

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 GERMPLOSM

V.P.I. and S.U.
Blacksburg, VA

July 27-28, 1982

Submitted by

W. T. Fike, Secretary
S-9 Technical Committee

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

1. CALL TO ORDER

The 1982 meeting of the S-9 Technical Committee was held at the Donaldson Brown Center for Continuing Education, Virginia Tech, Blacksburg, Virginia on July 27 and 28, 1982. The meeting was called to order by Chairman A. Jeff Lewis at 8:15 a.m. on Tuesday morning.

2. INTRODUCTION OF ATTENDEES

<u>Name</u>	<u>Address</u>	<u>Telephone</u>
*John Bowers	Univ. of Arkansas Plant Sciences Bldg. Fayetteville, AR 72701	501-575-2605
*David W. Bradshaw	Dept. of Horticulture Clemson Univ. Clemson, SC 29631	803-656-3404
*David Coffey	Univ. of TN Dept of Plant & Soil Sci. P.O. Box 1071 Knoxville, TN 37901	615-974-7391
*Bill Fike	Crop Science Dept. North Carolina State University Raleigh, NC 27650	919-737-3267
Sheila Gillette	USDA, ARS Agric. Res. Ctr. Room 414, Bldg. 005 Beltsville, MD 20705	301-344-4275
Clarence O. Grogan	CSRS/USDA 6440 S. USDA Bldg. Washington, DC 20250	202-447-6195
*Philip Ito	HI Agric Extp. Sta. Coll of Tropical Agric. Human Res. 461 W. Lanikaula St. Hilo, HI 96720	808-935-2885
Quentin Jones	USDA, ARS Agric. Res. Ctr. Room 417, Bldg. 005 Beltsville, MD 20705	301-344-3311
*James S. Kirby	Agronomy Dept. Oklahoma State Univ. Stillwater, OK 74078	405-624-6417

2. INTRODUCTION OF ATTENDEES (Continued)

<u>Name</u>	<u>Address</u>	<u>Telephone</u>
*Robert Kleiman	USDA, ARA No. Reg. Res. Ctr. 1815 N. University St. Peoria, IL 61604	309-685-4011
*A. Jefferson Lewis	Dept. of Horticulture Virginia Tech Blacksburg, VA 24061	703-961-5019
*Gilbert R. Lovell	Coordinator, S-9 Project Georgia Expt. Station Experiment, GA 30212	404-228-7255
*Warren Meadows	LSU, Hort. Dept. 4560 Essen Lane Baton Rouge, LA 70809	504-766-3471
Muriel J. O'Brien	USDA, ARS, RM. 4C Bldg. 009 Germplasm Resource Lab Ag. Res. Ctr., West Beltsville, MD 20705	301-344-3617
Charles A. Pantoni	N.C. Agr. & Tech State Univ. Greensboro, NC 27411	919-379-7535
*Jeff Pederson	Auburn Univ. Dept. Agronomy & Soils Auburn, AL 36849	205-826-4100
*Gordon M. Prine	Univ. of Florida Agronomy Dept. 314 Newell Hall Gainesville, FL 32611	904-392-1811
*Oscar Ramirez	Univ. of P.R. Agric. Expt. Sta Dept. of Horticulture Venezuela Contract Sta. Rio Piedras, P.R. 00927	809-787-9705
*Roy E. Sigafus	Univ. of KY Agronomy Dept. Lexington, KY 40546	606-257-3144
*Oliver Smith	Texas A&M University Soil & Crop Sciences Dept. College Station, TX 77843	713-845-5389
Paul Soderholm	USDA-ARS Subtropical Hort. Res. Sta. 13601 Old Cutler Road Miami, FL 33158	305-238-9321

3. INTRODUCTION OF ATTENDEES (Continued)

<u>Name</u>	<u>Address</u>	<u>Telephone</u>
Deborah Strauss	LISA-CSU Managing Editor - <u>Diversity</u> 3850 Tunlaw Road, NW 113 Washington, DC 20007	202-965-3372
Francisco Vazquez	USDA-ARS-SR-MITA P.O. Box 70 Mayaguez, PR 00709	809-832-2435
George A. White	USDA-BARC Room 322, Bldg. 001, BARC West Beltsville, MD 20705	301-344-3328
J. B. Wilson	USDA, ARS U.S. Plant, Soil & Nutr. Lab Cornell Univ. Towers Rd. Ithaca, NY 14853	

*Members of the S-9 Technical Committee.

3. WELCOME

Participants at the Regional Meeting were welcomed to Virginia Tech by Dean E. N. Boyd of the College of Agriculture. Dean Boyd also substituted for Director Curtis Jackson who was in India. Dean Boyd described VPI's enrollment as well as its role in Virginia's Agriculture.

4. APPROVAL OF MINUTES

Dr. Oliver Smith moved for approval of the 1981 meeting minutes as published. The motion was seconded by John Bowers and approved.

5. APPROVAL OF AGENDA

The agenda prepared by Chairman Jeff Lewis was accepted by the committee. Announcements were also made concerning the Agronomy Horticulture Farm Tour on Tuesday as well as the Banquet on Tuesday night.

Agenda
S-9 Technical Committee
Donaldson Brown Center for Continuing Education
Virginia Tech
Blacksburg, VA 24061

1. Call to Order, 8:15 a.m., July 27, 1982
2. Introduction of Attendees
3. Official Welcome
4. Approval of Minutes, 1981 Meeting
5. Approval of Agenda, 1982 Meeting
6. Appointment of Committees:
 - A. Nominations
 - B. Time and Place of Next Meeting
 - C. Resolutions
7. Remarks from the Administrative Advisor
8. State Progress Reports and Research Plans
9. Tour (Tuesday afternoon)
 - Agronomy Farm - Dr. D. D. Wolf
 - Variety Flower Trails - Dr. A. J. Lewis
 - Horticulture Farm - Mr. Jon WoogeBus departs front of CEC approximately 1:00 pm. Spouses welcome.
10. Banquet (Tuesday night)
 - Speaker: Dean Howard Massey, Director, VPI, International Program in Agriculture, 7:00 pm.
11. Other Agency Reports and Research Plans
12. Southern Region Plant Introduction Station Report
13. National Program Staff Report
14. CSRS Report
15. Plant Exploration Proposals
16. Committee Reports:
 - A. Nominations
 - B. Time and Place of Next Meeting
 - C. Resolutions
17. Unfinished or New Business
18. Adjournment, Noon, July 28, 1982

6. APPOINTMENT OF COMMITTEES

Chairman Jeff Lewis appointed the following committees:

- | | |
|-----------------------------------|---------------------------------------------------------|
| A. Nominations | David Coffey, Chairman
James Kirby
Jeff Lewis |
| B. Time and Place of Next Meeting | Oscar Ramirez, Chairman
Philip Ito
Gilbert Lovell |
| C. Resolutions | David Bradshaw, Chairman
Oliver Smith
Bill Fike |

7. REMARKS FROM ADMINISTRATIVE ADVISOR

Dean Boyd, Gil Lovell, and Question Jones mentioned the following items:

- a. Proposed 1983 meeting of the four Regional Committees in Des Moines, Iowa. A tour would be taken to the Plant Introduction Station at Ames as well as the School of Agriculture of Iowa State University. The possibility of touring the Pioneer Breeding Nursery was discussed.
- b. There will also be a National Germplasm meeting in 1983. Location and time to be announced later.

8. STATE PROGRESS REPORTS AND RESEARCH PLANS

The following state representatives presented their annual reports. Copies are included in the Appendix:

<u>State</u>	<u>Representative</u>
Alabama	Jeff Pedersen - Agronomy and Soils
Arkansas	John Bowers - Horticulture
Florida	Gordon Prine - Agronomy
Georgia	Absent
Hawaii	Philip Ito - Horticulture
Kentucky	Roy Sigafus - Agronomy
Louisiana	Warren Meadows - Horticulture
Mississippi	Absent
North Carolina	Bill Fike - Crop Science
Oklahoma	James Kirby - Agronomy
Puerto Rico	Oscar Ramirez - Horticulture
South Carolina	David Bradshaw - Horticulture
Tennessee	David Coffey - Plant and Soil Sciences
Texas	Oliver Smith - Soil and Crop Science
Virginia	Jeff Lewis - Horticulture

9. TOUR TUESDAY AFTERNOON

A bus tour was taken to the following locations. The tour was varied and enjoyed by all.

- Agronomy Farm - Dr. D. D. Wolf
- Variety Flower Trails - Dr. A. J. Lewis
- Horticulture Farm - Mr. Jon Wooge

10. BANQUET

An informal get together Tuesday Evening was climaxed by a Slide Show and talk by Dean Howard Massey: Director of VPI's International Program in Agriculture.

11. OTHER AGENCY REPORTS AND RESEARCH PLANS - (SEE APPENDIX)

- a. Dr. Robert Kleiman presented the Northern Regional Research Center Report.
- b. Dr. George White presented the Germplasm Resources Laboratory Report.
- c. Dr. Muriel O'Brien of the Germplasm Resources Laboratory discussed her work with eggplant.
- d. Dr. Francisco Vazquez reported on the work at the Mayaguez Institute of Tropical Agriculture.
- e. Dr. Paul Soderholm presented his report for the Subtropical Horticulture Research Unit at Miami, Florida.
- f. A written report from Dr. L. N. Bass was passed out to the Committee.

12. SOUTHERN REGIONAL PLANT INTRODUCTION STATION REPORT

Regional Coordinator Gil Lovell presented the Experiment Station Report and the Proposed Budget for 1983. A copy of his report is included in the Appendix.

13. NATIONAL PROGRAM STAFF REPORT

Dr. Quentin Jones discussed the Role of and the History of the National Program Staff. A copy of his report is found in the Appendix. He also discussed the GRIP Project.

Deborah Strauss passed out copies of "Diversity". This publication is "A News Journal for the Plant Genetic Resources Community" and is well received by the Agriculture Community.

14. CSRS REPORT

Dr. Clarence Grogan discussed the importance of the Federal - State Partnership. He also summarized Germplasm Release Information concerning the American Seed Trade Association. A copy of the Recommended Policies is attached.

15. PLANT EXPLORATION PROPOSALS

The Plant Exploration Committee consisting of Gordon Prine, Oliver Smith and Gil Lovell reviewed the proposals and recommended the following priority. Discussion followed and their recommendations were approved.

1. Collection of Australian Cotton Species from the Kimberly Plateau, by James McD. Stewart from Tennessee in the amount of \$7500.

15. PLANT EXPLORATION PROPOSALS (Continued)

2. Collection of sweet potatoes from Peru by Dr. Wanda Collins, North Carolina State University for \$2068.
3. Exploration and Collection of Peruvian Pigmented Cotton by James Vreeland, University of Texas, \$3435.

Copies of these Proposals can be found in the Appendix.

It was also noted that our number one recommendation for 1982 will be carried over until 1983. This was the collection for Wild Bean Species in Mexico by George Freytag of the Mayaguez Institute of Tropical Agriculture.

16. COMMITTEE REPORTS

- A. Nominations - David Coffey, Chairman of the Nominating Committee reported that his committee nominates Bill Fike (North Carolina) as Chairman of the S-9 Technical Committee and Oliver Smith (Texas) as Secretary for the 1982-83 term. He then moved that these nominations be accepted and that Bill Fike and Oliver Smith be elected by acclamation. Seconded and passed.
- B. Time and Place of Next Meeting - Oscar Ramirez, Chairman of The Time and Place of Next Meeting Committee recommends that the 1983 annual meeting of the S-9 Technical Committee be held at Des Moines, Iowa as a joint meeting with the other Regions. As an alternate meeting site, the Southern Regional Plant Introduction Station at Experiment, Georgia is recommended. The time of the meeting is left to the Regional Coordinator Gil Lovell and the new Chairman to make arrangements with the other Regions. These arrangements should be made for the last week of July or the first week of August.
- C. Resolutions - David Bradshaw, Chairman of the committee moved acceptance of the following resolutions. (These resolutions were approved by the S-9 Committee).

Resolution 1

Be it resolved that the S-9 Technical Committee expresses its appreciation to Jeff Lewis for his well done dual role as Chairman and Host for the 1982 meeting.

Resolution 2

Be it resolved that the S-9 Technical Committee expresses our gracious thanks also to representatives of the VPI Staff and Faculty for their cooperation in making arrangements for the meeting, their interest in the germplasm program and their role in making our program a success. A special thanks to Dean Boyd for his welcome to Virginia and his substitution for Curtis Jackson, to Dale Wolfe our host for the tour of the Agronomy Farm, to John Wooge our guide at the Horticultural Farm and to Dean Massey for his enlightening dinner program on VPI's role in International Agriculture.

16. COMMITTEE REPORTS (Continued)

C. Resolutions (Continued)

Resolution 3

Be it resolved that the S-9 Technical Committee expresses a special recognition to John Bowers for his long and faithful service as Arkansas's representative to our committee - may his retirement be happy and fulfilling. To Bert Princen - congratulations on your promotion - sorry to see you leave. To Jeff Pedersen - Alabama; Warren Meadows - Louisiana; Dave Coffey - Tennessee; and Robert Kleiman - NRRC, -- it is good to have you as members of our committee - we look forward to a fine association with all of you -- and finally - to our USDA Cooperators and Friends - Welcome Back -- Your presence has made this meeting worthwhile and enlightening for all of us.

17. UNFINISHED OR NEW BUSINESS

All unfinished and/or new business was discussed during the session.

18. ADJOURNMENT

There being no further business the meeting was adjourned at 11:50 a.m. on July 28, 1982.

APPENDIX

State and Federal Agency Reports

Written reports are attached in the following order:

State:

ALABAMA
ARKANSAS
FLORIDA
HAWAII
KENTUCKY
NORTH CAROLINA
OKLAHOMA
PUERTO RICO
SOUTH CAROLINA
TENNESSEE
TEXAS
VIRGINIA

Federal:

MAYAGUEZ INSTITUTE OF TROPICAL AGRICULTURE (MITA)
NATIONAL PROGRAM STAFF (NPS)
SUBTROPICAL HORTICULTURAL RESEARCH STATION
GERMPLASM RESOURCES LABORATORY (GRL)
NORTHERN REGIONAL RESEARCH CENTER (NRRC)
NATIONAL SEED STORAGE LABORATORY (NSSL)
SOUTHERN REGIONAL PLANT INTRODUCTION STATION (SRPIS)

S-9 TECHNICAL COMMITTEE REPORT

Agency: Auburn University

Submitted by: J. F. Pedersen

Address: Department of Agronomy and Soils, Auburn University,
Auburn University, Alabama 36849

Accession User: J. F. Pedersen, C. S. Hoveland, R. L. Haaland, and
C. D. Berry

Address: Department of Agronomy and Soils, Auburn University,
Auburn University, Alabama 36849

Nature of Research: Improved cultivar development from Phalaris aquatica
L. PI accessions.

Progress to Date: Release of 'Oasis' Phalaris. This cultivar is well
adapted to the Southeast, especially the Black Belt region. Certified
seed is being produced on an exclusive basis by International Seeds,
Halsey, Oregon and may be available to producers as soon as the fall
of 1984.

Publications: Hoveland, C. S., R. L. Haaland, C. D. Berry, and J. F.
Pedersen. 1982. Oasis phalaris a new perennial grass. Alabama
Agricultural Experiment Station Circular 259.

Cultivar Releases: 'Oasis'

Accession User: J. F. Pedersen, R. L. Haaland, C. S. Hoveland, and
C. D. Berry

Address: Department of Agronomy and Soils, Auburn University,
Auburn University, Alabama 36849

Nature of Research: Improved cultivar development from Festuca arundinacea
Schreb. PI accessions.

Progress to Date: Release of 'Triumph' tall fescue. This cultivar pro-
vides earlier grazing than 'Kentucky-31' in the Southeast. It also
has a more open sod than 'Kentucky-31' and is therefore better
adapted to use with legumes. Certified seed is being produced on
an exclusive basis by International Seeds, Halsey, Oregon and should
be available to producers by the fall of 1983.

Publications: Hoveland, C. S., R. L. Haaland, C. D. Berry, and J. F.
Pedersen. 1982. Triumph - a new winter productive tall fescue
variety. Alabama Agricultural Experiment Station Circular 260.

Cultivar Releases: 'Triumph'

Accession User: J. F. Pedersen

Address: Department of Agronomy and Soils, Auburn University,
Auburn University, Alabama 36849

Nature of Research: Screening tall fescue germplasm for general adapta-
tion to Alabama conditions and to identify possible sources of
pest resistance.

Progress to Date: 350 PI accessions not previously evaluated in Alabama
were established in short rows in the fall of 1981. Information
including seedling vigor, heading date, general disease resistance,
and total seasonal accumulated yield has been collected for each entry.

Publications: None

Cultivar Releases: None

Accession User: J. D. Norton

Address: Department of Horticulture, Auburn University, Auburn University,
Alabama 36849

Nature of Research: Increase of Citrullus sp. and Cucumis sp. and evaluation
of above germplasm

Publications: Gautney, T. L. and J. D. Norton. 1982. Muskmelon pickle-
worm resistance. Hort. Sci. 17:404-405.

Cultivar Releases: None

Accession User: G. C. Sharma

Address: Alabama Agricultural and Mechanical University, Department of
Natural Resource and Environmental Studies, P.O. Box 183, Normal,
Alabama 35762

Nature of Research: Evaluation of Abelmoschus esculentus germplasm for
dry seed production and the biochemical composition of the seed.

Progress to Date: Establishment of 240 accessions in the field. Only
flowering dates have been recorded at this time.

Publications: None

Cultivar Releases: None

S-9 TECHNICAL COMMITTEE REPORT

Agency: Arkansas Agricultural Experiment Station

Submitted by: J.L. Bowers

Address: Department of Horticulture and Forestry, University of Arkansas,
Fayetteville, AR 72701

Accessions received: Dr. Robert L. Haynes, Research Horticulturist, University of Arkansas at Pine Bluff, Pine Bluff, Arkansas received 66 accessions of *Citrullus lanatus* and 70 accessions of *Cucumis melo*. Dr. J.O. York, Professor of Agronomy, University of Arkansas, Fayetteville, Arkansas received 5 accessions of Zea Mays. Dr. Lance M. Tharel, Research Agronomist, South Central Small Farms Research Center, Rt. 2, Box 144-A, Booneville, Arkansas 72927 received 29 different lots of *Lespedeza* from the Regional Plant Introduction Station, Experiment, Georgia 30212.

Accession User: J.O. York

Address: Department of Agronomy, University of Arkansas, Plant Sciences Building 105, Fayetteville, Arkansas 72701

Nature of Research: Sorghums collected by U.S.D.A. from Kenya, Africa for use in the Arkansas Plant Breeding Program presented in Table 1.

Accession User: G.L. Klingaman

Address: Department of Horticulture and Forestry, University of Arkansas, Plant Sciences Building 314, Fayetteville, Arkansas 72701

Nature of Research: In the spring of 1982 the first planting of various plant introductions and National Arboretum releases was made on a 4 acre tract at the University of Arkansas Main Agricultural Experiment Station, Fayetteville. The planting is intended as an area for observation with plant adaptability determined when plants are grown under low maintenance conditions. New plantings will be added as plant materials are acquired and become large enough for outplanting. New acquisitions to the program during 1981-82 are *Acer velutinum* NA-21700-S, *Callicarpa bodinieri* NA-47044, *Hosta* sp. NA-39410, *Ilex buergeri* NA-45117, *Ilex rotunda* NA-45285, *Pyrus calleryana* 'Capitol' NA-48418, *Pyrus Calleryana* 'Whitehouse' NA-48519, *Viburnum* x 'Chesapeake' PI 445781 (NA-43149), *Viburnum* x 'Eskimo' PI 445780 (NA-43148, *Viburnum plicatum* f. *tomentosum* 'Shasta' PI 427119 (NA-36800) and *Hosta tsushimensis* NA-45167.

Accession User: J.L. Bowers

Address: Department of Horticulture and Forestry, University of Arkansas, Plant Sciences 311, Fayetteville, Arkansas 72701

Nature of Research: Planted PI 165560 and PI 217425 in the spinach nursery and increased seed of these two accessions so we can use these in our future field screening for white rust and downy mildew.

Sorghums Collected by the U.S.D.A. from Kenya,
Africa for Use in the Arkansas Plant Breeding Program

J. O. York
Agronomy Department, University of Arkansas
Roger Bulford
U. S. Fish and Wildlife Service, Denver, CO

Table 1.
1981, Sorghum Introductions Grown at Fayetteville, Arkansas.

Introduction	Peri- carp color	Testa present	Protein precip- itation (BR 54) *		Date mid- flower
			Immature	Mature	
Kitui/1	White	yes	0.219	0.010	8-12
My 177/1	White	yes	1.683	0.013	9-20
Mbitini Local	White	yes	0.096	0.007	8-15
Muvemba Local	White	yes	0.495	0.032	8-14
954066	White	yes	1.095 ^{1/}	1.291	7-30
954066	Brown	yes	---	1.573	7-30
956001	White	yes	2.655	2.825	8-14

	Plant height inches	Sweet stalk	Bird damage %	Pericarp and Testa Genotype
Kitui/1	147	yes	100	B ₁ B ₁ B ₂ B ₂ ssyyzzTpTp
My 177/1	108	yes	0	B ₁ B ₁ B ₂ B ₂ ssyyzzTpTp
Mbitini Local	131	yes	100	B ₁ B ₁ B ₂ B ₂ ssyyzzTpTp
Muvemba Local	129	yes	100	B ₁ B ₁ B ₂ B ₂ ssyyzzTpTp
954066	69	no	0	B ₁ B ₁ B ₂ B ₂ --yyzzTpTp ^{2/}
956001	114	yes	0	B ₁ B ₁ B ₂ B ₂ ssyyzzTpTp

^{1/}Mixture of white and white - brown pericarps.

^{2/}The white pericarps were ss and the white-brown pericarps were S-.

* Hagerman, A.E. and L.G. Butler. 1978. Protein precipit-
ation method for the quantitative determination
of tannins. *J. Agric. Food Chem.* 26:809-812.

1982 S-9 Technical Committee Report

Agency: Florida Agricultural Experiment Stations

Submitted by: G. M. Prine

Address: Department of Agronomy, University of Florida, Gainesville, FL 32611

Number of pages: 7

Accession User: Steven G. Pueppke

Address: Department of Plant Pathology, University of Florida,
Gainesville, FL 32611

Nature of Research: Screening seeds of peanut and sibling species
(Arachis spp.) for peanut lectin

Progress to Date: We have completed screening 4,556 lines of Arachis for isolectins of peanut lectin. Four lines are devoid of the lectin, and the remainder contain the lectin or an immunologically indistinguishable material. Isolectin profiles of 116 Arachis hypogaea lines were catalogued, as were the isolectins of 38 lines of sibling Arachis spp.

