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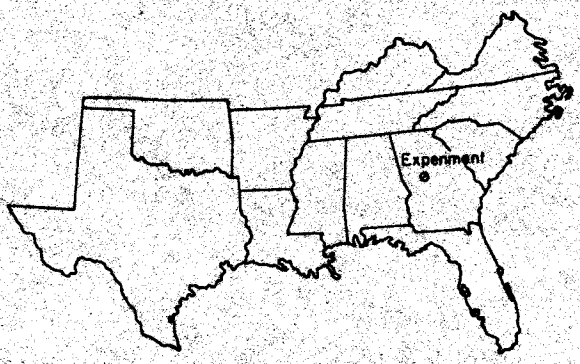
MINUTES OF THE MEETING OF THE S-9 TECHNICAL COMMITTEE ON THE INTRODUCTION, MULTIPLICATION AND EVALUATION OF NEW PLANTS FOR AGRICULTURAL AND INDUSTRIAL USES AND THE PRESERVATION OF VALUABLE GERMPLASM



U. S. Department of Agriculture
Northern Regional Research Center
Peoria, IL

July 28-29, 1981

Submitted by

A. J. Lewis, Secretary
S-9 Technical Committee

1. CALL TO ORDER

The meeting of the S-9 Technical Committee was called to order by Chairman James A. Kirby at 8:15 a.m. July 28, 1981, at the USDA Northern Regional Research Center in Peoria, IL.

2. INTRODUCTION OF ATTENDEES

Name	Address	Telephone
*David W. Bradshaw	Dept. of Horticulture Clemson University Clemson, SC 29631	803-656-3404
Kenneth D. Carlson	NRRC, Horticultural and Special Crops Lab 1815 N. University St. Peoria, IL 61604	309-685-4011
**David L. Coffey	Dept. of Plant and Soil Sciences University of Tennessee P. O. Box 1071 Knoxville, TN 37901	615-974-7391
*William T. Fike	Department of Crop Science North Carolina State University Raleigh, NC 27650	919-737-3267
*Philip J. Ito	Department of Horticulture University of Hawaii Hilo, HI 96720	808-935-2885
*J. S. Kirby	Agronomy Department Oklahoma State University Stillwater, OK 74078	405-624-6417
Robert Kleiman	Northern Regional Research Center 1815 N. University St. Peoria, IL 61604	309-685-0903
*A. J.Lewis	Horticulture Department VPI & SU Blacksburg, VA 24061	703-961-5019
*Gilbert R. Lovell	Coordinator, S-9 Project S. Regional PI Station Experiment, GA 30223	404-228-7255
A. J. Oakes	Germplasm Resources Laboratory Beltsville, MD 20705	301-344-3639
L. H. Princen	Northern Regional Research Center USDA 1815 N. University St. Peoria, IL 61604	309-685-4011

2. INTRODUCTION OF ATTENDEES (Continued)

Name	Address	Telephone
*Oscar D. Ramirez	Agriculture Experiment Station Department of Horticulture College of Agriculture University of Puerto Rico Rio Piedras, Puerto Rico	809-767-9705
*Roy E. Sigafus	Agronomy Department University of Kentucky Lexington, KY 40546	606-257-2644
*L. N. Skold	Department of Plant & Soil Science University of Tennessee P. O. Box 1071 Knoxville, TN 37901	615-974-7391
Cecil Smith	Northern Regional Research Center USDA 1815 N. University St. Peoria, IL 61604	309-685-4011
Dudley Smith	Texas Ag. Experiment Station College Station, TX 77801	713-845-8484
*Oliver E. Smith	Soil and Crops Sciences Department Texas A & M University College Station, TX 77443	713-845-4620
*Richard J. Stadtherr	Department of Horticulture Louisiana State University Baton Rouge, LA 70808	504-388-2729

*Members of the S-9 Technical Committee.
**Dr. Coffey will replace Dr. Skold who is retiring.

3. WELCOME

The S-9 Technical Committee members and visitors were welcomed by Dr. L. H. Princen, Chief, Horticultural and Special Crops Laboratory, and by Dr. W. H. Tallent, Director, Northern Regional Research Center.

4. APPROVAL OF MINUTES

Dr. Larry Skold moved approval of the 1980 meeting minutes as published. The motion was seconded and approved.

5. APPROVAL OF AGENDA

The agenda prepared by Chairman Kirby was modified to include a discussion of the S-9 project review, a proposal for combined regional meetings in 1983, and a discussion of instituting a user service fee for P.I.'s.

Agenda
S-9 Regional Technical Committee
Northern Regional Research Center
Peoria, IL

1. Call to order, 8:00 AM July 28, 1981
2. Introduction of attendees
3. Official Welcome: Dr. L. H. 'Bert' Princen, Chief, Horticultural and Special Crops Laboratory
4. Approval of minutes, 1980 meeting
5. Approval of agenda, 1981 meeting
6. Appointment of committees:
   A. Nominations
   B. Time and Place of Next Meeting
   C. Resolutions
7. Discussion of registration fee proposal
8. Discussion of travel priority to S-9 meetings
9. State Progress Reports and Research Plans
10. Other Agency Reports and Research Plans
11. Remarks from Administrative Advisors: Dr. Dudley T. Smith (representing Dr. C. R. Jackson)
12. Report from National Program Staff
13. Report from Southern Regional Plant Introduction Station
14. Exploration Proposals and discussion of proposal review committee process
15. Discussion of report format and duplication procedures
16. Committee Reports:
   A. Nominations
   B. Time and Place of Next Meeting
   C. Resolutions
17. Unfinished or new business
18. Adjournment, Wednesday noon
19. Tour of the NRRC facilities, Tuesday afternoon

6. APPOINTMENT OF COMMITTEES

Chairman Kirby appointed the following committees:

A. Nominations	David Bradshaw, Chairman Phil Ito Gil Lovell
B. Time and Place of Next Meeting	Larry Skold, Chairman Oliver Smith Jack Oakes
C. Resolutions	Roy Sigafus, Chairman Oscar Ramirez Dick Stadtherr

7. REGISTRATION FEE PROPOSAL

Dr. Larry Skold moved that a registration fee be charged annually for meeting participants to defray the costs of local travel, arrangements, etc. and banquet costs. The fee would be set annually by the Chairman, Secretary and representative for the host institution. The motion was seconded and passed.

8. TRAVEL PRIORITY TO S-9 MEETINGS

Concern was expressed regarding the problem some members are having in obtaining approval to travel to S-9 meetings. The problem seems acute among the federal agencies involved. A motion was made and passed to communicate this concern through the inclusion of a resolution in this year's minutes.

The possibility of the four regional committees meeting at a central location in 1983 was discussed. Oliver Smith moved that the S-9 Committee go on record in favor of such a meeting; the motion was seconded and passed. It was suggested that the regional coordinators and advisors communicate and report back to their respective members.

9. STATE PROGRESS REPORTS AND RESEARCH PLANS

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

Representative	State
(Not represented)	Alabama
J. L. Bowers *(in absentia)*	Arkansas
G. M. Prine *(in absentia)*	Florida
G. R. Lovell	Georgia
P. J. Ito	Hawaii
R. E. Sigafus	Kentucky
R. J. Stadtherr	Louisiana
(Not represented)	Mississippi
W. T. Fike	North Carolina

9. STATE PROGRESS REPORTS AND RESEARCH PLANS (Continued)

Representative	State
J. S. Kirby	Oklahoma
O. D. Ramirez	Puerto Rico
D. W. Bradshaw	South Carolina
L. N. Skold	Tennessee
O. E. Smith	Texas
A. J. Lewis	Virginia

10. OTHER AGENCY REPORTS AND RESEARCH PLANS

Dr. Bert Princen presented the Northern Regional Research Center report. Dr. Jack Oakes presented the Germplasm Resources Laboratory report. Reports submitted by P. K. Soderholm for the Subtropical Horticulture Research Unit and by L. N. Bass for the National Seed Storage Laboratory were presented *in absentia*. Copies of these reports are included in the Appendix.

11. REMARKS FROM ADMINISTRATIVE ADVISOR

Dr. Dudley Smith, representing Dr. C. R. Jackson, discussed several items. Among these were (1) possible service fees for P.I. users, (2) a joint meeting of the regional committees possibly in 1983, (3) the pending S-9 project revision, and (4) several items relative to funding and management.

12. NATIONAL PROGRAM STAFF REPORT

The report, prepared by Dr. Quentin Jones, was presented by Dr. Jack Oakes. A copy is included in the Appendix.

13. SOUTHERN REGIONAL PLANT INTRODUCTION STATION REPORT

Regional Coordinator Gil Lovell presented the report along with FY-82 budget information. A copy is included in the Appendix.

14. EXPLORATION PROPOSALS

Four plant exploration proposals are pending. They were reviewed by committee (Prine, Skold, and Lovell) and recommended in the following priority:

(1) Collection of Wild Bean (*Phaseolus*) Species in Mexico. George Freytag MITA.

(2) Peanut Plant Germplasm Exchange with People's Republic of China. Ray O. Hammons, USDA-ARS, Tifton, GA.

(3) Exploration and Collection of Peruvian Cotton, *Gossypium barbadence* Series, in North Coast, Peru. James Vreeland, University of Texas.

(4) Germplasm Collection of Tropical and Subtropical Forage Legumes in Southern China. Albert E. Kretschmer, University of Florida, Ft. Pierce, FL.

The latter of these proposals requires further work before it can be sent forward.

14. EXPLORATION PROPOSALS (Continued)

A motion was made by Dr. Skold and seconded by Phil Ito that a formal 3-member review committee be appointed to review exploration proposals. One member would rotate off each year and the senior member serve as chairman. Gil Lovell would be an Ex-officio member of the committee. The motion passed.

15. REPORT FORMAT AND DUPLICATION

The draft proposal for preparation of committee reports was accepted with one exception. Pages subsequent to page 1 should be identified in the upper page corner opposite the bound side of the report. Duplicate front and back, single-spaced, on white bond. Bring approximately 40 copies to the annual meeting. After making any necessary corrections, mail 250 copies to the Regional Coordinator. The Regional Coordinator will collate and distribute the combined reports.

16. COMMITTEE REPORTS

A. Nominations - David Bradshaw, Chairman of the Nominating Committee, placed in nomination Jeff Lewis as Chairman of the S-9 Technical Committee and Bill Fike as Secretary for the 1981-82 term. It was moved that the nominations be closed and Lewis and Fike be elected by acclamation. Seconded and passed.

B. Time and Place of Next Meeting - Larry Skold, Chairman of the committee, moved that the 1982 annual meeting of the S-9 Technical Committee be held in Blacksburg, Virginia, at a time to be arranged by the Chairman and Coordinator. Seconded and passed.

C. Resolutions - Roy Sigafus, Chairman of the Resolutions Committee, moved acceptance of the following resolutions:

Resolution 1

Be it resolved that the S-9 Technical Committee expresses its appreciation that L. H. 'Bert' Princen and associates for making the arrangements for the meeting at Peoria and for the excellent tour of facilities and explanation of projects in progress. We are appreciative of the special arrangements at Jumer's Castle Lodge for lodging and the banquet, and for the transportation to and from meetings and airport.

Resolution 2

Be it resolved that the S-9 Technical Committee expresses its appreciation for the warm welcome from Director William H. Tallent, former S-9 committee member. His continued interest in the activities of the committee is greatly appreciated.

16. COMMITTEE REPORTS (Continued)

C. Resolutions (Continued)

Resolution 3

Be it resolved that the S-9 Technical Committee expresses its appreciation to Jim Kirby, the out-going chairman, and to Jeff Lewis, secretary, for work done and to be done, and to Dudley Smith, for so ably substituting for advisor Curtis Jackson.

Resolution 4

Be it resolved that the S-9 Technical Committee expresses its recognition of the faithful service of recently retired Dick Hamilton, and the up-coming retirements of Dick Stadtherr and Larry Skold. A welcome is extended to Larry's replacement, Dave Coffey.

Resolution 5

Be it resolved that the S-9 Technical Committee requests that a concern of this committee be transmitted to the appropriate administrators relative to travel to S-9 meetings. In 1980, at least one member did not attend due to a 10-20% reduction in travel funds. This year four state and two federal representatives are absent.

The motion to approve the resolutions was seconded and passed.

17. UNFINISHED OR NEW BUSINESS

There was no unfinished or new business.

18. ADJOURNMENT

The meeting adjourned at 11:30 a.m. on July 29.

19. NRRC TOUR

A tour of the laboratory, arranged by Dr. Princen, took place Tuesday afternoon and included the following labs and programs: Seed Analyses and Computerization, Soybean Breeding Program, Antitumor and Natural Pesticide Research, Photosynthesis Research, Tissue Culture Research, Starch-Derived Chemicals, Vegetable Oils and Diesel Fuel, Kenaf Fiber Program, Hydrocarbon Screening, Industrial OilSeed Crops, Natural Toxicants, and Culture Collection.

APPENDIX

State and Federal Agency Reports

Written reports are attached in the following order:

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

National Program Staff
Subtropical Horticulture Research Station
Germplasm Resources Laboratory
National Seed Storage Laboratory
Northern Regional Research Center
Southern Regional Plant Introduction Station

ALABAMA S-9 PLANT INTRODUCTION ACTIVITIES
July 1980-July 1981

Carl S. Hoveland, Agronomy and Soils Department
Auburn University, Alabama 36849

Plant introductions delivered in 1980-81 included 102 *Citrullus* species for seed increase at Auburn

HORTICULTURAL CROPS
(no reports)

AGRONOMIC CROPS

Tall Fescue (C. S. Hoveland and R. L. Haaland)

Triumph, a new tall fescue (*Festuca arundinacea*) cultivar, has been approved for release by Auburn University and seed will be produced and marketed on an exclusive basis by one company. Triumph tall fescue offers several distinct advantages over the commonly grown Ky-31 cultivar. Winter forage yields of Triumph have averaged 82% more than Ky-31 with differences being even greater at some locations. Late spring production is somewhat lower than Ky-31, resulting in similar total annual yield. Triumph has more open sod, offering less competition to associated clovers. Seed of Triumph has to date been free of the *Acremonium* fungus associated with fescue toxicity. This may account for the high average daily gain of 2.1 lb. on steers grazing Triumph. Higher stocking rate on Triumph resulted in substantially more beef per acre than on Ky-31. Triumph is not cold hardy north of Alabama so it is adapted to the Lower South where winter survival is not a problem.

