinin content, which may be correlated to resistance.

PUBLICATIONS: None

CULTIVAR RELEASES: None

ACCESSION USERS: J.L. Caddel and R.C. Berberet

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

NATURE OF RESEARCH: Evaluation of Alfalfa (Medicago spp.) introductions as sources of resistance to blue alfalfa aphid (Acyrtosiphon kondoi Shinji and spotted alfalfa aphid (Therioaphis maculata Buckton). Much of this research is conducted in cooperation with the USDA-ARS Plant Introductions Laboratory, Ames, Iowa.

PROGRESS TO DATE: A total of 450 world collection accessions have been evaluated for resistance to the blue alfalfa aphid. Several of these accessions from southern USSR, Iran, Afghanistan, and Pakistan have 5-20% resistant plants for this aphid.

PUBLICATIONS: None

CULTIVAR RELEASES: None

ACCESSION USER: C.M. Taliaferro

ADDRESS: Dept. of Agronomy, Oklahoma State University, Stillwater, OK 74078

NATURE OF RESEARCH: Tissue culture of introduced bluestem grasses.

PROGRESS TO DATE: Techniques were developed which make possible the in vitro culture of tissues of 'old world' bluestem grasses (Bothriochloa spp.) and regeneration of plants from such cultures. A total of 522 plants were regenerated from cultures of two accessions of Bothriochloa ischaemum var. ischaemum (PI's 301535 and 301573) and two accessions of B. intermedia var. indica (PI's 301539 and 301551). Young inflorescences were used as explants. Twenty-five obvious somaclonal variants were identified from among the 522 regenerants. The ability to induce callus production and subsequent plantlet formation in these strongly apomictic grasses has potential for use in their improvement.

PUBLICATIONS: Doye, Bernadine G. 1986. Callus initiation and plantlet regeneration of apomictic bluestem grasses (Bothriochloa spp.).

M.S. Thesis. Okla. St. Univ. 35 p.

CULTIVAR RELEASES: None

1986

S-9 TECHNICAL COMMITTEE REPORT

AGENCY: University of Puerto Rico
College of Agriculture
Agricultural Experiment Station

SUBMITTED BY: Guillermo J. Fornaris
College of Agriculture
University of Puerto Rico
Agricultural Experiment Station
Río Piedras, Puerto Rico 00928

ROOT CROPS: M. Santiago and G. Fornaris
Corozal Agricultural Research and Development
Center, Agricultural Experiment Station,
Río Piedras, Puerto Rico 00928

NATURE OF RESEARCH: To obtain, through plant introduction and selection,
better root crops with high yielding ability, resist-
ant to the prevalent maladies and adapted to our
conditions.

PROGRESS TO DATE: An experiment with five yams (*Dioscorea alata*) cvs.
showed that cvs. Gunung and Binugus produced the
highest yields. They are showing tolerance to a
fungus disease known as "Candelilla" (*Colletotrichum*
gloeoporioides). A taniel (*Xanthosoma* sp.) cv. named
Alela, which was introduced to the collection last
year, has shown some tolerance to "Mal Seco", a
disease caused by a pathological microorganisms complex,
but its yields are relatively low. Four cvs. of cas-
sava (*Manihot esculenta*) were recommended for release.
These cultivars are Llanera, Serrallés, Tremesiana and
Forastera.

PUBLICATIONS: None

CULTIVAR RELEASES: None

BANANAS AND PLANTAINS: M. Santiago and G. Fornaris, Corozal Agricultural
Research and Development Center, Agricultural Experiment
Station, Río Piedras, Puerto Rico 00928

NATURE OF RESEARCH: To obtain, through plant introduction and selection,
better banana and plantains cvs. with high yielding
ability, resistant to the prevalent maladies and
adapted to our conditions.

PROGRESS TO DATE: Results obtained in the evaluation of 12 plantain cvs. keep showing that cv. Maricongo is the best performing one. The banana cv. 3A, which is showing outstanding performance, has been included in a replicated experiment (in progress), together with cvs. 1A, 2A, 4A and Grand Nain.

PUBLICATIONS: None

CULTIVARS RELEASES: None

FRUITS: S. Martínez and G. Fornaris, Adjuntas Substation and Fortuna Agricultural Research and Development Center, Agricultural Experiment Station, Río Piedras, Puerto Rico 00928

NATURE OF RESEARCH: To obtain, through plant introduction and selection, better fruit trees with high yielding ability resistant to the prevalent maladies and adapted to our conditions.

PROGRESS TO DATE: Production data of the selections in the replicated soursop (Anona muricata) experiment has been taken for the first time, since this is their first year of production. Evaluations of fruit weight, external and internal color, shape, taste and pulp thickness were made in the guava (Psidium guajava) collection. The evaluation of the sapodilla (Manilkara sapota) cvs. continues, together with the Food Technology Laboratory personnel. The evaluation of the pomelo (Citrus maxima) cvs. at Adjuntas Substation continues.

PUBLICATIONS: None

CULTIVAR RELEASES: None

COFFEE: E. Boneta and G. Fornaris, Adjuntas Substation, Agricultural Experiment Station, Río Piedras, Puerto Rico 00928

NATURE OF RESEARCH: To obtain, through plant introduction and selection, better coffee cvs. with high yielding ability, resistant to coffee rust and adapted to our conditions.

PROGRESS TO DATE: Twenty-six coffee (Coffea sp.) cvs. resistant to various races of coffee rust (Hemileia vastatrix) are under evaluation, as well as 49 arabian cultivars susceptible to the disease. Cultivar H-1 is so far the highest yielder. Within the rust resistant cvs. Catimor (C-25 43-2) has been showing the highest yield.

PUBLICATIONS: None

CULTIVAR RELEASES: None

FORAGES: D. Vera, L. E. Tergas and A. Sierra-Bracero, Corozal Agricultural Research and Development Center, Agricultural Experiment Station, Río Piedras, Puerto Rico 00928

NATURE OF RESEARCH: To obtain, through plant introduction and selection, better forages in regard to seasonal yield, nutritive value and adaptability to the various climatic and soil conditions of Puerto Rico.

PROGRESS TO DATE: Legumes introduced in 1984 are under evaluation for adaptation to humid environmental conditions at Corozal. Desmodium qualifolium PI 41810, Macropodium atropurpureus cv. Siratro, Medicago sativa cv. Salinera and Saladina sintetica from INTA, Argentina and two Stylosanthes accessions were the best adapted legumes. Evaluation of alfalfa varieties at Juana Díaz indicated that Florida 77, Florida 66/Florida 77 blend, Florida 66, Maracay and Valador are highly productive in the semi-arid regions of P.R. and could be recommended for hay-making. The best performing grasses at Corozal among several introduced were Panicum maximum PI 13606, P. virgatum PI 422006, Gatton panic P. maximum PI 13605, Paspalum nicorae PI 30590 and 30591, but at Juana Díaz Chloris gayana PI 13598 and a local cultivar of Cynodon sp. were the most productive ones. The evaluation of tropical grass species under grazing using the mob technique continued this year at three municipalities. Results at Toa Baja showed that the most productive grasses in this region were Brachiaria radicans PI 299499, Cynodon plectostachyus PI 409749, Eriochloa polystachya, P. maximum PI 349676, P. coloratum makarikari grass PI 203520 and Panicum maximum PI 291047 out-yielded all the other grasses at Coamo. But, in Juana Díaz the most productive ones were P. maximum PI 259553, P. maximum PI 291047, C. ciliaris PI 263509, C. ciliaris Tx 2464 and C. ciliaris cv. Nueces. All the grasses showed seasonal variations in forage productivity associated with rainfall distribution.

PUBLICATIONS: None

CULTIVAR RELEASES: None

1986

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 2.

* * * * *

Accession User: B. V. Conger
Address: Department of Plant and Soil Science, University of Tennessee,
P.O. Box 1071, Knoxville, Tennessee 37901-1071.
Nature of Research: Evaluation of orchardgrass (Dactylis glomerata L.) germplasm
for persistence under East Tennessee conditions. Evaluation of diploid
species of Dactylis and subspecies of D. glomerata for their response to in
vitro culture and as possible parents for interspecific hybridization.
Progress to Date: From a total of more than 5000 plants established from 216
accessions in 1978, more than 100 continue to be evaluated for agronomic
characters. Two genotypes, which had their origin in the USSR and the
Federal Republic of Germany, respectively, are being maintained in the
greenhouse for cell and tissue culture experiments. These genotypes produce
somatic embryos directly from cultured leaf segments. Plants from 12
diploid Dactylis species and subspecies of D. glomerata were established
from 17 accessions obtained from the Western Regional Plant Introduction
Station and from 10 accessions obtained from the Welch Plant Breeding
Station at Aberystwepth. These plants have not survived field conditions at
Knoxville. They are being maintained in the greenhouse. Preliminary
experiments were initiated to confirm the chromosome members of these plants
and to test their response to in vitro culture but no conclusive results
have been obtained. It is hoped that additional progress will be obtained
during the next year.
Publications: Hanning, G. E. and B. V. Conger. 1986. Factors influencing
somatic embryogenesis from cultured leaf segments of Dactylis glomerata. J.
Plant Physiol. 123:23-29.
Cultivar Releases: None

Accession User: B. N. Duck

Address: School of Agriculture, University of Tennessee at Martin,
Martin, TN 38238-5008.

Nature of Research: Evaluation of Vicia spp. for agronomic adaptation.

Progress to Date: A total of 470 accessions representing 15 Vicia spp. were obtained from the Southern Regional Plant Introduction Station and evaluated in field plantings during the 1985-86 season. About 60% of these had been classified V. sativa; species angustifolia, ervilia, and villosa each represented 9 to 13% of the accessions. Eight accessions of roughpea (Lathyrus hirsutus) were secured from the Western Regional Plant Introduction Station and evaluated with the vetches. All accessions were planted (50 seeds each) in rows 3.7 m long with 0.9 m between rows. Common vetch (V. sativa cv. 'Cahaba White') and hairy vetch (V. villosa) were used as standards. About 25% of the accessions were winterhardy; species V. articulata and V. villosa were generally hardy, V. angustifolia was intermediate for this trait, and V. sativa was generally non-hardy. Ratings were made for early and late spring vigor, flowering date, and maturity. Hardy accessions of V. sativa were much earlier in maturity than those of V. villosa, but the latter were generally more vigorous. Sixty-three accessions were selected for further observation and seed were harvested for planting in fall 1986.

Publications: None

Cultivar Releases: None

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: Corn Breeding

Progress to Date: Several open-pollinated white corn varieties have been intermated. Random-mating with mild selection for adaptation is being used to develop a source of germplasm for white corn breeding.

Publications: None

Cultivar Releases: None

1986

S-9 Technical Committee Report

Agency: The Texas Agricultural Experiment Station
Submitted by: Oliver E. Smith
Address: Soil and Crop Sciences Department
Texas A&M University
College Station, Texas 77843
Phone: 409-845-5389

Page 1 of 3

* * * * *

Accession User: Raymond D. Brigham
Address: Texas A&M University Agricultural Research and Extension Center
- Route 3, Lubbock, Texas 79401; phone: (806) 746-6101.
Nature of Research: Breeding soybean (*Glycine max*) for disease resistance.
Progress to Date: Plant introductions 227555 and 200503 are being used as sources of resistance to soybean mosaic virus. Plant introductions 171451, 200449, 227687, 229385, 323558 and 340029 are being used in insect resistance studies, primarily with the soybean stem borer (*Dectes texanus*).
Publications: None
Cultivar Releases: None.

Accession User : Raymond D. Brigham
Address: Texas A&M University Agricultural Research and Extension Center;
Route 3, Lubbock, Texas 79401; (806) 746-6101
Nature of Research: Breeding sesame (*Sesamum indicum*) for earliness, suitable seed color and size, capsule size and plant type.
Progress to Date: The following plant introductions are being used as sources for one or more of the forestated characters: 153517, 251702, 251703, 257656, 257657, 265520, 265522, 265523, 297027, 297028, 436600 and 436602.
Publications: None.
Cultivar Releases: None.