Publications: Pueppke, S. G. 1982. Multiple molecular forms of peanut lectin: classification of isolectins and isolectin distribution among genotypes of the genus Arachis. Arch. Biochem. Biophys. 212, 254-261.

Accession User: J. W. Scott

Address: Bradenton Agricultural Research & Education Center, 5007-60th Street East, Bradenton, FL 33508

Nature of Research: Evaluation of tomato (Lycopersicon sp.) germplasm for resistance to bacterial spot, Xanthomonas campestris pv. vesicatoria Doidge, and Fusarium wilt race III, Fusarium oxysporum (Schlecht) f. Lycopersici (Sacc.) Synder & Hans.

Progress to Date: About 200 P.I. accessions shown to have some promise from previous work have been seeded and transplanted and will be field screened for bacterial spot incidence this summer. Five hundred thirty-five P.I. accessions are being screened for Fusarium wilt race III resistance at present to see if there is another source than the one used in Australia.

Accession User: J. M. Crall

Address: Agricultural Research Center, University of Florida, IFAS,
Post Office, Box 388, Leesburg, FL 32748

Nature of Research: Incorporation of resistance to gummy stem blight into watermelon breeding lines.

Progress to date: F₁ progenies from crosses made in 1981 between our lines and P.I. 271778 and P.I. 189224 were grown in the field. Crosses to them were made with several of our more promising breeding lines.

Accession User: Paul Mislevy, Agricultural Research Center, Ona,
Florida 33865

Nature of Research: Evaluation of grazing management techniques on
small paddocks.

Progress to date: Three stargrass (Cynodon nlemfuensis Vanderyst var.
nlemfuensis) entries (Ona stargrass, PI 224566, Puerto Rico
stargrass Puerto Rico number 2341 and cane patch stargrass)
have each been grazed under 13 grazing pressure x plant
height treatments for one year. Continuous grazing at the
proper grazing pressure appears to be equal to rotational
grazing, regarding specie persistence. Measurements being
made are yield, quality, CHO, leaf-area and persistence.

Publications: Hodges, E. M., P. Mislevy, L. S. Dunanvin, O. C. Ruelke,
and R. L. Stanley, Jr., 1979. Ona stargrass. University
of Florida, IFAS Circular S-268. 11 p.

Cultivar release: Ona stargrass.

Nature of Research: Evaluation of Hemarthria entries under mob grazing.

Progress to date: Six new Hemarthria entries (PI 364888, 349753, 365887,
365509, 367874, and 364884) were compared with presently
released varieties. Grasses were grazed on a year-around
basis at 3, 6, 9 and 12 week intervals. Data indicate PI 364888
appears to be far superior to any Hemarthria entry presently
grown in South Florida. Persistence and quality appear to be
excellent.

Nature of Research: Evaluation of Cynodon entries under mob grazing.

Progress to date: Seven Cynodon entries are being compared for yield,
quality, persistence, and carbohydrates when grazed at 2, 4,
5 and 7 week intervals during the warm season. Ona stargrass,
PI 224566 and Puerto Rico stargrass (Puerto Rico #2341) are
being compared with Cynodon hybrids from Tifton, Georgia. No
results are presently available.

Publications: Mislevy, P. and W. G. Blue. 1981. Reclamation of quartz
sand tailings from phosphate mining: I. Tropical forage
grasses. J. Environ. Qual. Vol. 10, No. 4, 449-453.

Accession User: D. A. Knauft

Address: Department of Agronomy, University of Florida, Gainesville,
FL 32611

Nature of Research: Peanut breeding.

Progress to date: Screening work is continuing with Arachis hypogaea
L. material segregating from crosses of PI's resistant to
leafspot or rust. Additional crosses are also being made.

Accession User: B. Dehgan

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

Nature of Research: Evaluation of hydrocarbon producing plants for
cultivation in the southeast

Progress to date: An "International Seed Exchange Program" was
established to obtain seeds of Euphorbia spp., Asclepias spp.
and other latex bearing-hydro-carbon producing plants. A
number of species have been cultivated and a few have been
tried under field conditions.

Accession User: O. Charles Ruelke and Scott Christiansen

Address: Agronomy Department, University of Florida, Gainesville, FL 32611

Nature of research: Limpograss forage evaluation: Effect of cutting
frequency and nitrogen level on DM yield, seasonal productivity,
crude protein, IVOMD, total non-structural carbohydrate percentages (TNC)
in stem bases and plant persistence.

Progress to date: The most notable new finding was the ability of PI 364888,
PI 299993 PI 349753 PI 299995 limpograsses to adapt a prostrate
morphology under 3-week cutting intervals. The first three
limpograsses produced many tillers per unit area from greater
numbers of stolons and the residual leaf area following
defoliation was sufficient to maintain healthy stands. However,
Big alta (299995) did not persist under frequent defoliation and
480 kg/ha N. PI 364888 has yield quality and persistence
characteristics superior to the three cultivars released in 1979
and is being reviewed for cultivar release.

Publication: Scott Christiansen, O. C. Ruelke, and R. O. Lynch. 1981.
Regrowth in darkness as influenced by previous cutting treatment
for four limpograss genotypes. Proc. Soil and Crop Sci. Soc. Fla.
40:156-159.

Accession User: Emil A. Wolf

Address: Agricultural Research Education Center, Belle Glade, FL 33430.

Progress to date: Selections from PI 196831 resistant to early blight,
caused by Cercospora apii, and bacterial leaf-spot, caused by
Pseudomonas chicorii, were crossed onto Florida 2-14 celery
cultivar in 1980. An F₂ population from this cross is being
grown for selection this winter and backcrossing to the commercial
parent. Early blight resistant celery lines coming out of
crosses of commercial cultivars and Belle Glade AREC lines with
PI 171495 are in various stages of selfing and backcrossing to
combine the resistance with good horticultural characters in
adapted cultivars.

Accession User: L. S. Dunavin

Address: Agricultural Research Center, Route 3, Box 575, Jay, Florida 32565-9524.

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

Progress to date: The limpgrass P.I. 364888 Hemarthria altissima is being evaluated in comparison with Tifton 44 bermudagrass at low, medium, and high fertility levels. It is also being compared with Pensacola bahiagrass, and Tifton 44 bermudagrass when grown in combination with Florigraze rhizoma peanut. P.I. 364888 did relatively well in both trials during the establishment period, based on limited data from 1981.

Accession User: S. C. Schank

Address: Agronomy Department, University of Florida, Gainesville, FL 32611

Nature of Research: Forage Grass Breeder.

Progress to date: No report received.

Publications: S. C. Schank, O. C. Ruelke, W. R. Ocumpaugh, J. E. Moore and D. W. Hall. 1982. Survenola digitgrass, tropical forage grass. Fla. Agr. Exp. Sta. Circ. S-292. 16 pages.

Cultivar releases: Survenola digitgrass, July 1982.

Accession User: G. M. Prine

Address: Agronomy Department, University of Florida, Gainesville, FL 32611

Nature of Research: New crops and plant introductions, working particularly with perennial Arachis for forage; pigeonpea for grain, napiergrass, napiergrass-pearlmillet hybrids and Leucaena for biomass; blue and white lupines for green manure, forage and seed; subterranean and other annual clovers for forage; crotalarias for green manure; and miscellaneous other crops.

Progress to date: 1. Arachis. Florigraze rhizoma peanut (Arachis glabrata) released for increase in 1978 increased in acreage about 100 acres in winter of 1981-82 to a total average of about 250 acres. This was first commercial increase in acreage. Enough rhizomes are available from commercial growers to plant an additional 1000 to 2000 acres in winter of 1982-83. A shortage of bermudagrass sprig harvesters and planters may hamper the rate increase of Florigraze. Arbrook rhizoma peanut (PI 262817) still looks superior to Florigraze on droughty sands. I expect to ask for a release committee for Arbrook in fall of 1982 with possible release as a named cultivar in cooperation with USDA, SCS, in winter of 1983-84.

Napiergrass: I have collected about 40 accessions of napiergrass and napiergrass-pearlmillet hybrids at Gainesville. PI 300086, which we have in several experiments, appears to be as productive as any other napiergrass at present.

Pigeonpeas: We are testing the top lines of crosses received originally from ICRISAT in India at several locations in state for grain production. We should have a grain pigeonpea cultivar ready for release in a couple more years.

Ryegrass: Florida 80 ryegrass seed will be available in limited quantities from Peterson Seed Division of Pioneer International Inc. Gulf, Magnolia and Florida Rust Resistance cultivars are represented in Florida 80. Rust was the worst on ryegrass in 1981-82 season that it has been in many years. This appears to be due to lower rust resistance in common ryegrass, the release of rust susceptible ryegrass cultivars developed during the low rust period since development of Gulf, Magnolia and Florida Rust Resistant cultivar and perhaps a new race of rust.

Publications: G. M. Prine, L. S. Dunavin, Paul Mislavy, K. J. McVeigh and R. L. Stanley, Jr. 1982. Florida 80 ryegrass. Fla. Agr. Exp. Sta. Circ. S-291. 12 pages.

Cultivar releases: Florida 80 ryegrass

Cultivar User: Paul Lyrene

Address: Fruit Crops Department, University of Florida, Gainesville, FL 32611

Nature of Research: Fruit Crop Breeder

Exploration Report: Wayne Sherman, Bob Knight and Paul Lyrene made a 5-day exploration and collection trip in Georgia and North Carolina to obtain blueberry breeding material. A population of wild Vaccinium ashei was located near Claxton, Georgia which had very blue fruit. Several of the best of these plants were collected. An extensive search of the mountaintops along the Blue Ridge Parkway in North Carolina revealed large populations of highbush blueberry. When chromosome numbers from a broad sample of these were counted, all were tetraploid. Thus the elusive mountain-top hexploid early-ripening blueberry described by W. H. Camp in 1946, which was a primary goal of our explorations in North Carolina, was not found.

Accession User: D. W. Gorbet

Address: Agricultural Research Center, Rt. 3, Box 383, Marianna, FL 32446

Nature of Research: Peanut (A. hypogaea) introductions being evaluated and/or utilized in breeding program

Progress to Date: PIs 261893, 261906, 262090, 196658, 162539, and selections from prior crosses with PIs 306230, 121067, 203396, and 145681

were utilized in greenhouse crossing for leaf spot resistance studies. Selection and evaluations are continuing in segregating populations and with advanced selections from crosses made with various PIs, as previously reported.

Accession User: R. B. Volin and L. Ramos

Address: University of Florida Agricultural Research and Education Center,
18905 SW 280 Street, Homestead, FL 33031

Nature of Research: Evaluation of tomato Lycopersicon sp. germplasm for resistance to target leafspot, Corynespora cassicola.

Progress to Date: Tomato germplasm (14 P.I. accessions and 9 commercial cultivars) were screened as seedlings for resistance to target leafspot. Fungal isolates taken from infected foliage of commercial fresh market tomato cultivars were used as inoculum sources. Resistant plants had no visible symptoms or only sparse lesions on cotyledon leaves. Moderately resistant plants had lesions symptoms on both cotyledons and true leaves. Some lines produced a mixed response, i.e., some plants in the line were resistant with sparse foliar lesions yet others were quite susceptible and severely affected.

Table I. Response of tomato accessions and cultivars to target spot (Corynespora cassicola) isolates in Florida.

Seedling Response		
<u>Resistant</u>	<u>Moderately Resistant</u>	<u>Mixed Response</u>
112215	79532	91918
120265	110595	97231
	114038	100697
Indian River	126430	108245
Manalucie	126433	124132
		126417
	Tropic	126436
	Florrrda MH-1	
	Manapal	Walter PF
		Homestead 24
		Duke
		Flora-Dade

Our results correspond reasonable well with those of others who have screened tomato P.I. lines to Corynespora cassicola isolates outside Florida. We are incorporating factors for resistance in the breeding program.

Accession User: Ronald M. Sonoda

Address: Agricultural Research Center
Box 248
Ft. Pierce, FL 33450

Nature of Research: Looking for resistance to Rhizoctoma foliar blight and rust diseases and waterlogging and cold tolerance in Macroptilium atropurpureum introductions.

Progress to date: Collected Macroptilium species in Colombia South America in July 1982. Found 20 of 104 M. atropurpureum tested to be highly resistant to Uromyces appendiculatus (rust).

Publications: R. M. Sonoda and A. E. Kretschmer, Jr., 1982. Identification of Macroptilium atropurpureum accessions resistant to Uromyces appendiculatus. Univ. of Florida, IFAS, Ft. Pierce, ARC Res. Rept. RL-82-1. 7 p.

Accession User: Victor E. Green, Jr.

Address: Department of Agronomy, University of Florida, Gainesville, FL 32611

Nature of Research: Sunflower production and management and screening introductions for resistance to Alternaria.

Progress to Date: PI 432,510, collected among the Indian villages in the Desert Southwest by Dr. Charles B. Heiser, Jr., of Indiana University at Bloomington continues to show promise as an open-pollinated line tolerant of the black stem and leaf spot disease of sunflower caused by the fungus Alternaria helianthi. It is a tall, robust, late blooming cultivar, and as such, could be used for silage where corn does not thrive. It offers good possibilities of combining well with other sunflower lines or with other species of Helianthus. Work will continue on this plant introduction as time and funds permit.

Accession User: C. A. Kuwite and D. E. Purcifull

Address: Plant Pathology Department, University of Florida, Gainesville, FL 32611

Nature of Research: A study of a winged bean strain of cucumber mosaic virus.

Progress to date: The following plant introductions were tested for, and found susceptible* to a winged bean strain of cucumber mosaic virus. All of the introductions are cultivars of Vigna radiata: PI 377166, PI 377167, PI 377168, PI 377020, PI 377021, PI 377022.

*Susceptible-produced local lesions

Publications: Kuwite, C. A. 1981. M. S. thesis.
Kuwite, C. A. 1982. Some properties of a cucumber mosaic virus strain isolated from winged bean (Psophocarpus tetragonolobus) in Florida. Plant Disease 66 (in press).

Annual S-9 Technical Committee Report

Agency: Hawaii Institute of Tropical Agriculture & Human Resources

Submitted By: P. J. Ito

Address: Dept. of Hort., 461 W Lanikaula St., Hilo, HI 96720

Page 1 of 3

Accession User: J. L. Brewbaker

Address: Dept. Hort., U. Hawaii, Honolulu, HI 96822

Nature of Research: Interspecific hybridization of genus Leucaena

Progress to Date: U. H. accessions of the tropical nitrogen-fixing tree, genus Leucaena include all 10 recognized species. Nine of these species have been crossed in most combinations, and generally display self-incompatibility but cross-fertility among species. The polyploid L. leucocephala (2n = 104) is unique in its self-fertility. Species of probable commercial importance in the tropics include L. diversifolia (for highland fuelwood use), L. macrophylla (lowland fuelwood) and L. shannoni (bee pasture, erosion control), in addition to the widely used L. leucocephala.

Publications:

Brewbaker, James L. 1982. (Ed.) Leucaena Research Reports, Vol. 2. 88 pp. Council Agric. Plann. Dev., Taipei, Taiwan

Brewbaker, James L., Rich Vand Den Beldt and Ken MacDicken. 1981. Nitrogen-fixing tree resources; Potentialities and limitations. In "Biological Nitrogen Fixation", Ed. Halliday; Proc. of Conf. in Cali., Colombia.

Cultivar Release: None

Accession User: J. L. Brewbaker Nitrogen Fixing Tree Association
(International)

Address: Dept. Hort., U. Hawaii, Honolulu, HI 96822

Nature of Research: Evaluation and use for tropical fuelwood

Progress to Date: Cultivars of arboreal or "Salvador Type" leucaena (Leucaena leucocephala (Lam) de Wit) from U. Hawaii collection of 735 accessions have been distributed worldwide and are of increasing use in about 70 countries for dendrothermal power, village fuelwood, charcoal, and for use as wood for props and construction. Varieties of primary prominence are identified here by K numbers (U. Hawaii) and PI numbers in parentheses as follows: K8 (263695), K28 (281607), K67 (288005). Estimated tropical acreage planted to these cultivars is currently 250,000 ha.

Publications:

LEUCAENA RESEARCH REPORTS, J. L. Brewbaker, ed. (Vol. 1, 1980, Vol. 2, 1981. Vol. 3, in press), U. Hawaii and Taiwan Council Agric. Planning and Development.

Cultivar Releases: (Only K8 has been formally released)

Accession User: S. Whitney
Address: Maui Branch Station, P. O. Box 269, Kula, HI 96790
Nature of Research: Improvement of Sub-Tropical and Tropical Forage
Progress to Date: Selected five selections of Eragrostis superba for seed increase and further testing: PI 226-074, 276-055, 295-706, 364-831, 400-246 from out of 83 selections (one of which was not a superba)

Publication: None
Cultivar Release: None

Accession User: R. L. Phillips
Address: Mauna Loa Macadamia Nut Corp. Hilo, HI 96720
Nature of Research: Evaluating low growing legumes and grasses for orchard ground cover.
Progress to Date: Following are being tested: Aeschynomere folcata (PI 322289 & 364378), Indigofera endecaphylla (PI 185532, 298617 & 199343), Indigofera neglacta (PI 257752), White clover (11 cultivars) and Policfor joscii.

Publications: None
Cultivar Release: None

Accession User: R. W. Hartman and B. S. Kim
Address: Dept. of Hort. U. of H. Honolulu, HI 96822
Nature of Research: Breeding for pepper resistant to bacterial spot and seed increase of phaseolus species.
Progress to Date: Twelve resistant PI lines of pepper have been crossed with the susceptible 'Keystone' to study the inheritance of resistance to bacterial spot (Xanthomonas campestris pv. vesicatoria). F₂ and BC generations are being analyzed. A single dominant gene which confers hypersensitivity has been found in PI 271322. Quantitative genes for resistance have been found in 241670, 244670, 297495, 308787, 369994, 322719 and 377688. 250 lines of seed were planted for the Pullman Plant Introduction Station of P. lunatus (28), P. coccineus (177), P. acutifolius (29), Miscellaneous (16). Seed were planted on 9/20/81 and 11/4/81. Harvesting started on November 24, 1981 and continued for some lines until July 1, 1982.

Publication: None
Cultivar Release: None

Accession User: P. J. Ito and R. A. Hamilton

Address: Dept. of Hort., 461 W Lanikaula St., Hilo, HI 96720

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

Progress to Date: Twenty seven introductions were made from Brazil, Mexico, and Australia. Of interest is the Stevia introduction used as a sweetening agent.

Publications:

Hamilton, R. A., P. J. Ito and E. T. Fukunaga. 1982. An outstanding new macadamia variety named in honor of William Purvis. Hawaii Macadamia Producers Assoc. 21st Annual Meeting, pp. 58-68.

Hamilton, R. A., C. G. Cavaletto and D. Anderson. 1982. 'Pahala' Macadamia named. Hawaii Macadamia Producers Assoc. 21st Annual Meeting, pp. 69-75.

Cultivar Release: Greengold (R27T8) avocado maturing in late winter, tolerant to Methyl Bromide fumigation, good quality and good shelf life.

KENTUCKY ANNUAL REPORT TO S-9 TECHNICAL COMMITTEE
Blacksburg, Virginia - July 27-28, 1982

Kentucky Agricultural Experiment Station
Submitted by Roy E. Sigafus, Department of Agronomy
University of Kentucky, Lexington, Kentucky 40546-0091

Accession User: John C. Snyder*, Catherine Carter, Robert Schwartz, and Don Good. Department of Horticulture, University of Kentucky.

Nature of Research: Role of trichomes and tridecanone in resistance of Lypersicon hirsutum to pests.

Progress to Date: Resistance of this tomato species is being studied by classical chemical, morphological, and genetical techniques using the two-spotted spider mite and tobacco hornworm. Plant introductions 251303 and 134417 are used for crossing with the tomato cultivar 'Ace'.

Publications: Carter, Catherine D. Tomato leaf trichome and spider mite resistance, Dissertation. University of Kentucky, 1982.

*Dr. Snyder is carrying on protein banding pattern studies with legumes in 25 species including Phaseolus, Vigna, and Macroptilium. He would be interested in contacting taxonomists or others interested in species characterization and identification.

Accession User: A. D. Genovesi* and G. B. Collins. Department of Agronomy, University of Kentucky.

Nature of Research: Corn anther culture.

Progress to Date: The German corn hybrid 'Prior' and its four inbreds, PI 433485-8, and Chinese hybrid 'Ching-huang 13' and inbreds 438948 and 438950 were brought in through Beltsville quarantine. Anther culture study details given in article accepted by Crop Science, In vitro production of haploid plants of corn via anther culture by A. D. Genovesi and G. B. Collins.

*Present address - DeKalb Agr. Res., Sycamore Road, DeKalb, IL 60115

Accession User: Dr. Georgia C. Eizenga, Research Geneticist, USDA-ARS, Department of Agronomy, University of Kentucky.

Nature of Research: Cytology of Festuca-Lolium complex.

Progress to Date: A total of 47 accessions of tall, meadow, and giant fescue and annual and perennial ryegrasses were obtained in 1981 and seeded in the greenhouse. At present, 5 plants from each accession are being maintained. It is difficult to get plants to be crossed to flower at the same time or to even flower at all. Growth chamber, greenhouse, and field plantings will be used. Work being done is a continuation of the program that resulted in the development of 'Kenhy' tall fescue from derivatives of tall fescue-annual ryegrass hybrids. Giant fescue introductions were first used at Lexington in 1967.

Accession User: N. L. Taylor, Department of Agronomy, University of Kentucky.

Nature of Research: Cytological and genetical studies of Trifolium.

Progress to Date: Trifolium curator Dr. N. L. Taylor and co-workers report first counts of chromosomes of two Trifolium species for a total of 189 in the genus. Confirmation counts were made for six additional species. New species are T. philisticum, PI 269090 and T. strepens. Confirmation counts were made on T. amabile, PI 291769, T. physodes, PI 296683, and T. badium, PI 292066.

Publications: N. Giri, N. L. Taylor, and G. B. Collins. 1981. Chromosome numbers in some Trifolium species with a karyotype for T. physodes. Can. J. Genet. 23:621-626.