Triumph was developed by a combination of mass and recurrent selection. Clonal selections were made from PI 231560 (Morocco), 231561 (Morocco), 231562 (Morocco), 251823 (Italy), 234719 (France), 331557 (Morocco), and 297903 (Australia). Breeders seed will be maintained by Auburn University. A publication with small plot and grazing data on this cultivar is now being prepared.

Phalaris (C. S. Hoveland and R. L. Haaland)

Oasis, a new phalaris (*Phalaris aquatica*) cultivar, has been approved for release by Auburn University and seed will be produced and marketed exclusively by one company. Oasis phalaris is a cool season perennial grass adapted in the Lower South and has several valuable characteristics. Forage yields and nutritive quality are higher than Ky-31 tall fescue in autumn and winter. Animal daily grain and daily cow lactations when grazing Oasis phalaris is equal to that on annual ryegrass and generally superior to that obtained on tall fescue. It is a drought-tolerant branch-type grass that offers less competition than tall fescue to associated clovers. Oasis, because of nematode susceptibility, is best adapted to clay or wet soils from about 33°N latitude southward except in mild pacific Coast climate areas.

Oasis was developed by a combination of mass and recurrent selection. Clonal selections were made from PI 240280 (Portugal), 236482 (Australia), 240284 (Italy), 207960 and 207960 (South Africa), 219636 (Iraq), and 240242 (Algeria). Breeders seed will be maintained by Auburn University. A publication on this cultivar is now being prepared.

S-9 Technical Committee Report
Arkansas Agricultural Experiment Station
Fayetteville, AR 72701

Period of July 1, 1980 to July 1, 1981

Mr. Hazell Reed, in the department of Horticulture and Forestry is screening the following plant accessions of Phaseolus vulgaris: P.I. 150414 from (El Salvador), P.I. 151393 (Columbia), P.I. 165426 (Mexico), P.I. 207259 (Columbia) and P.I. 416389 (Turkey) and these plant accessions of Vigna unguiculata: P.I. 115679 (England), P.I. 145198 (Australia), P.I. 147078 (Brazil), P.I. 147077 (Brazil) and P.I. 152194 (Paraguay) for biological nitrogen fixation and host strain specificity with selected rhizobia bacteria.

Dr. G.L. Klingaman has been evaluating at the Main Experiment Station several different ornamental plants for suitability for Northwest Arkansas. Most of the specimens are still too small for evaluation as to suitability. The following brief remarks are noteworthy:

Ilex micrococca (NA40182) - did not survive winter of 1979-80, a relatively mild one.

Sedium spurim - RayaPink (NA41643) growing but has not flowered up to this time. Does not possess much to recommend it for this area.

Abies sachalinensis (P.I. 227618) - is now ready for out planting in 1982.

Cleyera ochnacea (P.I. 436991) - has survived in container production area for two winters under microfoam.

Other items too small for evaluation at this time are as follows:

Alnus pendula (NA44982), Carpinus laxiflora (NA45224), Fagus crenata (NA45009), Fraxinus longicuspis (NA44949), Heteropappus hispides (NA45242) dead, Siphonosmanthus delavayi (NA36268), Vaccinium bracteatum (NA45482), Buxus microphylla Koreana (P.I. 319277 (NA24918), Buxus sempiverens P.I. 242520 (NA18608) and Fauria crista-gali (NA48819).

Mr. D.H. Wallace of the Atkins Pickle Company, Atkins, Arkansas grew out four plant accessions of Capsicum annuum L. and only one accession P.I. 249542 represented the type Mr. Wallace was looking for on the basis of fruit shape but it was too hot to meet the requirements for the product the company wanted to use in their trade.

Chick Peas: Our 1980 plans on a study involving three planting dates and four different plant spacings within the row were not successful due to the very high temperatures. We did harvest enough seed to maintain the lines and these are being increased this year on the Main Station.

July, 1981

1981 Florida Report to S-9 Regional Technical Committee

Prepared by G. M. Prine

Scientists from many disciplines in Florida continue to receive and evaluate plant introductions obtained from or through the Southern Regional Plant Introduction Station. Test plantings of various introductions are widely scattered throughout the state. In this report, the investigator and where he is located in the state, will be given along with information about promising introductions.

Dr. Steven G. Pueppke, Plant Pathology Department, Gainesville, reports that during the past year I have screened 4,556 PI's of Arachis hypogaea and 65 introductions of other Arachis species for the presence or absence of the peanut seed lectin (PNL). Lectin was present in all of the A. hypogaea lines, but it was absent in one A. villosa and 3 A. spp. lines (PI 261871, 338287, 338292, and 338294).

PNL from 116 A. hypogaea lines also was purified and resolved into multiple molecular forms (isolectins) by isoelectric focusing. Three different isolectin profiles were identified and all 116 of the lines were classified accordingly. The data have been written up and submitted to Archives of Biochemistry and Biophysics.

Noel R. Lake, University of Florida, Physical Plant Division, Gainesville reports that perennial peanuts (Arachis sp.) interplanted with Florida turfgrasses can provide a lower maintenance, summer-flowering ground cover. Energy is conserved by less fertilizer requirements, less mowing frequency, and higher height of cut.

Arachis glabrata 'Arblick' was planted in front of the new Horticultural Sciences Building on the University of Florida campus during early spring of 1979. Then the area was seeded with centipedegrass seed. Now in the early summer of 1981 both perennial peanuts and turfgrass are well established and seem to be growing in the symbiotic relationship we had anticipated. Since the low nitrogen fertilizer requirements of centipede seem to be satisfied by the leguminous perennial peanuts and since this lawn area soil was well prepared with superphophate and colloidal phosphate, only a little potash

fertilizer is required to maintain both grass and peanuts in a slow, steady, but healthy state of growth.

Some Bahiagrass areas on Campus were planted at about the same time with other cultivars of Arachis glabrata. Incidentally, the Florigraze cultivar is preferred by wild rabbits.

This grass-peanut combination does not provide the pure stands of grass that turf specialist prefer, but the combination seems to thrive at the level of culture provided by most homeowners, and the yellow flowers all summer are a beautiful bonus.

Dr. Jay Scott, Assistant Professor of Vegetable Crops, Agricultural Research and Education Center, Bradenton, responded that he has some difficulty in giving the total picture as to Lycopersicon P.I. use since he just started working here on July 1. There was not much new activity with regard to ordering and screening new P.I. accessions. Historically, of course, P.I.'s have been invaluable sources of germplasm for Florida tomato breeding for disease resistance, insect resistance, and quality work.

The following P.I.'s were screened (or used as controls in screening breeding lines) during the last year for the purpose described:

P.I.#	Project
114968	Breeding hot set tomatoes
257489	Breeding hot set tomatoes
289308	Breeding hot set tomatoes
29443	Breeding hot set tomatoes
34115	Breeding hot set tomatoes
303720	Breeding hot set tomatoes
272655	Breeding high soluble solids
263713	Breeding for high titratable acids
126436	Breeding for high titratable acids
303720	Breeding for high Vitamin C
270246	Breeding for high Vitamin A
126445*	Breeding for leafminer resistance - rated good
126449*	Breeding for leafminer resistance - rated good
128230*	Breeding for leafminer resistance - not good
140403*	Breeding for leafminer resistance - susceptible check

* Work carried out by Dr. D. J. Schuster, Entomologist/Vegetable Crops

Dr. R. B. Volin, Associate Professor of Vegetable Crops at Agricultural Research and Education Center, Homestead, reported on the status of tomato breeding there.

The tomato breeding program in Homestead has utilized tomato P.I. lines primarily for disease resistance screening. The screening project was started in 1969-70 with the main objective being the search for resistance to brown root rot (BRR) Pyrenochaeta lycopersici. We have narrowed our use to the few listed at the end of this report and through backcrossing have now several advanced tomato lines ready for release as multiple disease resistant breeding lines.

We have found that the highest resistance to P. lycopersici exists in the L. hirsutums and L. peruvianums, however, recovery of market traits and maintaining multiple diease resistance from such wide crosses is very difficult. We've found BRR resistance to be quantitative and, in addition, have had very limited success with the cross of L. esculentum x L. peruv. Several of these tomato species have exceptionally large and robust root systems which I've found is heritable.

Another project I've been working on involves screening some of these same P.I.'s for resistance to tomato bacteria leafspot. Again, it looks like we may be dealing with additive factors with differences in resistance being associated with degree of tolerance. There doesn't seem to be any high level resistance genes in lycopersicon for this disease as there are for Fusarium wilt, gray leafspot or nailhead spot.

Dr. Volin lists tomatoes having outstanding resistant to Brown Root Rot as follows:

225	P.I. 127829 - DI	L. peruvianum var. humifusium a.
226	P.I. 127805 - DI	L. pinpinellifolium
227	P.I. 126445 - DI	L. hirsutum
228	P.I. 269140 - DI	L. escuventum x L. hirsutum
229	P.I. 127826 - DI	L. hirsutum
230	OND KVFN - DI	L. esculentum x L. hirsutum

P.I.'s with large root size were:

231	P.I. 270278	L. esculentum
232	P.I. 142880	L. esculentum
233	P.I. 91458 - DI	L. esculentum
234	P.I. 280591	L. esculentum x hirsutum

Other P.I.'s used in Dr. Volins breeding program:

235	P.I. 126446	L. hirsutum
236	720518	L. hirsutum
237	Mugorlan	L. glandulosum
238	P.I. 203231	L. esculentum
239	P.I. 262906	L. esculentum
240	P.I. 260397	L. esculentum
241	P.I. 143524	L. punpenellifolium
242	P.I. 128645	L. perunanum
243	P.I. 128286	L. esculentum
244	P.I. 127817	L. esculentum
363	P.I. 390517	L. hirsutum vs. glabratum
364	P.I. 126449	L. hirsutum vs. glabratum

P.I.'s used for bacterial leaf spot breeding:

P.I. 272664	L. spp.
P.I. 140403	L. spp.
P.I. 127805 - DI	L. pinpinellifolium

P.I.'s used for insect resistance were:

P.I. 126449	L. hirsutum vr. glabratum

Dr. David Baltensperger, White Clover and Forage Legume Breeder, Agronomy Department, Gainesville reported that various plant introductions of Alysicarpus vaginalis, A. rugosus, A. ovalifolium, A. monilifer, and A. longifolius are currently being evaluated at Gainesville, FL for nematode resistance and other agronomic traits. Alysicarpus monilifer (CPI 40612) appears to have excellent seedling vigor. The PI material included and respective countries of origin are shown in Table 1.

Table 1. Alysicarpus species evaluated at Gainesville, FL., in 1981.

Species	P.I. No.	Country
vaginalis	158805	Guinea
vaginalis	189493	India
vaginalis	217904	India

Table 1. Alysicarpus species evaluated at Gainesville, FL., in 1981. continued.....

Species	P.I. No.	Country
vaginalis	219829	Ceylon
vaginalis	322296	Brazil
vaginalis	316125	Australia
vaginalis	257667	Australia
vaginalis	CQ 770	Australia
vaginalis	Q 7005	Australia
vaginalis	CPI 34149	Australia
vaginalis	CPI 33216	Australia
vaginalis	CPI 33959	Australia
vaginalis	CPI 60170	Australia
rugosus	189492	India
rugosus	200207	Kenya
rugosus	257666	Australia
rugosus	283178	India
rugosus	286530	India
rugosus	CPI 3769	Australia
rugosus	CPI 29736	Australia
ovalifolium	316124	Australia
monilifer	CPI 40612	Australia
longifolius	CPI 16671	Australia

Dr. Dan Gorbet, Peanut and Sorghum Breeder, Agricultural Research Center, Marianna gave the following report on peanut (Arachis hypogaea) introductions being evaluated and/or utilized in his program. PI's 261893, 261906, 262090, 196658, 162539, and selections from prior crosses with PI's 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 PI's, as previously reported.

Dr. David Knauft, Peanut Breeder, Agronomy Department, Gainesville reported approximately 300 peanut PI's were screened for resistance to Meloidogyne arenaria, rootknot nematode. Although significant differences in resistance were found, these differences were not of a magnitude that would be useful to plant breeders.

Crosses between Florunner and seven PI's reported in the literature to be resistant to rust (Puccinia arachidis) are currently being evaluated in the F_2 generation to determine inheritance of resistance. These PI's are 314817, 298115, 315608, 381622, 341879, 350680, and 405132.

Dr. Al Norden, our other peanut breeder in Florida, uses lots of PI's in his program but had nothing new to report this year.

Dr. Ken H. Quesenberry, Forage Breeder, Agronomy Department, Gainesville reported that the experiment on the effect of four rest intervals (3,5,7, and 9 weeks) between grazing on P.I.'s 299993, 299995, 349753, 364874, 364884, 364887, 364888, and 365509, Hemarthria accessions. Most genotypes were lower yielding at the three week grazing interval. P.I. 364888 was generally the highest yielding entry at all grazing frequencies and was equal to or not significantly different from other lines in persistence at all grazing frequencies. A grazing experiment comparing seasonal animal gain on 364888 vs. Pensacola bahiagrass was initiated in 1981.

Resistance in Aeschynomene and Desmodium species to the southern root knot nematode, Meloidogyne incognita, was determined in 1980-81. Florida common A. americana, and P.I.'s 421680 and 420304 were found to be resistant, but other accessions including P.I. 420313, 420314, and CIAT numbers 2868, 9666, 9881 and 9882, were susceptible. 'Florida' carpon desmodium, D. heterocarpon was susceptible, but accession IRFL 1699 and 1946 appear to be resistant. The inheritance of this resistance is currently being studied. Segregating generations from crosses between a number of A. americana introductions are currently being evaluated.

Victor E. Green, Jr., Sunflower Agronomist, Agronomy Department, Gainesville reported that he is using numbered PI Introductions and derivitives from them in a sunflower, Helianthus spp. testing and improvement program at the University of Florida, in cooperation with the USDA-ARS and with private seed companies. These include both oilseed and confectionery accessions. At present, we are looking for tolerance or resistance to mainly the Alternaria black spot disease caused by Alternaria helianthi, the main obstacle to sunflower production in the Southeastern United States. Recently, this disease has been reported in the main sunflower producing area of the Red River Valley of MN, ND, and SD. Accessions include those collected from USSR, Romania, Yugoslavia, Africa, Canada, Spain, Argentina, and France. It would be burdensome to trace back to PI numbers at this time. But we are presently screening about 600 sorts, all of which trace back to PI accessions. The oil content of the sunflower achenes has been raised from about 25% to about 48% oil in the achenes by weight through the use of these accessions.