Accession User: Mark A. Hussey
Address: Soil and Crop Sciences Department, Texas A&M University; College Station, Texas 77843; (409) 845-8795.
Nature of Research: Breeding for rhizomatous, seed production and winterhardiness in buffelgrass (*Cenchrus ciliaris*).
Progress to Date: Plant introductions 409157, 409162 and 409171 are rhizomatous and also possess high seed yielding characters. Plant introduction 409704 is quite winterhardy and is being evaluated throughout Texas in an effort to quantify its winterhardiness, forage production and quality characters.
Publications: None.
Cultivar Releases: None.

Accession User: Charles Simpson and others

Address: Texas A&M University Agricultural Research and Extension Center;
Box 292, Stephenville, Texas 76401 (817) 968-4144

Nature of Research: Breeding for earliness and leaf spot resistance in peanut (*Arachis hypogaea*).

Progress to Date: The plant introduction 109839 was introduced into the United States from Venezuela and has been identified as having leaf spot resistance. In crosses made with Florunner a late maturing peanut and PI 109839 also a late maturing peanut a number of desirable types were produced, some having both leaf spot resistance and earliness. The earliness factor is obviously a result of transgressive segregation.

Publications: None.

Cultivar Releases: 'Langley' this variety was developed from the cross between Florunner x PI 109839. The variety 'Langley' yields the same as Florunner, but matures 10 days earlier.

Accession User: George Tereshkovich

Address: College of Agricultural Sciences; Department of Plant and Soil Science; Texas Tech University; Box 4169; Lubbock, Texas 79409.
Phone: (806) 742-2837

Nature of Research: Cultural Studies with pungent (hot) peppers (*Capsicum* species), chili, cayenne, jalapeno and paprika.

Progress to Date: In 1985, the following plant introductions were planted and the data in Table no. 1 were obtained.

Pungent Peppers Grown at Lubbock, Texas in 1985.

P.I. Number	Yield per acre pounds	Ave. wt. per fruit g	Fruit bearing habit*	Average plant height cm
138563	4,356	14.9	P	33
140373	10,164	18.9	P	53
162605	9,583	25.6	P	67
167361	11,616	28.9	P/E	58
172775	Plants variable in size, productive, but pods are mixed as to size, shape & color		P/E	-
176892	No plant survival	--	--	-
179200	10,164	44.8	P/E	52

204685	5,808	10.9	--	-
256056	4,356	13.4	P	61
288958	6,970	18.2	P	45
357467	Suitable for ornamental planting purposes, (low border)			
357566	3,775	16.8	P	58
357625	5,808	16.6	P	34

* P = Pendent; E = Erect

Publications: No. T-4-185 'Pungent Peppers for West Texas'
Cultivar Releases: None.

1986
S-9 TECHNICAL COMMITTEE REPORT

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

Page 1 of 3

Accession User: Jeff McCormack
Address: Southern Exposure Seed Exchange
P.O. Box 158
North Garden, VA 22959

Nature of Research: This firm is involved in breeding and selection of various plants of horticultural interest, including Allium cepa, Helianthus annuus, and Petroselinum crispum.

Progress to Date: Several lines of Allium cepa aggregatum obtained as PI's in the past several years are still in field testing. One line is scheduled for release as soon as sufficient stock is available. A single accession of Petroselinum crispum (PI 358066) is being tested now, but has been quite variable in horticultural traits. Limited field testing of Helianthus annuus is proceeding this year, but previous testing of PI's resulted in two cultivar releases. 'Hopi Dye' is of interest for two reasons: as a natural dye source, and it reportedly contains a male fertility restorer gene, useful in hybrid sunflower production.

Publications: none

Cultivar Releases:
Helianthus annuus 'Hopi Dye' (PI 432508)
H. annuus 'Progress' (PI 430541)

Accession User: P.C. Newcomb
Address: Monticello, P.O. Box 316, Charlottesville, VA 22902

Nature of Research: Monticello is the home of Thomas Jefferson. The Foundation is attempting to recreate the landscape of Monticello as it was in Jefferson's lifetime, obviously requiring unimproved or little-improved cultivars of many flower, fruit, and vegetable species. Jefferson was an avid horticulturist and grew a great diversity of plants. The Foundation has recently established the Historic Plant Center, which will be concerned with plant species and cultivars of historic interest.

Progress to Date: The only use of PI material to date has been three accessions of Zinnia violacea (perhaps a synonym for Z. elegans). These were from Mexico and Belgium, and appear to be

improved forms with large, colorful flowers. The plants have been removed from public display, pending verification of authenticity. With non-PI material, numerous unimproved species are presently grown in the vegetable and flower gardens, propagated from collected seeds. Limited amounts of seeds and old fruit tree cultivars are offered for sale.

Publications: none

Cultivar Releases: none

Accession User: Dr. Daniel Bossut

Address: Dept. of Physiology, Medical College of Virginia
MCV, Station 551, Richmond, VA 23298

Nature of Research: Experiments were designed to determine an animal model for experimental pruritus (itching). The behavior of rats, cats, and dogs was observed following the rubbing of Macuna deeringiana and M. pruriens (cowhage) pods on their skins.

Progress to Date: The treatment did not produce a change in the subjects' behavior. Therefore, the project was discontinued.

Publications: none

Cultivar Releases: none

Accession User: Wayne Randolph

Address: Colonial Williamsburg Foundation
P.O. Box C, Williamsburg, VA 23187

Nature of Research: Like Monticello, Williamsburg is a historic site and is dedicated to interpreting our nation's past for the modern world. This involves historic crop cultivars.

Progress to Date: The Zea mays cultivar 'Hamilton' ('Cherokee'), PI 487413 is in trial now to see if it is adapted to the Tidewater area. Dr. Louis Bass suggested it as closely resembling the description of the "white flint field corn" type commonly grown in this area in the 18th century.

Publications: none

Cultivar Releases: none

Accession User: M. Rangappa

Address: Dept. of Life Sciences
Virginia State University
Petersburg, VA 23803

Nature of Research: Dr. Rangappa has been involved for several years in screening Phaseolus vulgaris lines for resistance to air pollution. Ozone and sulfur dioxide in particular are under investigation. This is a joint effort of the USDA, NCSU, and VSU. The work at VSU involves preliminary field screening of accessions, followed by chronic dose response evaluation in open-top field chambers. VSU is ideal for field screening due to heavy industrial pollution in near-by Petersburg. The Phytotron at NCSU is used for acute dose response trials. Eventually, all P. vulgaris accessions will be screened.

Progress to Date: Over 9000 accessions have been screened to date. Details were given in last year's report; this year's activity has been primarily testing of PI's which did not germinate last year. Of the PI's which have resistance to ozone (less than 35% injury after 2 hrs. of 0.6 ppm ozone), most were of vining habit.

Publications: Reinert, R.A., J.A. Dunning, W.W. Heck, P.S. Benepal and M. Rangappa, 1984. Screening of bean (Phaseolus vulgaris) for sensitivity to ozone. HortScience 19(1):86-88.

Cultivars: none

1986 Report of the
Seed Viability and Research Unit, National Seed Storage Laboratory
to the
National Plant Germplasm Committee
and to the
Regional Technical Committees on Plant Germplasm
by
Dorris C. Clark, Acting Director

The many significant accomplishments of 1985 are somewhat secondary to the sudden death of Dr. Louis N. Bass, Director of the National Seed Storage Laboratory. His leadership in the area of seed preservation is greatly missed; however, the effective practices that he adopted have become a launching base for future methods of maintaining valuable germplasm. We will always be grateful for his many contributions to the tremendously important work of preserving the wealth of plant germplasm being maintained in the National Plant Germplasm System.

PLANT GERmplasm PRESERVATION

Seed samples were received from all components of the U.S. National Plant Germplasm System, commercial seed companies, state experiment stations, and individual plant breeders. Foreign sources of seed were acquired under an agreement between ARS and the IBPGR which provides duplicate storage of world base collections of many major crops. The National Seed Storage Laboratory also coordinated numerous viability tests for the Regional Plant Introduction Stations.

During 1985, the 7,787 accessions added to the base germplasm collection brought the total cataloged accessions in storage to 198,854. In addition, 17,968 accessions of CIMMYT wheat and 6,549 IRRI rice accessions were received for storage. A total of 3,986 seed-increase samples were received. Arrangements were made for seed increase of about 95 cataloged accessions and about 300 sweet corn inbred lines that required a seed increase before they could be cataloged into the collection. Approximately 14,687 accessions stored at the NSSL were tested for viability. Over 11,300 accessions from various germplasm curators were tested for germination as part of the program to monitor the viability of the entire U.S. germplasm collection. For numerous accessions a partial purity test was required to obtain pure seed for a germination test. Samples of some species required use of special dormancy-breaking procedures to determine total viability potential. Seeds of 584 accessions were sent to 72 scientists in 18 countries. Seed inventories on microfiche or computer printout were sent to scientists upon request. Updating of the NSSL-owned accession records residing in the GRIN Data Base continued. Preparation was made to reload the NSSL Data Base into GRIN-2. Barley genetic stocks maintenance, distribution, and associated studies carried out under an extramural CRIS consisted of growing 200 genetic, 45 trisomic, and 20 multiple genetic stocks to study characteristics and to increase fresh seeds. Various mutant stocks were crossed with primary trisomics for linkage studies.

To develop more multiple genetic stocks, 14F₁ hybrid, 18F₂, and 23F₃ lines were grown. Seven genetic stocks were received and increased. Crosses of a new haploidy initiator (hap) with shin Ebisu 16 (SE16) to establish hap line in SE16 background were backcrossed to reach the goal. Seeds of 76 genetic stocks and 58 trisomic stocks including telotrisomics and acrotrisomics were distributed. Based on the telotrisomic analysis, the centromere positions in all seven chromosomes were located in the genetic linkage maps of barley. Two acrotrisomic lines, 6S⁶L and 7S⁷L, were used for genetic linkage mapping in barley chromosomes.

Acquisition, documentation, germination testing, and regeneration of germplasm accessions have increased over recent years. With the cooperation of coordinators of the Regional Plant Introduction Stations and other germplasm curators, more has been accomplished in acquisition, preservation, viability testing, and regeneration of germplasm introduced into the National Plant Germplasm System. The limited space and staff resources for meeting the demands of long-term seed preservation has become critical. Stopgap measures for storage space is now being studied, such as storing seeds in existing aisles within the cold-storage vaults. The only suitable solution, however, will be through the construction of a new seed-storage building.

The NSSL will continue to acquire suitable germplasm for inclusion in the base collection. Viability testing of stored germplasm will be conducted as nearly on schedule as possible with the limited personnel available. Participation with GRIN continues as one of the high priority activities of NSSL.

PUBLICATIONS

- SHAHLA, A. and T. TSUCHIYA. 1985. New trisomics in barley. Barley Genet. Newsl. 15:21-22.
- SHAHLA, A. and T. TSUCHIYA. 1985. Further information on telotrisomic analysis in barley. Barley Genet. Newsl. 15:22-23.
- SHAHLA, A. and T. TSUCHIYA. 1985. Genetic analysis with two acrotrisomics in barley. Agron. Abst. 1985 Ann. Meet.:69-70.
- FURUTA, Y. and T. TSUCHIYA. 1985. Cytogenetics in a new compensating trisomic type for chromosome 4 in barley. Agron. Abst. 1985 Ann. Meet.:54.