Accession User: Dr. Robert E. McNeil, Extension Specialist in Nursery Crops, Department of Horticulture, University of Kentucky.

Nature of Research: Woody ornamental plant performance in 1982.

Progress to Date: The winter and spring of 1982 has given evidence of being one of the most severe time periods in which plant damage occurred due to cold temperatures. Tree and shrub damage has been more severe on many plants than during the 1976-78 time period. Temperatures went as low as -11°F on January 10 and as low as -13°F on January 17, 1982. Severe frosts with temperatures as low as 18°F occurred on April 7, 1982 in the Lexington, Kentucky area.

As a result of this combination of events, the spring of 1982 will go down in history as a spring lacking many flowering displays.

Evidence of abnormalities started early in 1982 when the Arnold Arboretum introduction Hamamelis X intermedia 'Arnold Promise' failed to bloom. Many other plants failed to make their usual displays and these included Forsythia and the U.S.D.A. introduction Pyrus calleryana 'Bradford'.

A number of plants were froxen back to the ground. National Arboretum introductions Pyracantha watereri NA 19618-C, Pyracantha 'Mohave' NA 32225-C, and Pyracantha 'Shawnee' were frozen back to the ground for the first time since 1978.

During the 1976-78 time period Cercis chinensis had been put in severe stress with some stem damage and no flowering. In 1982 this species was killed back to the ground.

Other plants exhibit only partial damage. Alnus japonica NA 33517, though lacking dead branches, is poorly leafed out during the summer of 1982. Lonicera pileata f. yunnanensis PI 267886 suffered rather drastically as approximately 50% of its branches did not leaf out. In addition, many different shrubs exhibited individual branch loss from only one or two branches up to 50-60% of their branch structure. The remaining branches on these plants appear to be normal.

1982

S-9 Technical Committee Report
North Carolina State University
W. T. Fike - Crop Science Department

Of the 26 campus research personnel who receive information direct from my office, four cooperators receive a total of 252 lines, consisting of four species, four plant genera. These are just a very small part of the total number of plant introductions under test in North Carolina, as many hundreds of accessions are in various stages of advanced testing.

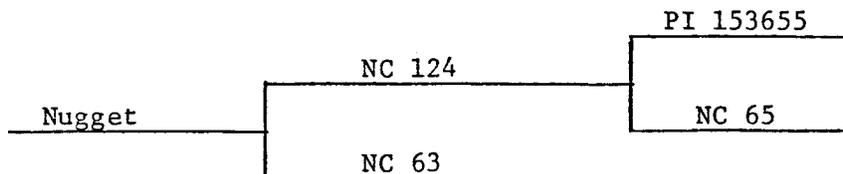
PLANT INTRODUCTION OF SPECIAL INTEREST.

1. Dr. D. H. Timothy, Grass Breeder, Crop Science, reports the Pennisetums of previous years are still being tested at more advanced stages for adaptation and yield. Being a sterile bunch-type perennial grass makes release to the farmers a long-drawn-out process. The yield and quality of the grass, however, makes the adoptive process worthwhile. Slides will be shown on establishment practices used for this grass.
2. Dr. Wanda Collins, Sweetpotato Breeder, Horticulture, is presently maintaining the following sweet potato PIs:

PI 344140	PI 296116	PI 399164	PI 344124
PI 134413	PI 399162	PI 153908	PI 324885.

These are simply maintained at the present time. She plans to use them for breeding to increase dry matter content next year.

In addition 'Pope' was released in 1981. 'Nugget', which is listed in the pedigree has the following pedigree:



'Scarlett' was released in 1982 by J. W. Moyer and W. W. Collins. It also has PI 153655 in its history. The publication is "in press" and she does not have copies at the present time.

A reprint from Horticultural Science 17(2):265, 1982, on the Pope Sweet Potato by W. W. Collins and J. W. Moyer is attached.

Dr. Collins also has a request for a proposed exploration to collect sweet potato lines in Peru in conjunction with her attendance at the International Symposium on Root and Tuber Crops in Lima. This proposal is attached.

3. Dr. T. C. Wehner, Cucumber Breeder, Horticulture is currently maintaining all cucumber plant introduction lines (approximately 700), both as lines and as germplasm in a large intercrossing base population.

The following PI lines have shown promise:

- a. For high rate of shoot regeneration in tissue culture

PI 279463 Japan	PI 171612 Turkey	PI 172846 Turkey
PI 401732 Puerto Rico	PI 177363 Syria	PI 211984 Iran

- b. For rapid germination at low temperatures

PI 109484 Turkey	PI 174166 Turkey	PI 229860 Korea
PI 222985 Iran	PI 169392 Turkey	

- c. For resistant or susceptible response to gummy stem blight (Didymella bryoniae)

22 PI lines

- d. For resistant or susceptible response to belly rot (Rhizoctonia solani)

129 PI lines

- e. For resistant or susceptible response to pickleworm (Diaphania nitidalis)

8 PI lines

Explorations - He would be interested in obtaining seed of lines of Cucumis sativus var. hardwickii from India, and C. sativus var. sativus and var. yunanensis from China.

4. Dr. Dennis Werner, Peach Breeder, Horticulture is currently maintaining and evaluating the following Prunus persica introductions.

PI 101835	PI 125025	PI 146137	PI 65974-2
PI 102705	PI 129674	PI 151158	PI 77876
PI 104287	PI 129678	PI 240928	PI 78544
PI 104488	PI 131075	PI 10254	PI 82413
PI 105362	PI 131209	PI 34685	PI 91459
PI 106062	PI 131430	PI 34688	PI 93826
PI 112032	PI 133551	PI 36126	PI 101663
PI 112033	PI 133982	PI 43289	PI 101664
PI 113452	PI 133984	PI 55776	PI 101665
PI 113455	PI 133987	PI 62602	PI 101667
PI 117679	PI 134150	PI 63850	PI 101668
PI 119840	PI 134151	PI 65821	PI 101686
PI 119846	PI 134401	PI 65974	PI 010823

His major objective in maintaining these materials is to facilitate evaluation of bloom date and bacterial spot resistance.

Explorations - He would very much be interested in obtaining Prunus persica germplasm from China. Significant progress in peach breeding, particularly as it relates to the problems faced in peach culture in the Southeastern United States, will be difficult due to the narrow base of germplasm available.

5. Dr. Johnny Wynne, Peanut Breeder, Crop Science, and others in the group are using several plant introductions in their peanut breeding program. The use is increasing their emphasis on pest resistance and increasing international activity. A list of PIs being used and why follows:

- a. Plant introductions being evaluated for yield in North Carolina:

16 PIs from Japan

PI 459086	PI 459090	PI 372578	PI 372581
PI 459087	PI 372575	PI 372579	PI 372582
PI 459088	PI 372576	PI 459092	PI 459093
PI 459089	PI 459091	PI 372580	PI 459094

- b. Parents for early leafspot resistance:

PI 270806 PI 109839
PI 269685

- c. Parents for recurrent selection for yield:

PI 138870 PI 152122

- d. Parents for late leafspot resistance:

PI 259747 PI 298115

- e. Parents in genetic vulnerability study:

PI 155245 PI 262113
PI 275699

- f. Plant introductions used in Rhizobium-host strain interaction study:

87 PIs now being evaluated.

6. Dr. Randy Gardner, Tomato Breeder, Horticulture, stationed at the Mountain Horticultural Research Station, Fletcher, North Carolina.

- a. Using PI 126445 (Lycopersicon hirsutum). Identified as early blight resistant and crosses made in an effort to incorporate resistance into new tomato varieties.

Proposal for Collection of Sweet Potatoes (Ipomoea batatas)
and Related Species in Peru

Wanda W. Collins
Associate Professor
Department of Horticultural Science
North Carolina State University
Raleigh, N. C.

The International Board for Plant Genetic Resources (IBPGR) lists the following reasons for the consideration of an international germplasm system (collection, maintenance, distribution) for sweet potatoes:

1. Sweet potato is an important crop ranking seventh in terms of production worldwide with an average annual production of about 100 million metric tons.
2. Based on calorie yields, nutritive value, adaptability, versatility, its tropical origin and vegetative reproduction, the sweet potato can potentially make a greater contribution to world agriculture in the future.
3. The risk of losing significant amounts of germplasm is already high and is expected to increase.
4. The establishment of an international repository for sweet potato germplasm is expected to greatly speed up the realization of the potential for this crop.

They suggest that collection activities be concentrated in Guatemala, Ecuador, Columbia and Peru.

I propose to collect sweet potato genotypes in Northern Peru during February, 1983, in conjunction with a trip I am making to attend the International Symposium on Root and Tuber Crops. Since my expenses (air fare, etc.) to this meeting will be paid, I only need funds for subsistence and travel inside the country. The collection trip would be coordinated with local experts through the office of Dr. L. George Wilson, US-AID. Dr. Wilson, a sweet potato expert himself, is on loan to US-AID for one year from N. C. State University, and would coordinate our activities with the Peruvian Ministry of Agriculture. Any funds requested will include his travel expenses as well as those of a local scientist.

The purpose of this collection will be to select high yielding, high bulk density (high dry matter) types to incorporate into our breeding program as well as others. Our specific objectives are:

1. To increase potential yield of our commercial lines by enhancing our germplasm base which is critically narrow at the present time.

2. To increase components of total yield (% dry matter and number of roots) to approach the tremendous potential of sweet potatoes which is, as yet, unattained in U.S. breeding programs due to our severe selection criteria for table quality; these lines would be tested for use as industrial sources of starch (i.e. for fuel alcohol production).

In addition available germplasm of closely related species (Section Batatas) would be collected. Germplasm holdings of those lines are very limited worldwide at the present time.

The most important regions for collecting according to IBPGR are the coastal desert plain of Peru and montaña region where much diversity has been noted. Exact destinations will be formulated after identification and consultation with local sources of information. Dr. Wilson has just arrived in Peru and will make necessary contacts as time permits. Therefore I have attached no definite itinerary.

Budget

	<u>1 person</u>	<u>3</u>
Per diem 8 days @ \$32	\$256	\$768
Airfare within Peru	300	900
Land transportation	300	300
Miscellaneous (shipping, supplies, etc.)	100	100
Total		<u>\$2068</u>

1982

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 3

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Accession User: D. E. Weibel
Address: Agronomy Department, Oklahoma State University, Stillwater, OK 74078
Nature of Research: Sorghum breeding and genetics [Sorghum bicolor (L.) Moench]

Progress to Date: 261 pedigree rows out of 900 have a recently converted sorghum in their pedigrees. All of our sorghums can be designated as plant introductions. Eight parental lines developed from recently converted sorghums are being evaluated for combining ability in hybrid combination. Six bloomless lines from the recent Yemen collection of sorghums are being studied to identify their bloomless gene or genes, 1074, 1075, 1077, 1286, 1287, 1288.

Publications: None

Cultivar Releases: None

Accession User: K. J. Starks
Address: Plant Science Laboratory, USDA/ARS, P.O. Box 1029, Stillwater, OK 74076

Nature of Research: Locate sources of resistance to insect pests of sorghum and pearl millet

Progress to Date: New accessions are routinely screened as they become available. Since the advent of biotype E greenbug, new sources of resistance have been found in PI264453 and PI220248 sorghum. These should be available commercially in 1983. Chinch bug resistance in pearl millet was released in 1982. The source is a breeding population that originally had entries from the Southern Regional Plant Introduction Station.

Publications: Starks, K. J., Casady, A. J., Merkle, O. G. and Boozaya-Angoon, D. Chinch bug resistance in pearl millet. J. Econ. Entomol. 75:337-339. 1982.

Accession User: C. M. Taliaferro
Address: Agronomy Department, Oklahoma State University, Stillwater, OK 74078

Nature of Research: Development of kleingrass (Panicum coloratum) germplasm with increased cold tolerance.

Progress to Date: Natural selection has increased the level of cold-tolerance in kleingrass germplasm advanced through ten generations. The more winterhardy kleingrass population traces to P.I.'s 142284, 196364, 166400, and 196363 from which equal quantities of seed were composited and planted on the Southwestern Livestock and Forage Research Station near El Reno, Oklahoma, in 1954.

Publications: The manuscript, "Registration of OKPC-1 Kleingrass Germplasm" has been submitted for publication.

Cultivar Releases: OKPC-1 Kleingrass germplasm was released in spring 1982.

Accession User: C. M. Taliaferro

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

Nature of Research: Investigation of bermudagrass [Cynodon dactylon (L.) Pers.] seed production and the development of winterhardy, seed-propagated bermudagrass cultivars.

Progress to Date: We have identified several winterhardy bermudagrass plant introductions with reasonably good fertility and seed production potential. Examples are P.I.'s 206427, 206553, 251809, 253302, and 297827. These are highly self-incompatible and thus can be used in cross-compatible combinations to produce a seed-propagated, winterhardy, bermudagrass cultivar. Seed production from a planting of two such clones averaged 743 kilograms/hectare in a 3-year study at the Southwestern Livestock and Forage Research Station near El Reno, Oklahoma. P.I. 253302 served as one of the parents in this single-cross production block.

Publications: Ahring, R. M., C. M. Taliaferro, and W. L. Richardson. 1982. Bermudagrass seed production under different management. *Agron. J.* 74:445-446.

Ahring, Robert M., C. M. Taliaferro, and R. D. Morrison. 1974. Seed production of several strains and hybrids of bermudagrass, Cynodon dactylon (L.) Pers. *Crop Sci.* 14:93-95.

Cultivar Releases: None to date but we have proposed the release of a seed propagated, winterhardy bermudagrass for soil conservation and turf usage. The proposed cultivar name is "Guymon."

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 root growth traits.

Progress to Date: Peanut genotypes (PI 405915, PI 404021, PI 404020, PI 355993, PI 261966, PI 336920, PI 360862, PI 268643, PI 355283) were compared with standard cultivars and breeding lines for larger root volumes and dry weights. Among these PI's, PI 355993 had the most extensive root system in terms of root volume and dry weight.

Publications: None

Cultivar Releases: None

Accession User: D. J. Banks, H. A. Melouk, and J. S. Kirby

Address: Department of Agronomy and Plant Pathology and USDA-ARS, Oklahoma State University, Stillwater, OK 74078

Nature of Research: Evaluation of peanut germplasm for resistance to early leafspot (Cercospora arachidicola) and germplasm development.

Progress to Date: In field and laboratory tests the following genotypes have shown resistance to early leafspot: Arachis helodes Mart. ex Hoehne, P.I.'s 468146 (collection GK 30031) and 468147 (collection GK 30036); A. hypogaea L., P.I.'s not yet assigned, collections GKSPSc 224 (Brazil), SPA 417 (Peru), and SPA 422 (Peru). In addition, a yellow flowered single plant selection from P.I. 468295 (collection BPZ 98 from Bolivia) showed moderate field resistance to early leafspot. Crosses among these genotypes and with some commercial cultivars were made and the hybrids will be evaluated in the summer of 1982. Evaluation for leafspot resistance is continuing among segregating progenies of crosses utilizing P.I. 109839 as a source of resistance.

Publications: Banks, D. J. and J. S. Kirby, 1981. Inheritance of wine seed coat (testa) and yellow flower color in peanuts. Proc. Am. Peanut Res. and Educ. Soc. p. 66 (abstract)

Melouk, H. A. and D. J. Banks, 1982. Resistance in peanut germplasm to Cercospora arachidicola. Proc. Am. Peanut Res. and Educ. Soc. (abstract, in press).

Banks, D. J., H. A. Melouk, and D. L. Ketring, 1982. Peanut germplasm development, Proc. Am. Peanut Res. and Educ. Soc. (abstract, in press).

1982

S-9 TECHNICAL COMMITTEE REPORT

Agency: University of Puerto Rico, Agricultural Experiment Station
 Submitted: O. D. Ramírez
 Address: Department of Horticulture, College of Agricultural Sciences,
 University of Puerto Rico, Agricultural Experiment Station,
 Río Piedras, Puerto Rico 00927

* * * * *

Forages: J. Vélez Santiago, Corozal Substation, Agricultural Experiment Station, Corozal, Puerto Rico

Nature of Research: To obtain through plant introduction and selection better forages in regard to seasonal yield, nutritive quality and adaptability to the various climatic and soil conditions of Puerto Rico.

Progress to Date: A grass evaluation study in two soils of P. R. (Bayamón and Vega Alta clays) was completed. In general the Bermudas and stargrasses were more productive than Pangola digit grass when grown in a Bayamón clay. Cenchrus ciliaris (P. I. 263509), P. maximum cv. Makueni (P. I. 349676), P. maximum cv. common, C. dactylon cv. Coast cross 1 (P. I. 255455), D. decumbens cv. Transvala (P. I. 299752) and Digitaria sp. cv. Slenderstem (P. I. 300935) were more productive than Pangola (P. I. 111110) and C. nlemfuensis cv. nlemfuensis cv. Star, during the short cool days.

Publications: Vélez-Santiago, J., Arroyo Aguilú, J. A. and Fuentes, F. J., Productivity of a number of herbage cultivars over a two year period in two soils, Bayamón and Vega Alta clays. J. Agr. Univ. P. R. (in press).

Cultivar Release: None

Coffee: E. Boneta and O. D. Ramírez, Adjuntas Substation, Agricultural Experiment Station, Río Piedras, P. R.

Nature of Research: To obtain through plant introduction and selection better coffee cultivars with high yielding ability, resistant to coffee rust and adapted to our conditions.

Progress to Date: Nine coffee lines resistant to various races of coffee rust introduced from Brazil are under observation. Six grafted cvs. also resistant to coffee rust were received from Miami, of which three survive. Seed of 9 coffee lines received from Brazil was sent to the Germplasm Resources Laboratory at Beltsville, Md., for germination and quarantine; when ready the trees will be sent to us for evaluation.

Publications: None

Cultivar Release: None

Root Crops: O. D. Ramírez, J. J. Green and J. Badillo, Corozal and Isabela Substations, Agricultural Experiment Station, Río Piedras, P. R.

Nature of Research: To obtain through plant introduction and selection better rootcrops with high yielding ability and adapted to our conditions.

Progress to Date: Evaluation of cassava cvs. continued. Three high yielding cvs. were obtained in the various trials. These are P R P. I. 12901, 12902 and Jamaica 18.

Publications: Ramirez, O. D., J. J. Green and Caloni, I., Evaluation and acceptability of ten cassava cultivars. J. Agr. Univ. P. R. (in press)

Cultivar Release: None

Bananas and Plantains: O. D. Ramirez, M. Santiago, Corozal Substation Agricultural Experiment Station, Rio Piedras, P. R.

Nature of Research: To obtain through plant introduction and selection better banana and plantain cvs. with high yielding ability and adapted to our conditions.

Progress to Date: A new banana cv. Grand Naine (P. R. P. I. 13503) introduced from Honduras seems very promising in its preliminary evaluation. Bunches are quite uniform with an average weight of 79.83 lb, 10.33 hands and 177.33 fingers. Fruits ripen very nicely with an excellent flavor and texture.

Publications: None

Cultivar Release: None

Ornamentals: O. D. Ramirez, Department of Horticulture, Agricultural Experiment Station, Rio Piedras, P. R. 00927

Nature of Research: To obtain through plant introduction new ornamental plants well adapted to our conditions.

Progress to Date: A total of 42 ornamentals were received from L. S. U., Miami, National Arboretum and U. S. D. A. Plant Introduction Station. Among these, some of the most promising are P. I. 407400 (Lantana camara), which has variegated leaves; P. I. 424895 (Torenia fournieri)-segregated and three flower colors have been obtained; P. I. 782611 (Ficus natalensis) is very good for bansai. From last year, Ixora coccinea cv. Thai Dwarf (P. I. 413760) and Nerium oleander cv. Petit Pink (M-25188) are being increased. Both are very slow growers. Also a collection of 12 Hoya cvs. are under evaluation. None of them has flowered as yet.

Publications: None

Cultivar Release: None

Table 1. - Identification of grasses evaluated in Bayamón and Vega Alta clay, soils near Arecibo, Puerto Rico.

Grasses	Bayamón Soil		Vega Alta Soil		Common Name
	USDA PI ^{1/}	Plant Introduction Number	PRPI ^{2/}		
<u>C. ciliaris</u>	263509	13084			Buffel
<u>C. ciliaris</u>	275102	13085			Buffel
<u>C. plectostachyus</u>	--	13330		X ^{3/}	Callie
<u>C. dactylon</u>	255455	11504		X	Coastcross-1
<u>Digitaria sp.</u>	300935	11537		X	Slenderstem
<u>C. dactylon</u>	293611	11212		X	Bermuda
<u>C. nlemfuensis</u> cv. <u>nlemfuensis</u>	--	2341		X	Star
<u>C. dactylon</u>	--	-		X	Oklan
<u>D. decumbens</u>	299752	6439		X	Transvala
<u>D. milanjiana</u>	299699	6543		X	Milanjiana
<u>D. decumbens</u>	111110	0560		X	Pangola
<u>H. altissima</u>	299995	6446			Bigalta
<u>C. plectostachyus</u>	341818	11487			Star
<u>P. maximum</u>		-		XX ^{4/}	Common
<u>P. maximum</u>	349676	12917		XX	Nakueni
<u>C. dactylon</u> cv. <u>courssi</u>	288218	8991		XX	Bermuda

^{1/} United States Department of Agriculture plant introduction number.

^{2/} University of Puerto Rico Agricultural Experiment Station plant introduction number.

X^{3/} Grasses common in both soils.

XX^{4/} Grasses evaluated only in the Vega Alta soil.

Table 2. - Total forage and crude protein yields of 12 forage grasses harvested at a 42-day interval during a period of 736 consecutive days (from 10-30-78 to 1-26-80).