Dr. O. Charles Ruelke, Forage Crops Specialist, Agronomy Department, Gainesville reported these items.

1. In an extensive evaluation of nine new hybrid bermudagrasses, Tifton Hybrid 81 (Coastal X Kenya 61) X Berlin, which is a hybrid from introduced material from Kenya and Germany, has shown superior yield potential, cold tolerance, and satisfactory persistence under mob grazing and hay harvesting in Florida. Subject to satisfactory performance under grazing, it will be released as a new cultivar.
2. From eight genotypes selected from 53 selections and introductions of Hemarthria species, the tetraploid introductions 'Bigalta' and P.I. 364888 had markedly higher yields at the 5 and 9 week grazing frequency and P.I. 364888 was generally the highest yielding entry at all grazing frequencies and was not significantly lower in IVOMD than Bigalta.
3. Four Hemarthria introductions, P.I. 299993, P.I. 299995, P.I. 349753 and P.I. 299888 are being studied for their carbohydrate food reserves in response to fertilization and defoliation.
4. Repeated efforts to topseed red, white, and arrowleaf clovers in productive stands of Hemarthria introductions P.I. 299993, P.I. 299995 and P.I. 299888 were of limited success. Investigations indicate the possibility of allelopathy.
5. Limpograss (Hemarthria spp) introductions P.I. 299993, P.I. 299995, P.I. 349753 and P.I. 364888 were evaluated for their regrowth in the dark following cutting frequencies of 2.5, 5, 10, 15 and 25 week intervals. Introductions with greater stubble weights were significantly affected by cutting treatments.

Paul Mislevy, Agronomist, Agricultural Research Center, Ona has expanded the planting of the introduction "Cane Patch" Cynodon nlemfuensis Vanderyst var nlemfuensis. This introduction performed well regarding yield, quality and persistence in a small plot grazing experiment. Further studies will be conducted to determine species persistence under variou. grazing pressures and plant heights.

In another small plot grazing study 6 Hemarthria introductions are being tested under various grazing frequencies to monitor yield, quality, persistence and non-structural carbohydrates, three introductions appear to be persisting quite well under the 9 and 12 week grazing frequency on the south Florida flatwood soils. The above 3 entries have good digestibility, are competitive against common bermudagrass and establish rapidly.

Dr. Leonard S. Dunavin, Associate Professor of Agronomy, Agricultural Research Center, Jay, had these comments:

1. Three introductions of rabbitfoot clover (Trifolium arvense L.) yielded dry forage as follows in 1980-81: P.I. 244322 yielded 6340 kg/ha, P.I. 120076 yielded 4770 kg/ha, and P.I. 258454 yielded 4280 kg/ha. The latter has been utilized in various small trials at ARC, Jay for several years.
2. The limpograss P.I. 364888 Hemarthria altissima has been placed into a new trial with Tifton 44 bermudagrass where several management regimes will be imposed on each grass.
3. Pennisetum orientale P.I. 219610 is being continued in trials with 'Llano' buffelgrass.
4. Insects decimated Arachis benthamii P.I. 338282 in the fall of 1980, and 2/3 of the plots at ARC, Jay failed to produce any living material of this peanut in 1981 with less than 1/2 stand in the remaining 1/3 of the plots. Arbrook (A. glabrata) also lost stand while Florigraze (A. glabrata) looks very good in 1981.
5. Hemarthria altissima P.I. 349752, which had looked good in trials at ARC, Jay, was very severely damaged by drought in the summer of 1980 with a great loss of stand.

Dr. Gordon M. Prine, New Crops and Plant Introduction Specialist, Agronomy Department, Gainesille announces the commercial kickoff of Florigraze rhizoma peanut (chance seedling out of P.I. 118457), Arachis glabrata Benth. Enough planting material has been given to commercial rhizome producers to plant 150 acres. About 30 acres of commercial plantings will be available to be dug this winter, 1981-82. This should plant another 900 to 1000 acres. Enough planting material should be available to plant 2000 acres in winter of 1982-83, and 5,000 acres in 1983-84 and 25,000 acres in 1984-85. We have recently discovered that the Bermuda King sprig harvester and planter can be used to harvest and plant Florigraze rhizomes.

Florida Reseeding annual ryegrass (Lolium multiflorum) has been renamed Florida 80. Florida 80 ryegrass has germplasm from Gulf, Magnolia and Florida Rust Resistant ryegrasses which were derived from one or more plant introductions.

Arbrook perennial peanut (Arachis spp. P.I. 262817) continued to be superior for hay, in trials at Gainesville. Winter kill of Arbrook in panhandle of Florida last winter suggests this accession cannot be planted as far north as Florigraze. We are increasing Arbrook for possible future release with USDA, SCS.

Because of the much larger rhizomes, Arbrook promises to be harder to propagate than Florigraze. Large plant die-offs occurred in Arachis benthamii P.I. 338282 from yet unknown causes.

A part of my program is now focused on high-energy producing crops. I am concentrating on the annual regenerating perennials such as elephant grass.

We grew out over 100 accessions of fababean (Vicia faba) over the last winter. Fababeans seem to be extremely succeptable to white mold, (Sclerotium rolfsii).

Selection continues on pigeonpea (Cajanus cajan) crosses received from ICRISAT in India. A number of F_7 lines are being tested across North Florida for grain in 1981.

Dr. Ken Buhr, Plant Breeder, Agronomy Department, Gainesville, is beginning a breeding program on pigeonpeas for grain.

Dr. James M. Crall, Watermelon Breeder, Agricultural Research Center, Leesburg, reports that this year we initiated projects to develop resistance to gummy stem blight (Mycosphaerella citrullina [C. O. Smith] Gross.) and mosaic (WMV 2) in watermelon. In the former project we are using P.I. 189225 and P.I. 271778 as sources of resistance. In the latter project we are using an African accession obtained from Dr. Raymon Webb at Beltsville as "Egun" as the resistance source. We are uncertain as to the origin of "Egun" but think it might be related to the S-9 project.

Dr. Stanley C. Schank, Grass Breeder, Agronomy Department, Gainesville announces that after several more years of evaluation, a Digitaria hybrid has been formally released from the University of Florida. The forage grass is named 'Survenola' and has been tested extensively in Surinam, Venezuela and many other tropical locations for the past 15 years. The grass was most often tested as X46-2 and appears to be limited in adaptation to upland sandy soils in Florida, and as a hay crop. Parents of the cross were D. sp P.I. 299892 and D. valida P.I. 299850.

Plant Introduction Publications during 1980-81

1. Adjei, M. B., P. Mislevy and C. Y. Ward. 1980. Response of tropical grasses to stocking rate. Agron. J. 72:863-868.
2. Christiansen, Scott, O. C. Ruelke, and R. O. Lynch. 1981. Regrowth in darkness as influenced by previous cutting treatments of four limpograss genotypes. Soil & Crop Sci. Soc. of Fla. Proc. Vol. 39. (in press).
3. Mislevy, P. and P. H. Everett. 1981. Performance of 16 subtropical grasses under various management practices. Agron. J. Vol. 73. July-August.
4. Prine, G. M., L. S. Dunavin, J. E. Moore and R. D. Roush. 1981. 'Florigraze' rhizoma peanut, a perennial forage legume. Univ. of Fla. Agr. Exp. Sta. Circ. S-275. 22p.
5. Quesenberry, K. H., W. R. Ocumpaugh and O. C. Ruelke. 1981. Hemarthria altissima - A pasture grass for the tropics. Proc XIV International Grassland Congress. In Press.
6. Quesenberry, K. H. and W. R. Ocumpaugh. 1981. Forage potential of Aeschynomene species in north central Florida. Soil & Crop Sci. Soc. Florida Proc. In Press.
7. Ruelke, O. C. and K. H. Quesenberry. 1981. Topseeding winter clovers in limpograss, potentials and problems. Soil & Crop Sci. Soc. of Fla. Proc. Vol. 39. (In press).
8. Volin, R. B. and Leandro Ramos. 1980. The association of brown root rot resistance with yield components and root weight among tomato selections grown in infected and noninfected soil in Dade County, Florida. Proc. Fla. State Hort. Soc. 93:224-226. 1980.

Georgia Report to S-9 Technical Committee

July 28-29, 1981

The following are reports received from scientists who are utilizing plant introductions in their research and plant breeding programs.

I. J. H. Bouton, Agronomy Department, UGA, Athens, GA

Work is continuing on selection of tall fescue, Festuca arundinacea Schreb., for yield and persistence in the lower south. The base for this selection program was the USDA world collection of tall fescue. We are currently in the third cycle of a recurrent selection program. There has been considerable mortality of the material. The remaining lines trace back to 50 of the original 181 introductions.

A recurrent selection program was also begun to develop alfalfa, Medicago sativa L., with better grazing persistence. The base of this program was, in large part, the USDA world collection. We are currently in the first cycle of selection in this program.

II. Ray O. Hammons, Wm. D. Branch, and A. C. Mixon, Coastal Plain Experiment Station, Tifton, GA

The Evaluation, Utilization, Multiplication, and Preservation of Peanut Introductions from Georgia in 1980-81[1/]

EVALUATION:

Twenty Arachis hypogaea L. and two Arachis species introductions with reported resistances to either leafspot fungi and one susceptible introduction were scored for disease reaction under natural field conditions in 1980 at the agronomy research farm near Tifton, GA. The two wild species, PI 336985 (A. villosulicarpa) and PI 338279 (A. stenosperma) showed no visable signs of leafspot infestation.

Since the predominant fungus was Cercosporidium personatum (Beck. and Curtis) Deighton, the A. hypogaea entries with early leafspot resistance in general and the one check proved to be more susceptible than introductions with late leafspot resistance.

Twelve peanut introductions and seven other genotypes were also evaluated for percent oil and protein as well as additional characteristics with agronomic importance (3). PI 258491 (Virginia Red) contained 55.4% oil which was the highest and 22.1% protein which was the lowest content among the ninteen entries. PI 405933 (A. monticola) had the highest protein level with 29.2%.

[1/] Contribution to the regional S-9 project from the USDA-ARS and Univ. of Georgia cooperative peanut breeding programs, Dept. of Agronomy, Coastal Plain Experiment Station, Tifton, GA.

Host-suitability by the fall armyworm, Spodoptera frugiperda (J. E. Smith), was determined among fourteen species of Arachis including twelve introductions (4). PI 261851 (A. burkartii) and PI 261872 (A. villosa) were considered the least suitable hosts and classified as resistant.

Fifty-seven new introductions were used in a screening procedure for Aspergillus flavus (Link) Fries resistance. This identification phase constitutes an intricate part of the overall aflatoxin breeding program.

UTILIZATION:

Six peanut germplasm lines, CBR-R1, CBR-R2, CBR-R3, CBR-R4, CBR-R5, and CBR-R6, with resistance to the Cylindrocladium black rot disease caused by the pathogen, Cylindrocladium crotalarie (Loos) Bell & Sobers, were released in March, 1981 (2). These lines were developed by repeated single-plant selection from the following introductions: PI 268573, PI 331326, PI 336931, PI 339974, PI 362137, and PI 362142, respectively.

Reciprocal crosses between PI 109839 and PI 341879 resulted in flop phenotypes from complementary recessive gene recombinations (1). The trait was found to have digenic inheritance with a 1/16 distribution in the F_2 generation.

MULTIPLICATION:

One hundred and eighteen recent introductions were increased in singular two-row plots. During the growing season, various morphological and agronomic traits were classified for future descriptive referencing.

PRESERVATION:

The majority of fresh seed from these plant introductions have been returned to the SRPIS for storage and preservation.

1981

S-9 TECHNICAL COMMITTEE REPORT

Agency: Hawaii Institute of Tropical Agriculture and Human Resources
Submitted By: P. J. Ito
Address: Beaumont Research Lab, 461 W. Lanikaula St., Hilo, HI 96720

Accession User: J. L. Brewbaker
Address: Department of Horticulture, University of Hawaii, Honolulu, HI 96822
Nature of Research: Collecting and Testing Leucaena Species and Nitrogen Fixing Trees
Progress to Date: Collection of Leucaena species has been expanded in the past four years from 378 to 722 accessions. All are planted at Waimanalo, Hawaii. Seed collection of Nitrogen-Fixing trees have been started with a total of 150 accessions drawn from such tropical genera as Acacia, Mimosa, Prosopia, Calliandra and Sesbania.
Publication: None
Cultivar Release: None

Accession User: Hawaii Foundation Seed Facility, J. Chung-Manager
Address: CTAHR, University of Hawaii, 41-696 Nonokio St., Waimanalo, HI 96745
Nature of Research: Co-sponsored by University of Hawaii and the Hawaii Crop Improvement Association, the Hawaii Foundation Seed Facility increases, processess and stores seeds of major Hawaiian field crops. Initial seed collections are confined to maize, sorghum, leucaena and other tropical leguminous trees.
Progress to Date: Major germplasm include 1) tropical maize inbreds composites and cultivars; 2) Inbreds, hybrids, composites and cultivars of field and high lysine corn, popcorn and also sweet and supersweet corn bred at the University of Hawaii; 3) world collection of leucaena spp.; and 4) selected species of tropical leguminous trees.
Publication: None
Cultivar Release: None

Accession User: R. W. Hartman and B. S. Kim
Address: Department of Horticulture, University of Hawaii, Honolulu, HI 96822
Nature of Research: Breeding for pepper resistant to bacterial spot and lettuce resistant to spotted wilt virus and seed increase of Phaseolus species.
Progress to Date: Twelve resistant PI pepper lines were crossed with 'Keystone' and F_1 Hybrids of PI224451 and PI271322 showed resistance equal to the resistant parent, while other hybrids were intermediate between parents. Of the 531 accessions of lettuce tested for spotted wilt resistance, PI167128, 342510, 342517 & 342526 showed resistance. Five hundred lines of bean seeds were received from Pullman for increase during the winter in Hawaii.
Publication: None
Cultivar Release: None

Accession User: Hawaii Plant Materials Center, Robert J. Joy
Address: P. O. Box 236, Hoolehua, HI 96729
Nature of Research: The testing of plants for use in conservation work
Progress to Date: See Table 1
Publications: None
Cultivar Released: None