1986 S-9 Technical Committee Report

Agency: Soil Conservation Service
Submitted by: H. Wayne Everett
Address: Fort Worth Federal Center
P.O. Box 6567
Fort Worth, Texas 76115

Page 1 of 6

Accession user: Brooksville Plant Materials Center
Address: 14119 Broad Street, Brooksville, Florida 33512
Nature of research: Development of new conservation plants for MLRA 138, 151-155, and 270-273 (emphasis on cropland erosion problems).
Progress to date: In 1985, selected species were collected or assembled that had potential as cover crops. Sufficient material of Indigofera hirsuta and Cassia fasciculata were gathered to begin evaluation in 1986. Crotalaria lanceolata will be collected again in 1986. All available foreign material has been assembled. Indigofera pilosa, Crotalaria grantiana, Lathyrus cicera, and Melilotus albus are being assembled over a long period of time due to a scarcity of material. The bamboos discussed in previous years were destroyed due to a lack of spread over the three-year initial evaluation period. Field evaluation of PI-299648, Digitaria macroglossa, for coastal dune stabilization, is continuing to evaluate its potential as a weed. In Puerto Rico, PI-490363 and PI-490364, Paspalum nicorae and 'Kuivato' Eragrostis lehmanniana, PI-198581, have performed well for critical area stabilization and forage production on the semi-arid part of the island.
Publications: 1
Cultivar releases: None

Accession user: Americus Plant Materials Center

Address: Route 3, Patton Drive, Americus, Georgia 31709

Nature of research: Development of conservation plants for MLRA's 128-130, 133, 136, and 137.

Progress to date: PI-490363, PI-490364, PI-310131, and PI-202044, Paspalum nicorae, continue to be evaluated for forage and critical area planting purposes, particularly peach orchard cover and grassed waterways. While it establishes more quickly from seed when planted in grassed waterways than 'Pensacola' bahiagrass, seed production problems and potentials need to be worked out before a release can be planned. PI-166400, 'Selection 75,' Panicum coloratum, and PI-301477, 'WW-477,' Bothriochloa ischaemum, field plantings are adapted and continue to perform well in the Black Belt area (MLRA 135) of Alabama for marginal cropland conversion, forage, and critical areas.

PI-286452, Lespedeza cuneata, 'Appalow' sericea lespedeza. The full range of adaptation and performance have not been determined for Alabama and Georgia. Field plantings of Appalow appear to be adapted and have potential as a warm-season pasture legume in addition to being a good plant for critical area stabilization.

PI-434285, Salix X cottetii, 'Bankers' dwarf willow. Field plantings have been established in Alabama and Georgia to determine the adaptation and performance for streambank stabilization.

PI-218004, Lespedeza virgata, 'Ambro' virgata lespedeza. Ambro has never been fully evaluated as a warm-season legume for pastures. It grows well in a bahiagrass mixture at Americus, and with tall fescue, lovegrass, and common bermuda at other locations. Wildlife biologists are now interested in the plant as a source of food and cover for quail, turkey, and geese. Field plantings are under way to evaluate the adaptation and performance of Ambro for wildlife.

PI-267817, Arachis glabrata, 'Arbrook' perennial peanut. Field plantings are being established in Alabama and Georgia to determine its range of adaptation and performance as a warm-season forage.

Publications: 1

Cultivar releases: 1

Accession user: Quicksand Plant Materials Center

Address: Quicksand, Kentucky 41363

No report received.

Accession user: Coffeeville Plant Materials Center

Address: Route 3, Box 215-A, Coffeeville, Mississippi 38922

Nature of research: Development of conservation plants for MLRA's 118, 131, and 133-135.

Progress to date: PI-163453, Glycine soja, was released as 'Quail Haven' for wildlife food and it has good potential as a warm-season cover - green manure crop. It is a better seed producer and has better reseeding qualities than does 'Bobwhite.'

PI-220584, Calamagrostis pseudophragmites, is in the field-testing program. It has good erosion control potential for effluent water disposal and can be propagated year-round vegetatively. Tests relating to fertilizer requirements and clipping recovery are underway.

PI-421132, Elaeagnus umbellata, was released as 'Ellagood' autumn olive in cooperation with the Georgia PMC. It is adapted to the southeastern United States and ripens its fruit from 30-100 days later than other varieties. This makes it more useful as a wildlife food shrub.

PI-168939, Quercus acutissima, was released as 'Gobbler' sawtooth oak in cooperation with the Kentucky PMC.

Publications: 1

Cultivar releases: 3

Accession user: East Texas Plant Materials Center

Address: Agriculture Building, SFASU
P.O. Box 13000, SFA Station
Nacogdoches, Texas 75962

Nature of research: Development of conservation plants for east Texas.

Progress to date: About 45 warm season grasses and legumes of foreign origin are being evaluated for adaptation to east Texas climatic conditions. This Center is just beginning to evaluate plant materials and, as a first step, many named varieties with commercial availability were planted to determine their usefulness to east Texas conditions.

Publications: None

Cultivar releases: None

Accession user: Knox City Plant Materials Center

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

Nature of research: Development of conservation plants for MLRA's 42, 77, 78, 80-87, 112, 118, 119, 133B, 150A, and 150B of Texas and Oklahoma.

Progress to date: Several accessions of Pinus eldarica, Pinus sylvestris, and Pinus nigra are being evaluated at Knox City and four off-Center sites for use in windbreaks. Evaluations will continue for 4-5 more years before any selections are made.

PI-469254, Eragrostis superba, is still being evaluated and may be released for range, pasture, and critical area plantings. There are several field plantings of PI-469254 in Texas as well as an initial evaluation at Knox City comparing PI-469254 with 'Palar' and a variety commercially available in Texas.

Two accessions of Pennisetum flaccidum, PI-422664 from North Carolina and PI-315868 from Los Lunas, are being evaluated for adaptation at Knox City.

Twenty-four accessions of Thuja orientalis are being evaluated at Knox City in cooperation with the Manhattan PMC.

PI-421727, Cassia fasciculata, was released as 'Comanche' partridge pea. It is a reseeding legume for inclusion in seeding mixes for wildlife and for beautification.

PI-477962, Engelmannia pinnatifida, was released as 'Eldorado' engelmann daisey. It is perennial and useful in seeding mixtures where an early spring forb is needed for browse forage.

Publications 1
Cultivar release: 2

Accession user: South Texas Plant Materials Center

Address: Caesar Kleberg Wildlife Research Institute
Texas A&I University
P.O. Box 218
Kingsville, Texas 78363

Nature of research: Development of wildlife and rangeland plants for south Texas.

Progress to date: Warm-season grasses and legumes of foreign origin are being evaluated for adaptation. No selections have been made. In addition, 'Nueces' buffelgrass and wilman lovegrass, kleingrass has been planted to act as a base grass for interseeding different cool- and warm-season forbs and legumes.

'Corto,' Australian saltbush Atriplex semibaccata, PI-432439, was replanted due to a poor stand from 1985. 'Corto' will be harvested for seed production and will be used for revegetating saline areas while the stand will be studied for wildlife usage.

Observations are currently being made on woody species T-53229, Cordia sinensis, and T-53230, Maerua crassifolia. These collections were made in Niger and will be observed for wildlife and livestock forage uses.

PI-202044, Paspalum nicorae, will be observed for possible forage values in south Texas.

Publications: None

Cultivar releases: None

Accession user: Hawaii Plant Materials Center

Address: P.O. Box 236, Hoolehua, Hawaii 96729

Nature of research: Development of new conservation plants for Hawaii and the Pacific (including Guam, northern Mariana Islands, Caroline Islands, and America Samoa).

Progress to date: T-37868, Paspalum vaginatum, has been the best accession tested for stabilizing aquaculture pond banks. It is scheduled for release in late 1987 or 1988.

T-37919, Desmodium heterophyllum, shows promise as a low-maintenance legume for ground cover in orchards and other erosion-prone areas.

T-37926, Desmodium ovalifolium, shows promise for ground cover in orchards and possibly for forage.

T-37869, Pennisetum purpureum, is a stiff-growing napiergrass that shows promise for windbreak, biomass, and possibly for forage.

Publications: None

Cultivar releases: None

National Program Staff Report
to Regional Technical Committees
July 1986
Henry L. Shands

This report will briefly address some of the activities currently happening in the National Plant Germplasm System (NPGS).

Budgets. We are now all aware that the Gramm-Rudman-Hollings cuts will not be restored to base funding. The 4.3 percent cut taken in 1986 has been permanently incorporated in 1987 budgeting. The \$1.0M clonal repository money mentioned in the 1985 report for transfer from CSRS to ARS was effected. Proposed funding increases for germplasm in FY87 total \$2.8M or about 21 percent. These are new thrust proposals and do not alleviate the pressures imposed by GRH on current base funding levels.

The estimated funding for plant germplasm research follows:

<u>Research</u>	<u>FY 1986</u>	<u>FY 1987</u>
Acquisition	2,267,200	2,369,100
Maintenance	6,717,700	7,477,500
Evaluation	4,088,500	5,664,300
Enhancement	843,500	1,281,400
Total:	<u>13,916,900</u>	<u>16,792,300</u>

Regional Plant Introduction Stations. Geneva is now advertising for a GS-14, category 4, Curator and leader. Experiment now has a curator for the sweet potato repository being established there. Ames is beginning to receive the first regenerated seed from the Latin American Maize collection. Pullman has had to release one employee because of state funding reductions to the program.

National Clonal Germplasm Repositories. The Geneva repository for apples and hardy American grapes was dedicated in March. The Hilo, HA repository construction is now running behind schedule because of contractor problems and it appears to have a November completion date projection; the curator is now on the job. The Leesburg, FL citrus repository construction is expected to be complete in September. Delays in lease agreement signing at UC-Riverside threaten the construction schedule, currently thought to be complete in August of 1987.

National Seed Storage Laboratory. The expansion of the facility continues to be number one priority on ARS construction list. While important to the NPGC, its priority has not been substantial enough yet to pass OMB. Once past OMB muster, it will require significant attention to get past the Hill. Space is a problem for research, storage and servicing the vault samples. NSSL will accept backup collections for the special genetic stock collections. It is essential that researchers identify important collections for preservation under the best of storage conditions. Each Regional Technical Committee has a responsibility to keep alert for these collections as key people retire or experiment stations close positions. Kindly see that freshly regenerated seed is sent to NSSL whenever possible.

U. S. National Plant Quarantine Station. A new accord between APHIS and ARS is in the review process to be enacted in FY1987. The new APHIS facility at BARC-E will be staffed with ARS technicians to conduct the indexing work. The need to improve the movement of prohibited material out of quarantine has long been recognized as a priority but various institutional problems have prevented it. Now, Crop Advisory Committees (CAC) must take the lead in establishing priorities for material entering quarantine and identifying what material should be moved to the front of the line once in the system.

Carribbean Quarantine Site. ARS is attempting to arrange with APHIS a site in the Carribbean where temperature- or photoperiod-sensitive introductions can be quarantined. Conversion to day-length neutrality can be initiated simultaneously before the material moves to mainland users.

Crop Advisory Committees. A very successful workshop involving the chairs of the CACs was held at Beltsville 16-18 June 1986. Doctors Kinney and Harris addressed the group and pledged their continued support to the germplasm effort as one of the top priorities of their agencies. The meeting was coordinated by the USDA-ARS National Program Staff's Germplasm Matrix Team. The workshop enabled the 36 CACs to express their concerns in an informal setting where a good dialogue ensued and many aspects of the CAC activities and responsibilities were addressed.

Germplasm Resources Information Network (GRIN). GRIN has released version 2.0 and has been conducting short courses for curators and data entry personnel. We are hopeful that TCs and CACs will identify special genetic stock collections to be entered into the database to enlarge the informational base for the NPGS user. GRIN will be initiating the work on the genetic code database in FY87. This is in collaboration with the new Plant Gene Expression Center (PGEN) located at Albany, CA and forming the consortium with UC-Berkeley. The Center is hiring for FY87 activities and, when fully staffed, will have some ten scientists.