Species	USDA P. I. ^{1/}	Harvests 1 to 9				Harvests 10 to 18			
		Green forage yields Mt/ha	Dry matter content %	Dry forage yields Mt/ha	Crude protein yields Mt/ha	Green forage yields Mt/ha	Dry matter content %	Dry forage yields Mt/ha	Crude protein yields Mt/ha
<i>C. ciliaris</i>	263509	267.99 ^{3/} a	25.58 b	69.06 a	8.17 a	181.90 ^{3/} a	27.63 cd	49.66 a	6.04 a
<i>C. ciliaris</i>	275102	234.85 b	26.00 a	65.26 a	8.26 a	158.56 ab	30.27 ab	47.71 ab	5.82 a
<i>C. plectostachyus</i> cv. Callie	13330 ^{2/}	202.23 cd	28.44 a	56.22 b	7.11 bc	117.94 cd	32.80 a	37.91 cd	4.89 bc
<i>C. dactylon</i> cv. Coasteross-1	255455	210.82 bc	25.53 b	52.68 bc	7.45 ab	144.18 bc	29.71 bc	42.19 ac	5.68 ab
<i>Digitaria sp.</i> cv. slenderstem	300235	218.02 bc	24.73 bc	52.54 bc	6.32 cd	149.45 bc	26.84 bc	39.97 bd	4.58 c
<i>C. dactylon</i>	293611	173.17 ef	28.91 a	46.26 cd	6.66 bd	106.23 de	32.61 a	36.06 cd	4.85 bc
<i>C. nleufuensis</i> cv. nleufuensis	2341	170.58 ef	28.53 a	47.66 cd	6.45 cd	108.24 de	30.28 ac	32.60 d	4.42 c
<i>C. dactylon</i> cv. Oklan	--	170.39 ef	28.12 a	47.38 cd	6.04 df	112.08 d	30.42 ac	34.35 cd	4.28 c
<i>Digitaria decumbens</i> cv. Transvala	299752	194.57 ce	22.63 cd	43.73 de	5.45 eg	131.03 bd	26.02 de	34.02 cd	4.41 c
<i>Nictaria nlanlana</i>	299699	180.83 df	22.33 d	40.20 ef	4.83 gh	79.53 e	24.82 e	20.19 e	2.41 d
<i>Digitaria decumbens</i> cv. Pangola	111110	161.72 f	23.08 cd	36.84 f	4.21 h	96.53 de	24.15 e	23.12 e	2.81 d
<i>Hemarthria altissima</i> cv. Bigalta	299995	99.23 g	24.11 bcd	23.12 g	2.84 i				
<i>C. plectostachyus</i> ^{5/}	341818					129.95 bd	31.14 ab	40.07 bd	4.55 c

^{1/} United States Department of Agriculture plant introduction number.

^{2/} University of Puerto Rico Agricultural Experiment Station plant introduction number.

^{3/} Yields in the same column followed by one or more letters in common do differ significantly at the 5% level according to Duncan's multiple range test.

^{4/} Yield data for 9 crops (from October 30, 1978 to October 3, 1979).

^{5/} Yield data for 9 crops (from October 8, 1978² to November 26, 1980).

Table 3. - Forage and crude protein yields of 12 grasses from November 15, 1979 through March 21, 1980
in a Bayamón clay loam soil.

Species	USDA P.I. ^{1/}	Green forage yields	Dry matter content	Dry forage yields	Crude protein yields
<u>Cenchrus ciliaris</u>	263509	61.08 a ^{3/}	26.83 cd	15.93 a	1.93 a
<u>Cenchrus ciliaris</u>	275102	49.15 b	28.18 bc	13.42 b	1.70 ab
<u>C. plectostachyus</u> cv. Callie	13330 ^{2/}	36.02 de	30.46 ab	10.51 c	1.33 cd
<u>C. dactylon</u> cv. Coastcross-1	255455	42.10 bd	26.82 ce	11.74 bc	1.54 bc
<u>Digitaria sp</u> cv. Slenderstem	300935	46.25 bc	23.96 df	11.23 bc	1.27 cd
<u>C. plectostachyus</u>	293611	29.41 ef	31.76 a	10.77 c	1.43 bd
<u>C. nlemfuensis</u> cv. <u>nlemfuensis</u>	2341	26.82 ef	29.88 ac	7.37 de	1.09 df
<u>C. dactylon</u> cv. Oklan	--	25.78 f	28.27 ac	7.60 de	0.93 ef
<u>Digitaria decumbens</u> cv. Transvala	299752	36.90 ce	23.33 ef	8.36 d	1.14 de
<u>Digitaria milanjana</u>	299699	26.70 ef	24.26 df	6.89 de	0.80 f
<u>Digitaria decumbens</u>	111110	23.28 f	22.55 f	5.87 e	0.45 g
<u>C. plectostachyus</u>	341818	21.68 f	31.95 a	7.13 de	0.84 f

^{1/} United States Department of Agriculture plant introduction number.

^{2/} University of Puerto Rico Agricultural Experiment Station plant introduction number.

^{3/} Yields in the same column followed by one or more letters in common do not differ significantly at the 5% of probability.

Table 4. - Total forage and crude protein yields of 12 forage grasses harvested at a 42 day interval during a period of 756 consecutive days from 2-26-79 to 3-25-81 (Vega Allu clay).

Species	USDA P. I. ^{1/}	Green forage yields Mt/ha	Dry matter content %	Dry forage yields Mt/ha	Crude protein yields Mt/ha	Green forage yields Mt/ha	Dry matter content %	Dry forage yields Mt/ha	Crude protein yields Mt/ha
<u>Panicum maximum</u> cv. Common	--	182.14 a	26.4 ce	46.89 a	4.52 a	152.27 bc ^{2/}	27.83 ef	42.39 bc	4.56 a
<u>Digitaria decumbens</u> cv. Transvala	299752 ^{1/}	164.92 ab	28.0 ed	46.86 a	3.35 b	149.63 bc	28.16 ef	40.92 bc	4.23 ab
<u>Digitaria sp.</u> cv. Slenderstem	300935	165.58 ab	28.8 c	46.46 ab	3.36 b	141.93 cd	29.39 e	39.95 bcd	3.77 a
<u>Panicum maximum</u> cv. Nakueni	349676	164.48 ab	27.9 ed	45.74 ab	3.60 b	161.34 ab	30.01 e	48.24 a	4.37 a
<u>Digitaria milaniana</u>	299699	170.99 ab	25.0 e	42.36 ac	3.48 b	171.09 a	25.84 g	44.19 ab	4.44 a
<u>Cynodon dactylon</u> cv. Coursif	238118	112.01 cd	37.0 a	41.76 ac	3.06 b	101.13 fg	37.58 ab	37.81 cde	3.44 cd
<u>Cynodon dactylon</u>	293611	109.86 cd	37.4 a	40.61 bc	3.32 b	96.80 g	37.79 ab	35.42 de	3.47 cd
<u>C. plectostachyus</u> cv. Callie	--	104.56 cd	36.9 a	39.37 bc	3.12 b	96.02 g	38.26 a	36.19 de	3.74 c
<u>C. dactylon</u> cv. Oklan	--	116.19 c	33.1 b	39.13 bc	2.87 b	123.87 e	32.78 d	39.37 bcd	3.49 cd
<u>C. dactylon</u> cv. Coastcross-1	259455	119.36 c	32.6 b	38.31 cd	3.35 b	115.72 ef	34.16 d	38.88 cde	3.68 c
<u>Digitaria decumbens</u>	111110	148.96 b	26.1 de	37.67 cd	3.08 b	129.84 de	26.78 fg	34.44 e	3.42 cd
<u>C. nlemfuensis</u> cv. nlemfuensis	--	89.49 d	36.2 a	32.72 d	2.89 b	72.77 h	35.86 bc	25.31 f	2.90 d

^{1/} United States Department of Agriculture plant introduction number.

^{2/} Yields in the same column followed by one or more letters in common do not differ significantly at the 5% level of probability.

Table 5. - Forage and crude protein yields of 12 grasses during the season of short day from November 19, 1980 through March 24, 1981 in a Vega Alta clay.

Species	USDA P.I. ^{1/}	Green	Dry	Dry	Crude
		forage yields Mt/ha	matter content %	forage yields Mt/ha	protein yields Mt/ha
<u>P. maximum</u> cv. Makueni	349676	55.77 ^{2/} a	27.85 e	15.55 a	1.41 ab
<u>Digitaria milanjana</u>	299699	54.52 a	21.55 g	11.66 cd	1.22 bc
<u>P. maximum</u> cv. common	--	50.66 ab	27.92 e	14.14 ab	1.52 ^{2/} a
<u>Digitaria decumbens</u> cv. Transvala	299752	53.44 a	25.18 f	13.22 bc	1.37 ab
<u>Digitaria</u> spp.	300935	49.91 ab	26.76 ef	13.08 bc	1.22 bc
<u>C. dactylon</u> cv. Oklan	--	42.70 bc	28.70 de	12.03 bd	1.05 cd
<u>C. dactylon</u> cv. Coastcross-1	255455	43.09 bc	30.70 cd	13.14 bc	1.24 bc
<u>C. dactylon</u> cv. Coursii	288218	33.41 de	33.71 ab	11.05 cd	1.01 cd
<u>Cynodon dactylon</u>	293611	36.71 cd	34.47 a	12.58 bd	1.24 bc
<u>Cynodon plectostachyus</u> cv. Callie	--	36.88 cd	33.52 ab	12.20 bd	1.30 ab
<u>Digitaria decumbens</u>	111110	42.68 bc	24.43 f	10.57 de	1.05 cd
<u>C. nlemfuensis</u> cv. <u>nlemfuensis</u>	--	27.13 e	31.44 bc	8.53 e	0.97 d

^{1/} United States Department of Agriculture plant introduction number.

^{2/} Yields in the same column followed by one or more letters in common do not differ significantly at the 5% level of probability.

Table 6. - Dry-weight mineral composition (percent) of 12 tropical grasses grown in a Bayamón and Vega Alta clay soils and harvested every 6 weeks Carrochales, Arceibo

Grasses identification	Crude protein	Bayamón clay				Vega Alta clay				
		P	K	Ca	Mg	Crude protein	P	K	Ca	Mg
<i>C. ciliaris</i> PI. 263509 ^{1/}	13 ^{2/}	0.30	2.54	0.30	0.23	4 ^{2/}	+	+	+	+
<i>C. ciliaris</i> PI. 275102	13	0.27	2.33	0.30	0.22	+	+	+	+	+
<i>C. plectostachyus</i> cv. Callie	13	0.25	1.72	0.43	0.19	11	0.21	0.84	0.39	0.17
Coastcross-1 PI. 255455	14	0.29	2.16	0.33	0.19	10	0.21	0.81	0.29	0.16
<i>Slenderstem</i> digitgrass PI. 300935	11	0.25	2.31	0.37	0.35	10	0.18	0.78	0.37	0.26
<i>C. dactylon</i> PI. 293611	13	0.29	2.02	0.41	0.18	10	0.20	0.86	0.35	0.22
Star cv. <i>nicmfuensis</i>	14	0.31	2.01	0.36	0.21	11	0.21	1.04	0.37	0.23
Bermuda Oklan	12	0.26	1.95	0.35	0.14	9	0.17	0.76	0.26	0.11
Transvala digitgrass PI. 299752	13	0.32	2.53	0.53	0.25	10	0.19	0.81	0.32	0.12
Pangola <i>milanjiana</i> PI. 299699	12	0.26	2.36	0.36	0.23	11	0.19	0.87	0.33	0.13
Pangola PI. 111110	13	0.29	1.95	0.37	0.25	11	0.17	0.92	0.30	0.16
Star PI. 341818	12 ^{3/}	0.29	2.06	0.46	0.18	+	+	+	+	+
Bermuda <i>coursif</i> PI. 288218	-	-	-	-	-	9	0.17	0.87	0.26	0.12
Common Guinea	-	-	-	-	-	11	0.19	0.83	1.07	0.58
Guinea PI. 349676	-	-	-	-	-	9	0.17	0.91	0.55	0.54

^{1/} United States Department of Agriculture plant introduction number.

^{2/} Includes and average of 4 replications composited for the 18 cuttings.

^{3/} not sown in the Bayamón clay

^{4/} not sown in the Vega Alta clay

1982
S-9 Technical Committee Report

Agency: Clemson University
Submitted by: D.W. Bradshaw
Address: Department of Horticulture, Clemson University, Clemson, SC
29631

Page 1 of 9

* * * * *

Accession User: D.W. Bradshaw
Address: Department of Horticulture, Clemson University, Clemson, SC
29631

Nature of Research: Evaluation of Ilex crenata subsp. radicans
Progress to Date: Fourteen clones of Ilex crenata radicans have been evaluated from 14 to 16 years in the Clemson Horticultural Gardens. Four PI's have been named and released. All 14 have been described in S.C. Ag. Experiment Station Circular 187. The following PI's were named and released:

- PI 275853 - Ilex crenata 'Carefree'
- PI 276080 - Ilex crenata 'Gayle'
- PI 276082 - Ilex crenata 'Tyke'
- PI 276112 - Ilex crenata 'Crescent'

Publications: Imported Clones of Ilex crenata radicans and Their Usefulness to the Landscape Industry. South Carolina Agricultural Experiment Station Circular 187.

Cultivar Releases: Ilex crenata 'Carefree'
Ilex crenata 'Gayle'
Ilex crenata 'Tyke'
Ilex crenata 'Crescent'

Accession User: George Fassuliotis
Address: U.S. Vegetable Laboratory, 2875 Savannah Highway, Charleston, SC 29407

Nature of Research:

- 1) Evaluation of Lycopersicon peruvianum for resistance to root-knot nematode, Meloidogyne incognita, under high temperature
- 2) Evaluation of L. peruvianum for regeneration potential in tissue culture and effect on root knot resistance.

Progress to Date:

- 1) PI accessions 126443, 126930, 128648, 128649, 128654, 128656, 128657, 128659 and 128663 were tested for root knot resistance at soil temperatures of 26 and 32 C. All PI accessions showed high levels of resistance at 26 C. At 32 C resistance decreased in 6 of the 9 accessions. In further testing of the 3 resistant accessions at 32 C, one highly resistant plant from PI 128648 and two from PI 128657 retained a high level of resistance and are currently being grown for seed increase.

- 2) The same PI accessions were tested for regeneration potential from cotyledons in tissue culture. PI 128649, 128659, 128657, and 126443 showed a high potential for regeneration

Publications: None
Cultivar Releases: None

Accession User: H.F. Harrison
Address: U.S. Vegetable Laboratory, 2875 Savannah Highway, Charleston, SC 29407
Nature of Research: Evaluation of southernpea and related Vigna species for resistance to metribuzin
Progress to Date: Approximately 300 Vigna lines have been screened. Significant differences in the response of lines to metribuzin have been detected.
Publications: None
Cultivar releases: None

Accession User: Perry Nugent
Address: U.S. Vegetable Laboratory, 1875 Savannah Highway, Charleston, SC 19407
Nature of Research: Study Races of Powdery Mildew and search for resistance to various muskmelon diseases
Progress to Date: We have 3 years data on a powdery mildew race study on muskmelons which includes PI's 164720, 164323, 164723, 164756, 164794, 164825, 164826, 164856, 165515, 165525, 179892, 182950, 182951, 182953, 182954, 183046, 183311, 234607 and 435992. Several of these selections have not gotten race 3 powdery mildew throughout the test. This year Dr. Claude Thomas, Weslaco, TX and Dr. A.L. Kishaba, Riverside, CA are including these lines in their race studies and we hope to get more information on races nation wide in a few years.

Crosses have been made with PI's 164323, 183311, 266935, 140471, 436533 and the cultivar 'Mainstream' to produce lines with superior multiple resistance. We hope to get powdery mildew, downy mildew, alternaria, gummy stem blight and anthracnose resistance into one breeding line from this work. Also from the crosses of 266935, 140471, 436533 and 'Mainstream', we hope to combine gummy stem blight resistance in these lines and locate higher levels of resistance.

Publication: None
Cultivar Releases: 'Mainstream' and Green Ice

Accession User: B.B. Rhodes
Address: Edisto Experiment Station, Blackville, SC 29817
Nature of Research: Use of Citrullus and Cucurbita with disease resistance in developing disease resistant melon and pumpkin cultivars
Progress to Date: Citrullus PI's (189225 and 299379) with resistance to race 2 anthracnose have been incorporated into several lines. PI's (189225 and 271778) with resistance to gummy stem blight have also been used as sources of resistance to this disease. There is evidence that PI 189225 has true horizontal resistance to fungal

pathogens. It also demonstrates resistance to downy mildew and Fusarium wilt.

Previously mentioned Citrullus PI's are being studied to characterize genetic and biochemical components of resistance.

Cucurbita PI's with resistance to downy and powdery mildew as well as squash bug and cucumber beetle will be used to develop a resistant pumpkin cultivar. PI's used in the initial phase of the program have been reported. Additional sources of resistance will be listed as they become available.

Publications:

SOWELL, G. JR., RHODES, B.B. and NORTON, J.D. 1980. New sources of resistance to watermelon anthracnose. HortScience. J. Amer. Soc. Hort. Sci. 105(2):197-199.

RHODES, B.B. 1979. Pumpkin breeding and variety testing. 1979 Biennial Report of Vegetable Breeding in the Southern U.S., HI, and PR. U.S. Veg. Lab. Charleston, p. 35. (abstract)

RHODES, B.B. 1979. Watermelon breeding and variety testing. 1979 Biennial Report of Vegetable Breeding in the Southern U.S., HI, and PR. U.S. Veg. Lab. Charleston, P. 60. (abstract)

RHODES, B.B. and SOWELL, G. JR. 1980. Fruit lesions and destruction of watermelon biotypes inoculated with race 1 anthracnose. SR-ASHS (abstract).

RHODES, B.B. and LOVE, S. 1981. Watermelon breeding and variety testing. 1981 Biennial Report of Vegetable Breeding in the Southern U.S., HI, and PR. U.S. Veg. Lab. Charleston, p. 53. (abstract)

Cultivar Releases: None

Accession User: Earlene A. Rupert

Address: Department of Agronomy and Soils, Clemson University, Clemson, SC 29631

Nature of Research: Interspecific hybridization and tissue culture propagation of Trifolium species

Progress to Date: From embryo and callus cultures we have obtained 21 F₁ and 9 backcross combinations among species of Trifolium in Sect. Lotoidea. Parental species include T. ambiguum, T. hybridum, T. isthmocarpum, T. montanum, T. michelianum, T. nigrescens, T. occidentale, T. repens, and T. uniflorum. New and repeat hybrids have been obtained of T. ambiguum with T. montanum, T. hybridum and T. occidentale, and of T. repens with T. isthmocarpum, T. nigrescens, T. occidentale, and T. uniflorum. Ninety-four genotype combinations of these and related hybrids are maintained in the greenhouse. First generation hybrids with T. ambiguum are thus far self-sterile and backcrosses to neither parent have been obtained. However, most hybrids with T. repens occasionally produce viable seed from open or hand pollination with parental pollen and frequently can be outcrossed with other species.

Publications: None
Cultivar Releases: None

Accession User: Wesley Witcher and Janet McLeod
Address: Department of Plant Pathology and Physiology, Clemson University, Clemson, SC 29632
Nature of Research: Evaluation of Okra Abelmoscus esculentus (L.) Moench PI's for resistance to Fusarium oxysporum f. sp. Vasinfectum (Atk.) and root knot nematode.
Progress to Date: No PI was highly resistant to either pathogen but 39 lines were somewhat resistant to root knot nematodes Meloidogyne incognita Race 3 (Kofoid and White) and 10 were somewhat resistant to Fusarium oxysporum f. sp. vasinfectum (Atk.). See tables.
Publications: M.S. thesis and manuscript sent to HortScience
Cultivar Releases: None

Accession User: J.E. Wyatt¹, A. Day¹, P.S. Benepal², and M.J. Sullivan³
Address: ¹U.S. Vegetable Laboratory, 2875 Savannah Highway, Charleston, SC 29407. ²Virginia State University, Petersburg, VA 23803. ³Clemson University, Blackville, SC 29817
Nature of Research: Development of snap bean lines with resistance to Mexican bean beetle
Progress to Date: PI 169903 was used as the resistant parent in crosses with BBL Supreme. Seventy F₅ lines were tested in replicated trials at three locations in 1979. Several lines had bean beetle resistance equal to or better than PI 169903. Intercrossing and further testing of lines have been carried out in 1980 and 1981
Publications:
 WYATT, J.E., DAY, A., BENEPAI, P.S., and SULLIVAN, M.J. 1980. Breeding beans (Phaseolus vulgaris L.) for resistance to Mexican bean beetle (Epilachna varivestis Mulsant.). Proceedings of the 2nd EUCARPIA/IOBC Meeting of the Working Group BREeding for Resistance to Insects and Mites. Christ Church College, Canterbury, Kent, U.K. 1980.
Cultivar Releases: None

Accession User: J.E. Wyatt
Address: U.S. Vegetable Laboratory, 2875 Savannah Highway, Charleston, SC 29407
Nature of Research: Insect resistance and pod quality of okra accessions
Progress to Date: Insect feeding is being observed on 26 okra accessions to determine if resistance is present. Pod fiber and wall thickness are being measured and plant spininess assessed for possible use in a breeding program
Publications: None
Cultivar Releases: None

Accession User: J.E. Wyatt¹, George Fassuliotis¹, and A.W. Johnson²
Address: ¹U.S. Vegetable Laboratory, 1875 Savannah Highway, Charleston, SC 29407. ²Georgia Coastal Plain Experiment Station, Tifton, GA 31794

1 Table I. Thirty-nine okra plant introductions with mean gall ratings of
2 3.0 or less, inoculated in the greenhouse with 1000 eggs of Meloidogyne
3 incognita Race 3.**

4	P.I.	Gall Index	No. of Observances	Origin
5	Clemson Spineless	4.20000	12	(Cultivar)
6	120834	3.00000	12	Turkey
7	123451	3.00000	11	India
8	140317	3.00000	11	Iran
9	165501	3.00000	12	India
10	179157	3.00000	10	Turkey
11	179840	3.00000	10	India
12	274347	3.00000	7	Egypt
13	370026	3.00000	11	India
14	176383	2.91667	12	Turkey
15	274346	2.91667	12	India
16	177238	2.90909	11	Turkey
17	182133	2.90909	11	Turkey
18	169074***	2.83333	12	Turkey
19	182121***	2.83333	12	India
20	306379	2.83333	6	Philippines
21	164714	2.81818	11	India
22	183252	2.81818	11	India
23	274342	2.80000	5	Iran
24	120841	2.77778	9	Turkey
25	180406	2.77778	9	India
26				
27				

1 Table I (continued)

2

3	179623	2.75000	12	Turkey
4	370030	2.72727	11	India
5	176387	2.66667	12	Turkey
6	182130	2.66667	9	Turkey
7	183013	2.66667	9	India
8	274352***	2.66667	12	Iran
9	310473	2.66667	9	India
10	357990***	2.66667	6	Yugoslavia
11	357997***	2.66667	3	Yugoslavia
12	142785***	2.60000	10	Iran
13	164562	2.60000	10	India
14	120835***	2.33333	12	Turkey
15	167096***	2.33333	9	Turkey
16	176386***	2.30000	10	Turkey
17	177236***	2.16667	6	Turkey
18	357989***	1.00000	1	Yugoslavia
19	357991***	0.80000	5	Yugoslavia
20	357994***	0.00000	1	Yugoslavia
21	357998***	0.00000	3	Yugoslavia
22				
23				
24	* Gall index: 0 = 0; 1 = 1 to 2; 2 = 3 to 10; 3 = 11 to 30; 4 = 31 to			
25	100; 5 = over 100 galls/plant.			
26	** F Value Significant at P = 0.05			
27	*** P.I.'s with Mean egg mass index of 3.0 or less			

1 Table II. Ten okra plant introductions with mean wilt ratings of less
2 than 2.5, and two selections with no ratings, inoculated with Fusarium
3 oxysporum f. sp. vasinfectum in the greenhouse.