TABLE 1. Progress of species being tested

Species	Hawaii Accession or PI no.	Purpose	Outstanding Characteristics
Canavalia Kauensis	HA-3879	Dry land pasture	Low-growing, drought tolerant legume
Cenchrus ciliaris (Western Australia Buffelgrass)	HA-4196	Dry land pasture	Highly productive, drought tolerant
Cenchrus setigerus (Birdwood grass)	HA-4198	Dry land pasture	Highly productive, drought tolerant, beardless seed
Crotalaria juncea (Sunn Hemp)	HA-6	Green manure legume	Vigorous grower, nematode resistant, non-toxic
Desmodium triflorum (Three-flowered Beggar weed)	PI-188882	Ground cover	Low-growing, low maintenance
Digitaria valida (Digitgrass)	PI-299877	Erosion control and beautification	Attractive blue color
Erythrina fusca var. fastigata	HA-3853	Landscape, windbreak	Fast-growing attractive
Glycine wightii (Glycine)	PI-224980	Dry land pasture	Nutritious palatable, drought tolerant legume
Hemarthria altissima ('Greenalta" Limpograss)	PI-299994	Pasture	Productive and palatable
Hemarthria altissima ('Bigalta' limpograss)	PI-299995	Pasture	Productive and palatable
Leucaena leucocephala (Giant leucaena)	PI-263695	Biomass, windbreak	Drought tolerant, vigorous, productive
Panicum maximum (guineagrass)	PI-156074	Pasture	Fine leaves palatable
Panicum maximum var. trichoglume	PI-259549	Pasture	Drought tolerant, palatable, good seed production
Paspalum hieronymii (Hieronymii)	PI-310108	Ground cover on heavy use areas and orchards	Low-growing, mat-forming & wear resistant
Paspalum vaginatum (Seashore paspalum)	HA-190	Pond-bank stabilizaiton	Salt and flood-ing tolerant
Pinus eldarica (Afganistan pine)	HA-4183	Windbreak, Ornamental	Fast, vigorous growth
Sesbania tormentosa ('Ohai)	HA-3555	Dry land pasture wildlife	Drought tolerant legume, browse-type growth

Accession User: P. J. Ito and R. A. Hamilton
Address: Department of Horticulture, 461 W. Lanikaula Street, Hilo, Hawaii 96720
Nature of Research: Introduction and Testing of Tropical Fruits & Nuts
Progress to Date: Introduced 67 different fruits and nuts, mostly tropical and from Brazil. Other introduction from Brazil have been planted at two locations. Special projects on improvement by breeding of avocado, guava, macadamia and papaya, with emphasis on disease resistance are being done with progeny population being grown.
Publication: None
Cultivar Release: Macadamia HAES No. 294 = 'Purvis' and No. 788 = 'Pahala'; lychee BR10T2 = 'Poamoho'

KENTUCKY ANNUAL REPORT TO S-9 TECHNICAL COMMITTEE
Peoria, Illinois July 28-29, 1981

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

Germplasm obtained through plant introduction sources has contributed to three rather substantial competitive grants awarded to Kentucky researchers. Dr. G. A. Rosenthal obtained over 650 miscellaneous legumes accessions. He is now in the second year of a four-year grant to characterize toxic secondary amino acids present in these legume seeds.

John Snyder has reports on legumes and tomatoes. His work on mite resistance in tomatoes will be continued on grant funds. Although he received several pepper accessions, he has no report on this work but has stored seed for future use.

No report is given on tissue culture studies with legumes. However, efforts will be expanded with grant funds on hybridization of Trifolium species.

It may take several years before positive results are obtained from accessions. Dr. R. C. Buckner has nothing new to report on giant fescue, but he is still using materials obtained in 1967. Results of use of more recent accessions are given below from several workers.

Accession User: Dean E. Knavel

Address: Department of Horticulture and Landscape Architecture, University of Kentucky, Lexington, Kentucky 40546-0091.

Nature of Research: Evaluation of muskmelon (Cucumis melo) germplasm for resistance to gummy stem blight.

Progress to Date: None of the P.I.'s showed resistance by the leaf-disc method of screening at 10^6 spore concn., but at 10^4 the following P.I.'s showed possible resistance: 313969, 266928, 266935, 436533, 323498, and 140471. These are presently growing in the field for observation for field resistance.

Accession User: Robert E. McNiel

Address: Department of Horticulture and Landscape Architecture, University of Kentucky, Lexington, Kentucky 40546-0091.

Nature of Research: Evaluation of woody plants for use in the landscape.

Progress to Date:

(1) Betula ermoni subchordata (PI 256254) was planted in Lexington on April 21, 1959. Two plants survived until 1978-79 before dying from bronze birch borer infestations. Both plants were over twenty feet in height and quite colorful during the winter months when their white bark was exposed. The tree which died in 1978 was 11 inches in diameter near the soil line. The tree which died in 1979 was 15 inches in diameter near the soil line.

(2) A rooted cutting of Viburnum dilatatum 'Erie' was planted out in Lexington in 1976. In 1981 it had developed into a shrub that was 55 inches tall and 60 inches wide. Fruit development has been abundant and displaying a colorful red in the fall. Fall foliage color presents no special quality. (PI 347259 NA 32226)

(3) A rooted cutting of Lonicera pileata yunnanensis was planted out in Lexington in 1973. On March 24, 1976, the plant measured 13 inches high and 32 inches wide. In 1981, the plant was 65 inches high and 120 inches wide. Width had increased by layering of the lateral branches. The plant appears to be a good dense honeysuckle with a lower growth habit than normal for honeysuckle. (PI 367886)

(4) Planted in Lexington as a seeding in 1975, by March 24, 1976, a single plant of Crataegus monogyna (PI 358404 NA 36765) was 72 inches tall and 18 inches wide. In 1981, the tree had reached 168 inches in height and 108 inches in width. The tree is moderately colorful when its white flowers are in full bloom in May. Fruit production is limited. The tree has experienced some Japanese beetle damage.

(5) A rooted cutting of Buxus microphylla 'Intermedia' (PI 326543) was planted out in Lexington in 1973. It was grown adjacent to B. m. 'Koreana' and B. m. 'Wintergreen'. Form, texture, and color of B. m. 'Intermedia' comes closer to resembling Buxus sempervirens than either B. m. 'Koreana' or B. m. 'Wintergreen'. 1976-78 when B. sempervirens was receiving considerable foliage and stem damage.

(6) A seedling of Alnus maritima (NA 36310) was planted in Lexington during 1975. On March 24, 1976, the plant measured 36 inches high and 13 inches wide. In 1981, the multistemmed plant is 108 inches high and 60 inches wide. It was heavily fruiting in 1980 and 1981. Seed collected in 1980 from the plant did not germinate. The plant appears to be pest free and very clean in appearance. The plant is located in a lawn and receives water only from natural rain fall.

(7) A rooted cutting of Juniperus conferta 'Emerald Sea' (PI 323932) was planted in Lexington in 1972. On March 24, 1976, the plant was 6 inches high and 25 inches wide. In 1981, the plant was still 6 inches high but was 36 inches wide. In the years between, the plant received considerable damage from rabbit consumption when snow cover prevented rabbits from getting to other food sources. The plant had been nearly eliminated by Spring 1981.

Accession User: A. D. Genovesi* and G. B. Collins

Address: Department of Agronomy, University of Kentucky, Lexington, Kentucky 40546-0091.

Nature of Research: Production of haploid plants of corn from anthers.

Progress to Date: Through the Beltsville Plant Introduction Office, corn was obtained from China and Germany. After increase under quarantine, seed was sent to Lexington for anther culture studies.

For some unexplained reason the 'Prior' inbreds from Germany did not respond as well as the Chinese hybrid 'Ching-huang 13'. In general, inbreds were not responsive. (Prior hybrids PI 433485-8; Ching-huang 13 inbreds 438948 and 438950). When the Texas inbred Tx601 was crossed with a Minnesota inbred A188 and with the inbreds of Ching-huang 13, the resulting plants produced anthers which could be cultured. Anthers from a previous introduction from Japan, 'White-8-row' PI 303879 could be cultured.

A paper by Genovesi and Collins is now in review.

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

SUBJECT: Comments on P.I.'s in Breeding by H. C. Mohr, Department of Horticulture, University of Kentucky, Lexington, Kentucky 40546-009

In breeding watermelons and honeydew melons, resistance to several diseases has become highly desirable, although not originally a primary objective. Since most P.I.'s are decidedly inferior in horticultural qualities, it has seemed preferable to use named cultivars carrying the genes for resistance (where available) as parental material. Several disadvantages to this have been experienced. Sometimes the level of resistance has proved to be notably less than that described as present in the original P.I., which raises the question of whether the mode of inheritance was accurately reported, or whether the environmental-genotype interaction is responsible. Sometimes, the progeny prove to be susceptible to another disease to which resistance must then be sought, which establishes the desirability of using multiple-resistant cultivars (but may seriously complicate the screening of segregating populations).

As a conclusion, it would appear to be desirable to carefully evaluate the mode of inheritance of resistance with consideration of gene interaction against a range of different environments and to develop multiple-resistance in cultivars before releasing them.

Accession User: John C. Snyder

Address: Department of Horticulture and Landscape Architecture, N-318 Agricultural Science Building North, University of Kentucky, Lexington, Kentucky 40546-0091.

Nature of Research: Identification of leguminous species via seed protein electrophoresis.

Progress to Date: We have examined 158 accessions representing 26 different species of Phaseolus, Vigna, and Macroptilium. Protein banding patterns appear to be distinct and easily identifiable for each species. Among the accessions received, we have uncovered several examples of probable misclassification among both better and lesser-known species. For example, of 10 V. mungo P.I.'s minor and major variations of banding patterns within species are found.

The technique we are using involves little sample or preparation. Each electrophoretic gel represents less than 75 micrograms of seed tissue. At least 40 samples can be run/man/day. We would like to extend this survey to as many of the species of subfamily Faboideae as possible. Any assistance in this matter will be appreciated.

Accession User: Catherine Carter and John C. Snyder

Address: Department of Horticulture and Landscape Architecture, N-318 Agricultural Science Building North, University of Kentucky, Lexington, Kentucky 40546-0091.

Nature of Research: Role of trichomes in two-spotted spider mite resistance of Lycopersicon hirsutum.

Progress to Date: Lycopersicon hirsutum P.I. 251303 and L. esculentum have been successfully crossed and the F_1 has been sib-mated to produce an F_2. Parents, F_1 and F_2 have been characterized for several trichome and mite resistance variables. Among F_2 individuals, the densities (number/unit leaf area) of the multicellular-tipped Type VI glandular trichome plays a major role in host-plant resistance to the mite. F_2 individuals which possess densities of Type IV trichomes similar to that of the L. hirsutum parent also posses similar levels of resistance.

Publications: C. Carter and J. Snyder. 1980. Trichome differences in Lycopersicon species. HortScience 15:98.

_____. 1981. Leaf trichomes and mite resistance of Lycopersicon esculentum and L. hirsutum. HortScience 16:36.

_____. 1981. Segregation of tomato trichome types and spider mite resistance. HortScience 16:36.

1981

Louisiana S-9 Technical Committee Report

Agency: Louisiana State University
Submitted by: Richard J. Stadtherr
Address: Department of Horticulture, Louisiana State University, Baton Rouge, LA 70803

Louisiana Report, August 1981

In 1980, plant accessions sent to Louisiana included 79 ornamentals from the National Arobretum and Plant Introduction Station and 21 from the Miami Subtropical Research Station. Drs. Richard Taylor and Jim Griffin, Rice Research at Crowley, LA obtained seed of 30 *Trifolium ambiguum* selections and 5 *Alysicarpus vaginalis*, respectively. Unfortunately 21 of the accessions received on April 14, 1980 arrived in such bad shape that a number failed to grow.

In 1976, 79 woody and herbaceous ornamental plants were received plus seeds of 149 *Trifolium repens*, 11 *Trifolium subterraneum*, 23 other clovers, 44 *Zea mays*, 43 *Lycopersicon* spp. (tomatoes), 17 *Lotus corniculatus*, 15 *Vigna unguiculata*, 4 *Desmodium unicatum*, 4 *Dolichos lablab*, 3 *Dolichos biflorus* and 2 *Indigofera tinctoria*.

* * * * * *

Accession User: Richard J. Stadtherr
Address: (Same as above)
Nature of Research: Evaluation of woody and herbaceous ornamental plants for use in Louisiana
Progress to Date: Selected accessions have been increased and distributed. Propagation studies are underway for those more difficult to come from cuttings. Certain Rhododendron accessions have been used in a breeding program.

The ornamentals which were grown for 5 years are included in this report. Most plants are grown at least a year in a lath house before they are planted in field trials. If they are not large enough at this time they are held until they have sufficient size to be planted in the trials.

Most of our Burden Research Farm plantings were lost due to increases in a container production area. The only remaining species is *Ilex gale*, NA 36814 which average 12' X 6' now. Viburnum X 'Cayuga' PI 315888 died in 1978; while *Viburnum dilatatum* 'Erie' PI 347259 succumbed in 1980. Most viburnum species and hybrids appear to require more cold temperatures to break their rest period than Zone 9 usually gets.

Plants given to the Audubon Arboretum, Gloster, MS usually grow much better. *Camellia japonica* 'Frost Queen' PI 352669 grew well; however, it was dropped since there are many superior flowering varieties and bud hardiness with them is not the problem here.