Diversity Magazine. This publication has not had the broad base of support necessary to sustain operations, namely subscriptions. It is the responsibility of the entire germplasm community to do its best to bring it to the attention of users who will be pleasantly surprised to find how much information it contains. It can serve as the information link for the NPGS and all within the system should contribute to it via germplasm news items, release notices, review articles, and subscriptions.

Some plant germplasm activities. In corn, the regeneration project of Latin American Maize collections continues and is bringing in materials from South America. The evaluation phase facilitated by the grant of \$1.5M from Pioneer Hi-Bred Seed is being managed by rehired annuitant, Quentin Jones. That program will evaluate native corns in eleven countries over five years. The RFLP mapping project at Raleigh is in the planning stage.

In soybean, proposed mapping projects are moving ahead at Ames and Beltsville while new new funding to support maintenance at Urbana and Stoneville will help them considerably. Alternative uses of soybean will receive support by new projects at Wyndmere, PA and Peoria, IL labs.

In small grains, evaluation is still a major effort. The Aberdeen, ID facility proceeds to the 25 percent plan stage this summer of 1986.

1986

S-9 TECHNICAL COMMITTEE REPORT

Agency Tropical Agriculture Research Station
Submitted by: Francisco Vázquez
Address: U.S. Department of Agriculture, Science and
Education, Agricultural Research Service,
Tropical Agriculture Research Station, P.O. Box
70, Mayaguez, Puerto Rico 00709

Accession User: F. Vázquez
Address: Tropical Agriculture Research Station, P.O. Box 70,
Mayaguez, Puerto Rico 00709
Nature of Research: Agronomic evaluation and seed increase of
forage legumes (Stylosanthes and Centrosema).
Progress to Date: In cooperation with Dr. Luis Tergas,
University of Puerto Rico, Mayaguez Campus, 30
Stylosanthes and 33 Centrosema accessions were
planted at Mayaguez for agronomic evaluation and seed
increase. A duplicate planting was made at the
Isabela experiment farm.

Accession User: F. Vázquez, A. Sotomayor-Ríos
Address: Tropical Agriculture Research Station, P.O. Box 70,
Mayaguez, Puerto Rico 00709.
Nature of Research: Evaluation of a new forage grass.
Progress to Date: In cooperation with Dr. Luis Tergas,
University of Puerto Rico, Mayaguez Campus, a
Graduate Student MS thesis work was initiated at the
Isabela experiment farm. The research work consists
in evaluating (mob grazing) two Cynodons: Tifton
79-16 developed by Dr. Glenn Burton and local
stargrass, Cynodon nlemfuensis. All plots were
established and the experiment was initiated.

Accession User: F. Vázquez
Address: Tropical Agriculture Research Station, P.O. Box 70,
Mayaguez, Puerto Rico 00709.
Nature of Research: Evaluation of tropical plant germplasm.
Progress to Date: Yams Collection (Dioscorea alata, D.
esculenta, and D. bulbifera).

The yams collection (18 varieties) was evaluated at
two different locations for growing and cultural
characteristics and disease reaction to Anthracnose
and scorch. The first is locally known as Candelilla

and the second is of unknown etiology. Dioscorea alata cultivars were the most susceptible to both unfavorable conditions. Gunung showed the best Anthracnose resistance, with the highest vigor and yields. Cultivars Doli and Beti (D. esculenta) had the best yields and some resistance to Anthracnose.

Passion fruit - (Passiflora edulis and P. edulis var. flavicarpa).

Five promising passion fruits and some exotic inbreds from Australia have been evaluated for local adaptation, disease reaction, and yields. The major foliar diseases appeared to be Septoria, Anthracnose, and scab.

Plant Introductions:

Theobroma cacao - Budwood from 50 clones of cacao introduced from the Miami Subtropical Horticulture Station. Three plants of each clone will be transferred to the permanent field collection.

Other Plant Introductions:

Anthyllis vulneraria (2 accessions)
Spathodea campanulata
Cassia bakerianum
Salacca edulis
Canavalia ensiformis (4 accessions)
Canavalia maritima
Sesbania spp.
Indigofera spp.

Germplasm Collections:

Fruit trees, vines, and shrubs - Over 518 accessions of 407 species of tropical and subtropical fruits and nuts, ornamental shrubs, and trees are maintained at the TARS grounds. Only 142 of these accessions have their PI numbers.

Dioscorea spp. - Eleven selections of Dioscorea alata, 5 selections of D. esculenta, and 1 of D. bulbifera have been grown in replicated plots in two different locations (Mayaguez and Isabela) for evaluation. Requests for plant material were processed during the months of February and March, 1986.

Musa spp. - Forty four (44) banana and 24 plantain selections are maintained at TARS for evaluation and distribution.

Legume seed - Seeds of various species of legumes are available in small amounts for distribution.

Canavalia ensiformis - Jack bean

Lablab purpureus - (Dolichos lablab) - Hyacinth bean

Pachyrhizus erosus - Yam bean

Phaseolus vulgaris - Common bean

Psophocarpus tetragonolobus - Winged bean

Pueraria lobata - Kudzu

Vigna unguiculata - Cowpea

Theobroma cacao - In cooperation with the American Cocoa Research Institute (ACRI), TARS maintains a disease-free collection of selected cacao clones which serve as a permanent source of budwood for worldwide distribution. The collection consists of 372 clones with three mature plants representing each clone. The cacao collection provides plant material for continued breeding research, serving also as a source of moderate or large-scale distributions to scientists, cacao breeders, and institutions in U.S. and throughout the world. New clones are added to the collection once these are grafted and achieve the proper size for transplanting.

TARS, in cooperation with the American Cocoa Research Institute (ACRI) is providing technical support to the Agricultural Experiment Station of the University of Puerto Rico in a newly created program of cacao hybrid seed production. Grafted trees of 8 selected clones have been provided to the Agricultural Experiment Station.

Passiflora edulis - The five passion fruit hybrids introduced from Miami in 1984 are still under evaluation at three locations in Puerto Rico.

Cuphea spp. - Seeds of 3 cultivars were received from the Plant Introduction Station, Ames, Iowa. Seed harvested will be returned to Ames for evaluation on seed quality and dormancy.

Germplasm Distribution:

TARS is directed to answering local, national and foreign needs for plant germplasm. Requests for vegetable seeds, tubers, yams, cuttings, trees, fruits, nuts, etc., have been handled throughout Puerto Rico, Virgin Islands, Continental United States, and foreign countries. A summary of these distributions follows:

<u>Germplasm</u>	<u>Packets</u>	<u>No. of persons</u>	<u>Countries</u>
Vegetable seeds	48	22	20
Tubers, yams, etc.	86	59	61
Trees, fruits, nuts	2134	15	15
Other seeds	43	25	26
Cacao pods	405	5	1
Cacao budwood	35	1	1

Accession User: A. Sotomayor-Ríos

Address: Tropical Agriculture Research Station, P.O. Box 70,
Mayaguez, Puerto Rico 00709.

Nature of Research: Increase and initial evaluation of agronomic crops at the St. Croix Experiment Station.

Progress to Date: The St. Croix site was used for the first time for plant germplasm activities for grow-out of selected species. Accessions grown were: corn (5), pearl millet (23), sorghum (150), squash (4), sunflower (1), soybeans (10), and beans-Phaseolus spp. (21). Harvested seed was returned to the Coordinator of the Regional Plant Introduction Station. Corn diseases and pests were minor, sorghum had rust and some stalk rot, but seeds were free of molds. Iron chlorosis condition was expressed on soybeans and beans leaves, probably due to lack of inoculation. Pearl millet was virtually free of pathogens and pests.

Accession User: A. Sotomayor-Ríos

Address: Tropical Agriculture Research Station, P.O. Box 70,
Mayaguez, Puerto Rico 00709.

Nature of Research: Increase and evaluation of sorghum collections.

Progress to Date: Part of the Ethiopian Collection (1425 accessions) was planted, selfed, and classified by Mr. Angel Bosques-Vega, University of Puerto Rico, Mayaguez, in cooperation with TARS staff. Most of the selfed seed was returned to the Coordinator of the Regional Plant Introduction Station. One thousand entries have been harvested.

Accession User: G. F. Freytag

Address: Tropical Agriculture Research Station, P.O. Box 70,
Mayaguez, Puerto Rico 00709.

Nature of Research: Tropical bean germplasm and genetic stocks.

Progress to Date: Several seed increases of wild bean species were introduced. Available are 216 numbers corresponding to 19 species. Snap and dry bean European cultivars (55) were obtained from Dr. Fred Bliss, at the University of Wisconsin from the seed protein electrophoretic study of the Ph.D. program of Paul Gebts. Increased seed from these cultivars was harvested at TARS and sent to PIO for accession.

Accession User: G. F. Freytag

Address: Tropical Agriculture Research Station, P.O. Box 70,
Mayaguez, Puerto Rico 00709.

Nature of Research: Release of bean germplasm lines.

Progress to Date: Three white bean germplasm lines TARS-IM (BCMV)-1, TARS-IM(BCMV)-2, and TARS-IM(BCMV)-3 with immune reaction to all known strains of bean common mosaic virus (BCMV) were released this year. These lines derive their resistance from two genes: the dominant I gene which gives a hypersensitive reaction to necrotic strains of BCMV, and the recessive bc-3 gene which is also resistant to all known strains of BCMV and also protects the I gene from the hypersensitive type reaction. The bc-3 gene comes from PI 181954 originally collected in Syria.

Another small white bean breeding germplasm line, 5W-372 was developed and released at TARS from the breeding germplasm at Mayaguez. This line has been tested in the National Rust Nursery trials in 1983-85 and has been consistently resistant or immune to all rust races in the U.S. In tests at Beltsville it has been found to be resistant to 49 races to which it has been inoculated. Since genes in this line are closely linked, cultivar improvement with this line should be a simple matter, and cultivars containing this resistance should not suffer losses from bean rust at any location in the U.S.

This year for the first time a breeding population composed of genes from an intercross of 3 bean species has been released as Interspecific Triple Cross "KH". This population has been grown in Puerto Rico at several locations and shows great adaptability, diversity, and promise for new disease resistance, cold tolerance, and plant structure.

Accession User: F. W. Martin

Address: Tropical Agriculture Research Station, P.O. Box 70,
Mayaguez, Puerto Rico 00709.

Nature of Research: Development of tropical, stress resistant
sweet potatoes.

Progress to date: Five years ago the sweet potato breeding
project introduced seed from Japan, Taiwan, Solomon
Islands, Nigeria, Central America, and the West
Indies, as well as the USA. From these initial
introductions, populations were established on the
basis of selection and polycrossing, and numerous
selections have been made and tested as possible
varieties. One new cultivar, 'Papota', has been
released and other selections are ready for release.

Of special interest is the development of
stress-resistant populations. Stresses are imposed
on the population either in the field or the
greenhouse. The Mayaguez soils impose several
stresses, defined here as the tropical soils stress
complex (TSSC) which include heavy soil, poor
drainage, acidity, low fertility. If sweet potatoes
are grown in this situation and are selected from
this situation, the tolerance to this stress
increases.

Publications: Martin, F. W. 1986. Notice of release of
"Papota" sweet potato. Mimeographed after approval,
Tropical Agriculture Research Station, Mayaguez,
Puerto Rico.

Martin, F. W. and Carmer, S. G. 1985. Variation in
sweet potato for tolerance to some physical and
biological stresses. *Euphytica* 34:457-466.

1986

S - 9 TECHNICAL COMMITTEE REPORT

Agency: U. S. Department of Agriculture, Subtropical Horticulture Research Station

Submitted by: E. J. Garvey and R. J. Knight, Jr.
Address: 13601 Old Cutler Road, Miami, Florida 33158
Page 1 of 5

Accession Users: E. J. Garvey and R. J. Knight, Jr.
Address: U. S. Department of Agriculture, Subtropical Horticulture Research Station, 13601 Old Cutler Road, Miami, Florida 33158
Nature of Research: Introduction, preservation and evaluation of tropical and subtropical plants.