4	P.I.	Wilt Index	# of Observations	Origin
5	357993		0	
6	357995		0	
7	357996	1.00000	1	Yugoslavia
8	357989	1.33333	3	Yugoslavia
9	379584*	1.56150	16	Japan
10	379352	1.66666	3	Yugoslavia
11	357990	1.71717	11	Yugoslavia
12	379353	1.75000	12	Japan
13	357992	2.00000	5	Yugoslavia
14	357999	2.00000	3	Yugoslavia
15	357998	2.33333	3	Yugoslavia
16	174004	2.38462	13	Turkey

17 * P.I. 379584 is A. manihot*, a wild relative of okra.

18 ** Wilt index from 1 (no vascular discoloration or wilt symptoms) to 4
19 (vascular discoloration and leaf abscission).

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1 Table III. Okra plant introductions inoculated with 1000 Meloidogyne
2 incognita, Race 3, eggs, with no galls or egg-masses after 55 days.

P.I.	No. Plants*
120835	1
169704	2
176386	1
177238	1
179624	1
182121	1
269495	1
357991	4
357998	1

14 * 12 Plants per P.I. inoculated
15
16
17
18
19
20
21
22
23
24
25
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27

Nature of Research: Breeding beans for resistance to root-knot nematodes.

Progress to Date: PI 165426 was used as the resistant parent in development of bush snap beans with resistance to Meloidogyne incognita. Resistant lines do not produce root galls; nematode reproduction is reduced to an insignificant level

Publications:

WYATT, J.E., FASSULIOTIS, GEORGE, JOHNSON, A.W., HOFFMAN, J.C., and DEAKIN, J.R. 1980. B4175 root-knot nematode resistant snap bean breeding line. HortScience, 15:530.

WYATT, J.E., GASSULIOTIS, GEORGE, and JOHNSON, A.W. 1980. Efficacy of resistance to root-knot nematode in snap beans. J. Amer. Soc. Hort. Sci. 105:923-926.

Cultivar Releases: B4175 - Snap bean breeding line

1982

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, TN 37901
Page 1 of 2.

* * * * *

Accession User: B. N. Duck
Address: School of Agriculture, University of Tennessee at Martin, Martin,
Tennessee 38238
Nature of Research: Evaluation of forage legumes
Progress to Date: Plantings destroyed by flooding in 1980 were repeated and expanded in 1981. Seeds were obtained from the Southern, Northeastern, and North Central Regional Plant Introduction Stations. Totals of 333 perennial (involving four species) and 114 annual (involving five species) legume accessions were planted in fall, 1981, on field sites typical of the region. About 60% of the perennials survived the winter, whereas almost all of the annuals were eliminated by freezing injury. Observation of surviving accessions will continue. The winter of 1981-82 was unusually severe for the area; consequently, accessions that did not survive will be planted again for further observations.
Publications: None
Cultivar Releases: None

Accession User: H. A. Fribourg
Address: Department of Plant and Soil Science, University of Tennessee,
P. O. Box 1071, Knoxville, TN 37901
Nature of Research: Evaluation of *Dolichos lablab* for seed production and summer grazing.
Progress to Date: In 1981, lablab was evaluated for seed production at three locations in East, Middle and West Tennessee. From a plot area of approximately 1.0 ha, 363 kg of clean seed were obtained. At the Martin Station in Northwest Tennessee, creep-grazed beef calves on lablab with cows on bermudagrass gained about 0.9 kg per day during 100 days from June-September. The chemical principle, variety, etc. responsible for the pungent, disagreeable fragrance of the blossoms of lablab is of particular interest to the accession user.
Publications: None
Cultivar Releases: None

Accession User: J. M. Stewart
Address: USDA, ARS, Department of Plant and Soil Science, University of Tennessee, P. O. Box 1071, Knoxville, TN 37901
Nature of Research: Cytogenetics of *Gossypium* and incorporation of potentially useful characters of exotic diploid cottons into cultivated tetraploid species.

Progress to Date: Fertility in hybrids of *Gossypium hirsutum* x *G. stocksii* and *G. arboreum* x *G. amourianum* has been obtained by colchicine treatment. The latter hybrid is particularly noteworthy since it is a synthetic AD tetraploid with caducous bract trait and can be crossed directly with commercial cottons. A few seed of the first backcross to *G. hirsutum* have been attained. The first reported hybrid of *G. hirsutum* x *G. populifolium* was obtained. The 3x hybrid has some fertility. In work designed to capture the wild *Gossypium* cytoplasm, hybrids were made of *G. stocksii* x *G. hirsutum*, *G. trilobum* x *G. hirsutum*, *G. lanceolatum* x *G. hirsutum*, *G. longicalyx* x *G. hirsutum*, *G. somalense* x *G. arboreum*, and *G. bickii* x *G. arboreum*.

Under a proposal approved by the S-9 Committee, a collection trip was conducted in Australia for *Gossypium* species. That effort resulted in new collections of all the known Australian species except *G. cunninghamii*. Included were two species, *G. costulatum* and *G. pulchellum*, for which seed had not been previously collected. In addition, numerous *Hibiscus* species were collected. Plants are currently being established from all the accessions.

Publications: Menzel, M. Y., C. A. Hasenkampf, and J. M. Stewart 1982. Incipient genome differentiation in *Gossypium*. III. Comparisons of *G. hirsutum* and Asiatic diploids using heterozygous translocations. *Genetics* 100:89-103

Cultivar Releases: None

Accession User: D. R. West

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

Nature of Research: Synthesis and evaluation of Non-corn belt maize germplasm.

Progress to Date: Caribbean flint/dent and Cateto flint maize populations were obtained from the NC-7 Plant Introduction Station and grown in 1982. Notes were taken on agronomic characteristics and seed was increased by hand pollination. The Caribbean flint/dent population was found to be segregating for white and yellow grain. White kernels were selected from the population and will be incorporated into a new white corn population. The white kernels from Caribbean will provide a source of hard grain for this new population.

Publications: None

Cultivar Releases: None

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 (713) 845-5389
 Page 1 of 3

* * * * *

Accession User: C.E. Thomas and R.E. Webb
 Address: Southern Region, Crop Protection and Production Research,
 P.O. Box 267, Weslaco Texas 78596
 Nature of Research: Evaluation of Multidisease - resistant Muskmelon
 breeding lines.

Progress to Date: Cucumis melo:
 P.I. 180280 - resistant to WMV-1
 P.I. 124111 - resistant to downey mildew
 (Pseudoporonospora cubensis).
 P.I. 164323 - resistant to downey mildew
 (Pseudoporonospora cubensis).
 P.I. 164723 - resistant to downey mildew
 (Pseudoporonospora cubensis).

Publications: The Potential for Controlling Downey Mildew of Canta-
loupe Using Plant Introduction
Sources of Resistance. 1982 Phytopathology 72:362 (Abstract)
Resistance to Downey Mildew in Cucumis melo Plant Intro-
ductions and American Cultivars. 1982 Plant Disease 66:500-502.

Cultivar Releases: None

Accession User: M.E. McDaniel and T.S. Tesfaye
 Address: Soil and Crop Sciences Department, Texas A&M University,
 College Station, Texas 77843

Nature of Research: Inheritance of Greenbug Resistance in Oats.

Progress to Date: The Greenbug resistant lines P.I.s 251896, 251898,
 258612, 258637, and 258644 were found to have a common single,
 partially dominant gene conditioning greenbug reaction.
 P.I. 251580 was found to have a single, partially dominant
 gene conditioning greenbug resistance, but this gene seems
 to be different from the one in the other lines stated.

Publications: None

Cultivar Releases: None

Accession User: Fred R. Miller and Others
 Address: Soil and Crop Sciences Department, Texas A&M University,
 College Station, Texas 77843

Nature of Research: Host plant resistance

Progress to Date: Sorghum for grain P.I.s 264453 from Spain and
 220248 from Sicily were found to be resistnat to a new green-
 bug biotype E.

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Publication: Miscellaneous Publication 1451. Proceeding for Host Plant Resistance Short Course (1980). Department of Agricultural Communications, Texas A&M University, College Station, Texas 77843.

Cultivar Releases: None

Accession User: Raymond D. Brigham and Keith Young

Address: Texas A&M University Agricultural Research and Extension Center, Route 3, Lubbock, Texas 79401

Nature of Research: Breeding insect resistance into established lines of soybeans.

Progress to Date: P.I.s 340029, 200449 and 229358 are being used as insect resistant parents.

Publications: None

Cultivar Releases: None

Accession User: Gerald Seiler

Address: P.O. Drawer 10, Southern Region, Conservation and Production Research Laboratory, Bushland, Texas 79012

Nature of Research: Using wild sunflower accession in breeding for disease, insect and drought resistance.

Progress to Date: P.I. 274518 has been identified as a potential source of resistance to leaf spot.

Publications: None

Cultivar Releases: None

Accession User: Kent R. Keim

Address: Box 4169, Department of Plant and Soil Science, College of Agricultural Sciences, Texas Tech University, Lubbock, Texas 79409

Nature of Research: Limited and full irrigation study with 17 pigeonpea, Cajanus cajan lines.

Progress to Date: Observation notes are being taken to determine suitability of these introductions to the High Plains of Texas.

Publications: None

Cultivar Releases: None

Accession User: Robert Murry

Address: Department of Anthropology, Ethno-Botany Laboratory, Texas A&M University, College Station, Texas 77843

Nature of Research: Research on Bauhinia esculenta a drought-tolerant legume, very high in protein and oil content.

Progress to Date: P.I.s 409126 and 458917 are being studied.

Publications: None

Cultivar Releases: None

Accession User: Troy Cowan

Address: 6314 Nancy Street, Corpus Christi, Texas 78412

Nature of Research: Research studies with Leucaena leucocephala a fast growing tree.

Progress to Date: P.I.s 288005 and 404037 are being evaluated for general adaptation and cold tolerance.

Texas

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Publications: None

Cultivar Releases: None

Accession User: Oliver E. Smith

Address: Soil and Crop Sciences Department, Texas A&M University
College Station, Texas 77843

Nature of Research: Screening Sesame P.I.s for cotton root rot
resistance.

Progress to Date: 56 sesame P.I.s were planted on land of the Central
Blackland area of Texas where cotton root rot is a problem
but no root rot occurred on any of the sesame P.I.s during
1981.

Publications: None

Cultivar Releases: None

Plant introductions received in the state from the Regional Plant
Introduction Station at Experiment Georgia were 179 for the period
July 1, 1981 through June 30, 1982.

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S-9 TECHNICAL COMMITTEE REPORT

Agency: Virginia Agricultural Experiment Station

Submitted by: A.J. Lewis

Address: Department of Horticulture, VPI&SU, Blacksburg, VA 24061

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* * * * *

Accession User: Chester L. Foy

Address: Department of Plant Pathology and Physiology, Virginia Polytechnic Institute and State University, Blacksburg, VA 24061

Nature of Research: These accessions are being used in a search for varieties tolerant to glyphosate herbicide and broomrape (*Orobancha* spp.). Broomrape is a parasitic herb, subsisting on the roots of broadleaf plants, mainly in areas with a hot and dry climate. *Orobancha ramosa* has threatened the tomato industry of California in the past and has recently been discovered in Texas. *O. minor* has been found in the eastern U.S. Although the broomrapes are not presently a widespread agricultural problem in the United States, the lack of understanding of the population biology and dynamics of this plant necessitates that it not be dismissed from consideration as a potential parasitic weed of leguminous crops, tobacco and sunflower. The broomrapes, collectively, constitute a very serious pest in many developing countries located in semi-arid regions of the world, causing heavy losses in agricultural production. The broomrapes are also a threat to the tomato crop of Israel, where Dr. Reuven Jacobsohn of the Agricultural Research Organization Volcani Center, Bet Dagan, Israel, is screening for tolerance to broomrape. Screening for tolerance to glyphosate is being conducted by the Department of Plant Pathology and Physiology at Virginia Tech. These efforts are all parts of an international (BARD) research project.

Finding sources of tolerance to glyphosate and/or broomrape, if such exists, would justify the initiation of a breeding program in which those genes could be introduced into new varieties. None of the varieties now being grown commercially is known to have such tolerance, to either the herbicide or the parasite. The existence of such tolerance to both factors, each of which is insufficient to be of practical importance by itself, could lead to an integrated broomrape control approach in which genetic tolerance to the herbicide and parasite would be combined. Success in these objectives would be a major scientific achievement and would provide a gene source for breeding tomatoes in which broomrape could be controlled by means that are both environmentally safe and economically feasible.

Progress to Date: The 200 *Lycopersicon* accessions received in 1982 have not yet been screened. However, 300 accessions obtained earlier have been. Some differences in response to glyphosate have been observed but require further confirmation and evaluation. Dr. Jacobsohn (in Israel) has completed the screening of approximately 500 tomato varieties for resistance to broomrape. Some differences have been observed in the degree of infection among varieties, but thus far none are considered to be of sufficient magnitude to be of practical value.

Publications: None

Cultivar Releases: None

Accession User: Donald M. Davies

Address: Rt. 1, Box 75, Sperryville, VA 22740

Nature of Research: Evaluation of *Helianthus tuberosus* as biomass for the production of fuel alcohol.

Progress to Date: Ten accessions were planted early this year. The top growth and tubers will be tested for sugar content, mashed and distilled to determine their suitability for the production of alcohol.

Publications: None

Cultivar Releases: None

Accession User: D.D. Wolf

Address: Department of Agronomy, Virginia Polytechnic Institute and State University, Blacksburg, VA 24061

Nature of Research: Evaluation of lespedeza as a forage crop for Virginia.

Progress to Date: Six accessions were established in the Spring of 1982. They will be evaluated in 1983.

Publications: None

Cultivar Releases: None

Accession User: M. Ranzappa

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

Nature of Research: Screening for resistance to cabbage looper and imported cabbage worm; protein chemistry of accessions showing signs of resistance is being studied.

Progress to Date: User received 550 *Brassica* accessions in March 1982. These accessions are being grown under field conditions with natural insect populations. Results are expected to be available at the end of the growing season.

Publications: None

Cultivar Releases: None

Accession User: John Randall

Address: Department of Biology, Virginia Polytechnic Institute and State University, Blacksburg, VA 24061

Nature of Research: Biosystematic work in the identification of flavonoids, proteins, etc.

Progress to Date: One *Trisetum* accession obtained.

Publications: None

Cultivar Releases: None

1982

S-9 TECHNICAL COMMITTEE REPORT

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

Accession User: A. Sotomayor-Ríos
Address: Mayaguez Institute of Tropical Agriculture, P.O. Box 70,
Mayaguez, Puerto Rico 00709.
Nature of Research: Evaluation of sorghum (Sorghum bicolor L.
(Moench)) germplasm for yield and low HCN-p.
Progress to date: A large group of sudangrass and forage sorghums
have been evaluated for yield, many agronomic characters
and hydrocyanic acid potential (HCN-p). Outstanding
single crosses and three-way hybrids producing over 40
tons of green forage per hectare showing HCN-p of less
than 200 ppm have been obtained.
Publications: "Agronomic Comparison and Hydrocyanic Acid Potential
(HCN-p) of Single Crosses and Three-Way Forage Sorghum
Hybrids and Their Parents" (submitted for publication).
Cultivar Releases: None.

Accession User: A. Sotomayor-Ríos
Address: Mayaguez Institute of Tropical Agriculture, P.O. Box 70,
Mayaguez, Puerto Rico 00709.
Nature of Research: Evaluation and improvement of corn (Zea mays).
Progress to date: Field corn varieties and lines have been
introduced from Mexico and other countries searching for
germplasm with high yield potential and resistances to
diseases and insects.
Publications: None.
Cultivar Releases: None.

Accession User: F. W. Martin
Address: Mayaguez Institute of Tropical Agriculture, P.O. Box 70,
Mayaguez, Puerto Rico 00709.
Nature of research: Evaluation and selection of okra for
characteristics favorable to edible seed production.
Progress to date: This work has been terminated successfully and
phased out. Much valuable information was obtained,
some PI's have been selected for low "gossypol" and low
cyclopropenoid fatty acids, and some selections from
populations have been made. The information suggests
that okra should be a useful and productive grain crop.

Publications: Martin, F. W., Rhodes, A. M., Ortíz, M., and Díaz, F. 1981. Variation in Okra. *Euphytica* 30:697-705.

Martin, F. W., and Ruberté, R. Variability in okra seed quality. *Jour. Agric. Univ. Puerto Rico* 55: 205-212. 1981.

Cultivar Releases: None.

Accession User: F. W. Martin

Address: Mayaguez Institute of Tropical Agriculture, P.O. Box 70, Mayaguez, Puerto Rico 00709.

Nature of Research: Tomato prebreeding activities, including searches for disease resistance, searches for new genes affecting shelf life of fruits, development of techniques for wide species crosses.

Progress to date: Crosses with L. hirsutum revealed cryptic variation potentially useful for extending shelf life. A technique has been developed for revealing genetic transformation, if it occurs in tomato. A large number of accessions are currently being screened for early blight and late blight resistance.

Publications: None.

Cultivar Releases: None.

Accession User: G. F. Freytag

Address: Mayaguez Institute of Tropical Agriculture, P.O. Box 70, Mayaguez, Puerto Rico 00709.

Nature of Research: Collection of wild bean (Phaseolus) species germ plasm in Mexico.

Progress to date: This collecting trip was very successful in that we were able to accomplish all proposed objectives. In large part the success was due to the cooperation and assistance received from several Mexican institutions and the scientists who accompanied us in the field. Viable seed was obtained from 6 known species, and from 3 not yet identified, over a wide range of localities throughout Central Mexico. Three localities are of particular significance. Near Telixlahuaca, Oaxaca, seed was obtained from a farmer's field in which we suspect introgression (gene transfer through hybridization) from P. anisotrichus, a determinant species growing on very poor soils in desert habitats. Two small, isolated sites were found in southern Jalisco (near Tapalpa and La Calaverna) where the wild species of P. vulgaris and P. coccineus were found growing together with all types of intermediates in what seemed to be completely natural habitats. There was no evidence of any incompatibilities at these locations. We believe these collections to be the first sites to provide evidence that natural introgression played an important role in the predomestication of the common bean. At a third locality (near Manantlán) we found wild P. vulgaris growing extremely well in association with wild corn, Zea diploperennis. We feel this association seemed to be

advantageous to the wild P. vulgaris since more seed was produced per plant at this location than at others in the area where the wild bean was growing on other vegetation.

We also visited the College's Biochemical Laboratory which is under the direction of Dr. María Luisa Ortega-Delgado. She discussed with us some of the bean research they are doing on sugars and other carbohydrates of beans. They also are working with tannins, mostly in sorghum. Since Dr. Sullivan has an interest in electrophoretic techniques of globulins of beans he spent some time looking at the work being done by the student Haydée Hernández-Unzón. We were impressed by their well equipped labs and by the amount and high quality of the work being accomplished. In 1980-81 8 theses have been produced in this lab in the areas of physiology and biochemistry.

Seed is presently being screen house increased in Puerto Rico.

Publications: None.

Cultivar Releases: None.

Accession User: J. Sullivan (UPR) and G. F. Freytag (ARS)

Address: Mayaguez Institute of Tropical Agriculture, P.O. Box 70, Mayaguez, Puerto Rico 00709.

Nature of Research: Improvement of bean through interspecific crosses.

Progress to date: Many seed accessions of over 30 wild species of bean (Phaseolus) have been obtained from P.I. collections, breeders, foreign institutions and others. This germ plasm collection is being increased, evaluated, and studied in the screenhouse in Mayaguez, and under field conditions in 3 locations in Puerto Rico. Special attention is being given to determining ecologic conditions appropriate to normal flowering and seed set for each species and to the variability of each. Evaluation of each species will include useful characteristics, especially resistance or susceptibility to disease and pests. Disease-free seed is being obtained for deposit in USDA's seed storage. (Many P.I. numbers received were incorrectly identified as to species and these errors will be corrected.)

Publications: None.

Cultivar Releases: None.

Accession User: Francisco Vázquez

Address: Mayaguez Institute of Tropical Agriculture, P.O. Box 70, Mayaguez, Puerto Rico 00709.

Nature of Research: Evaluation and Maintenance of Tropical Plant Germ Plasm.

Introductions:

Theobroma cacao - Seventy two clones were grafted on Amelonado seedlings after being indexed for swollen shoot virus, and observed for other diseases at the Miami Subtropical Horticultural Research Station. This clonal material will become permanent part of the cacao collection at MITA.

Cola nitida - Seeds of three Cola varieties introduced via the Miami Station were grown at MITA and will become part of the C. nitida permanent collection.

Alstonia macrophylla and A. scholaris were introduced from the Florida Fairchild Tropical Garden. Both species will be evaluated for adaptability and growth habit during a 5-year period.

Collections:

Theobroma cacao - The USDA in cooperation with the American Cocoa Research Institute (ACRI) maintains at MITA a collection of disease-free clones for worldwide distribution to breeders and cocoa growers. The collection consists of 690 trees, 275 clones, 4 hybrids, and 31 Amelonado seedlings. It will be expanded to accommodate the new clones to be received over the next several years.

Dioscorea (Yam varieties) - Six species including 18 selections of Dioscorea alata, D. esculenta, and D. bulbifera have been planted for evaluation and/or distribution.

Vegetables - Seeds of some species are available for distribution.

Cowpea - Vigna unguiculata
Winged bean - Psophocarpus tetragonolobus
Beans - Phaseolus vulgaris
Hyacinth bean - Dolichos lablab

Tropical fruit trees and nuts - Fruits and seeds of some of these tropical and subtropical fruit trees are available.