Over the years many plant introductions have been propagated and distributed to nurseries, arboreta and gardens. Here is a list of those which have been the most popular accessions:

Woody accessions

Ardisia japonic	NA 18686
Buxus microphylla 'Morris Dwarf'	NA 7027-c
Buxus microphylla 'Morris Midget'	NA 7026-c
Callistemon citrinus	PI 330375
Callistemon sieberi	NA 30284
Chamaecyparis pisifera 'Squarrosa Argentea'	PI 236222
Cunninghamia konishii	NA 28521
X *Cupressocyparis leylandii* 'Leightons Green'	NA 4464-c-c-c
X *Cupressocyparis leylandii* 'Silver Dust'	PI 405936
Cyptomeria japonica	NA 29008
Euonymus Fortunei 'Longwood'	BN 17493-60
Firmiana simplex	PI 317365
Forsythia ovata	PI 316967
Gardenia spatulifolia	NA 31452
Gordonia axillaris	PI 324982
Hibiscus syriacus 'Diana'	NA 3224-c
Hibiscus syriacus 'White Beauty'	PI 183818
Ilex cassine	PI 254592
Ilex crenata	PI 317234
Ilex crenata	PI 317235
Ilex montana	PI 316703
Ilex montana	PI 316704
Ilex X 'Albert Close'	PI 331202
Ilex X 'William Cowgill'	PI 331203
Ilex X 'Howard Dorsett'	PI 331204
Ilex X 'Edward Goucher'	PI 331205
Ilex X 'Harry Gunning'	PI 331206
Ilex X 'Accent'	PI 329154
Ilex X 'Elegance'	PI 329153
Ilex X 'Oriole'	PI 329156
Ilex X 'Tanager'	PI 329155
Ilex X 'Wirt L. Winn'	NA 23214-c
Ilex glabra 'Ivory Queen'	NA 14278-c
Ilex verticillata 'Cacapon'	PI 377678
Ilex verticillata 'Fairfax'	PI 377679
Ilex verticillata 'Shaver'	PI 377681
Juniperus conferta 'Blue Pacific'	PI
Juniperus conferta 'Emerald Sea'	PI 323932
Kolreuteria formosana	PI 62345
Lonicera insularis	PI 316409
Lonicera pileata var. yunnanensis	PI 367886

Woody accessions (continued)

Magnolia grandiflora 'Little Gem'	NA 29649-c
Magnolia X 'Ann'	PI 326570
Magnolia X 'Betty'	PI 326574
Magnolia X 'Jane'	PI 326576
Magnolia X 'Judy'	PI 326571
Magnolia X 'Pinkie'	PI 326577
Magnolia X 'Randy'	PI 326572
Magnolia X 'Ricki'	PI 326573
Magnolia X 'Susan'	PI 326575
Nerium Oleander 'Petite Pink'	M 25188
Photina integrifolia	PI 307304
Photina sp.	PI 325008
Prunus campanulata	NA 38415
Pyracantha X 'Mohave'	PI 347258
Pyracantha X 'Shawnee'	PI 315887
Pyrus calleryana var. fauriei	PI 317371
Rhododendron Oldhamii	PI 325036
Phododendron X 'Ben Morrison'	PI 337618
Rhododendron X 'Mrs. LBJ'	PI 337619
Rhododendron X 'Koromo Shikibu'	NA 16012-c

Herbaceous accessions

Agapanthus sp.	PI 270534
Agave sp.	PI 23211
Allamanda cathartica	PI 354111
Alocasia cucullata	PI 354160
Bambusa multiplex var. rivierorum	PI 77014
Begonia serratipetala	PI 351480
Bouganvillea X 'Miss Manila'	M 21612
Burbridgia schizochilea	PI 242616
Callisia repens	PI 406942
Coleus blumei	PI 424746
Coleus blumei var. Verschaffeltii (30 accessions)	
Crinum asiaticum	PI 354193
Dombeya X 'Rosemond'	PI 205654
Dyckia microcalyx	M 24878
Dyckia sp.	M 24834
Ficus natalensis	PI 78261
Hedera canariensis 'Gloire de Marengo'	NA 30347-c
Impatiens hawkeri 'New Guinea spp. and hybrids'	
Indigofera incarnata var. alba	NA 27542-c
Justicia sp.	M 21855
Justicia sp.	M 21857
Justicia sp.	M 21858
Lantana X 'Tahi White'	M 22482
Lilium formosanum	NA 40252
Liriope, 7 species and hybrids	
Passiflora X 'Incense'	PI 384497
Pyrrosia lingua	PI 235271
Sasa pygmaea (Arundinaria)	MS 839
Senecio sp.	M 25022
Shibatea Kumasaca	NA 27566-d

Publications: Stadtherr, R. J. 1976. Unusual ornamentals worth trying. La. Agric. 20(1):10-11. (Fall)

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Submitted by: James F. Fontenot
Address: Department of Horticulture, Louisiana State University,
Baton Rouge, LA 70803
Accession User: James F. Fontenot
Address: (Same as above)
Nature of Research: Breeding research in pepper, potatoes and okra
Progress to Date:

Our Pepper project has been revised and the title is Pepper Breeding and Production. Our breeding objectives are high yield, improved fruit type as to shape, color, culinary quality, shipping and storage quality. Development of sweet and hot peppers which are resistant to tabasco mosaic virus, cucumber mosaic virus, tobacco etch virus, and southern wilt (Sclerotium rolfsii) is desired. Another need is resistance to the pepper weevil insect. Resistance to frost, heat and drought is also considered very important. Other characteristics which are important are time of maturity (concentrated fruit set for mechanical harvest) plant height, and ease of pod abscission. Our primary aim is to develop better sweet and hot pepper cultivars for commercial and home garden production.

In this science or art, of improving or changing pepper plants, many methods have proven satisfactory. Under this project we use the backcross method, the pedigree method and the mass-pedigree method.

A systematic survey of available plant material from over the world will continue. Plants with the desired characters will be selected and selfed and individuals of unlike genetic constitution will be crossed. As in the past this will involve the infiltration of the germplasm of one species into another.

At this writing we have 33 Capsicum annuum, 20 Capsicum chinense, and 11 Capsicum frutescens plant introductions.

Our potato breeding and development project was also revised since last year. The principal objectives of the Louisiana potato breeding project are: wide adaptability; high yield; frost, heat and drought resistance; insect and disease resistance (particularly late blight and scab); improved culinary quality (including chipping quality; French frying quality, and baking quality); resistance to after-cooking darkening; improved storage ability; better shape and skin color; and resistance to tuber greening. Development of an oblong russet type adapted to Louisiana conditions is highly desirable.

Other objectives are to gain a further insight into the physiological changes during rest and to ascertain the effect of growth regulators, applied as preplant, preharvest and postharvest treatments on the production, storage ability and quality of potatoes. The total alkaloid content must be investigated. Air pollution may be a limiting factor in potato production and cultivar selection is essential to minimize yield losses. We have 27 potato clones that are related to different plant introductions.

The project objectives of okra are the same as before and are high yield, improved pod type as to culinary quality, spinelessness, color, shape, length, shipping and storage quality. Improved plant types for mechanical harvest such as uprightness, increased internode length, increased pod stem length, and large pod base, Fusarium wilt, nematode and drought resistant indiviudals are desired. High oil and protein content are desired in the seed. At present we are evaluating 88 plant introductions.

* * * * * *

Submitted by: R. W. Taylor
Address: Louisiana State University Rice Experiment Station
Crowley, LA 70526
Accession User: J. L. Griffin and G. A. Meche
Address: (Same as above)

Nature of Research: Evaluation of alfalfa (Medicago sativa L.) cultivars for adaptability to southwest Louisiana environment and for resistance to insect and disease complexes.

Progress to Date: Eighteen alfalfa varieties were grown on a Crowley silt loam soil at the Rice Experiment Station to evaluate yield and stand persistence. Inoculated seed of each variety were drill planted in 20-cm rows on October 9, 1979, at a rate of 33.6 kg/ha. Fertilizer was applied at a rate of 560 kg of 0-20 (N-P_2O_5-K_2O) prior to planting and also following the first harvest in early May. The experimental design used was a randomized, complete block design with four replications. The experimental area was treated with Furadan 4F (1.1 kg ai/ha) in early spring for control of alfalfa weevil. Forage was harvested at an 8-cm stubble height with a flail-type harvester when alfalfa plants were in the early bloom stage. Dry matter yields are reported by clipping dates and seasonal total.

For the first harvest only three varieties yielded less than 3350 kg of dry matter per hectare (Table 1). Yields were highest for 'NK-78010' (3889 kg/ha) and lowest for "Fla 66A' (2881 kg/ha). For the second harvest in early June, yields averaged 647 kg/ha lower than those observed for the first harvest. After June, little rainfall was received and regrowth was minimal. Consequently, forage yields for the third harvest in mid-July averaged only 1427 kg/ha. Total seasonal dry matter yields averaged 7946 kg/ha. Yields ranged from approximately 9.0 mt/ha for 'Cimarron' to 6.3 mt/ha for 'Dawson'. Forage dry matter yields were lower than those reported for alfalfa varieties grown on upland soils in southeast Louisiana.

Following the last harvest, stands had begun to thin and large cracks in the soil were noted. To offset drought conditions, the experimental area was enclosed with a levee and flood irrigated to a depth of 5 cm. Levees were immediately opened to allow excess water to run-off. Unfortunately, after draining, rainfall was received and alfalfa plants died due to lack of aeration. It was felt that under more normal environmental conditions, stands would have been more productive. Insects and diseases were not noted as major facors limiting yields. Further studies are needed to re-evaluate the potential for alfalfa production in southwest Louisiana.

Table 1. Forage yields of several alfalfa varieties grown at the Rice Experiment Station, Crowley, LA, 1980.

Variety	Forage yield (kg DM/ha)			
	Harvest date			
	5-1	6-4	7-16	Total
Cimarron	3761	3293	1802	8856[a]*
K7 - 28	3718	3284	1728	8730[ab]
NK - 78010	3889	3123	1556	8568[abc]
Arc	3846	3073	1481	8400[abcd]
Hi-phy	3661	3199	1494	8354[abcd]
Williamsburg	3640	3130	1580	8350[abcd]
Saranac	3708	3128	1514	8350[abcd]
Vanguard (NAPB-42)	3670	3175	1491	8336[abcd]
Delta	3484	3200	1544	8228[abcde]
Olympic	3776	2834	1306	7916[bcdef]
Apollo	3330	2932	1505	7767[cdef]
Weevilchek	3655	2869	1123	7647[def]
Team	3749	2695	1200	7644[def]
Classic	3564	2765	1271	7600[def]
WL-318	3257	2741	1441	7439[ef]
K7-29	3519	2482	1249	7250[f]
Fla 66A	2881	2801	1557	7239[f]
Dawson	3385	2121	841	6347[g]
Average	3583	2936	1427	7946

* Season totals followed by the same letter are not significantly different at .05 to DNMRT.

Publications: None

Cultivar Releases: None

Accession User: R. W. Taylor, J. L. Griffin, and G. A. Meche

Address: LSU Rice Experiment Station, P.O. Box 1429, Crowley, LA 70526

Nature of Research: Evaluation of annual clovers, white clovers (Trifolium repens), and red clovers (Trifolium pratense) for forage production in southwest Louisiana.

Progress to Date: Twenty-three clover varieties representing eight species (arrowleaf (Trifolium vesiculosum Savi), Crimson (T. incarnatum L.), subterranean (T. subterraneum L.), persian (T. resupinatum L.), white (T. repens L.), red (T. pratense L.), ball (T. nigrescens Viv.), and berseem (T. alexandrinum L.) were planted on a Crowley silt loam soil at the Rice Experiment Station to study seasonal distribution and total forage dry matter yields. The experimental design used was a randomized, complete block design with four replications. Forages were broadcast by hand on October 12, 1979 and seeded using a Kincaid small plot seeder on Octover 15, 1980. Fertilizer was applied at a rate of 560 kg/ha of 0-20-20 (N-P_2O_5-K_2O) at planting. Forage was harvested on February 12, March 4, April 1, April 25, and May 26, 1980, and March 10, April 8, May 13, and June 24, 1981.

1980 Results

Even though the clovers were seeded on a prepared seedbed in mid-October, very little early forage production (prior to January) from any of the species was noted. Seasonal production of the clover species was variable and differences among varieties within each species was minimal.

Forage dry matter production across the season was more consistent for 'Abon' persian clover than for any other clover species. Production in February and March averaged 2464 kg/ha and production in April and May was comparable to that of red and white clover during the same time period. Persian clover has a bad reputation for producing bloat in cattle. However, bloat can be controlled either by feeding poloxalene or by growing clover in a mixture with grass.

Crimson clover is supposedly unsurpassed for production of early grazing in fall and winter. However, production for crimson clover up to mid-February averaged only 541 kg of dry matter per hectare. In early March crimson clover yield was higher than the other clovers but yield decreased for the third harvest in early April; no forage was available after that date.

Sub clover yield increased steadily from 687 kg dry matter per hectare in February to 1511 kg/ha in late April after which time production ceased because of maturity. The growing season of sub clover corresponded closely to that of ryegrass indicating that a ryegrass-sub clover mixture may be desirable.

Forage yields of red, white, and ball clover up to early March averaged only 477 kg dry matter per hectare. Production in March and April increased sharply until late April when yield of red clover leveled off and yields of white and ball clover decreased markedly. In contrast to red, white, and ball clover, production of berseem and arrowleaf clover was higher in February and March but lower in April and May.

Total season dry matter yields of the various clover species ranked as follows: persian = red > berseem = white = sub = arrowleaf > ball > crimson. Forage yields ranges from 5.8 mt/ha for persian to 2.9 mt/ha for Crimson (Table 2). Yields of red clover averaged approximately 2.2 mt/ha lower than those reported by Owen and Mondart (Owen, C.R., and C.L. Mondart, Jr. 1963. Tensas: A red clover bred for Louisiana. La. Agric. 7(1):8-9, 15.). Other researchers have also reported higher yields for red than white clover (Owen C.R., and A.T. Harrell. 1970. White and red clover compared in forage yields and nutritive value. La. Agric. 13(3):4-5, 13 and Allen, Marvin. 1967-73. Annual Reports, Southeast Louisiana Dairy and Pasture Experiment Station.)

Table 2. Forage yield of several clover species and varieties grown at the Rice Experiment Station, Crowley, LA, on a Crowley silt loam soil during 1979-81.

Species & variety	Forage yield (kg DM/ha)		
	Harvest year		2-year mean
	1979-1980	1980-1981	
Arrowleaf clover			
Amclo	4188[de]	2428	3308
Meeche	4138[de]	3261	3700
Yuchi	4303[cde]	3151	3727
Mean	4210	2947	3578
Ball clover			
Common	3896[e]	2132	3015
Berseem clover			
Winter Hardy	4689[cd]	3325	4007
Crimson clover			
Chief	2880[f]	3349	3114
Dixie	2929[f]	3353	3140
Mean	2904	3351	3128
Persian clover			
Abon	5740[a]	3101	4421
Red clover			
K4-183	5749[a]	3882	4816
Kenland	5544[ab]	3350	4446
Kenstar	5271[ab]	3288	4280
Nolin's	-	3614	3614(1 yr)
Redland II	5432[a]	4504	4968
Tensas	4846[bc]	-	4846(1 yr)
Mean	5368	3727	4496
Subterranean clover			
Miss. Ecotype	4222[de]	2591	3407
Mt. Barker	4670[cd]	3257	3964
Nangeela	-	3176	3176(1 yr)
Tallarook	4436[cde]	3163	3799
Woogenellup	4185[de]	4124	4155
Mean	4379	3263	3700
White clover			
LA S-1	4381[cde]	2891	3636
Lucky	4721[bcd]	-	4721(1 yr)
Nolin's Improved	4449[cde]	3005	3727
Regal	4406[cde]	2686	3546
Sacramento	4828[bc]	2267	3548
SC Med Flowering	5273[ab]	3117	4196
Mean	4676	2793	3895

*Season totals followed by the same letter are not significantly different ($P < 0.05$) by Duncan's New Multiple Range Test.