Progress to Date:

The SHRS maintains as live plants 8,126 accessions of fruit trees, ornamentals, beverage, sugar, spice, medicinal, and industrial crops. It is, along with the Tropical Agriculture Research Station in Mayaguez, PR, the National Plant Germplasm Repository for avocado, mango, coffee, banana and plantain, and tropical Ziziphus. We hold the U.S. replicate of the World Collection of sugarcane and related grasses. We also have important collections of the fruit crops lychee, annona, and carambola. The SHRS serves as a quarantine facility for Theobroma cacao.

Four hundred and seventy four (474) introductions were received into the collections during the covered period. These included 187 tropical and subtropical fruits, 100 ornamentals, 149 beverage, and 38 chemurgic, spice and medicinal crops. (Table I).

Between June 1, 1985 and May 31, 1986, 2004 distributions were made. (Table II). Eighty-four percent (84%) went to researchers, botanical gardens, and private individuals within the U.S. (Table III).

Large distributions of Mangifera and Persea were sent to research stations in India, Colombia, Panama, Mexico, Nigeria, Canary Islands, Fiji Islands, and Guam.

The program of supplying latex from Hevea brasiliensis to a chemist at Purdue University was continued. Twenty (20) shipments were made.

One hundred and thirty five (135) Theobroma cacao accessions were introduced into the Quarantine Facility and 37 clones were released from quarantine. The released clones were indexed and found to be free of Cacao Swollen Shoot Virus. Fifty three (53) indexed virus free clones were sent to TARS/Puerto Rico for establishment into their permanent collection.

Bark of 7 species of Annonaceae were sent to the College of Pharmacy at Purdue University, one of which (Annona bullata) was found to have high levels of an anti-cancer, anti-malarial property.

The neem, Azadirachta indica, received a great deal of attention. Twenty-three (23) distributions of seeds and leaves were made during the covered period, and 47 requests have been received so far for this fall's crop. These requests have come from researchers in government and industry, both foreign and domestic, as well as from private citizens.

Publications:

Androcioli Filho, A., Siqueira, R., Caramori, P. H., Pavan, M. A., Sera, T., and Soderholm, P. K. 1986. Frost injury and performance of coffee at 23°S in Brazil. Expl. Agric., volume 22, pp. 71-74.

Accession User: R. J. Knight, Jr.

Address: U.S. Department of Agriculture, Subtropical Horticulture Research Station, 13601 Old Cutler Road, Miami, Florida 33158

Nature of Research: Improvement of Tropical and Subtropical Fruit Crops

Progress to Date:

Further work with passion fruit selection M-30709, discussed last year, indicates that it can be used in breeding as a source of the compact growth habit, hitherto unreported for this crop. The compact trait appears to be a simple Mendelian recessive which may occasionally be affected by modifier genes. Work at Miami on propagules from Mayaguez revealed that M-30709 is also self-compatible under south Florida's growing conditions. This trait can be of value where honeybees are used as pollinators, since they are less efficient at pollen transfer than the larger-bodied carpenter bees often used on this crop.

Efforts to raise the level of fertility in the amphiploid hybrid between Passiflora edulis and the maypop (P. incarnata) produced a number of fruit having more than 100 seeds, near the norm for maypop and the purple form of P. edulis but below the average for most yellow cultivars. These fruits' juice content is directly related to number of seed, but some of the hybrids average a higher volume of juice per seed than do the parent species, and the juice is sweeter than that of either parent, so this plant may have economic potential.

The Fwangtung sweet carambola (Averrhoa carambola, P.I. 479214), introduced from Thailand in 1973, is being planted commercially for the fresh fruit trade. It has a higher content of soluble solids (sugars--11.6%) than the tart-tasting Golden Star (8.8%), and is lower in total acids (0.24% vs. 0.46%). Fwangtung promises to be valuable in breeding. Of a

population of 70 seedlings derived from crossing Golden Star by Fwangtung, 43% had a lower acids content than either parent, and 74% had a higher soluble solids content than did Golden Star.

Publications:

Campbell, C. W., Knight, R. J., Jr., Olszack, R. 1985. Carambola production in Florida. Proc. Fla. State Hort. Soc. 98: 145-149.

Table I. Germplasm Receipts at USDA/ARS, Miami, Florida from June 1, 1985 through May 31, 1986.

<u>Material</u>	<u>Number of Introductions Received</u>
Miscellaneous Ornamentals and Shade Trees (includes Orchids and Ferns)	100
Tropical and Subtropical Fruits	187
<u>Cacao</u>	135
<u>Coffea</u>	14
Medicinal, Chemurgic, and Tropical Vegetables <u>z/</u>	<u>38</u>
	Total: <u>474</u>

z/ Includes edible palms, spices, and beverages

Table II. Germplasm Distribution Material from USDA/ARS, Miami, Florida from June 1, 1985 through May 31, 1986.

<u>Material</u>	<u>Number of Distributions</u>
Miscellaneous Ornamentals and Shade Trees (includes Orchids and Ferns)	840
Tropical and Subtropical Fruits	792
<u>Cacao</u>	193
<u>Coffea</u>	16
Medicinal, Chemurgic, and Tropical Vegetables <u>x/</u>	<u>163</u>
	Total: 2004

x/ Includes edible palms, nuts, spices, rubber, sugarcane, beverages.

Table III. Distributions of Plant Introductions from USDA/ARS, Miami, Florida from June 1, 1985 thru May 31, 1986

<u>Destination</u>	<u>Number</u>	<u>Percent of Total</u>
Florida	1117	55.74
California	48	2.40
Rest of Continental U.S., Hawaii and Canada	393	19.61
Caribbean Region <u>x/</u>	71	3.54
Mexico and Central America	51	2.54
South America	107	5.34
Europe	34	1.70
Asia	77	3.84
Africa	45	2.25
Pacific Basin <u>y/</u>	61	3.04
	Total: <u>2004</u>	Total: <u>100.00</u>

x/ Including Puerto Rico and the Virgin Islands

z/ Including Australia, Malaysia, Guam, Hawaii, New Zealand, Philippines, Pacific Islands

REPORT OF THE
GERMPLASM INTRODUCTION AND EVALUATION LABORATORY
TO THE
REGIONAL TECHNICAL COMMITTEES ON PLANT GERMPLASM

June 1986

RESEARCH LEADER'S OFFICE

R. E. Perdue, Jr.

Changes at Beltsville, effective November 8, 1985 (to gain increased operating funds, save personnel positions, improve efficiency, and strengthen research programs): The Plant Exploration and Taxonomy Laboratory (PE&TL) was abolished. PE&TL scientists C. R. Gunn, J. H. Kirkbride, and E. E. Terrell (who subsequently retired), and Support Scientist R. W. Spjut were assigned to a new unit - The Systematic Botany, Mycology, and Nematology Laboratory (SEMNL). This new unit will be part of the new Biosystematics and Beneficial Insects Institute (BBII). A. Y. Rossman, a mycologist, is Research Leader of SEMNL; L. V. Knutson, an entomologist, is Director of BBII.

The Plant Exploration Office (R. E. Perdue, Jr., Plant Exploration Officer; G. M. Christenson and S. M. Saufferer, Support Scientists; M. S. Hatcher, Germplasm Program Assistant; and B. C. Lubis, Secretary) was transferred to the new Germplasm Introduction and Evaluation Laboratory (GIEL), (otherwise made up of employees assigned to the former Germplasm Resources Laboratory).

R. E. Perdue, Jr. became Research Leader of GIEL. Other GIEL scientists are A. A. Atchley (Ecogeography of Wheat and Wheat Relatives), L. W. Briggie (Small Grain Evaluation), J. A. Duke (Alternative Crops and Ecogeography of Wheat and Wheat Relatives), D. H. Smith, Jr. (Curator, Small Grain Collection), and G. A. White (Plant Introduction Officer).

An important note to ARS germplasm workers who will conduct field work abroad: Directive 303.6, "Field Party Advances", was issued January 24, 1985. This is an important authority because it can be used to charge substantial field operating costs to "Other Services" rather than to "Travel and Transportation of Persons", and save travel ceiling. For further guidance, consult M. S. Hatcher, (301) 344-2431.

The Plant Exploration Office obtained approval for 2 teams to visit Turkey in 1986. This was an ordeal. To obtain approval for field work in Turkey, we must submit applications to the Turkish Embassy in Washington at least 6 months before field work is scheduled. Applications must be prepared by participants! One member of each team, telephone calls to no avail, failed to provide the information we needed in time for us to meet deadlines. The net effect - inefficient use of time and funds. We had to hand carry late applications to the Embassy. There were cables and international telephone calls and undue inconvenience for the Turkish Embassy. One trip had to be delayed resulting in an increased cost of \$700 for airfare. The PEO cannot respond effectively to germplasm workers' needs without their cooperation.

A list of plant explorations approved for 1986 follows:

1986 Plant Explorations

<u>Collection Objectives</u>	<u>Area to be Explored</u>	<u>Proposed Collectors</u>	<u>Exploration Dates</u>	<u>Recommended Funding</u>	<u>WRII</u>
<u>Helianthus (sunflower)</u>	N.E. U.S.	G. J. Seiler, Bushland, TX W. W. Roath, Ames, IA	10/13/85-10/30/85	\$ 3,000	0500-21010-006-02D
<u>Zea (teosinte)</u>	Mexico	J. F. Doebley, College Station, TX H. G. Wilkes, Boston, MA T. A. Kato Y., Mexico R. Guzman, Mexico J. Sanchez, Mexico	11/15/85-1/15/86	1,775	0500-21010-006-02D
<u>Solanum (potato)</u>	Bolivia	R. W. Hoopes, Ithaca, NY R. E. Hanneman, Madison, WI K. A. Okada, Argentina	2/86-3/15/86	9,525	0500-21010-006-03D
<u>Avena (oats)</u>	Turkey	M. D. Simons, Ames, IA R. A. Forsberg, Madison, WI	7/15/86-8/31/86	12,800	0500-21010-006-03D
<u>Elymus</u>	Australia	J. G. Carman, Logan, UT C. F. Crane, Logan, UT	11/23/85-12/15/85 1/4/86-1/25/86	7,828	0500-21010-006-01D
<u>Oryza (rice)</u>	Brazil	E. H. Nowick, Crowley, LA D. E. Groth, Crowley, LA	3/15/86-5/1/86	13,228	0500-21010-006-02D
TOTAL.				\$48,156	

10/1/85

A. A. Atchley

During CY 1985 (and subsequently), Dr. Atchley and his staff explored new approaches to guiding germplasm collection. With particular attention to wheat and its wild relatives in Anatolia, satellite imagery was obtained for use in the 1986 field season. Prior to that, rules of inference determined from the field activities of a contractor during 1985 were used to form a prototype expert system on the SYMBOLICS 3670 Artificial Intelligence machine. Graphics software was applied and, when necessary, developed to help demarcate areas of high interest for collectors. In addition, progress was made toward a cooperative agreement with a mathematical consultant to explore actual modeling of distribution of desirable genetic traits in centers of diversity.