New Germ Plasm

Sorghum collections - About 1,000 entries of the Yemen and Ethiopian collection were grown. Plants were selfed and the seeds returned to Georgia and Arizona.

Corchorus capsularis (White Jute) - Three cultivars were grown and the seeds were returned to the National Seed Storage Lab. in Fort Collins, Colorado.

Hibiscus cannabinus (Kenaf) - Fifteen cultivars were grown. The seed was returned to Experiment, Georgia.

Vigna ambcenensis - The only PI of this species sent from Georgia was increased at MITA. The seed was returned to Experiment, Georgia.

Arachis hypogaea (Peanuts) - Fourteen rust resistance peanut lines (FESR-1 to FESR-14) were grown. Seed is available for distribution to breeders.

Abelmoschus esculentus (Okra) - Two hundred and four entries were increased.

In order to avoid cross pollination the 204 okra entries were interplanted with sweet corn. The seed will be returned to Experiment, Georgia.

Vernonia galamensis - Seed from this species introduced via Maryland was planted at MITA for seed increase. There is evidence that it has a short-day requirement. The seedlings have grown successfully in our latitude, but they have not bloomed yet.

Germ Plasm Distribution:

MITA receives numerous requests for tropical germ plasm from all parts of the world. A summary of these distributions follows:

<u>Germ Plasm</u>	<u>Packets</u>	<u>No. of Persons</u>	<u>Countries</u>
Vegetable seed	205	119	32
Tubers, yams, cuttings, etc.	62	21	21
Trees, fruits, nuts	29	9	9
Other seeds	42	4	4
Budwood	5	5	5

In addition, ornamental trees, shrubs and exotic fruit trees have been distributed locally to institutions and individuals.

The National Plant Germplasm System (NPGS)
 Report of the National Coordinator to IR-1, NC-7, NE-9, S-9, and W-6
 April 15, 1982

Budgets

Plant germplasm has emerged from the dungeon of neglect. We are still etiolated and blinking at the bright light but we have confidence that there is a real commitment on the part of this administration, and supportive attitudes in the OMB and Congress, to make sure that this country's plant genetic resources will be properly maintained and utilized.

We realize that there are very serious pressures that demand lean Federal budgets but it is also recognized that our agriculture generates more wealth than any other segment of our economy and that it can only continue to do so if we have the genetic resources to support increased efficiency in food, feed, and fiber production.

FY '82 - We received a modest increase of \$660,000 for this year. It doesn't sound like much, relative to the need, but it keeps us from losing ground to inflation and permits us to gear-up some for an expanding program.

FY '83 - The President's budget includes \$3.8 million for plant germplasm (ARS). If this survives the budget process, it will indeed add some muscle to the NPGS. These funds have been allocated by functional categories as follows:

	<u>\$000</u>
Acquisition	235
Maintenance	1,195
Evaluation	1,070
Enhancement	1,100
Research on Genetic Diversity	100
Monitoring Genetic Vulnerability	100
Total	<u>3,800</u>

Maintenance - The following locations and crops will be recipients of this increase:

	<u>\$000</u>
Pullman, WA, RPIS (many crops)	100
Ames, IA, RPIS (many crops)	100
Experiment, GA, RPIS (many crops)	100
Geneva, NY, RPIS (many crops)	75
Fort Collins, CO, NSSL	200
Byron, GA (bamboo)	40
Stoneville, MS (soybeans)	90
Urbana, IL (soybeans)	70
Beltsville, MD (small grains)	100
Miami, FL (subtropical fruits)	90
Mayaguez, PR (tropical fruits)	90
Oxford, NC	40
Madison, WI (potato)	40
TBD (sweet potato)	60
Total	<u>1,195</u>

Evaluation - Distribution of funds in this category will be to the following crops:

	<u>\$000</u>
Wheat	300
Corn	250
Alfalfa	60
Tomatoes	135
Beans	75
Oats	100
Potato	50
Subtotal	<u>970</u>
Facilitating CAC's*	100
Total	<u>1,070</u>

Enhancement - This area of activity will be receiving the following support by location and crop:

	<u>\$000</u>
<u>Beans</u> , East Lansing, MI	50
Mayaguez, PR	100
Prosser, WA	80
<u>Potatoes</u> , Prosser, WA	75
Aberdeen, ID	75
<u>Cotton</u> , Stoneville, MS	150
<u>Plums</u> , Byron, GA	150
<u>Citrus</u> , Orlando, FL	150
<u>Range Grasses</u> , Logan, UT	150
<u>Millet (Pennisetum)</u> , Tifton, GA	120
Total	<u>1,100</u>

Site Assessment Working Group for Small Grains Facility. Dr. Terry B. Kinney, Administrator, ARS, has appointed a five-man working group to make an objective assessment and recommendation on the location of a new facility for the Small Grains Collection. Dr. C. O. Qualset, University of California, Davis, will chair the working group. Other members are D. R. Dewey, ARS, Logan, UT; W. H. Skrdla, ARS, Ames, IA; D. J. Schrickel, Quaker Oats, Chicago, IL; and J. C. Bouwkamp, University of Maryland, College Park, MD.

Workshop on "Tissue Culture and Cryogenics in Germplasm Preservation." The International Board for Plant Genetic Resources (IBPGR) and the National Plant Germplasm Committee (NPGC) are co-sponsoring a workshop on the above subject at Colorado State University, Fort Collins, during the week of August 16, 1982. Presentation of papers and open discussion will take place on August 16 and 17, followed by drafting of position statements and recommendations. The NPGC will hold a regular meeting on August 18-19. The restructured ARS Plant Germplasm Coordinating Committee, now called the ARS Plant Germplasm Operations Committee (GPOC), will meet on the afternoon of Aug. 19 and on the morning of Aug. 20.

* CAC = Crop Advisory Committee

Beltsville laboratories join NPGS. We have two laboratories in BARC (Beltsville Agricultural Research Center) that will be directing more of their efforts to plant germplasm activities. The Plant Exploration and Taxonomy Laboratory (formerly the Plant Taxonomy Laboratory) will be taking an active part in planning and executing plant explorations. Dr. Robert Purdue is Chief of the Laboratory and he and his staff have had a great deal of experience in plant collecting, documentation, and identification. They will be a big help in working with the Crop Advisory and Regional Technical Committees in planning and with crop specialists in doing the field work.

The second laboratory is the Economic Botany Laboratory under Dr. James Duke. This laboratory has been bringing together a wealth of information on the eco-geographic distribution of weeds and other economic plants. Now they are going to be providing information on eco-geographic distribution of genetic diversity in our major crop plants so that we can do a more intelligent job of planning explorations to meet our needs. The Data Base Management group is also in Dr. Duke's Laboratory.

QUENTIN JONES
National Coordinator, NPGS

1982

S-9 TECHNICAL COMMITTEE REPORT

Agency: U. S. Department of Agriculture
Subtropical Horticulture Research Unit

Submitted by: Paul K. Soderholm

Address: 13601 Old Cutler Road
Miami, Florida 33158

Page 1 of 5

Accession User: P. K. Soderholm & R. J. Knight

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

Nature of Research: Introduction, preservation and evaluation of tropical
and subtropical plants.

Progress to Date:

During the year ending May 31, 1982, 2,384 distributions were made, 78 percent of which went to recipients in the United States (Table 1). One major distribution consisting of 16 species was made in November 1981.

Plant material from the Station's germplasm bank has been used in many ways this year by researchers throughout the world. As an example, one chemist has tapped the rubber producing species Hevea brasiliensis, Castilla elastica, Ficus ssp., and Cryptostegia ssp., collecting latex to use in his research into the biosynthesis of natural rubber and other hydrocarbon polymers. Others are investigating flavor components and fiber content of tropical fruits in a cooperative project. Cacao, coffee, bamboo, palms and bananas have been supplied to scientists investigating methods of tissue culturing these crops.

Also during this year 1,083 accessions were recorded, (Table 3) more than half of which were fruit species. Cacao was added to the germplasm collection from Trinidad, Ecuador, and England (Kew Gardens). Coffee came through the Glenn Dale Plant Introduction Station quarantine from Brazil and Colombia.

Carpodiptera ameliae Lundell, P.I. 149254 produced seed for the first time this year. This beautiful flowering tree was introduced in 1925 from San Luis Potosi State in Mexico. Four of the five original seedlings were distributed that same year, but only one tree other than the specimen at the station is known to have survived. Asexual propagation has proven ineffective. The species is dioecious, and fortunately the Station tree is male and the other female. We crossed the two this year and now have

six seedlings that will be planted near the mature tree for future seed production. In the meantime, more pollination will be made this year so that distribution can proceed at the earliest possible date.

In 1970 Spathodea campanulata Beuvois, M 21575, the yellow flowered African Tulip Tree was introduced from Kenya by this station. The seed we received produced only one self-incompatible yellow individual among many reds. We found that yellow flower color is recessive to red and controlled by a single gene. So it was a simple but long term procedure to work towards producing seeds that yield all yellow plants. We have now reached that goal and will distribute seeds late in 1982.

Publications:

Soderholm, P. K. 1981. Catalog of plant germplasm available from the Subtropical Horticulture Research Unit, Miami, Florida. USDA, ARS, Agricultural Reviews and Manuals, ARM-S-19/Oct. 81.

Accession User: R. J. Knight, Jr.

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

Nature of Research: Improving subtropical and tropical fruit crops.

Progress to Date:

Mango. Selection M- 27856 in 1981 continued to show outstanding field and laboratory resistance to anthracnose disease. Its fruit is bright-colored, sweet and spicy in flavor, and smaller than standard cultivars in size which may enhance its acceptance on European and Japanese markets. Selection M-20222 was reported one of the most consistently productive mangos in the Brazilian fruit germplasm collection at Cruz das Almas, Bahia.

Avocado. Heavy rains in August 1981 showed that cold tolerant avocado selection M-26395 has less anthracnose resistance than was previously apparent. It may still be of use in central Florida and southern Texas because of its high fruit quality under dry conditions.

Lychee. Seventy seedlings of those which fruited in 1981 were selected for further observation, and 17 that appeared outstandingly promising were kept for use in recurrent selection toward improved cultivars. An introduction from China, M-989, which appears identical with the cultivar, 'Yellow Red ', proved significantly superior in keeping quality to 8 others when stored for 6 weeks at 10°C in polyethylene bags.

Passion fruit. Hybrids between the temperate zone maypop (Passiflora incarnata L.) and introductions of purple and yellow passion fruit (P. edulis forms) proved to be fertile after being treated with colchicine, and seedlings of the treated hybrid parents proved to be tetraploids when their chromosomes were counted. Doubling the chromosome number did not remove self- and cross-incompatibility barriers.

Raspberry. Hybrid seedlings derived from crossing an Indian introduction, 'Mysore' (Rubus niveus Thunb.) with 'Heritage' red raspberry from the Northern United States were distributed to cooperating scientists in Poplarville, MS and Gainesville, FL for field evaluation under warm temperate conditions. Plants of this breeding proved to be pollen sterile but were seed fertile when back-crossed to 'Heritage', the pollen parent. Fruit quality of the first-generation seedlings is superior to that of the Indian parent, and the plants are more vigorous in southeastern Florida than is the northern red raspberry parent, thus the way appears open to develop improved cultivars.

Publications:

Sherman, W. B., R. J. Knight, Jr., and E. T. Crocker. 1979. Peach and nectarine testing in warm parts of the world. Proc. Trop. Reg. Soc. Hort. Sci. 23.

Hall, Nancy T., J. M. Smoot, R. J. Knight, Jr., and S. Nagy. 1980. Preprotein and amino acid compositions of ten tropical fruits by gas-liquid chromatography. J. Agric. Food Chem. 28: 1217-1221.

Knight, R. J., Jr. 1982. Partial loss of self-incompatibility in 'Golden Star' carambola. HortSci. 17: 72.

Table 1. Areas Receiving Distributions from USDA/ARS, Miami, Florida
from 1 June, 1981 through 31 May 1982

<u>Destination</u>	<u>Number</u>	<u>Percent of Total</u>
Florida	1577	66.15
California	49	2.06
Rest of Continental U.S. & Canada	285	11.95
Caribbean Region ^{1/}	113	4.74
Mexico and Central America	12	.50
South America	44	1.85
Europe	101	4.24
Asia	115	4.82
Africa	23	.96
Pacific Basin ^{2/}	65	2.73
	<u>2384</u>	<u>100.00</u>

^{1/} Including Puerto Rico and the Virgin Islands

^{2/} Australia, Guam, Hawaii, New Zealand, Philippines, Pacific Islands

Table 2. Types of Plant Material Distributed by USDA/ARS, Miami, Florida from 1 June, 1981 through 31 May, 1982.

<u>Materials</u>	<u>Number of Distributions</u>
Miscellaneous ornamentals and shade trees (includes orchids and ferns)	1283
Tropical and Subtropical fruit	705
Cacao	78
Coffea	17
Medicinal, Chemurgic, and Tropical Vegetables ^{1/}	<u>301</u>
	2384

^{1/} Includes edible palms, nuts, spices, rubber, sugarcane

Table 3. Germplasm Received at USDA/ARS, Miami, Florida from 1 June, 1981 through 31 May, 1982

<u>Material</u>	<u>Number of Introductions Received</u>
Miscellaneous ornamentals and shade trees (includes orchids and ferns)	128
Tropical and Subtropical fruit	620
Cacao	225
Coffea	22
Medicinal Chemurgic and Tropical Vegetables ^{1/}	<u>88</u>
	1083

^{1/} Includes edible palms, nuts, spices

REPORT OF THE
GERMPLASM RESOURCES LABORATORY
TO THE
REGIONAL TECHNICAL COMMITTEES ON PLANT GERMPLASM

Give fools their gold
and knaves their power
Let fortune's bubbles
rise and fall.
Who sows a field
or trains a flower
or plants a tree
is more than all.
J.G.W.

Laboratory Personnel

Extensive changes in laboratory personnel occurred during the past year. In May 1982, Howard Waterworth accepted a permanent position as the National Research Program Leader for Pathology and Nematology. Wayne Porter is Acting Laboratory Chief until a new Chief is named.

Austin Campbell and Jack Oakes moved in May of 1982 with their respective staffs to the Economic Botany Laboratory. The ARS portion of the Germplasm Resources Information Project also moved at this time to the Economic Botany Laboratory. Due to the move by Jack Oakes, David Smith will now curate the Rice Collection in addition to the Small Grains Collection. Erick Abadie, who works with the Small Grains Collection, was promoted to Computer Assistant.

Program Review

A review, by the Area Director and two Assistant Area Directors, of the research programs of the Germplasm Resources Laboratory was held on May 11, 1982. All permanent support personnel were invited to attend to increase their knowledge of the overall goals of the laboratory.

Plant Introduction and Exchange

During 1981, PI documentation included 12,792 items. These included 5,414 sorghums from Ethiopia and 2,201 millets from India. Over 50 percent of the PI's went to the Southern Regional Plant Introduction Station. In addition to the new PI's, 492 shipments of 9,567 items were received from foreign sources and forwarded. The bulk of these (318 shipments) went to curators or cooperators of National Plant Germplasm System (NPGS) and many will be assigned PI numbers later. These shipments included prohibited materials which must be increased under quarantine, collections, and accessions from the U.S. explorations to be organized by others before documentation, and miscellaneous species from botanical gardens and other sources for SCS, the National Arboretum, etc. Soybeans for the INTSOY

program and duplicates of previous introductions account for the bulk of remaining shipments. Assistance in terms of contacts, clearances, quarantine requirements, shipping arrangements, collector notebooks, and other supplies was provided for all 1981 and 1982 plant explorations and to several travellers.

Shipments outside the United States totalled 152,287 items in 2,149 shipments to 123 countries. These totals include shipment of 49,905 samples for cereal and cotton nurseries. Twenty percent of all shipments involved only one item and 52 percent involved six or less items. Considerable effort was expended to resolve quarantine problems with both exports and imports.

Also, 827 items were sent in 179 shipments to 56 countries in support of AID mission activities. More than half of these were accessions of Leucaena leucocephala (leadtree). As available, inoculum was provided with legume seed. Information about domestic and foreign sources for relatively large quantities of various crops, some not readily available in the U.S., was assembled for a few missions and with AID contractors. Approximately 2,000 coffee plants consisting of 22 varieties/breeding lines were distributed. Most went to Costa Rica, but smaller, representative lots went to the Miami Station. Visits were made to Brazil, Costa Rica, and Mexico as part of the AID project. A partial listing of tree seed sources is under compilation.

USDA Plant Inventories 185, 186, and 187 for 1977-79, respectively, are in print. Technical editing except for nomenclature of Inventory 188 has been completed. Final technical editing of 189 is pending.

Involvement in providing technical expertise on plant germplasm was very extensive in 1981 as shown below:

Formal Advisory - Technical assistant (S. Kenworthy) and technical member (G. White) of Task Force on the National Plant Germplasm System; technical advisor to GRIP Coordinating Committee; member of subcommittee on future priorities for project NE-9, member of four Regional Technical Committees on Plant Germplasm; direct interaction with Technical Committee on Noxious Weeds; consultant on plant introduction and exchange to IBPGR, FAO at Technical Conference, Rome; consultant for UNDP, FAO to the Institute of Plant Introduction and Genetic Resources, Sadovo, Bulgaria; key member of Registry Committee, GRIP; IBPGR/FAO Newsletter article on plant germplasm exchange; and preparation of Plant Inventories and other publications. Dr. White attended a Pisum Workshop at the Nordic Gene Bank, Lund, Sweden in March, 1982.

Exploration/collections assigned PI numbers 1981-June, 1982

Helianthus - Domestic

PI 468414-468897

Includes joint collections with A. Lukyanenko and N. Bochkarev, USSR in 1979 and with L. Cuk, Yugoslavia in 1980. Consists of 53 species.

- Sorghum - Yemen PI 464942-465964
 Portion of collection assembled by R. Voigt, University of Arizona/AID.
 Ethiopia PI 452502-457915
 Large collection assembled by the Ethiopian Sorghum Improvement Project and increased (quarantine) in Mexico.
- Millets - India PI 462383-464582
 Part of the IARI/Rockefeller Foundation collection. Includes Eleusine, Panicum, Paspalum, and Setaria.
- Medicago - Turkey PI 464657-464828
 Collection made by Elgin, Ratcliffe, Small (Canada), and Sencer (Turkey).
 United States/Canada PI 467885-468057
 Collection coordinated by Wilton.
- Arachis sp.- Argentina, Brazil, PI 468170-468372
 Bolivia, Paraguay
 Sponsored by IBPGR - various collectors.
- Maize - Brazil PI 466750-466853
 CENARGEN/IBPGR
 Paraguay Pending PI assignment
 Increase samples of 90 accessions for base storage at NSSL. IBPGR supported.
- Cucurbita - Argentina and Paraguay PI 458652-458743
 and others
 Collected by T. W. Whitaker while on special assignment in Argentina.

There are a number of other collections including several from IBPGR-sponsored expeditions that are pending documentation. The last groups of pulse crops from the Iran/India Pulse projects are being organized for PI documentation. Species include Vicia faba, Lens culinaris, Pisum sativum, Phaseolus vulgaris, Vigna radiata, and V. unguiculata subsp. unguiculata. Some of the Triticum collected by the Instituto del Germoplasma, Bari, Italy will be documented soon.

There are quarantine restrictions on many crop germplasm species for both imports and exports. It is wise to check out quarantine requirements, especially for vegetative items, well in advance of shipping the materials to the Quarantine Center or before requesting foreign materials. Requests for foreign materials should be addressed to the Plant Introduction Office with a copy to the Coordinator in your region. Be as specific as possible in identifying what you want. Give sources whenever known. You will be advised concerning any quarantine restrictions.

Agronomic Crop Germplasm

Approximately 1,000 rice accessions were increased in quarantine in 1981. A physical inventory of seed stocks of PI's and CI's, including weights, was completed. Progress has been made on the collation of data from some 60 individual tapes for the production of a Master File on rice germplasm. Certain listings which identify superior germplasm and further characterize the germplasm were compiled as an adjunct to the inventory.

Data were taken on 6,500 rows of wheat, barley, oats, rye, and triticale increased in Arizona and 7,600 increased in Idaho. These data have been added to the computer file. Approximately 102,400 packets of seed were distributed in 1981; 65,000 packets were sent to fill overseas requests. The numbers of items distributed by crop were: Aegilops, 456; Triticale, 7,850; rye, 1,365; oats, 1,660; barley, 40,000; and wheat, 51,075.

Renovation of the storage for the USDA Small Grain Collection has been completed to improve temperature control by adding insulation to the walls and ceiling and installing a new air conditioner.

A set of functional specifications for a new small grain facility was completed and a contract to develop plans was let to an architectural engineering firm. These plans are now 95 percent complete. A committee to decide on the site of the new facility will be visiting Beltsville on June 24 and 25. The committee will also visit Fort Collins, Colorado, and Aberdeen, Idaho.

Under the direction of GAO an experiment was completed to test the germination on random samples of all crops in the collection. Overall, germination was 84%. The study showed that there was no significant effect on germination of age of seed up to 20 years.

More researchers are taking advantage of the computer search capabilities to identify materials of potential use to their programs. One breeder has written that several useful and diverse materials have been found using the new system. A list on microfiche of 261 accessions which have 12 or more observations indicating tolerance or resistance to an insect or pathogen were distributed to 142 wheat researchers.

We also developed a system for maintaining detailed information on all seed distributed and increased during the year. All accessions distributed or increased during the year are sorted by crop, CI and PI numbers, and printed on microfiche along with the request number which identifies to whom the accession was distributed. Summaries of the number of packages of seed as well as the number of unique accessions distributed and planted for

increase are generated for each crop. Accessions which were unavailable for distribution are listed to ensure that they will be increased in the coming year. Summaries of the geographic destinations of the distributed accessions and of the recipients of the seed are also produced. A list of the 100 most frequently required accessions is generated.

A program was developed to give better access to the information contained in the name field of the passport information file. The name field is broken down into all its respective words or items, and the accession can be located alphabetically by any of these words or items. This will help prevent the inclusion of duplicates in the collection by permitting the more complete search for a particular name.

In accordance with a recommendation made by the GRIP Coordinating Committee, we are assigning PI (Plant Inventory) numbers to all new accessions, domestic and foreign. This number uniquely identifies an accession and should increase the accuracy of our handling of materials.