1981 Results

The clovers again showed little early forage production unitl after January. Seasonal production of the clover species was variable and differences among varieties within each species were minimal with two exceptions. 'Redland II' red clover and 'Woogenellup' subterranean clover produced approximately 850 kg/ha more than other varieties within the species (Table 2).

Forage production for Abon persian clover was highest through April with little production in May. Yields in 1981 were much reduced from yields in 1980 possibly due to poor growing conditions during the establishment phase. Stands for all species were poorer in 1981.

Yields of arrowleaf and white clovers were similar. 'Meechi' and 'Yuchi' yielded more than 'Amclo'. 'SC Medium Flowering' white clover again yielded more than all other white clover varieties. 'Common' ball clover produced the lowest yield of any of the clovers.

Berseem, crimson, and subterranean clover yielded more than arrowleaf, white, and ball clover. Red clovers yielded more than all other clovers. Crimson clovers again showed little regrowth after the April harvest when seend heads had been produced. All subterranean clovers produced seed under a four-week cutting scheme. Woogenellup produced 1077 kg/ha more dry matter than the average yield of the other four subterranean clover varieties. Redland II red clover yielded 971 kg/ha more dry matter than the average yield of the other red clover varieties.

Red, white, and Meeche arrowleaf clover produced forage up to late June although only the red clover varieties produced more than 550 kg/ha. Early production was highest for berseem clover and the subterranean clovers and lowest for ball, arrowleaf, and red clover. Midseason production was highest for crimson clover followed by Abon persian clover and lowest for common ball clover.

Total season dry matter yields of the various clover species ranked as follows: red clover > crimson = berseem = subterranean > persian = arrowleaf > white > ball (Table 2).

Summary 1980 and 1981

In general, the annual clovers provided more forage in January, February, and March, whereas, the perennial clovers produced more forage later in the season. Early production from the annual clovers may be enhanced if planted earlier in the fall. Late spring and early summer production from the perennial clovers depend in large part on adequate moisture during this period.

Publications: None
Cultivar Releases: None

LA-10

Accession User: R. W. Taylor, J. L. Griffin, and G. A. Meche
Address: LSU Rice Experiment Station, P. O. Box 1429
Crowley, LA 70526

Nature of Research: Evaluation of vetch (Vicia spp.) for forage and cover crop production in southwest Louisiana.

Progress to date: Six vetches, 'hairy' (Vicia villosa), 'Woodford' (Vicia grandiflora), and 'Cahaba White', 'Vantage', 'Vanguard', and 'Nova II' (Vicia sativa) were evaluated at the Rice Experiment Station to assess their potential use as a forage crop and cover crop. In 1979-80, the experimental design used was a randomized, complete block design with four replications. In 1980-81, the experimental design used was split plot design with varieties as main plots and harvest regime as subplots, Four replications were used. All varieties were planted on a Crowley silt loam soil on October 9, 1979 and October 15, 1980. Fertilizer was applied at the rate of 560 kg/ha 0-20-20 (N-P_2O_5-K_2O) at planting. Seeding rates in kilograms per hectare planted in 20-cm drills were: hairy and Woodford-28 and Cahaba White, Vantage, Banguard, and Nova II - 39. Harvests were made at an 8-cm stubble height with a rotary mower or a flail-type forage harvester. In 1979-80, a three-harvest regime was followed but for 1980-81 both a single-cut system and a multiple-cut system were employed. The single-cut system was designed to measure forage production under a cover crop scheme while the multiple-cut system measured forage production in a grazing scheme.

1979 - 1980 Results

Little difference in dry matter yield among the varieties was noted for the first harvest in mid-February. All entries yielded less than 1.1 metric tons of dry matter per hectare. A second harvest was made on April 1 and all entries with the exception of Nova II yielded more than 1.0 metric ton of dry matter per hectare; yields of Woodford averaged 1742 kg dry matter per hectare. On the third harvest no forage was available forVantage, Cahaba White, Nova II, and Banguard but substantial accumulation of dry matter was present for hariy and Woodford. Total season dry matter yields for hairy and Woodford were significantly higher than the other entries reflecting the fact that forage was unavailable on the third harvest for the Auburn releases (Table 3). Season total forage yields for the Auburn-released vetches, even though not significantly different from one another, averaged approximately 50% less than those of hairy and Woodford (4014 vs 2050 kg/ha).

These findings suggest that the Auburn releases make their growth earlier in the season and, therefore, mature earlier. From the standpoint of reseeding potential, these varieties should produce seed before they are plowed under and the summer row crop is planted. In contrast, the production of hairy and Woodford was more consistent across the growing season indicating that they would be more suitable for grazing or hay crop and also a cover crop if resseding is not desirable. It should be noted, however, that because vetches may differ in their ability to regrow after mowing, results may have been different if entries were not harvested until maturity.

Table 3. Forage yields of several vetch species and varieties grown at the Rice Experiment Station, Crowley, LA, on a Crowley silt loam soil during 1979-1981.

	Year				
		1980-181			
Species & variety	1979-1980 Multi-cut system	Multi-Cut system	Single-Cut System	Mean	Multi-cut system 2-year mean
	kg DM/ha				
Cahaba White (Vicia sativa)	2144[b*]	3855[c]	6910[ab]	5383	2999
Emeral (V. sativa)	-	3742[c]	6652[ab]	5197	3742(1 yr)
Hairy (V. villosa)	4006[a]	4016[c]	6606[ab]	5311	4012
Nova II (V. sativa)	1942[b]	3778[c]	6803[ab]	5291	2860
Vanguard (V. sativa)	1895[b]	-	-	-	1895(1 yr)
Vantage (V. sativa)	2219[b]	3621[c]	7355[a]	5488	2920
Woodford (V. grandiflora)	4022[a]	3493[c]	5893[b]	4693	3758

* Individual system totals followed by the same letters are not significantly different ($P < 0.05$) by Duncan's New Multiple Range Test.

1980- 1981 Results

The first harvest was made on February 17, 1981. Woodford vetch yielded significantly less than all vetch varieties except hairy vetch. Nova II yielded significantly ($P < 0.05$) more than all other vetch varieties. A third harvest was obtained on April 15. No significant differences between vetch varieties occurred although hairy vetch yielded more than the other varieties.

Total seasonal yields under the multiple-cut regime were similar for all varieties and ranged from 3493 kg DM/ha for Woodford vetch to 4016 kg DM/ha for hairy vetch (Table 3). Under the single-cut regime simulating a cover crop farming system, yields ranged from 7355 kg DM/ha for Vantage to 5893 kg DM/ha for Woodford vetch. Vantage was significantly ($P < 0.05$) superior to Woodford but was not significantly different from the other vetches. Under the single-cut system, the Auburn releases proved to be equal to hairy vetch and equal to or superior to Woodford vetch.

Publications: None

Cultivar Releases: None

LA-12

Accession User: R. W. Taylor and G. A. Meche
Address: LSU Rice Experiemtn Station, P.O. Box 1429
Crowley, LA 70526
Nature of Research: Evaluation of birdsfood trefoil (Lotus corniculatus L.) varieties for adaptability to southwest Louisiana.
Progress to Date: Sixteen varieties birdsfoot trefoil were seeded with a Kincaid small plot seeder in six 20-cm drills on October 15, 1980. Fertilizer was broadcaset at the rate of 560 kg/ha of 0-20-20 (N-P_2O_5-K_2O) at planting. Dry fall and winter conditions resulted in poor stands so no yield data has been obtained. 'Vega II' showed the greatest seedling vigor and earlie-t spring growth. Vega II did not exhibit the usual winter rosette form of the other varieties. All varieties were allowed to set seed to encourage better stands.
Publications: None
Cultivar Releases: None

1981

S-9 TECHNICAL COMMITTEE REPORT

Agency: Mississippi Agricultural & Forestry Experiment Station
Submitted by: C. E. Watson, Jr.
Address: Department of Agronomy, Mississippi State Univ., Mississippi State, MS 39762

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Accession User: C. E. Watson and S. D. Linscombe
Address: Department of Agronomy, Mississippi State Univ., Mississippi State, MS 39762
Nature of Research: Evaluation of tall fescue (Festuca arundinacea Schreb.) germplasm for resistance to Helminthosporium sp.
Progress to Date: Plant introductions of tall fescue have been evaluated for resistance to net blotch caused by Helminthosporium sp. for the previous two years under both greenhouse and field conditions. Greenhouse evaluations have utilized cultures of H. sativum as inoculum. Field evaluations have relied on natural infestations. It appears that more than one species is involved in this disease in the field. Four introductions (P.I. 231560, 231561, 234748, and 325322) have shown high levels of resistance. No lines were found to have immunity to the disease.
Publications: Linscombe, S. D. and C. E. Watson, Jr. 1981. Screening tall fescue for resistance to Helminthosporium sp. So. Branch Amer. Soc. Agron. Abstr. p. 2.
Cultivar Releases: None

Accession User: L. E. Trevathan
Address: Department of Plant Pathology and Weed Science, Mississippi State University, Mississippi State, MS 39762
Nature of Research: Evaluation of ryegrass (Lolium multiflorum Lam.) germplasm for seedling vigor, heat/cold tolerance, and disease resistance.
Progress to Date: Ryegrass germplasm (315 PI accessions) were screened for seedling vigor, heat/cold tolerance, and symptoms of rust, Helminthosporium leaf spot, and barley yellow dwarf under field conditions. Only two of the 315 PIs failed to emerge: 189391 and 276664. Nine PIs emerged but did not survive: 189151, 189153, 189155, 189392, 196423, 198070, 231596, 251224, and 257270. Seventeen annuals and 43 perennials showed no symptoms of rust, Helminthosporium leaf spot, or barley yellow dwarf. Only three annual PIs failed to survive the winters of 1978 and 1979: 199251, 276663, and 376874. All of the 15 more productive annuals survived each winter and three of them - 235157, 240731,

and 266112 - showed no symptoms of any of the three diseases. None of the more productive perennials were characterized by tolerance to heat and/or cold and by resistance to all three diseases. PI 170521 and 220878 were tolerant to heat and cold and showed symptoms of Helminthosporium leaf spot only; PI 220528 was tolerant to both heat and cold and showed symptoms of rust only.

Publications: Trevathan, L. E. 1981. Evaluations of ryegrass introductions in Mississippi. Miss. Ag. and Forestry Exp. Station Res. Report Vol 5, No. 17.

Cultivar Releases: None

Accession User: William E. Knight

Address: Crop Science and Engineering Research Laboratory, USDA, ARS, SR, P.O. Box 272, Mississippi State, MS 39762

Nature of Research: Development of annual clovers adapted to the Southeast.

Progress to Date: Twenty-four accessions of berseem clover, Trifolium alexandrinum, and 23 accessions of Persian clover, Trifolium resupinatum, were received from cooperative work under PL-480 Project No. PK-ARS-48(N). These accessions were received too late for evaluation in 1980-81 but will be evaluated in 1981-82.

Dr. David Crespo provided 21 accessions from Elvas, Portugal. This collection included 1 rose clover, T. hirtum; 4 subterranean clovers (brachycalycinum) T. subterraneum; 1 strawberry clover, T. fragiferum; 4 vetches, Vicia sativa, V. benghalensis, and V. villosa; 1 winter pea, Lathyrus tingitanus; 10 medics, 3 M. nigra, 1 M. scutella, 2 M. arabica, 2 M. truncatula and 2 M. tornato.

Cooperators in Spain provided 100 accessions of subterranean clover, Trifolium subterranean. These accessions were grown in the greenhouse for seed increase and characterized. Seed and descriptions will be provided to Plant Introduction of these accessions. Some of these look potentially useful in the breeding program at Mississippi State and will be maintained as breeding lines.

Publications: None

Cultivar Releases: None

S-9 TECHNICAL COMMITTEE REPORT

W. T. Fike
North Carolina State University
Department of Crop Science
Raleigh, North Carolina

Of the 26 campus research personnel who receive information direct from my office, four cooperators received a total of 787 lines consisting of six species of four plant genera. These are just a 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.

A. Plant Introductions of Special Interest

1. Dr. D. H. Timothy reports that the Pennisetum of previous years continue to show promise and are being evaluated in pilot grazing studies. He would like Pennisetum flaccidum from the Himalaya foothills - locations of collecting areas are on file.

2. Dr. R. G. Gardner has used PI 126445 Lycopersicon hirsutum in crosses to L. esculentum in an attempt to transfer early blight resistance into the cultivated tomato.

3. Dr. T. C. Wehner 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:

   For high rate of shoot regeneration in tissue culture

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

   For rapid germination at low temperatures

PI 109484 Turkey	PI 169392 Turkey
PI 222985 Iran	PI 220860 Korea
PI 174166 Turkey	

   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.

B. New Crop Potential

1. Kenaf, sunflowers and sumac are being evaluated as potential new crops for North Carolina farmers.

   As many as 1200 acres of kenaf have been grown each year as a source of fine quality paper. The paper companies involved have a stockpile of raw material at this time. This crop is not being contracted because of this stockpile of raw material. One large deterrent to renewed interest in this crop is the lack of quality seed of a quality variety to use in farmer plantings. It would take at least two to three years to increase seed of any of these present varieties for planting and this would take a commitment from industry in addition to that already received by a local seed company in conjunction with the North Carolina Crop Improvement Association.