EVALUATION OF SMALL GRAIN GERMPLASM

L. W. Briggles

Data on field descriptors were obtained on 10,200 wheat accessions, 5,000 oat accessions, and 4,500 barley accessions during the 1984-85 period at 2 locations - Maricopa, AZ and Aberdeen, ID. Field data were recorded on such descriptors as number of days from planting to anthesis, plant height, spike (or panicle) type and density, straw lodging and breakage, and awn and glume characteristics. Spikes or panicles were collected from each accession at maturity. Seed and more precise spike data on the 1983 wheat accessions grown at Aberdeen were obtained during the winter of 1984-85 and will be finished during the winter of 1985-86. Similar data will be collected on as many of the 1983 oat accessions (panicles) as possible during the 1985-86 winter. The remaining oat panicle and barley and wheat spike data will be recorded as it can be scheduled. Grain from each plot each year was harvested and the weight recorded. Grain was (or will be) returned to Beltsville for storage and for use in further evaluation (for disease and insect resistance, quality factors, etc.). During the 1986 season approximately 3,000 wheat accessions will be grown at Maricopa to meet quarantine and propagation requirements. Field descriptor data will be obtained at the same time. Approximately 2,500 wheats, 2,500 barleys, and 400 non-shattering Avena spp. will be field evaluated at Aberdeen in 1986. About the same number of field evaluations will be conducted at Aberdeen in 1987. The Maricopa program will be expanded significantly in 1987.

A number of duplicate accessions occur in the National Small Grain Collection (NSGC). About 500 wheat accessions and 500 oat accessions which occur 2 or more times in the NSGC will be grown in appropriate blocks at Aberdeen in 1986 and a like number in 1987. After careful analysis similar agronomic and morphologic types will be bulked, and only the lowest CI or PI number of that variety will be maintained.

During 1984 and 1985 numerous accessions were evaluated for disease and insect resistance at several locations, as follows:

9,500 oats	Barley Yellow Dwarf (BYD)	Davis, CA and/or Urbana, IL
5,000 wheats	BYD	Urbana, IL
8,000 oats	crown rust	Ames, IA
15,000 wheats	leaf rust	Manhattan, KS
10,000 wheats	stripe rust	Pullman, WA
20,000 wheats	Hessian fly	Lafayette, IL
2,500 barleys	spot blotch and net blotch	Fargo, ND
5,000 wheats	common and dwarf smut (bunt)	Corvallis, OR.

In 1986 plans call for 2,000 Avena sterilis accessions to be evaluated for crown rust at Ames, IA; 5,000 wheats for leaf rust at Manhattan, KS; 2,500 barleys for spot blotch and net blotch at Fargo, ND; 5,000 wheats for stripe rust at Pullman, WA; 10,000 wheats, 2,500 oats and 2,000 barleys for BYD at Davis, CA; and 5,000 wheats for BYD and Soilborne Mosaic at Urbana, IL. Similar evaluations will be undertaken in 1987; in addition 2,500 winter barleys are to be evaluated for spot blotch at Athens, GA. We would like to increase our evaluations for disease and insect reaction in 1987, and to begin grain quality evaluation.

Growth habit (winter, facultative, or spring type) determinations are done primarily at Bozeman, MT from a late spring planting made in June. Data are also recorded on plots at Aberdeen, ID when growth habit is apparent. A replicated experiment including genotypes of wheat, barley, and oats, which represent known diversity in growth habit from true spring types to extreme winter types, will be grown in 1986 and 1987 to determine the best way to test for growth habit.

SUMMARY OF RESEARCH ACCOMPLISHMENTS FOR THE
NEW CROPS PROJECT

T. A. Campbell

In 1985 the New Crops Project completed studies on the crop potential of smooth sumac (Rhus glabra), common milkweed (Asclepias syriaca), and pokeweed (Phytolacca americana), and completed the first detailed growth analysis of common milkweed. This research demonstrated that although all 3 species have crop potential, smooth sumac presents the fewest agronomic problems at this time and would be most readily accepted by the farmer. By introducing these new sources of polyphenols, oil, hydrocarbon, and protein into U.S. agriculture, the U.S. demand for nonrenewable industrial raw materials could be reduced while allowing an increase in food production. Growth analysis of common milkweed elucidated possible mechanisms for the wide adaptability of this species and will serve as a basis for the development of efficacious management systems.

Cuphea is a potential domestic seed oil source of lauric acid for the soap and detergent industry. Seed shattering is a major deterrent to domestication of this species and there is little genetic variation for this trait. We are attempting to improve seed shattering using mutation breeding techniques. In greenhouse experiments, ethyl methanesulfonate (0.04 M) caused less damage to M_1 plants of Cuphea toluicana and C. wrightii than 0.001 M sodium azide. Both mutagens were applied at 30 C for 2 h to seeds which had been presoaked for 48 or 72 h. Based on an evaluation of the M_2 generation in the field, none of the presoak-mutagen combinations increased variation in several quantitative characters; however the EMS-72 h presoak combination appeared to at least double the mutation rate for a small-leaved, decumbent mutant with short internodes in C. toluicana compared to rates for other mutagen-pres soak time combinations. In a protoplast culture experiment using C. lutea, C. toluicana, and C. wrightii, 44, 65, and 62% of the protoplasts formed cell walls after 1 week in the KM medias 6p, 7p, and 8p, respectively.

Two new Crambe cultivars that will be high yielding, domestic sources of erucic acid for the chemical industry were released. These cultivars were generally superior to all existing Crambe cultivars in national trials; the cultivar BelEnzian will be an important component of the ARS crambe pilot project in CY 1986. The integration of Crambe into U.S. agriculture will reduce our dependence on imported rapeseed oil as a source of erucic acid while diversifying American agriculture and reducing crop surpluses.

Stokes aster is a potential new seed oil source of epoxy acid for the chemical industry. Two early flowering and 2 late flowering Stokes aster synthetics which have undergone recurrent selection for improved seedling vigor and seed retention at Beltsville were established in isolation nurseries; seeds will be produced and distributed.

Plans for CY 1986

The New Crops Project was abolished at the Beltsville Agricultural Research Center, however, the Cuphea mutation breeding program will be transferred to Oregon State University where it will be continued by Dr. Steven Knapp. Dr. Campbell was transferred to the Alfalfa Project and while research plans are still under development, it has been tentatively decided that he will pursue the following objectives in CY 1986:

1. Study the relationships between responses of alfalfa to toxic concentrations of Al in soil, hydroponic solution, and in vitro.
2. Develop techniques for evaluating responses of alfalfa germplasm to toxic concentrations of Al and begin evaluations.
3. Investigate the potential of alfalfa introductions in hybrid combination with male sterile alfalfa clones.

ECONOMIC BOTANY

J. A. Duke

Some scientists feel that one needs 100 test tubes, 100 petri dishes, or 100 pots to qualify as a research scientist. I disagree. I think 100 field observations on an economic species may be just as meaningful, certainly under field conditions as opposed to controlled conditions. Screening of germplasm under controlled environments can pinpoint resistance to certain stresses, e.g. diseases, minerals, temperatures, etc., but one needs the right germplasm before he buys his pots and growth chambers.

One of the most important goals of the Economic Botanist is to marshal the best germplasm available to give mankind the best returns from the thousands of economic plants available. There are 4 approaches to obtain germplasm of economic plants tolerant of marginal environments, e.g. of acid or alkaline environments. I'll refer to these approaches as the 4 "Es", all requiring research.

1. Ecosystematic (alias Ecogeographic): Finding the plant to match the stresses.
2. Exploration: Finding the plant to match the stresses.
3. Evaluation: Checking the plant against the stresses.
4. Experimental: Changing or selecting the plant to match the stresses.
 - a. New Biotechnologies
 - b. Mutation
 - c. Breeding and Enhancement
 - d. Selection in vitro

(1) Ecosystematics: In 1977, at Beltsville Symposium II, I defined ecosystematics as "integrated studies of the ecology, evolution, and systematics of ecosystems". Then I reported on the ecological amplitudes of 1,000 economic plants, data that I feel are the cornerstones of ecosystematics. Currently these studies are termed "ecogeographics". Our laboratory is at the forefront in linking the geographic distribution of 1,000 economic plants with ecological parameters and weeds among biotic factors. The Israelis are also at the forefront of ecogeographic research, uniquely tying the distribution of diseases to ecological parameters, and, perhaps, to alternate hosts.

Ecosystematic research can determine the best places to look for the most useful germplasm. Dr. Atchley is tackling artificial-intelligence applications of the ecogeographic data base.

(2) Plant explorers need ecogeographic information to pinpoint genera sites in the search for appropriate germplasm. No one, to my knowledge, has more ecogeographic data on 1,000 economic plants than we do. Once the explorer has collected plants, cooperation is needed with APHIS, our PI officer, and Glenn Dale to get the materials to the experimenter or evaluator conforming to regulatory guidelines.

(3) Lee Briggie and Dave Smith handle the evaluation. Cooperating with these evaluators, we can better guide our explorers, e.g. in obtaining bunt, rust, and smut resistance in our Turkish wheat explorations. Research with our climatic data bases could show where better to look for wild relatives of wheat for genetic enhancement of stress resistance. Such data have been incorporated in my first drafts for a proposed "Handbook of Grasses" with emphasis on Triticeae, discontinued once it was determined I'd be shifting from part-time to full-time Alternative Crops.

(4) Experimentally, there has been a great deal of effort in USDA looking, e.g., for aluminum tolerance or iron-efficiency in economic plants. But we have obtained these from the ecosystematic program without even leaving our desks. Stress tolerance can be obtained by any of the four research approaches, but all should be guided by ecosystematic principles. All four 'E's' are served by the expertise of the type we have in GIEL. The experimentalist needs to have the best array of germplasm with which to work.

My initial ecogeographic research was digging strange treasures - specific temperatures, rainfall, and pH patterns tied to specific locations of 1,000 economic plants. These researches gradually led to tabulations (or computerized data bases) showing the ecological amplitudes of these economic plants, such that explorers, evaluators, or experimental scientists could seek the proper germplasm for their research purposes. Though our biggest successes weren't this year, we did obtain iron-efficient sorghum and aluminum tolerant soybean. These are just 2 of the 1,000 species for which we have surprisingly useful capabilities. Our research can still guide plant explorers, evaluationists, and experimentalists in obtaining, via the Plant Introduction Officer, better germplasm for their needs. Ecogeographics is the cornerstone of economic botany as well as the other "Es".

I came back to the USDA in 1971 to launch a career in economic botany. I became involved in the Narcotics Replacement Program, which embraces all of the "Es". It is hardcore economic botany. I am pleased to have been selected to continue that work with the USDA, Chiang Mai, Thailand, where I will be trying to improve on the agricultural biotechnologies of cooperating hill tribesmen. Many of them have phased out opium production, such that Thailand is now a net importer rather than exporter of opium.

I have three book drafts in the pipeline, "Handbook of Energy Species", "Handbook of Nuts", and "Handbook of Money Crops", in decreasing order of readiness, all by invitation from CRC Press. These have grown out of Alternative Crops files, which could grow into a CRC encyclopedia. With good luck, I can finish only one before I leave. Without backup support here at Beltsville, I cannot continue the Alternative Crops encyclopedia from Thailand, though it clearly addresses needs of the Alternative Crops Program. CRC has two more economic botany books in press, Duke and Atchley's "Proximate Analysis Tables" and Duke, Atchley, Ackerson, and Duke's "Handbook of Agricultural Energy Potential of Developing Countries". I hope these will serve as swan songs to the economic botany program.

NATIONAL SMALL GRAIN COLLECTION

D. H. Smith, Jr.

The National Small Grain Collection is made up of accessions of wheat, barley, oats, rice, rye, triticale, Aegilops, and related wild and weedy species of the same genera. Current holdings in the collection amount to over 107,000 individual items.

The NSGC is charged with the responsibility for collecting, maintaining, distributing, and evaluating cereal crop germplasm. In the past 2 years approximately 5,000 accessions have been added to the collection as a result of response to our requests, collecting expeditions (many of which IBPGR sponsored), and voluntary contributions from various breeding programs throughout the world. During the past 2 years we have expanded our cold storage capability with the addition of a 20' x 30' insulated Norlake Box which can be maintained at 50°F and 40% RH as are the other 2 cold rooms. Distributions from the NSGC in 1985 exceeded 190,000 items. In 1986 approximately 204,000 samples were packaged and shipped. Over 50% of our distributions go to foreign requestors, as has been the pattern for quite some time. A more detailed enumeration of distributions to developing countries is available. Evaluations of wheat, barley, and oats are made cooperatively with Dr. L. W. Briggie.