Dr. Christopher Chapman, the Genetics Resource Officer (Wheat) of the International Board of Plant Genetics Resources (IBPGR), the Food and Agriculture Organization (FAO), has been stationed in the Washington regional office since October 1981. He has the responsibility of determining what wheat germplasm is available worldwide. As part of this project, he has analyzed the registry information for the wheat germplasm collection. He found that in the 49 years before the official establishment of the USDA Small Grains Collection in 1948, only 18 percent of the present wheat accessions were added. In the first three years after its establishment, the size of the collection doubled. More than 4,000 accessions were introduced into the collection in 1970, the most in any given year.

Dr. Chapman also made subjective decisions about the types of materials in the wheat collection and the way they were introduced. Approximately 45 percent are land races, 22 percent are breeders' lines, 8 percent are varieties, and 21 percent could not be classified using the registry information. Regarding mode of introduction, 64 percent came from other collections which are thought to be still in existence, 18 percent came from other collections which are thought to be now nonexistent, 16 percent were introduced directly into our collection from expeditions abroad, and 2 percent came from breeders.

We continued screening the Leucaena germplasm. Approximately 175 accessions were grown on two soil types in the greenhouse to evaluate for acid tolerance. Dry weights of roots and tops were obtained. To screen for mimosine and protein, leaf samples are being analyzed.

The scarification and germination studies of Leucaena have been completed. Seed stocks of two lines were scarified in 17 treatments and the germination observed. The manuscript has been completed.

Research on Leucaena literature has continued. Corrections and additions are needed prior to releasing a printout containing 1,308 citations. Reduction of TIS personnel and lack of a computer terminal have slowed progress on this project.

Horticultural Crop Germplasm - Pathology

Glenn Dale

We repropagated 150 varieties of apples, 100 of pear, and 25 of stone fruit. About 300 varieties of pears were advertised in Fruit Varieties Journal. Approximately 285 accessions were sent to the new Northwestern Fruit Repository in Corvallis.

The program for testing pome fruit introductions for viruses and mycoplasmas was continued. We initiated virus indexing on 15 new prohibited apple and 50 pear accessions, and 45 post-entry accessions. We read virus/mycoplasma infections in 25 apple and 10 pear varieties on which tests were begun during 1979 and 1980. About 40 percent of the accessions contained one or more viruses. We coordinated with APHIS the release of 36 varieties on which the three-year tests were finished. About 40 varieties were announced and distributed to United States breeders.

We also indexed vegetatively-propagated woody ornamental introductions for whatever viruses they may have. About 26 accessions were indexed; viruses were isolated from seven accessions. One was identified as Hibiscus ringspot virus. Another was described as a new virus from mustard spinach. The others are being studied.

Beltsville

Eggplant PI accessions were screened for resistance to Verticillium wilt. Preliminary screening was successfully accomplished in incubator-type growth chambers. Seedlings inoculated with Verticillium albo-atrum (wilt) were placed in plastic boxes containing wetted, sterile vermiculite. The method is most applicable for mass screening to determine total seedling susceptibility on first-round testing. Tests must be conducted in plastic boxes to overcome air-current drying effect that occurs in such chambers. Temperature setting was 21°C; light period was eight hours. Results were inconclusive in tests using (a) thumb-size clay pots or (b) individual test tubes as containers.

The presence of avirulent Verticillium isolates in fields of eggplant may reduce wilt-disease severity. Additional data in tests with avirulent isolates of V. albo-atrum from tomato and eggplant singly and in combination with the virulent isolate from cotton show higher disease-resistance ratings among 20 wilt-tolerant PI accessions of S. melongena. The isolate from strawberry was more pathogenic than the tomato or eggplant isolates when used alone and in combination with the virulent isolate, producing lower disease-resistance evaluations except for PI 320504 and 286099. When all three avirulent isolates were combined as inoculum, a slight decrease in resistance was noted. Cross-protection against the virulent isolate from cotton can be obtained with the tomato and eggplant isolates but not with the strawberry isolate.

Isolations of Alternaria brassicicola were made from the embryos of seeds of three Crambe species in continuation of the research on embryo-borne nature of this disease. Lowest percentage of contaminated embryos occurred in C. filiformis. To avoid isolating fungi from the seed coats, the seeds

were soaked in a 1.5 percent chlorine solution for different lengths of time. The greatest number of isolations were obtained from the embryos when surface-disinfection times were two or five minutes. Infectivity studies, using isolates from the embryos, continue.

Chlamydospore production of Fusarium oxysporum was greatest when the isolate was grown on liquid potato flour medium followed by a medium made from cotton seed meal. Lesser chlamydospore numbers were obtained on meals from soybean and alfalfa.

In tests using detached stem pieces of Hibiscus cannabinus, taken before and after flowering of the plants, showed that susceptibility to Botrytis gray mold was greatest in mature plants after they had flowered. Immature stems were not attacked by the fungus. Tests were terminated upon completion of first portion of agronomic study.

Under discussion at this time is the establishment of a project to update AH 165, "Index of Plant Diseases in the United States." Letters were sent to Heads of Departments in State universities and a note placed in Phytopathology News asking whether or not this Handbook should be revised. The responses from Department heads, individual scientists, and other researchers, both here and abroad, have been overwhelmingly in favor of the undertaking. Talks are now being centered on subject-matter approaches to the project, computerization of the data, and funding.

New Crops Germplasm

Chemurgic Crops

Fifty-five selected Crambe lines were established in head-rows in the field at Beltsville in a randomized complete block design. Plots were rated for seed retention and disease resistance and 17 lines were selected. Seed was weighed and is being chemically evaluated.

Four Cuphea species were evaluated in the field in cooperation with the University of Gottingen in West Germany. All grew quite well and exhibited no disease or insect susceptibility. Seed retention was poor for all species and all had viscid glandular hairs. It was concluded that as much as 75 percent of the seed could be saved if plots were harvested with a vacuum harvester at least two times per week from the beginning of ripening until frost. Detailed data are being collated in Germany.

Seed of 51 lines of 12 species of Cuphea were planted in the greenhouse for seed increase and preliminary evaluation. Seed set in the greenhouse was generally excellent for the self-pollinated species C. carthagenensis, C. aperta, and C. toluicana. To obtain seeds from the cross-pollinated species, two methods of intercrossing were evaluated: (1) transferring pollen with a camel's-hair brush and (2) touching the dehiscent anthers directly to the stigma. Only the second method was successful, but it was time consuming and did not permit the inclusion of all of the plants of an accession in the crossing block. Because of the poor seed retention, it is necessary to enclose flowers in a small transparent paper bag which was inverted and attached to the stem. A much more efficient method of seed

increase for the cross pollinated accessions would be to cage each accession, intercross with honey bees, and provide some method of catching the seed.

Forty-six kenaf lines were selected based on bast:core ratio and stem density. F_4 seed was planted in the field. Emergence was very poor. However, 50 plants were selected and cuttings were made for greenhouse seed increase.

Six Amaranthus lines were screened in the greenhouse and 100 aluminum-tolerant plants per line selected. F_3 seed was produced, bulked by line, and planted (ca. 18,000 seeds per line) in the field at Beltsville. Eighty-four plants per line were selected based on yield, lodging resistance, disease resistance, short stature, and seed retention.

Multiuse Perennials

Collection of field data from the Asclepias syriaca entries was completed and collated. A manuscript has been prepared and is in peer review. Highly significant differences were noted among entries for vigor, number of tillers, and regrowth after cutting. No disease problems were noted. There was insufficient material available for chemical analysis, but analysis of material from the original stands indicates there were highly significant differences among entries for polyphenols plus oil and hydrocarbon. Asclepias roots were soaked in Ga_3 , $Ga_4/7$, or kinitin in an attempt to induce root bub-break. None of the treatments were effective and the most effective treatment at this time appears to be storing the roots at $0^\circ C$ for two to three months.

Collection of Rhus glabra field data was also completed. Techniques for polyphenol plus oil, hydrocarbon, and tannin extractions were refined and in-house chemical evaluation is underway. Highly significant differences were noted among entries for vigor, number of tillers, and regrowth after culling. No disease or insect problems were noted in this nursery, but in other nurseries, mildew was a considerable problem. Chemical analyses of material from native stands indicated that there were highly significant differences in polyphenol plus oil and hydrocarbon.

Eight- or 24-hour daylengths supplemented and extended with incandescent or fluorescent light did not induce flowering in Asclepias syriaca or Rhus glabra after five months of exposure for Asclepias and three months for Rhus.

Stokes Aster

Nurseries were rated for seed retention and number of seed heads. Seed was harvested from the 346 best plants and 245 plants were selected based on yield and percentage oil. These are being vernalized in the field and will be dug as soon as weather permits. Early-flowering plants did not flower after vernalization in the greenhouse at $10^\circ C$ although this process has been effective in the past. A $0^\circ C$ room storage became available and experiments indicated that vernalization at this temperature was very effective; early plants are thus being re-vernalized at $0^\circ C$.

Germplasm Resources Information Project

Considerable significant actions have occurred since our report of last year.

1. A 300-megabyte disk drive has been acquired for the data base.
2. Eighteen computer terminals (CRT/Screens) have been received.
3. Much development work on Release I of the information system has been completed.
4. Data from NC-7, S-9, and W-6 are currently on the computer system at Beltsville and will soon be loaded into the final data base.
5. A user training session is being conducted 21-25 June 1982 at Fort Collins, Colorado, for NC-7 and W-6 personnel to familiarize these first two sites with the operation of the new information system.
6. Twelve Crop Committees are now formed (latest is peanuts). These committees continue to provide specific guidance regarding the acquisition, maintenance, and evaluation of germplasm.

There are two basic classes of users of GRIN -- those that maintain germplasm and those that use germplasm. The users of germplasm will have direct access to the information system at the end of the implementation of Release II of GRIN. Anyone interested in having direct access may contact: Richard Cooper, USDA-ARS-Plant Genetics and Germplasm Institute, Building 001, Room 126, Beltsville, Maryland 20705, phone: 301-344-2984 or 301-344-4244.

Publications

- Abbott, J. A. and T. A. Campbell. Vegetable amaranth (Amaranthus spp.): Sensory evaluations of 20 entries. Hortsci. (In press).
- Bhella, H. S. and George A. White. 1981. Ornamental plant introductions 1977. Plant Propagator 27(1):3-5.
- Campbell, T. A. 1981. Agronomic potential of Stokes aster. In E. H. Pryde, L. H. Princen, and K. D. Mukherjee (ed.) New Sources of Fats and Oils. American Oil Chemists Society Monograph 9.
- Campbell, T. A. and J. A. Abbott. Vegetable amaranth (Amaranthus spp.): Field evaluations of 20 entries. Hortsci. (In Press).
- Campbell, T. A. and G. A. White. Population density and planting date effects on kenaf. Agron. J. (In press).
- Moseman, J. G. and D. H. Smith, Jr. USDA Barley Germplasm Collection and Sources of Disease Resistance. Proceedings of Barley and Associated Breeding Methodology Workshop, Morocco, April 16, 1982.

- Moseman, J. G. and D. H. Smith, Jr. 1982. Purpose, Development, Utilization, Maintenance, and Status of USDA Barley Collection. International Barley Genetics Symposium, Edinburgh, Scotland, July 1982.
- O'Brien, Muriel J. Evaluation of eggplant accessions and cultivars for resistance to *Verticillium* wilt. (Submitted to Plant Disease.)
- Porter, Wayne M. and D. H. Smith, Jr. 1981. Genetic vulnerability. Letter to the Editor of Science 214:862.
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- Quesenberry, K. H., A. J. Oakes, and D. S. Jessop. Cytological and geographical characterization of *Hemarthria*. Euphytica (In press).
- Ratcliffe, R. H. and A. J. Oakes. Yellow sugarcane aphid resistance in selected *Digitaria* germplasm. J. Economic Entomology (In press).
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- Waterworth, H. E. and G. A. White. 1982. Plant introductions and quarantine: the necessity for both. Plant Disease 65:83-87.
- White, George A. and H. L. Hyland. 1981. USDA Plant Inventory No. 185. 245 pp.
- White, George A. 1981. USDA Plant Inventory No. 186. 418 pp.
- White, George A. 1982. USDA Plant Inventory No. 187. 446 pp.
- White, George A. and Sharon Drexler. 1982. Letter to the Editor. Horticulture LX(4):2-3.

Presentations and Other Achievements

- Campbell, T. Austin. Presented paper entitled "Preliminary evaluation of *Asclepias syriaca* L. germplasm" at the American Society of Agronomy Meeting held in Atlanta, Georgia, November/December 1981.
- Campbell, T. Austin. Presented paper entitled "Differential tolerances of *Amaranthus* strains to high levels of Al and Mn in acid soils" at the American Society of Agronomy Meeting held in Atlanta, Georgia, November/December 1981.

O'Brien, Muriel J. Invited to participate in the Third International Symposium on Plant Pathology, New Delhi, India, and to take part in discussions on plant disease problems, particularly diseases of economically important vegetable fiber crops.

Porter, Wayne M. 1981. The development of the wheat evaluation data file. Annual Wheat Newsletter 27:9-10.

Porter, Wayne M. 1981. Development of the wheat evaluation data file. Annual Plant Resistance to Insects Newsletter 7:32-34.

Porter, Wayne M. 1981. Development of the wheat evaluation data file. Barley Newsletter 24:104-107.

Oakes, A. J. Release of one cultivar, "Frioalta," of limpgrass has been made. Approval for registration has been received.

White, G. A. and S. Kenworthy. Made numerous information presentations about plant introduction and exchange and about the U.S. National Plant Germplasm System to many visiting scientists and delegations (primarily foreign).

White, G. A. Presented two lectures on plant germplasm at Institute of Plant Introduction and Genetic Resources, Sadovo, Bulgaria, November 1981.

White, G. A. Presented seminar on Plant Introduction and Exploration, University of Maryland, October 1981.

Processed Reports

Kenworthy, S. Importing Plant Material into the U.S. from a Foreign Country. February 1982.

Kenworthy, S. Sending Plant Material to a Foreign Country. December 1981.

White, G. A. and S. Kenworthy. Exchanges of Plant Germplasm with the United States. 1981. IBPGR/FAO Newsletter (pending publication).

Report for 1982 Meetings of the
W-6, NC-7, and S-9 Technical Committees

Northern Regional Research Center
Peoria, Illinois

General Developments at NRRC--Dr. L. H. Princen has taken over as Associate Center Director, replacing Dr. R. A. Rhodes who was promoted to Associate Regional Administrator of the North Central Region, ARS. Dr. E. B. Bagley has recently assumed the position of Chief of the Horticultural and Special Crops (HSC) Laboratory, the position previously held by Dr. Princen.

We have participated in the ARS program to develop a Strategic Plan for future research. We produced a research approach to develop new crops for American agriculture to improve farm economics and reduce U.S. dependency on other nations. The comprehensive approach took new crops from identification of suitable species through technology transfer.

New Crops Screening--Of the more than 100 species screened for oil and protein, *Sacoglottis gabonensis* from Ghana had the highest oil content (67%) and a Croton species from China had the highest protein content (47%, N X 6.25). Of the 227 different species examined for their fatty acid composition, a number exhibited unusual components. For example, *Reinwardtia indica*, Linaceae, had 70% of its acyl groups as epoxy oleic acid. This is the first time this fatty acid has been found in the linseed family. Other unusual fatty acids found ranged from 83% lauric acid (*Litsea cubeba*, Lauraceae) to 52% conjugated 18:4 (*Impatiens pallida*, Balsaminaceae). In-depth characterization of the lipids of *Dolichothele longimamma* revealed that fatty acids C₈ to C₁₈ were esterified to the C-3 hydroxyl groups of beta-amyrin, methyl oleanolate, maniladiol, erythrodiol, and longispinogenin. Analysis of small samples (one to three seeds) of *Cuphea* species collected in Mexico and Brazil showed species with a variety of fatty acid composition. Some were rich in C₁₀ or C₁₂ or even C₁₈ fatty acids. This information will hopefully be used in the program which is developing a *Cuphea* variety with useful agronomic and industrial characteristics.

Some of our resources in new crops screening group will be used to screen germplasm for allelopathic compounds. Hopefully, the large and unique germplasm collection at our disposal will yield compounds which will be useful to agriculture and give insights into biological systems of plants.

Chemical Analyses and Methods Development--Last season, six soybean germplasm lines were identified as having low levels (less than 5%) of linolenic acid. These lines were tested at six locations to see how the environment would affect the fatty acid content. One variety, P.I. 361088B, maintained its low level of linolenic acid at all locations. This particular line was unusual in that it contained a high level (>60%) of linoleic acid. Usually lower levels of linolenic acid are associated with high levels of oleic acid and reduced linoleic acid content.

In a cooperative program with J. R. Wilcox, ARS, Purdue University, we analyzed fatty acids from soybean seeds collected from plants grown from chemically

mutated seeds, also in an effort to reduce linolenic acid content. Continued work is being done on one line which produced seed with less than 3.5% linolenic acid content.

Several new major equipment purchases were made in the last year: (1) A triple-stage quadrupole mass spectrometer capable of performing mass spectrometry/mass spectrometry experiments was installed. This instrument will be used to identify and quantitate biologically active material in complex matrices. (2) A scanning electron microscope to replace one that is 12 years old, is being installed. (3) A high-resolution 300-Mz nuclear magnetic resonance spectrometer is being installed. These instruments although located in the HSC laboratory will be used for a variety of products throughout the Center.

Crambe--No commercial plantings of crambe were made this spring. The disastrous aphid infestation that destroyed the thousand 1981 acres, a fire in the Kentucky elevator where crambe seed was stored, and very poor quality seed produced on 20 acres planted in August 1981 in New Mexico combined to discourage commercial interest in crambe in 1982. Currently, insufficient quality seed is available for commercial production. Commercially, interest appears to be switching to rapeseed as a domestic source of high-erucic acid oil. If this occurs, our past support of a high-erucic, low-glucosinolate rapeseed breeding program at Oregon State University may prove to be significant (source of seed and information). Similarly, our evaluation and knowledge of oilseed crushing plants in Missouri, as well as potential growers there, may also prove to be valuable in any developing rapeseed program in this country. Crambe field and plot work continues in Kentucky this summer as a result of our cooperation with Dr. Durwood Beatty at Murray State University. Sufficient seed might become available to plant 1500 acres of crambe in 1983.

Our sludge-amended stripmine plots were seeded to crambe and kenaf on May 5, 1982. No further sludge additions were made, and residual affects of previous soil amendments will be evaluated through crop season 1983, at which time this project will be terminated. On May 17, sludge-amended stripmine plots were seeded to sweet sorghum, the start of a new energy-related program in cooperation with the Metropolitan Sanitary District of Greater Chicago. A preliminary study in 1981 indicated good performance of the sweet sorghum on the sludge-treated stripmine soil, both as a biomass and sugar producer.

Vernonia galamensis--Small plots of *V. galamensis* were planted in 1981 at Corvallis, OR (W. H. Foote); Murray, KY (D. Beatty); and Peoria, IL (K. D. Carlson). Plants reached heights of 6 feet at the first two locations but failed to blossom. In Peoria, no blossoms formed on shorter plants in field or growth chamber experiments. Data from fertilizer trials suggest limited response of *V. galamensis* to applied nutrient levels.

A pound of *V. galamensis* seed was sent to Dr. Quentin Jones at Beltsville in February 1982, and he has arranged for attempts to increase the seed in Mayaguez, PR (Dr. Sotomayor-Rios) and Tucson, AZ (Drs. Upchurch and Hogan).

Further evaluation of the species for seed set in the U.S., particularly the southern portions is desirable.

Hydrocarbon Crops--The NRRC Botanist collected 110 whole-plant species mostly in central Illinois. Cooperating USDA plant scientists provided 22 species: 6 from Texas, 12 from Arizona, and 4 from Georgia. Whole-plant samples representing 100 species primarily from the 1980 collection and from cooperating collectors were analyzed. *Rhus glabra*, *Rhus copallina*, *Campanula pyramidalis*, *Phalaris arundinacea*, *Asclepias amplexicaulis*, *Asclepias sullivantii*, and *Arctium lappa* contained 4 to 9% whole-plant oil.

Saponification of whole-plant oil extracts of *Aleurites moluccana* liberated 27.3% free acid; *Aleurites trisperma*, 22.2%; *Asclepias amplexicaulis*, 28.5%; and *Asclepias sullivantii* 36.5%. Rubber extracted from *Asclepias amplexicaulis* and *A. sullivantii* has molecular weight of about 10 and 14% of that of *Hevea*. Thin-layer chromatography of extracts from several leguminous whole-plant oil species was utilized to fingerprint the composition, and TLC Iatroskan analyzer identified a major component in an extract of *Baptisia tinctoria* as a wax ester.

Antitumor Screening and Fractionation--During the year, 30 new seed extracts were prepared and submitted to National Cancer Institute contractors for tests in their antitumor screen. The ethanol extract of *Diarthron vesiculosum* seed, which shows confirmed activity against PS leukemia, is in an advanced stage of fractionation. The elusive antileukemic compound in *Sesbania drummondii* seed has been isolated in crystalline form and has been characterized by NMR, X-ray crystallography, and chemical derivatization.

Diploclisia glaucescens--The seed of this menispermaceous plant has proved to be a rich source of β -ecdysone. Lesser amounts of several other ecdysones are present in the extract and await characterization.

Oat Attractants--Extensive fractionation of oat extracts yielded fractions that produced a significant aggregation response in *Oryzaephilus surinamensis* (L.) sawtoothed grain beetle). Mixtures of fatty acids composed primarily of palmitic, oleic, and linoleic acids, as well as ordinary triglycerides containing these same acyl groups, produced the strongest aggregation. Other triglyceride fractions were repellent, but their composition included C_{18} hydroxydiene acids. Volatile components of oats can be recovered by either vacuum distillation into a cold trap or by steam distillation of crude pentane extracts, and these volatiles also exhibit attractancy. A number of fractionations by preparative GC has bracketed the activity into a few hydrocarbon and carbonyl subfractions. Dr. Wendell Burkholder, Madison, WI, is our cooperator.

Lesser Peach Tree Borer--A project to isolate and identify chemical constituents of peach trees responsible for attracting gravid female lesser peach tree borers (*Synanthedon pictipes*) and stimulating oviposition is being pursued in cooperation with Dr. David Reed, Vincennes, IN. Volatile components thus far identified from attractive fractions are styrene, α -pinene, β -pinene, p-cymene, benzaldehyde, methyl benzoate, and ethyl benzoate. Many other minor unidentified constituents also occur in these fractions. A number of nonvolatile compounds have also been isolated from attractive bark extract fractions. No individual constituent has yet been shown to elicit significant and reproducible attraction. Further fractionation of volatile materials by preparative GC, identification of volatile and nonvolatile compounds from active fractions, and biological testing with the lesser peach tree borer continue.