1981

S-9 TECHNICAL COMMITTEE REPORT

Agency: Oklahoma Agricultural Experiment Station
Submitted by: J. S. Kirby
Address: Department of Agronomy, Oklahoma State University, Stillwater, OK 74078

* * * * *

Accession User: LeVern Lorenz
Address: R. R. 1, Box 60, Isabella, OK 73747
Nature of Research: Mr. Lorenz is a farmer who has a keen interest in vegetable crops and who utilizes PI material in his breeding and evaluation program.
Progress to Date: Mr. Lorenz reported that the 1980 season helped in the evaluation of tomato fruit set at high temperatures. He had previously obtained PI 324063 from the Philippines through NE-9. This introduction was crossed with other materials and was reported to be producing some very good segregates which were setting fruits at 105°F temperatures.
Publications: None
Cultivar Releases: None

Accession User: C. M. Taliaferro and W. L. Richardson
Address: Dept. of Agronomy, Okla. State Univ., Stillwater
Nature of Research: Forage grass breeding
Progress to Date: Many introductions (primarily bermudagrasses and old world bluestems) continue to be utilized in the grass breeding program. Although 'Hardie' and 'Oklan' bermudagrasses were released in 1974, the registration articles citing PI ancestry were published in 1980.
Publications:
Charles M. Taliaferro and William L. Richardson, 1980. Registration of Hardie bermudagrass. Crop Sci. 20:413.
Charles M. Taliaferro and William L. Richardson. 1980. Registration of Oklan bermudagrass. Crop Sci. 20:414.
Cultivar Releases: Hardie and Oklan bermudagrasses

Accession User: Dale E. Weibel
Address: Dept. of Agronomy, Okla. State Univ., Stillwater
Nature of Research: Sorghum breeding
Progress to Date: The entire sorghum improvement program is based on introductions. Increased use is being made of lines coming from the sorghum conversion program. Probably three-fourths of the sorghum breeding nursery traces to an introduction or conversion made during the last 30 years with considerable material tracing to the yellow endosperm lines (Kaura and Korgi) introduced in 1952. Dr. Starks, Entomologist, is currently screening the sorghum P.I. collection for resistance to biotypes C and E of the greenbug. PI 220248 has resistance to both biotypes and will be used in the breeding program.
Publications: None
Cultivar Releases: Thirteen breeding or germplasm (GP) lines with PI parentage were released in August of 1980 for use in commercial sorghum breeding programs.

Accession User: Kenneth J. Starks, USDA-ARS
Address: Dept. of Entomology, Okla. State Univ., Stillwater
Nature of Research: Insect resistance.
Progress to Date: In 1980, approximately 3000 sorghum accessions were screened for possible greenbug resistance. Approximately 20 accessions were found to possess some level of resistance to the new greenbug biotype E. Most of these are "grassy" types but are being crossed with adapted sorghums to start the incorporation of greenbug "E" resistance.

Additional work with Owen Merkle, USDA-ARS, Dept. of Agronomy, has resulted in a proposal to release three pearl millet lines which have resistance to chinch bugs. Most of the material originally was obtained from the PI station at Experiment, Ga., while the chinch bug resistance was discovered in a pearl millet breeding population developed by A. J. Casady at Kansas State University.

Publications: None
Cultivar Releases: Three pearl millet lines currently being proposed for release.

Accession User: D. J. Banks (USDA-ARS) and J. S. Kirby
Address: Dept. of Agronomy, Okla. State Univ., Stillwater
Nature of Research: Peanut Breeding
Progress to Date: Last year's report indicated the inheritance of leafspot resistance was being studied utilizing PI 109839. In our greenhouse study using detached leaves, PI 109839 failed to show any resistance to early leafspot caused by Cercospora arachidicola. The study is being continued under field conditions in hopes that differences in field tolerance might surface.

Considerable effort has been devoted to development of early-maturing Spanish peanuts utilizing 'Chico' (a selection from PI 268611) and the Spanish cultivar 'Comet.' The variety 'Pronto' was released in 1980 and the variety 'Spanco' was released in May, 1981.

Additional increases and distributions have been or are being made of the peanut germplasm, both wild and cultivated types, that was obtained during the International Board for Plant Genetic Resources (IBPGR) sponsored expeditions in South America during 1976-81. Just received is the 1981 material of 68 collections of cultivated peanuts from Peru made by Charles Simpson, Texas Agricultural Experiment Station and others.

A yellow-flowered (versus the normal orange) segregate was isolated from the collection US 98 (P.I. number yet to be assigned) made from a market in Cochabamba, Bolivia, in 1977. Inheritance studies involving this accession and some orange-flowered parents are underway. In our crosses, yellow was dominant to orange. Consequently, this trait could be useful as a genetic marker. Additional knowledge about the yellow flower trait may contribute to our understanding of the evolution of the cultivated peanut.

Publications:

Banks, D. J. and J. S. Kirby. 1979. Breeding for earliness in Spanish peanuts. Proc. Am. Peanut Res. and Educ. Soc. p. 56 (Abstract)

Kirby, J. S. and D. J. Banks. 1980. Methodology and success in breeding for early maturity. Proc. Am. Peanut Res. and Educ. Soc. p. 49 (Abstract)

Cultivar Releases: Spanco peanut. May, 1981.

1981

S-9 TECHNICAL COMMITTEE REPORT

Agency: University of Puerto Rico, Agricultural Experiment Station
Submitted by: O. D. Ramírez
Address: Department of Horticulture, College of Agricultural Sciences, University of Puerto Rico, Agricultural Experiment Station, P. O. Box H, Río Piedras, Puerto Rico 00928
Forages: J. Vélez Santiago, Corozal Substation, Agricultural Experiment Station, Corozal, Puerto Rico

Natural 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: Alfalfa cultivars Hayden P X-1, Mesa-Sirsa and Florida 66 were the best dry forage yielders, with 27,430; 25,400; and 24,384 kg/ha/year, respectively in an experiment on the southern coast of Puerto Rico. In the North Central part of the Island the highest dry forage yielders were Venezuela, Ariz (four varieties) and Tanverde, with 24,896; 19,376; and 20,717 kg/ha/year, respectively (tables 1, 2, 3).

The study with 6 Stylosanthes cvs. and Digitaria milanjiana (PI 299699) was concluded. The grass yields were 27,900 and 25,000 kg/ha for 65 and 79-day harvests respectively during an 11-month period. The highest stylo dry forage yielders were PI 279603, 361877 and IRFL 1416 at 65-day (15,310; 14,640; 12,660; kg/ha/year) and at 79-day harvests, (11,620; 11,320; 11,480 kg/ha/year) respectively (table 4).

Two grass evaluation studies were completed. In the first one highest dry forage yielders were PI's 259553 and 349676 with 49,952 and 49,659 kg/ha/year, respectively (table 5).

In the second experiment Cenchrus ciliaris PI's 263509 and 275102 were the highest dry forage yielders. Data of the second year is being analyzed (table 6). Vegetative material of Cynodon plectostachyus PI's 409742, 409743, 409745, 409746, 409747, 409748, 409749 and 409750 was sent to Dr. E. M. Hodges, Ona, Fla.

Publications: Published in the Journal of Agriculture of the University of Puerto Rico

1. Vélez-Santiago, J. and Arroyo-Aguilú, J. A., 1981. Effect of three harvest intervals on yield and nutritive value of seven Napier grass cultivars, J. Agr. Univ. P. R. 65 (2): 129-137
2. Sotomayor-Ríos, A., Rodríguez-García, J., and Vélez-Santiago, J., 1981 Effect of three harvest intervals on the yield and protein content of ten Brachiarias, J. Agri. Univ. P. R. 65 (2): 147-153.

Submitted for publication in the Journal of Agriculture of the University of Puerto Rico.

1. Vélez-Santiago, J., Arroyo-Aguilú, J. A. and Fuentes, F., Performance of 16 forage grasses cultivars in an Almirante soil in the humid Northern Coastal Plains of Puerto Rico.

2. Vélez-Santiago, J., Arroyo-Aguilú, J. A. and Torres-Rivera, S., Yield and chemical composition of five napier cultivars in the Northwest Coastal Plains of Puerto Rico.
3. Vélez-Santiago, J., Arroyo-Aguilú, J. A., and Torres-Rivera, S., Performance and chemical composition of 18 mondormant alfalfa cultivars in the Lajas Valley.
4. Vélez-Santiago and Arroyo-Aguilú, J. A., The effect of nitrogen fertilization and cutting frequency on the yield and chemical composition of five tropical grasses.
5. Vélez-Santiago, J., and Arroyo-Aguilú, J. A., Influence of two fertilizer levels on the herbage and crude protein yields of seven tropical grasses.

Cultivar Releases: None

Ornamentals: O. D. Ramírez, Department of Horticulture, Agricultural Experiment Station, Río Piedras, Puerto Rico 00928

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

Progress to Date: From Miami various introductions were received. Among these Dorstenia sp. (M-24066) is very promising to be used as a green foliage potted plant. It produces seeds that germinate. Ixora coccinea cv. Thai Dwarf (PI 413760) and Nerium oleander cv. Petite Pink (M-25188) both flowered but are very slow growers. Also 21 Bougainvillea cultivars were received of which 18 survive.

Publication: None

Cultivar Release: None

Fruits: O. D. Ramírez, Department of Horticulture, Agricultural Experiment Station, Río Piedras, P. R.

Nature of Research: To obtain through plant introduction better pineapple varieties or material with good characteristics that can be incorporated in the pineapple breeding program.

Progress to Date: Two pineapple varieties Queen and Kew were introduced from India. These varieties have some good chracteristics, and will be used in our breeding program.

Publication: Submitted for publication in the Journal of Agriculture of the University of Puerto Rico.

1. Ramírez, O. D. and Gandía, H. Comparison of nine planting distance on the yield of Pineapple P R 1-67.

Cultivar Release: Pineapple variety P R 1-67.

Coffee: C. J. Torres, Adjuntas Substation, Agricultural Experiment Station, Adjuntas, P. R.

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

Progress to Date: Coffee variety Pacas, introduced from El Salvador, in a preliminary evaluation proved to be a good yielder, well adapted to our conditions, and very good to be planted in full sunlight. Nine introductions resistant to coffee rust, caused by Hemilea vastatrix were introduced and are under observation.

Publication: None

Cultivar Release: None

Table 1. - Identification of non-dormant Alfalfa's cultivars or lines.

Identification	Source
1. Moapa	Agronomist Talia Gutiérrez Dominican Republic
2. Florida 66 (1978 seed)	Dr. O. C. Ruelke, Univ. of Florida, Gainesville
3. Tanhuato	Open, pollinated Corozal Agricultural Experiment Substation
4. UC - 164	William F. Lehman, Univ. of California, 1004 E Holton Road El Centro, California 92243.
5. UC - 76 E	Do.
6. UC - 163	Do.
7. Mesa Sirsa	Dr. M. H. Schonhorst, Dept. Plant Sciences, Univ. Arizona Tucson.
8. Hayden PX-1	Do.

Table 2. - Dry forage yields (MT.ha)[-1] of 8 alfalfa cultivars at the south of Puerto Rico for a period of 10 months (planted January 22, 1980).

Identification	March 20	April 21	May 19	June 20	July 22	Aug. 20	Sept. 22	Oct. 21	Total
Hayden PX-1	3.16 1/	4.43	4.12	3.41	3.00	2.74	2.96	3.33	27.15
Mesa-Sirsa	3.06	4.08	3.56	3.30	3.07	2.48	2.60	3.04	25.19
Florida 66 (seed 1978)	2.42	3.88	3.62	3.52	2.81	2.15	2.50	3.22	24.12
UC - 163	3.08	3.65	3.80	3.15	2.72	2.29	2.67	2.71	24.07
UC - 164	2.91	4.14	3.50	3.53	2.44	1.96	2.08	3.03	23.59
Moapa	2.67	3.51	3.55	3.15	2.47	2.11	2.40	2.72	22.58
UC - 76 E	2.68	3.31	3.78	2.99	2.33	1.84	2.20	2.76	21.89
Tanhuato	2.37	3.26	3.58	3.27	2.57	1.85	2.13	2.72	21.75
Average Yield	2.79	3.78	3.69	3.29	2.68	2.18	2.44	2.94	23.79
Rainfall (mm)	41.6	28.2	30.7	101.6	49.3	31.8	83.1	110.5	

1/ Average of 4 replicates

* to convert to short tons/acre, multiply these figures by 0.466.

Table 3. - Dry forage yield for 12 alfalfa cultivars at Corozal in a period of 511 consecutive days.

Accession Number or Name	1979 Yields	1980 Yields	Total Yields
	kg/ha	kg/ha	kg/ha
Venezuela	7,940	16,956	24,896
Ariz Four - Var.	6,339	13,037	19,376
Tanverde	6,081	14,636	20,717
Florida 66	5,904	13,698	19,602
Tanhuato	5,287	14,029	19,316
Moapa	5,097	9,356	14,453
Orca 2411	5,068	8,646	13,714
Peruvian	4,856	11,438	16,294
A. R. C.	4,718	8,331	13,049
VC - SW - 44	4,460	9,052	13,512
Hayden P - X - 1	3,997	9,486	13,483
Hayden (F Stocks)	3,179	8,428	11,607

Table 4. - Dry forage yields (MT.ha) and rainfall per period for 6 stylos and Digitaria milanjiana harvested every 65 and 79 days at Corozal

65 days

		Number of harvest and date					
		7th	8th	9th	10th	11th**	Total
	P I [1/]	6- 5-79 8-13-79	10-17-79	12-20-79	2-25-80	5-01-80	Yields
Stylosanthes guianensis	361877	5.65	2.53	1.75	0.93	3.56	14.42
" gracilis	261266	2.84	1.59	1.76	0.88	3.68	10.75
" guianensis	279603 [2/]	4.23*	2.07	2.44	1.55	4.78	15.07
" guianensis var. "Endeavour"	Q8558 [2/]	2.38	2.10	1.68	1.50	4.59	12.25
" guianensis var."Schofield"	IRFL-1413 [3/]	2.36	2.32	1.99	1.21	3.25	11.13
" guianensis (fine stem)	IRFL-1416	2.78	2.15	2.63	0.86	4.04	12.46
Digitaria milanjiana	299699	5.17	5.62	6.21	3.80	6.67	27.47
Rainfall (mm)		371	660	532	316	239	

79 days

		Number of harvest and date				
		10th	11th	12th	13th**	Total
	P I [1/]	6-25-79 9-12-79	11-30-79	2-19-80	5-07-80	Yields
Stylosanthes guianensis	361877	4.42	2.59	0.73	3.40	11.14
" gracilis	261266	3.54	2.00	0.44	3.42	9.40
" guianensis	279603 [2/]	3.45*	2.51	0.81	4.67	11.44
" guianensis var. "Endeavour"	Q8558 [2/]	2.63	2.37	0.64	4.63	10.27
" guianensis var."Schofield"	IRFL-1413 [3/]	2.15	2.85	0.77	3.53	9.30
" guianensis (fine stem)	IRFL-1416	3.31	2.97	0.57	4.45	11.30
Digitaria milanjiana	299699	6.16	6.61	4.55	7.32	24.64
Rainfall (mm)		845	506	418	270	

1/ USDA plant introduction number
2/ Accession No. from Queensland, Australia
3/ Indian River Florida No.