With the advent of hiring a technician to be located at the Central Arizona Research and Extension Center, increased activities in evaluating winter wheat for morpho-agronomic descriptors is anticipated. The winter conditions at Aberdeen, ID make it difficult to grow lines with winter habit and low levels of winter hardiness. This is not a problem under Arizona conditions since virtually any type of growth habit or hardiness level can be grown. A new building has been erected at the AZ site. It is merely a shell at this time and will need to be equipped with an air conditioned work space, equipment storage area, shop space, etc.

PLANT INTRODUCTION AND EXCHANGE

G. A. White

During 1985, a total of 95,854 plant germplasm accessions were distributed to 123 countries in 1853 shipments. Cereal nurseries accounted for 48,196 of the total. In addition, 1,124 items were provided in response to domestic requests.

PI numbers were assigned to 6,021 items. An additional 8000 samples were received from foreign sources. Many of these items will be returned for PI assignment after identification, organization, quarantine, and/or establishment. Celebration of PI 500000 on December 11 highlighted 'Purplestraw' wheat and commemorated 88 years of successful introduction of plant germplasm. Some examples of PI number assignments in 1985 are given below.

<u>CROPS</u>	<u>SOURCE/ORIGIN, OTHER INFORMATION</u>	<u>PI NUMBERS</u>
<u>Avena</u>	Minnesota/Cereal Rust Laboratory	497686-921
<u>Arachis</u>	Burkina Faso	496401-450
<u>Eragrostis tef</u>	Ethiopia	494188-495
<u>Glycine</u>	Australia	499904-952
<u>Gossypium</u>	Galapagos/A. E. Percival Australia/J. M. Stewart USSR/Vavilov Institute	499693-751 499752-812 499836-903
Forages	Romania/Rumbaugh-Taylor PRC/US Plant Germplasm Team 1980 PRC/D. R. Dewey 1983	494615-497750 499381-564 499565-688
<u>Helianthus</u>	US/G. Seiler	494566-614
<u>Medicago</u>	Canada Lesin's Collection	495165-593 498731-499161
<u>Prunus</u>	Japan/R. M. Jefferson	500074-146
<u>Solanum</u>	IR-1	497990-498422 500008-070
<u>Sorghum</u>	Yemen/USAID Sorghum/Millet Program	495917-250
Sugarcane and related spp.	Indonesian Sugarcane Expedition	495021-164
<u>Zea mays</u>	CIMMYT/Pioneer Hi-bred International	498441-723
<u>Triticum aestivum</u>	US/Purplestraw	500000

	<u>IBPGR</u>	
Many species	Zambia	494768-495000
<u>Sorghum</u>	Burundi	496269-370
<u>Abelmoschus</u>	Ivory Coast	496451-497242

We sent 3,198 accessions to 41 countries in 106 shipments as part of the AID Plant and Seed Materials Project. Cereals and vegetables accounted for over two thirds of the items. Over 6800 coffee plants (141 accessions) grown from seed in quarantine at Glenn Dale were sent to Costa Rica and Puerto Rico.

Personnel - H. Riley Hanes, Shipment Clerk at the Plant Germplasm Quarantine Center (PGQC), Beltsville, Maryland, passed away on May 11, 1986. His long and dedicated service and sense of humor will be sorely missed. Sharon Kenworthy departed USDA-ARS on June 6, 1986, after effectively serving nearly 10 years as Geneticist in the Plant Introduction Office (PIO). We wish her well as she plans more time with her sons and husband Bill and as she pursues other activities of interest.

In light of the changing personnel at PGQC, we would like the following address to be used for all future shipments channelled through PGQC:

USDA-ARS
Plant Germplasm Quarantine Center
Building 320, BARC-East
Beltsville, MD 20705

The "ARS" brings the shipment to our attention which is important, because the Quarantine Center is staffed with both APHIS and ARS personnel.

Future Plans -

1. Begin automation of PGQC operations with emphasis on linkage of PGQC, PIO, and Glenn Dale relative to quarantined introductions.
2. Continue reviewing and updating crop priority list assignments within NPGS.

Reminders -

1. All plant materials shipped or carried to foreign countries should be inspected and accompanied by a phytosanitary certificate.
2. Incoming foreign shipments should be inspected by quarantine officials to insure that U.S. importation requirements are met.
3. Holders and intended recipients of noxious weeds must have permits. Avena sterilis is an example of a noxious weed that is an important component of a germplasm collection.

Notes - ARS has a Memorandum of Understanding with the Rural Development Administration (RDA) of South Korea. Dr. Kim, Director of the Research Bureau, RDA, wishes to establish close ties with NPGS. Dr. White visited Suweon and 1 other station during June 1-8. Good contacts have already been established. PIO will gladly assist scientists in obtaining specific germplasm items of interest from South Korea.

- PIO is in the final stages of converting from a Datapoint Computer system for PI documentation to the GRIN database. This conversion will require some data modification and manual inputs in order to achieve compatibility with the new software. Any suspected errors, omissions, etc. in passport data should be called to our attention.

Germplasm going both directions,
Progress in the making!
Sharing germplasm collections
Yours for the
undertaking!

Anonpoet

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CROP ADVISORY COMMITTEES

M. A. Bohning

Thirty-five CACs have been established at this time. These represent most of the economically important food and fiber crops in the U.S. Two other committees, a pepper CAC and a tobacco CAC, are currently in the process of being formed. A list of these CACs follows.

The CACs are involved in a variety of activities including:

1. Determining the need for and planning of plant explorations.
2. Developing genetic vulnerability statements for the respective crops.
3. Developing plant descriptor lists to be used in describing the accessions in the respective germplasm collections. The descriptors include agronomic, biochemical, anatomic, and morphologic characteristics, and resistance to diseases, insects, and plant stresses.
4. Developing evaluation proposals using the descriptor lists to systematically describe the germplasm in the collections.
5. Developing enhancement proposals which identify ways to more effectively incorporate unadapted germplasm into plant breeding programs.
6. Developing guidelines for determining what germplasm should be preserved in collections.
7. Identifying critical needs and concerns on matters related to germplasm and bringing these to the attention of the appropriate groups and/or individuals in the NPGS.

In early June, the CAC chairmen, along with the regional coordinators, germplasm curators, and other key individuals in the NPGS met in Calverton, MD for a CAC workshop. All of the CAC chairmen were either present or had a representative attending. The ARS Germplasm Matrix Team organized and moderated the meeting. The Matrix Team discussed the roles and responsibilities of the CACs and their importance to the NPGS. The remaining time was devoted to discussing the needs and concerns of the CACs. The 2 day meeting allowed the chairmen to meet each other and exchange ideas which will help improve communication throughout the NPGS.

CAC

Alfalfa
Barley
Carya
Citrus
Clover
Cotton
Crucifer
Grass
Juglans
Leafy Vegetables
Maize
Malus
Oats
Pea
Peanut
Phaseolus
Potato
Prunus
Pyrus
Rice
Root & Bulb
Small Fruits
Sorghum
Soybean
Sugarbeet
Sugarcane
Sunflower
Sweet Potatoes
Tomato
Tropical Fruit & Nuts
Vigna
Vine crops
Vitis
Wheat
Woody Ornamentals

CHAIRMEN

Jim Elgin
Timothy Starling
Thomas Thompson
Jack Hearn
Richard Smith
R. Bridge
Paul Williams
Kay Asay
Gale McGranahan
Edward Ryder
Major Goodman
Roger Way
Darrell Wesenberg
Lloyd Cruger
Charles Simpson
Michael Dickson
Robert Hanneman
David Ramming
Richard Bell
Neil Rutger
Phil Simon
Jim Ballington
Keith Schertz
Thomas Kilen
Devon Doney
Donald Heinz
Jerry Miller
James Moyer
Edward Tigchelaar
Robert Knight
Richard Fery
Jim McCreight
Robert Pool
W. McCuistion
Harold Pellett

FUTURE CACS

Pepper
Tobacco

GERMPLASM RESOURCES INFORMATION NETWORK (GRIN)

J. Mowder

The Germplasm Resources Information Network culminated an 18 month enhancement effort on June 2, 1985 by providing a 4 day training session to 19 collection/support sites. The new system provides twice as many data elements to describe an accession and additional fast access points to the data, and doubles the size of the database. We anticipate an additional 4-5 months of system refinement to correct known problems and to modify the system in accordance with user feedback.

We have started loading data into GRIN2 and will continue to make this a high priority.

Our future plans are to revise the PUBLIC access procedures and to further enhance GRIN2 to meet new NPGS requirements.

GLENN DALE REPORT

B. J. Parliman

Twenty-six Malus, 4 Pyrus, 175 Prunus, 76 Ipomoea, 62 Solanum, 31 Citrus, 250 seeds per each of 13 lots of coffee and 129 ornamental, etc. genotypes were established. Four hundred Malus, Pyrus, and Prunus, 20 Solanum and Ipomoea, 174 ornamental genotypes, 89 lots of coffee seedlings and more than 20 Manihot genotypes were distributed (includes shipments to repositories). With the exception of 1 temporary collection, the development of automated inventories for all Glenn Dale germplasm is complete. Current inventories include 659 Pyrus, 1098 Malus, 555 Prunus, 200 Solanum, 160 Ipomoea, 50 Citrus, coffee as above, 80 postentry, 20 Zea seed lots, 536 ornamental, and 600 various genotypes in other permanent plantings on the grounds. The collection of nondistributed ornamental genotypes held at Glenn Dale has now been reduced to approximately 5% of its pre-1980 size. The remaining material will be distributed in 1986-1987. The Theobroma and Camellia collections are being shipped to appropriate collection sites and will not be maintained after the 1986 growing season. All Ipomoea and some Solanum genotypes are now being held in in vitro storage during quarantine and therapy procedures. Pome fruit repropagation and indexing and ornamental propagation continue. Indexing for other species is being conducted by APHIS personnel. In vitro and in vivo propagation/evaluation, etc., projects were initiated, and data were collected/analyzed prior to reporting results and project completion. Studies to improve the efficiency of fruit crop virus indexing were established and indexing has been expanded to include dsRNA assays for introductions with aberrant symptom expression. Unique dsRNAs have been detected and studied in Manihot. cDNA clones are being produced for the detection of pathogens. Plant introduction activities continue to shift strongly toward tasks relating to indexing prohibited category plant germplasm imports.

SOUTHERN REGIONAL PLANT INTRODUCTION STATION
Report to S-9 Technical Committee
July 22-23, 1986

This report covers the primary activities of this plant introduction station for the period of July 1, 1985 through June 30, 1986.

Plant Introduction

Germplasm of 3,664 new Plant Introductions (PI's) were added to the regional plant germplasm collections. This total included 37 genera and 114 species from 67 countries. The crop groups received were sorghum, peanuts, okra, pumpkins, gourds, forage grasses, and forage legumes. The five-year (1981-86) average receiving new germplasm is 2,524 PI's per year.

Seed Distribution

A total of 23,706 seed samples were shipped in all categories of distribution. In direct response to 242 requests 11,953 seed packets were shipped within the S-9 Region, 3,925 to the other three regions (NC-7, NE-9, and W-6) and 2,199 to 36 foreign countries. Shipments in other categories of distribution were: 391 PI's sent to the National Seed Storage Laboratory (NSSL) for long-term storage; 702 to NSSL for germination tests; 348 to the other three regions for consolidation of genus collections; 3,109 cultivar samples for the Forage Legume Variety Field Trials.