Apple Resistance--In cooperation with Dr. Hilary Goonewardene (Purdue University), we are seeking to establish the chemical basis for resistance to the apple maggot in Golden Delicious apples. Certain extracts of the apples have given positive results in bioassays with the insect larvae, and these extracts are being fractionated and analyzed.

Corn Resistance--In cooperation with Dr. J. G. Rodriguez (University of Kentucky), we are seeking to establish the chemical basis for resistance to certain field corn varieties to the rice weevil under southern field conditions. Certain extracts of a resistant corn give positive bioassay results. These active extracts are being fractionated and compared with similarly prepared extracts from a susceptible variety of corn.

Tissue Culture Research--Antitumor alkaloid production in *Cephalotaxus harringtonia* is apparently controlled genetically rather than environmentally. Trees growing at the northern limit of their range were found to not produce antitumor alkaloid esters suggesting environmental suppression of biosynthesis. However, when seedlings of these trees were grown in the laboratory under more favorable conditions, none produced alkaloid esters, and seedlings from producing trees grown under the same conditions produced alkaloids at high levels. Callus from the nonproducing trees was green and embryogenic; that from producers was dark brown and undifferentiated. Suspension cultures of these two cell lines were also qualitatively different. Dense brown cells of the latter variety persisted in suspension and were reminiscent of "resin" cells implicated in secondary metabolite storage in other plants.

Efforts to regenerate plants from cultured cells of *Cephalotaxus* and *Chenopodium quinoa*, a prospective food and forage crop for the West and Southwest, are meeting with some success, at least in the initial stage of development. Among common means of reproducing plants from culture, embryogenesis generally gives more normal plants. Both *Cephalotaxus* and *Chenopodium quinoa* have induced to form globular embryoids, the first step in embryogenesis. If further development can be stimulated, it will be the first time either genus has been regenerated.

Natural Toxicants in Vegetables--Oriental *Brassica* vegetables grown in Wisconsin by P. H. Williams have been analyzed for glucosinolates. Each morphological type appears to have a distinct pattern of glucosinolates. Types analyzed included *B. juncea*, *B. campestris* ssp. *pekinensis* (petsai), ssp. *chinensis* (pak choi), ssp. *nipposinica*, ssp. *perviridis*, and ssp. *rapifera* (turnip). For example, the total glucosinolate content of Oriental turnips is lower than that of U.S. market. These accessions may be valuable additions to our domestic germplasm.

Work has been initiated on the toxicant analysis of water celery or seri (*Oenanthe javanica*). The expected toxicants in this umbell are falcarinol, falcarindiol, and myristicin. Nine carrot cultivars (grown in Wisconsin) contain 0-2 ppm myristicin, 1-21 ppm falcarinol, and 38-268 ppm falcarindiol. Parsnips contain more of all three toxicants.

In the study of the mechanism of formation of epithioalkanes from glucosinolates, a rapid chemical test for the epithio grouping has been devised for research use.

Toxicology studies on 1-cyano-2-hydroxy-3,4-epithiobutane, 3-methylsulfinyl-propyl isothiocyanate, and other aglucons are in progress.

NRRC received 64 pounds of *Berberoa incana* seed grown by W. Skrdla. This will make a convenient source of 5-allyloxazolidine-2-thione for toxicological testing.

Recent NRRC Publications

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1982 Report of the
National Seed Storage Laboratory
to the
National Plant Germplasm Committee
and to the
Regional Technical Committees on Plant Germplasm
by

Louis N. Bass, Director

The National Seed Storage Laboratory experienced another very busy year with the receipt and distribution of numerous seed samples, many requests for tours of the Laboratory, and talks by members of the professional staff. Over 260 visitors from more than 25 states and 18 foreign countries toured the National Seed Storage Laboratory. This includes several grade school, high school, and college classes. In the spring of 1981 Dr. Bass appeared on the television program, "To Tell the Truth" and managed to stump all the panelists but one.

Germplasm Preservation

The 5,703 samples received during 1981 plus the 38,667 small grain samples and 1,987 CIMMYT corn samples previously received but not cataloged brought the total of cataloged accessions in storage, as of December 31, 1981, to 164,099. In addition to the cataloged accessions, 3,859 samples of rice seeds were received from IRRI. Germplasm accessions received from the IBPGR totaled 325 accessions from 3 countries.

Arrangements were made for seed increases of 1,123 accessions that were either low in germination or in number of seeds. Seed increase samples received totaled 2,567. Approximately 20,000 germination and 300 special tests were made on stored and incoming seed samples.

Twenty genetic stocks and three trisomic stocks were received, increased, and added to the collection. Seed increases were made on 370 genetic, 17 multiple genetic, and 72 trisomic stocks. Characteristics were evaluated on the 370 genetic stocks grown for increase. Various mutant stocks were crossed with primary trisomics for linkage studies. Thirteen F₁ and 82 F₂ or F₃ hybrids were grown for isolation of additional multiple genetic stocks. The telocentric chromosomes in all nine telotrisomic lines, including newly obtained Telo 3S, were identified by Giemsa banding technique. Three acrotrisomic lines were used for genetic linkage mapping in barley chromosomes. Samples of 78 genetic and 23 trisomic stocks were distributed.

Cooperation with GRIP Project

D. C. Clark

The National Seed Storage Laboratory is continuing to cooperate with the GRIP project.

Cooperation with IBPGR

The National Seed Storage Laboratory is cooperating with the International Board of Plant Genetic Resources. During the past year, 325 samples of germplasm from 3 countries were received from IBPGR.

Facility Needs

While the need for an addition to the National Seed Storage Laboratory still exists, the urgency for construction has been temporarily eased by switching from fixed sized metal cans to heatsealable foil-laminated flexible packages. It appears now that the Laboratory addition will not be needed until about 1988. However, planning must still move forward if that target date is to be met.

In spite of the report of the 1980 National Plant Germplasm Subcommittee that an addition to the present building be built, there is to be another site selection committee appointed to decide whether it will be more appropriate to add to the present building or to build a new facility elsewhere.

Research Notes

Environmental and Other Factor Effects Upon Seed Viability and Storage

L. N. Bass E. E. Roos P. C. Stanwood

Study the effects of storage conditions on seed longevity: Delphinium seeds at approximately 9.5% seed-moisture content, stored 18 months in sealed moistureproof packages, lost all viability during storage at 32°C/70% RH, 21°C/70% RH, 21°C/50% RH, and at room temperature (21-28°C). Seeds stored similarly at 10°C/70% RH declined 9%, while seeds stored at 10°C/50% RH, 5, -1, -12, -70, and -196°C and uncontrolled RH in paper envelopes showed only minor changes in viability. Seeds from the same lot dried to 4.8% moisture content before sealing declined 10% in viability during 18 months at room temperature. Similar seeds at 32°C/50% RH declined 30% at 21°C/70% RH and 21°C/50% RH declined 12 and 15%, respectively; at 10°C/70% RH and 10°C/50% RH declined 9%; at -5, no decline; at -1°C, declined 4%; at -12°C, no change; at -70°C, declined 6%; and at -196°C there was no change.

Alyssum seeds at 4.5 and 7% seed-moisture content stored in sealed moistureproof containers showed very little change in viability when stored at room temperature (21-28°C), 10, 5, -1, -12, -70, or -196°C.

Geranium seeds at 6.6 to 6.8% moisture content stored sealed at room temperature and 5, -1, -12, and -196°C showed no decline in viability at any temperature.

No tests were scheduled on other kinds of seeds stored as part of this project. Most seed samples stored in liquid nitrogen as part of a study on effects of temperature on longevity showed no deterioration during 3 years, while some seeds at higher temperatures showed some deterioration. Several plants from seeds of 40 accessions stored 3 years in liquid nitrogen were grown in the greenhouse. No mutations or abnormalities were observed in either seed germination or subsequent plant growth.

Seeds of 10 agricultural species were tested, using differential thermal analyses, for high-moisture limits for freezing damage. Peach and apple seeds were placed in liquid nitrogen and both kinds appeared to survive. Hop pollen stored 1 and 2 years in liquid nitrogen for Dr. Haunold (Corvallis, Oregon) produced excellent seed set; but pollen stored at 5 and -18°C gave no seed set.

Develop a method for predicting relative longevity of seed lots: Several seed lots of pearl millet were artificially aged at temperature and relative humidity combinations ranging from 10.0 to 32.2°C and 50 to 90% RH for up to 141 weeks, then tested for viability. Using a previously developed computer program, the viability data were analyzed. Statistical comparisons were made among various seed-aging treatments to determine their suitability as "artificial" seed aging tests for predicting which seed lots will store best, particularly under optimum conditions. Data heterogeneity, indicated by high chi-square and/or r^2 values, generally resulted from seeds stored at high RH (17% M), whereas seeds stored at lower RH (12% M) resulted in no data heterogeneity. Thus, artificial aging tests for predicting long-term storage under optimum conditions should not employ high relative humidities. However, there is some indication that rigid control of seed-moisture content may permit the use of high-seed moisture as part of the aging test.

Screen recalcitrant seeds for drying damage: Seeds of 24 tropical species were tested for dehydration damage to viability. Ten species were desiccation sensitive and 14 species were not. Chemical dehydration methods were generally unsuccessful in retaining seed viability.

Genetic Changes in Seeds During Storage

E. E. Roos

'Great Lakes' lettuce seeds at 4, 7, and 10% moisture content were stored 21 years in sealed cans at -12, -1, 10, 21, and 32°C with air, argon (A), carbon dioxide (CO₂), helium (He), nitrogen (N), and vacuum atmospheres. After 21 years of sealed storage, gas chromatography indicated that storage at high temperatures and seed moistures led to a marked increase in concentration of CO₂ and a corresponding decrease in germination percentage regardless of the initial atmosphere in the cans. Because of the small amount of seeds in the can, seeds sealed at 7 and 10% showed a loss in moisture content as a result of adjustment to the initial relative humidity in the cans. The 7% seeds averaged 5.5% and the 10% seeds averaged 7% after 21 years of storage. The seeds originally adjusted to 4% moisture content showed little change. Studies are in progress on possible chromosomal aberrations in these aged seeds. Preliminary results suggest that seeds in CO₂ and A atmospheres developed more chromosomal aberrations than did seeds in the other atmospheres.

Polyacrylamide electrophoresis of seed proteins has been used to further characterize genetic variability within bean (*Phaseolus vulgaris*) Plant Introduction (PI) lines. Ten heterogeneous PI lines were sorted according to seedcoat color, resulting in 77 sublines. Each subline was

grown in the field and 10 pods were harvested from individual plants of each subline in order to compare variability among seeds from the same plant, among plants within the same subline, among sublines within a PI, and among PI lines. Two regions in the acrylamide gels (the G₁ area and the region just below the G₁) were used to characterize each line. No variation among seeds from the same plant was evident. Variation among plants within a subline was seen occasionally and was associated with heterozygosity within the subline as revealed by segregation for seedcoat color and flower color.

Variation among sublines of a PI and among PI lines appeared to be random. Electrophoresis holds promise as a tool for characterizing genetic variation in *Phaseolus* germplasm.

Several isogenic lines of peas were grown in the field to increase the seed supply for further analyses.

Cryopreservation of Plant Germplasm

P. C. Stanwood

The National Seed Storage Laboratory received a 2-year (\$150,000) grant from Tropical Agriculture Research funds to study the possibility of using cryogenic techniques to preserve tropical seeds. Dr. Phillip Stanwood is leader of this project, which is being carried out in cooperation with the University of Hawaii.

Seeds of 24 tropical species were tested for freezing damage through DTA and storage tests. Seeds of the 10 species which appeared to be desiccation-tolerant survived freezing in LN₂. The desiccation-sensitive seeds did not survive freezing. Drying curves and DTA's were done on seeds of 15 tropical species. Initial dehydration experiments indicated that *Anthurium* seeds

cannot be dried below 45% moisture content and stored for more than 3 weeks at 5°C.

Seeds of 42 species were collected and conditioned. Seeds of 16 species were shipped to the National Seed Storage Laboratory for viability and storage studies. Initial seed-moisture content was determined on each seed collection, and drying studies were carried out on seed of several species. In all cases, drying had a deleterious effect on germination. The drying effect varied greatly among species. However, in one case, a small amount of drying increased the germination percentage, probably by breaking dormancy, but further drying resulted in a significant loss of viability. Studies on germination requirements of each species collected were initiated.

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Bass, L. N. Storage conditions for maintaining seed quality. In Finney, E. E., Jr., ed., *Handbook of Transportation and Marketing in Agriculture, Vol. II, Field Crops*, pp. 239-321, CRC Press. 1981.

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Technical Presentations

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SOUTHERN REGIONAL PLANT INTRODUCTION STATION

Report to S-9 Technical Committee

July 27-28, 1982

This report covers the primary activities of this Plant Introduction Station for the period of July 1, 1981 through June 30, 1982.

Plant Introduction

Germplasm of 2,476 new Plant Introductions (PI's) were added to the regional plant germplasm collections. Included were major groups of peanuts, millets, and sorghum along with 20 other genera. The first 1,200 PI's of a Yemen sorghum collection being increased in Puerto Rico were received and processed for storage and distribution.

Seed Increase

A total of 1,398 PI's, composed of 9 genera and 30 species, were included in the 1982 increase plantings at the Regional Plant Introduction Station. The main crops represented are: Peanuts, 135 PI's and Millets (Eleusine and Paspalum), 1,017 PI's.

The Mayaguez Institute of Tropical Agriculture (MITA) is increasing Sorghum and Okra for a total of 1,200 PI's.

Other cooperators are:

1. University of Florida

Dr. A. E. Kretschmer - 600 Tropical Legumes

2. Auburn University

Dr. J. D. Norton - 100 Cantaloupes & 100 Watermelon

3. South Texas Plant Materials Center

This new PMC is a cooperative unit of Texas A&I University and the Soil Conservation Service. In the 1982 growing season 321 PI's of tropical legumes and grasses are being regrown to provide fresh, viable seed stocks.

Curatorships:

1. Trifolium Collection - Dr. N. L. Taylor
University of Kentucky
2. Tripsacum Collection - Dr. D. H. Timothy
N. C. State University

Seed Distribution

A total of 12,218 seed packets were distributed. Of this total, 9,594 packets were distributed for basic research and plant breeding; 2,317 were sent to cooperators for seed increase to renew seed inventory; and 343 packets of forage legume cultivars were distributed as a service function to the Legume Section of the Southern Forage Breeders Work Group.

Distribution by RegionsS-9 (Total - 2,631)

Alabama	306	North Carolina	94
Arkansas	136	Oklahoma	100
Florida	49	Puerto Rico	24
Georgia	350	South Carolina	1330
Hawaii	29	Tennessee	7
Kentucky	19	Texas	179
Louisiana	0	Virginia	0
Mississippi	8	Virgin Islands	0

NC-7: 1,382NE-9: 171W-6: 1,284

In addition to the domestic distribution 4,126 seed packets were shipped to 46 foreign countries.

Screening for Disease Resistance - Grover Sowell, Jr., Research Plant Pathologist

Muskmelon Powdery Mildew: The final test indicated 44 PI's were resistant to race 1 of Sphaerotheca fuliginea.

CMV in Cowpeas: In cooperation with J. W. Demski cowpea PI's were screened to attempt to find single resistant plants. Seed will be saved from resistant plants following 2 inoculations.

Muskmelon Bacterium: The muskmelon bacterium was identified by means of physiological tests as Pseudomonas pseudoalkaligenes subsp. citrulli, the same bacterium found on many Citrullus lanatus PI's. The bacterium is killed on muskmelon seed by treatment with sodium hypochlorite and on watermelon seed by a 16 hour soak in 1000 ppm streptomycin. All seed of muskmelon and watermelon are treated before distribution.

Cowpea Viruses: 119 cowpea PI's were screened for viruses in the greenhouse and field. Results: 44 PI's, infected by CMV (cucumber mosaic virus)
29 PI's, infected by BICMV (Blackeye cowpea mosaic virus)
18 PI's, CMV & BICMV (causes severe stunt)
6 PI's, Other viruses

All these viruses have been reported previously on cowpeas in the United States.

Microflora of Sorghum Seeds: Began studies of PI sorghum seed to determine the identity and effect on seed germination of fungi in stored seed. Fusarium spp., Helminthosporium spp. and Curvularia spp. were the main fungi isolated, considered as potential pathogens. Pathogenicity tests of single-spore isolates were started. Some Fusarium isolates were pathogenic in preliminary tests.

Bacterium from Castorbeans: A bacterium believed to be Xanthomonas ricini and an Alternaria, A. ricini, were isolated from castorbean seed of PI 247096. These pathogens are seedborne. Tests are underway to determine how common they are on seed of PI's.

Microflora of Pepper Seeds: No pathogens were detected on PI pepper seed.

Ergot of Dallas Grass: The PI's resistant in previous tests were not resistant in the repeated test.

Watermelon Anthracnose: PI's previously showing high levels of resistance showed low levels of resistance in the 1981 field test. The possibility of a new race of the pathogen was investigated, however the pathogenicity of the standard isolate on PI 189225 prevented an accurate comparison of isolates. The results indicate that a spore concentration as low as 1000/ml is necessary for accurate results.

Plant Pathology and Genetics Research - Grover Sowell, Jr. and W. C. Adamson

Pepper, Bacterial Spot: The F_3 progenies from resistant x susceptible crosses and resistant x resistant crosses and the backcross F_2 populations were screened for resistance in the greenhouse. A total of 1800 lines were screened. PI 163192 carries a single dominant gene as reported by Cook and Stall (Phytopath. 53:1060-1063, 1963). PI 322719 and PI 163189 carry forms of resistance different from each other and from that of PI 163192. Resistance in 322719 appears due to a single dominant gene and in PI 163189 to a dominant and a recessive gene. Larger-fruited breeding lines are being tested in the field this summer as are lines combining genes for resistance.

Watermelon, Gummy Stem Blight: PI 189225 and PI 271778 with high and intermediate resistance were crossed with the susceptible 'Crimson Sweet'. The F_1 was inoculated and planted in the field at Blackville, SC in cooperation with B. B. Rhodes. Preliminary tests indicate that both the high level of resistance of PI 189225 and the intermediate level of resistance of PI 271778 are expressed in the F_1 indicating dominant genes for resistance. The objective of this research is to develop large-fruited breeding lines carrying 1 or 2 sources of resistance and to determine the mode of inheritance of resistance.

Watermelon Anthracnose: Twenty plants of each of thirteen lines which had shown resistance to anthracnose in one or more previous tests were grown in the greenhouse and inoculated. None of the PI's showed a majority of resistant plants when they were inoculated with 1000 conidia per ml. Resistant plants were selected, selfed and grown to maturity in the greenhouse for genetic studies.

Muskmelon Gummy Stem Blight: Three PI's resistant to gummy stem blight were inoculated. All plants showed resistance as expressed by the absence of stem cankers while the susceptible Planters Jumbo showed well developed stem cankers. PI 140471, PI 266935, PI 296345 and Planters Jumbo were crossed in all possible combinations. Segregating generations will be studied to determine whether resistance is genetically different and can be combined and to isolate improved resistant lines.

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Research Projects - Charles Adamson, Research Agronomist

Legumes: Five F₂ populations of Vicia sativa, crosses of Cahaba White with different PI's selected in previous screening tests, were planted at the Central Georgia Experiment Station at Eatonton. Few plants survived the extreme cold of the past winter.

New Crops for Oil and Hydrocarbon Production: Based upon the initial series of tests we have concluded that Phytolacca americana is the most promising species of the first test group. A test of this species in large plots at different planting densities has been established. Eupatorium capillifolium and E. compositifolium in field sampling have shown high yields of acetone extract, indicating high oil or polyphenol content. Eight entries of these species were established in a nursery and in a greenhouse for further study. Field populations are being further sampled.

Kenaf and Roselle Work: Seed of kenaf and roselle selections made at Savannah were produced in the greenhouse at Savannah and Experiment. Five fiber-type roselle lines and 4 root-knot nematode resistant kenaf lines have been assigned PI numbers and prepared for release as germplasm lines.

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Southern Regional Plant Introduction Station Budget

<u>Source of Funds</u>	<u>FY-82</u>	<u>FY-83</u>
Regional Research Funds (Pooled)	\$88,901	\$113,901
Regional Research Funds (Georgia Station)	23,706	-0-
TOTAL	<u>\$112,607</u>	<u>\$113,901</u>

Expenditures

Personal Services	90,129	95,762
Travel	317	500
Supplies & Operating	6,661	5,639
Equipment	3,500	-0-
Seed Increase (MITA)	12,000	12,000
TOTAL	<u>\$112,607</u>	<u>\$113,901</u>

<u>Source of Funds</u>	<u>FY-82</u>	<u>FY-83</u>
ARS (Base)	236,600	215,600
Special Allocations:		
ARS, NPS - Clover Curatorship, KY	5,000	5,000
Tripsacum Curatorship, NC	10,000	10,000
ARS, NPS - Germplasm Maintenance	40,000	?
ARS, NPS- Plant Exploration	4,200	3,435 (?)
TOTAL	<u>\$295,800</u>	<u>\$234,035</u>

Expenditures

Personal Services	180,300	152,200
Travel	5,000	4,000
Construction & Repairs	1,500	--
Supplies & Materials	12,610	6,400
Support Equipment	11,500	3,000
Other Services	--	8,000
Broad Form Cooperative Agreements		
1. University of Georgia (Temp. Labor)	15,000	20,000
2. Auburn University	4,571	2,000
3. University of Florida, Gainesville	1,119	--
4. " " " , Ft. Pierce	5,000	5,000
5. University of Kentucky	5,000	5,000
6. North Carolina State University	10,000	10,000
Non-Recurring Germplasm Maintenance -	40,000	?
Seed Storage Equipment & Increase		
Plant Exploration	4,200	3,435 (?)
Extramural Support - Bamboo Gardens, Savannah	--	15,000
TOTAL	<u>\$295,800</u>	<u>\$234,035</u>

Appendix

PLANT EXPLORATION PROPOSAL

1. Exploration and Collection of Peruvian Cotton, Gossypium barbadense Series, in North Coast, Peru - James Vreeland, University of Texas.