Seed Increase

A total of 4,864 PI's are included in the 1986 increase plantings. The major crop groups involved are sorghum, cowpeas, peanuts, sesame, peppers, squash, and melons. The P.I. Station is increasing 1,237 new and old PI's which include 34 genera and 91 species from 69 countries. Cooperators in several states (Alabama, Florida, Oklahoma, and Texas) are increasing 1,872 PI's of melons, peanuts, and tropical forage legumes. The Tropical Agriculture Research Station (TARS) at Mayaguez, P.R. increased and evaluated 1,000 PI's of Ethiopian Sorghums in two plantings during the Fall of 1985 and the Winter-Spring period of 1986. TARS also increased 755 Yemen Sorghum which were new to the S-9 Sorghum Collections.

Sorghum Evaluations

The evaluation of the Ethiopian Sorghum Collection is continuing. TARS has collected descriptor data on another 1,000 PI's. Another two years will be needed to complete this segment of the evaluation of the full 5,000 PI's.

Dr. Bill Wiseman, Entomologists, ARS, Tifton, GA will complete the evaluation for resistance of Fall Army Worm resistance in 1987.

Dr. Jim Webster, Entomologist, ARS, Stillwater, OK has completed evaluation of the collection for resistance to the aphid, Greenbug Biotype-E. A summary report is expected by December, 1986.

Dr. Webster also began evaluation for resistance to the Yellow Sugarcane Aphid. This aphid is an increasing problem in Texas and Oklahoma. It will require approximately 24-30 months to complete this project.

The following is a brief report from Dr. Kenneth Starks, Entomologist, ARS, Stillwater, OK which summarizes his and Dr. Webster's work with the older sorghum PI's:

"A new biotype (Biotype E) of the greenbug became dominant in much of the sorghum growing area in 1980 and the plant resistance that was present in 90% of the commercial hybrids was lost. Fortunately, PI 264453 has been used in breeding populations and breeders were able to have greenbug resistance available to growers by 1982. PI 220248 also retained resistance to Biotype E but its resistance is believed to be identical to that of PI 264453. Thus, additional sources of resistance is badly needed. During screening test of entries received from Experiment, GA PI 266965 and PI 302136 were found to have resistance to Biotypes C and E. In fact, the resistance level is higher than that of PI 264453. However, both of these introductions have 40 chromosomes though one was listed as S. bicolor. Kansas State has managed to get one seed after crossing with diploid sorghum but again the progeny had 40 chromosomes. We have not had any seed set after crosses with diploids. Therefore, we have made crosses with tetraploids. These are presently being screened for greenbug resistance and will then be sent to Keith Schertz who will continue the process of transferring the resistance to grain sorghum since the commercial breeders are very interested in these sources of resistance."

Dr. Tom Harvey, Entomologist, Kansas Experiment Station, Ft. Hays, is expected to complete his evaluation for resistance to Greenbug Biotype-E in 1987.

Dr. Jeweus Craig, Pathologist, ARS, College Station, TX began this Spring to evaluate the Ethiopian collection for resistance to Downy Mildew. This project will be completed in approximately 30 months.

Jim Strickland, our ARS Technician, grew the first 1,000 PI's of the Ethiopian sorghums at the Southwest Georgia Station, Plains, GA, in early June of the 1985 growing season. At the recommendation of the sorghum CAC we are going to document those PI's that can flower and produce seed in our long-day summer season. The 1985 results were mixed. The June planting produced a stand of plants 10-12 feet tall. After we had begun data collection on flowering, high wind conditions lodged 75-80% of the plants. The mess was impractical to sort out. Therefore, the 1986 planting was carried out on July 1. In this way we expect to have flowering begin at a more practical plant height while the days begin to shorten in late August and September.

Peanut Stripe Virus (PStV)

In the summer of 1982, Dr. Grover Sowell, ARS, Research Plant Pathologist, observed striping and mosaic symptoms in the leaves of some new peanut (Arachis hypogaea L.) introductions in the S-9 P.I. Station seed increase

plots. Symptoms differed from those normally produced by the endemic peanut mottle virus (PMV). On the basis of serology, electron microscopy, aphid transmission, physical properties, and polypeptide molecular weight, a potyvirus was identified as a virus that had not been previously described. Early infected groundnut leaflets invariably showed vein-banding along the lateral veins. Thus the virus was named peanut stripe virus (PStV).

All peanut introductions in the P.I. Station collections were placed under an "in-house" quarantine. All peanut introductions previously grown for increase in the presence of introductions from Peoples Republic of China, Philippines, Indonesia, Thailand, and Taiwan have been scheduled to be checked by serological tests for the presence of PStV.

Of the total peanut collection (7,526 PI's) at the S-9 P.I. Station, 3,566 have been identified as having been exposed to contamination with PStV through insect vectors in seed increase fields in the years 1976-1985. As of June 20, 1986, 428 PI's have been checked and contamination by PStV was verified in 26% (111) of the PI's. The clearance rate will increase after September 14, 1986, once the new S-9 Research Pathologist is in place and technical assistants are trained.

Dr. Carl Hoveland will be reporting on PStV research carried by various scientists of the University of Georgia.

APPENDIX I

Southern Regional Plant Introduction Station Budget

<u>Source of Funds</u>	<u>FY-86</u>	<u>FY-87</u>
Regional Research Funds (Pooled)	\$134,078	\$136,774
RRF (Committee of Nine Allocations)	?	?
TOTAL	<u>\$134,078</u>	<u>\$136,774</u>

Expenditures

Personal Services	115,100	117,796
Travel	2,500	500
Supplies & Operations	14,478	16,478
Equipment	2,000	2,000
TOTAL	<u>\$134,078</u>	<u>\$136,774</u>

Source of Funds

ARS Base (recurring Funds)	\$584,200	\$580,680
Special Allocations (Non-Recurring)	25,000	?
Plant Explorations (Non-Recurring)	18,003	?
TOTAL	<u>\$627,203</u>	<u>\$580,680</u>

Expenditures

Personal Services	\$152,000 ^{1/}	\$220,800 ^{2/}
Travel	13,000	19,000
Construction & Repairs	200,000	80,000
Supplies & Materials	44,227	50,011
Support Equipment	39,473	38,500
Vehicle Operations	3,000	4,000
Extramural Services (Curators, RSA's)	157,500	143,000
Plant Explorations	18,003	?
TOTAL	<u>\$627,203</u>	<u>\$555,711</u>

^{1/} This FY86 figure included salaries for 2 SY vacancies that will be filled July 7 and Sept. 14, 1986 - Sweet Potato Curator and Research Plant Pathologist.

^{2/} This FY87 projection includes salaries for two Technician vacancies.

II. Plant Exploration Proposals Received for FY 87 Funding

Regional
Priorities

Proposal Description

- I Zea spp. (teosinte); collection sites is several states in Mexico; November 15, 1986 - January 15, 1987; Dr. John F. Doebly, Texas A&M, Dr. H. Garrison Wilkes, University of Massachusetts.

Cost: \$8,175

Objective: To replenish the depleted U.S. germplasm of teosinte. Four collection teams will attempt to collect the full range of diversity in Mexican teosinte. Teosinte is a cross pollinated group producing only 10-15 seed per inflorescence; it shatters badly and requires short days for flowering. This proposal is somewhat different in that it offers to collect 20,000 to 60,000 seeds per site which would allow storage and distribution in the U.S. without the further expense and delay required by the usual seed increases.

- I Helianthus spp.(sunflower); Northwester U.S.; August 30 - September 12, 1987; Dr. Gerald J. Seiler, USDA:ARS, Bushland, TX.

Cost: \$3,000

Objective: Broaden and replenish germplasm collections of the domestic sunflower species. There has never been an extensive exploration for sunflowers in the Northwest U.S.

- II Cucumis sativus (cucumber), C. melo (muskmelon), Citrullus lanatus (watermelon); India; Dr. Todd C. Wehner, North Carolina State University and Dr. Jack E. Staub, USDA:ARS / University of Wisconsin; August 17 - September 15, 1987.

Cost: \$15,800

Objectives: Cucumber - collect for new plant habits, fruit types, disease resistance, and cold tolerance. Muskmelon - disease resistance (anthracnose race 2 and zucchini yellows mosaic virus), new plant habits and new fruit types. Watermelon - plant types (dwarf, gynoeceus, male sterile, or early flowering), fruit types (small size and yellow or orange flesh), disease resistance (same as in muskmelon).

1986 Plant Explorations

<u>Collection Objectives</u>	<u>Area of Exploration</u>	<u>Proposed Collectors</u>	<u>Exploration Dates</u>	<u>Recommended Funding</u>	<u>Reg. Project</u>
<u>Helianthus</u> (sunflower)	Eastern & N.E. USA	G.J. Seiler, ARS, Bushland, TX W.W. Roath, NC-7 Ames, Iowa Dragon Skoric, Yugoslavia	Oct. 13-29, 1985	\$ 3,000	S-9, NC-7, NE-9
<u>Zea mays subsp.</u> <u>Mexicana</u> (teosinte)	Mexico	H.G. Wilkes, Univ. of Massachusetts	Nov., 1985	1,775	S-9, NC-7
<u>Solanum</u> (Irish Potato)	Bolivia	B. Hooper, Cornell Univ.	Feb-Mar, 1986	9,725	NC-7
<u>Oryza</u> (rice)	Brazil, Amazon River Basin	Elaine Nowick, LSU E. Sonnier, LSU J.F. Robinson, ARS	Mar-May, 1986	13,228	S-9
<u>Avena</u> (oats)	Turkey	M. Simons, ISU R. Forsberg, Univ. of Wisconsin	Aug., 1986	12,800	NC-7
<u>Elymus</u> (rye)	Australia	J.G. Carman C.F. Crane Utah State Univ.	June-July, 1986	7,828	W-6
			Total	<u>\$48,356</u>	

III Artocarpus altilis and A. mariannensis, (breadfruit); Western Pacific Region; Carol D. Ragone (PhD Candidate, University of Hawaii); January 10 - February 28 and April 1 - May 20, 1987.

Cost: \$7,200

Objective: Breadfruit has long been a staple crop of Pacific cultures. It needs to be improved and collection is needed at this point to broaden the gene base for use in the future. Germplasm collected will be maintained at the Pacific Tropical Botanical Garden (a Congressionally chartered research center) and the National Clonal Germplasm Repository at Waiakea, Hawaii.

IV Carya spp. and Juglans spp., (pecan and walnut); 11 states in Mexico including Chihuahua, Vera Cruz, and Oaxaca; Dr. L. J. Grauke, Horticulture, LSU, Dr. Jerry Payne, ARS, Byron, GA, Dr. Bruce W. Wood, ARS, Byron, GA and Dr. Dan E. Parfitt, University of CA; July 15 - August 15, 1987.

Cost: \$7,449.86.

Objectives: Carya - in order to insure conservation of potentially valuable pecan germplasm, collections are being made from the entire range of the genus for inclusion in a germplasm repository. The Mexican populations of pecan are the most southern and are isolated from the U.S. populations. Possible contributions of this germplasm include altered phenology (periods of bud growth and nut maturation), dwarf growth habit, disease and insect resistance, zinc uptake efficiency, and potential rootstock material.

Juglans - since there is no Mexican walnut in the current Juglans germplasm repository, the opportunity to collect them should not be missed. Possible contributions of this germplasm include useful rootsacks for commercial cultivars of walnut tolerance to adverse soil conditions and nematode and disease resistance

V Plantanus spp. (sycamore); several states in Mexico; October and November, 1986; Dr. David L. Morgan, Texas Agr. Exp. Station, Dallas, Texas.

Cost:	North-Central Mexico	\$1,083
	Southern Mexico	<u>1,108</u>
		\$2,191

Objective: Collect seed of several species of Plantanus of which only one (P. mexicana) is in general cultivation. The principal use of the germplasm would be to screen for resistance to a leaf scorch disease (a bacterium) widespread in the U.S. Secondary uses are drought tolerance and resistance to lace bugs.