*= Average of 3 replicates
** = Harvest done at 2.54 cm above the ground

Table 5. - Identification of 16 grasses under evaluation

Grasses	Plant Introduction Number		Other
	USDA 1/	PRPI 2/	
Digitaria decumbens	111110	0560	"Pangola" Digitgrass
Digitaria milanjiana	299699	6543	
Digitaria spp.	300935	11537	"Slendestem" Digitgrass
Digitaria pentzii	290752	6439	"Transvala" Digitgrass
Panicum maximum	349676	12917	C. P. I. 3/ 37910
Panicum maximum	-	-	Common Guinea
Panicum maximum	259553	3622	
Cynodon plectostachyus	-	-	Minillas grass
Cynodon plectostachyus	341818	11487	
Cynodon nlemfuensis var. nlemfuensis	-	2341	Star grass
Cynodon dactylon	255455	11504	Coastcross I
Pennisetum purpureum	-	-	Dwarf Napier
Brachiaria spp.	299497	9625	
Brachiaria brizantha	-	1525	Signal grass
Hemarthria altissima	364261	13188	
Hemarthria altissima	299995	6446	

1/ United States Department of Agriculture plant introduction number.
2/ University of Puerto Rico Agricultural Experiment Station plant introduction number.
3/ Commonwealth Plant Introduction Number, South Johnstone Research Station, Queensland.

Table 6.- Identification of ten forage grasses under evaluation.

Grass Num.	Species Field Identification	Plant Introduction Num. USDA.PI.	PR.PI.	Other
1.	Cenchrus ciliaris	210693	13083	
2	do	263509	13084	
3	do	275102	13085	
4	do	284837	13086	
5	do	-	-	Texas-4454
6	do	-	-	Comercial variety
7	Panicum maximum	284765	13092	
8	do	291047	13093	
9	do	-	-	Common
10	do	349576	12917	CPI 37910 2/

1/ United States Department of Agriculture and Agricultural Experiment Station, University of Puerto Rico, plant introduction number.

2/ Commonwealth Plant Introduction Number of Australia.

Accessions received:

Species	Origin	USDA P.I.	Fla. PI.
Cenchrus ciliaris var. Nueces var. Llano	U.S.D.A. Soil Conservation Service		
Glycine wightii		311511	
" "		311510	
" "		337086	
" "		364850	
" "		364857	
" "		364858	
" "		260238	
Macroptilium lathyroides	Dominican Republic (CENIP)		
Centrosema pubescens			
Leucaena leucocephala			
Clitoria ternata			
Galactica sp			
Pachyrryzus tuberosus			
Terramus uncinatum			
Desmodium distortum			
Medicago sativa			
Stylosanthes guianencis	Fort Pierce, Florida	401505	7034
" "	"	401506	7035
" "	"	--	7921
" "	"	--	7812
" "	"	--	7919
Desmodium heterocarpon	"	217910	7959
Cynodon dactylon	Texas A & M		
cv. Coastal			
Tifton 44			
S-15			
S-54			
SS-15			

Legumes under evaluation

Legumes	Plant Introduction Number (USDA)	Origin
Desmodium ovalifolium	237955	Costa Rica
" "	238595	Costa Rica
Leucaenea leucocephala	237147	Costa Rica
" "	281606	Colombia
" "	282404	Colombia
" "	282454	Colombia
Stylosanthes gracilis	197559	Paraguay
guianencis	348951	Australia
hamata	348954	Australia
humilis	356018	Australia
scabra	348957	Australia

1981
S-9 TECHNICAL COMMITTEE REPORT

Agency: South Carolina Agricultural Experiment Station
Submitted by: David W. Bradshaw
Address: Department of Horticulture
Clemson University
Clemson, SC 29631
phone: (803)656-3404

* * * * * * * * * *

Accession User: J.S. Rice
Address: Department of Agronomy and Soils
Clemson University
Clemson, SC 29631
PHONE: (803) 656-3102

Nature of Research: Screening of *Agropyron intermedium* for adaptation to South Carolina.

Progress to Date: A preliminary screening program begun in 1973 indicated that the *Agropyron intermedium* - *A. trichophorum* complex had potential for adaptation to South Carolina locations. As a result, breeding work was initiated in 1976.

Fifty accessions were obtained from the Western Regional Plant Introduction Station. The seeds were planted in the greenhouse and 15 seedlings from each accession were transplanted at each of three locations. The spaced plants were rated for vigor, spread, height, and maturity. After three years, open pollinated seeds from 45 plants were harvested and used to initiate a second selection cycle.

Accessions contributing to the second cycle, with the number if greater than one o.p. families from each in parentheses were:

172686(3), 223668, 229918, 249146(2), 261098(4), 273732(7), 287739(6), 314054(5), 315067(2), 315353(3), 315354(4), 315355.

The remaining four families trace to cultivars Luna and Slate.

In addition, four experimental synthetic cultivars are in the process of being formed using the superior plants as parents. Evaluation of these will begin in the Fall of 1981.

Publications: None

Cultivar Releases: None

Accession User: Dr. Billy B. Rhodes
Address: Edisto Experiment Station
P.O. Box 247
Blackville, SC 29817
PHONE: (803) 284-3343
Nature of Research: Anthracnose resistance of watermelon, cucumber, cantaloupe, and squash.
Progress to date: In replicated tests in the field and greenhouse, Citrullus lanatus, PI 299778, has demonstrated resistance to a race of anthracnose which is pathogenic on watermelon, cucumber, and cantaloupe, but not on Butternut squash.
Publications: None
Cultivar Releases: None

Accession User: E.V. Wann
Address: U.S. Vegetable Laboratory
2875 Savannah Highway
Charleston, SC 29407
PHONE: (803) 556-0840
Nature of Work: Evaluation of cucumber (Cucumis sativus) for downy mildew resistance.
Progress to Date:

Evaluation of cucumber (Cucumis sativus) introductions for downy mildew resistance

PI NUMBER	SOURCE	DOWNY MILDEW RESISTANCE[1]
PI 418962	PRC	4.5
PI 418963	PRC	4.5
PI 418964	PRC	3.7
PI 418989	PRC	2.5
PI 419010	PRC	2.5
PI 419017	PRC	4.5
PI 419040	PRC	1.0
PI 419041	PRC	1.0
PI 419077	PRC	5.0
PI 419078	PRC	4.5
PI 419079	PRC	4.0
PI 419108	PRC	1.0
PI 419135	PRC	4.0
PI 419136	PRC	2.5
PI 419182	PRC	3.0
PI 419183	PRC	3.0
PI 419214	PRC	4.4
PI 435946	USSR	2.0
PI 435947	USSR	3.0
PI 436608	PRC	5.0
PI 436609	PRC	4.5
PI 436610	PRC	1.0
PI 436648	PRC	4.5
PI 436649	PRC	4.5

[1]Rating scale: 1-5: 1 = highly susceptible, 5 = highly resistant

Publications: None
Cultivar Releases: None

Accession User: R.L. Fery
Address: U.S. Vegetable Laboratory
2875 Savannah Highway
Charleston, SC 29407
PHONE: (803) 556-0840
Nature of Work: Screening of yardlong bean Vigna unguiculata spp. sesquipedalis for Cercospora leaf spot (Cercospora cruenta)
Progress to Date: 14 lines obtained from the Peoples Republic of China have been screened with the following results:

Resistant	Moderately susceptible	Susceptible
418980	419163	418979
419006		419005
419102		419101
		419164
		419165
		419166
		419167
		419168
		419169
		419199

Publications: None
Cultivar Releases: None

Accession User: M.L. Robbins
Address: S.C. Truck Experiment Station
P.O. Box 3158
St. Andrews Branch
Charleston, SC 29407
PHONE: (803) 766-3761
Nature of Research: Screening of okra germplasm for resistance to southern root-knot nematode (Meloidogyne incognito) and fusarium (Oxysporum vasinfectum).
Progress to Date: A number of selections not in the P.I. system have been received from Africa via the Mayaguez Institute of Tropical Agriculture. Also some selections have been received directly from the Ivory Coast. At this time these selections are being grown for seed increase.
Publications: None
Cultivar Releases: None

Accession User: Janet McLeod
Address: Department of Plant Pathology and Physiology
Clemson University
Clemson, SC 29631
PHONE: (803) 656-3450
Nature of Research: Resistance to southern root-knot nematode, Meloidogyne incognito and fusarium, Oxysoporum f. sp. vasinfectum of okra, Abelmoschus esculentus.
Progress to Date: Two hundred sixty-five okra P.I. accessions were screened for resistance to southern root-knot nematode. None were found to be resistant. These same okra P.I.'s are being screened for

resistance to fusarium. It appears that two P.I.'s exhibit a good degree of resistance. Coded P.I.'s will be identified at termination.
Publications: None
Cultivar Releases: None

Accession User: D.W. Bradshaw
Address: Department of Horticulture
Clemson University
Clemson, SC 29631
PHONE: (803) 656-3404
Nature of Research: Evaluations of ornamental plant introductions.
Progress to Date: When I was in Norway in 1978, I requested seed be collected from a Chamaecyparis lawsoniana 'Triumph van Boskoop'. Seedlings resulting from seed collected and grown in Norway were very uniform and useful as sheared hedges for windbreaks. Consequently, seeds have been forwarded to Beltsville, assigned the P.I. number 443014 and forwarded to the National Arboretum and to me. The seed were planted in September 1980. Currently, approximately 50 seedlings are growing vigorously with uniform shape and varying in size from 12 to 20 cm.
Publications: None
Cultivar Releases: None

1981

S-9 TECHNICAL COMMITTEE REPORT

Agency: Tennessee Agricultural Experiment Station
Submitted by: L. N. Skold
Address: Department of Plant and Soil Science, University of Tennessee, P. O. Box 1071, Knoxville, TN 37901

* * * * * *

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 late summer grazing.
Progress to Date: At the Martin Station in northwest Tennessee during a period of hot, dry weather, lactating dairy cows refused to graze lablab or a sorghum-sudangrass hybrid. Beef steers and heifers (320 kg) were then introduced to the pastures on July 28, 1980. After 42 days, animals grazing lablab gained an average of 0.37 kg per day and those grazing Sudax SX-17 gained an average of 0.20 kg per day. The lablab selection had been obtained from Dr. Ian Forbes of Tifton Ga., several years ago.
Publication: Fribourg, H. A., E. W. Culvahouse, N. W. Robinson, and R. J. Carlisle. 1980. Utilization of *Dolichos lablab* by dairy and beef cattle during hot weather. Progress Report--Clovers and Special Purpose Legumes Research 13:70-72.
Cultivar Releases: None

Accession User: B. V. Conger
Address: Department of Plant and Soil Science, University of Tennessee, P. O. Box 1071, Knoxville, TN 37901
Nature of Research: Evaluation of 216 orchardgrass, *Dactylis glomerata*, introductions received from the NE-9 and W-6 Regional Plant Introduction Stations and from the Plant Breeding Station, Aberystwyth, Wales.
Progress to Date: After three years of natural selection about 75% of the accessions were eliminated and the remaining accessions transplanted to a new location at Knoxville in a replicated nursery for further evaluation.
Publications: Conger, B. V. 1979. An Orchardgrass Source Nursery to Evaluate Genotypes Adaptable to Tennessee. Tenn. Farm and Home Sci. 109:7-9.
Cultivar Releases: None

Accession User: B. N. Duck
Address: School of Agriculture, University of Tennessee at Martin, Martin, TN 38237
Nature of Research: Evaluation of Legume Accessions
Progress to Date: Sixty two accessions of *Coronilla spp.*, six of *Vicia sativa* and 248 of 13 *Trifolium spp.* were received from the S-9 Plant Introduction Station in July and August, 1980, and planted at the Martin Station in northwest Tennessee for visual evaluation and natural selection. Two days after seeding, an unprecedented 3.8 inches of rainfall was received, causing much washing and essentially destroying the nursery.
Publications: None
Cultivar Releases: None

Accession User: D. R. West
Address: Department of Plant and Soil Science, University of Tennessee, P. O. Box 1071, Knoxville, TN 37901
Nature of Research: Evaluation of non-corn belt maize populations
Progress to Date: Two non-corn belt maize populations derived from Caribbean Flint/Dent and Cateto Flint were received from the NC-7 Plant Introduction Station in the spring of 1981. These were included in the corn breeding nursery for visual evaluation, tasseling and silking dates, and for seed increase. In 1982 crosses will be made with selected Tennessee cultivars and breeding lines.
Publications: None
Cultivar Releases: None

Accession User: J. M. Stewart
Address: Department of Plant and Soil Science, USDA-ARS, University of Tennessee, P. O. Box 1071, Knoxville, TN 37901
Nature of Research: Incorporation of potentially useful characters of exotic diploid cottons into cultivated tetraploid species.
Progress to Date: Using the exised ovule technique to produce F_1 plants, and colchicine to induce chromosome doubling, viable seed has been produced from crosses of *G. hirsutum* x *G. bickii*, *G. arboreum* x *G. australe*, and *G. hirsutum* x *G. australe*.

Successful crosses have been made using *G. herbaceum* (genome A_1) and *G. arboreum* (A_2) as females, and*G. armourianum* (D_{2-1}) and *G. harknessii* (D_{2-2}) as males, in all combinations. Fertile F_1 plants have not yet been obtained. *G. armourianum* and *G. harknessii* are species with deciduous bracts.

For the first time ever, a hybrid plant has been obtained from the cross *G. incanum* x *G. hirsutum*.

Publications: Stewart, J. M. 1981 (In press) *In Vitro* fertilization and embryo rescue. Environmental Experimental Botany.
Menzel, Margaret Y., Clare A. Hasenkampf, and J. M. Stewart. Incipient genome differentiation in *Gossypium*. III. Comparisons of *G. hirsutum* and Asiatic diploids using heterozygous translocations. (Submitted to Genetics)
Cultivar releases: None

1981

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) 845-4620

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Accession User: Ronald M. Jones and Charles E. Simpson
Address: Texas A&M University Agricultural Research and Extension Center, Box 292, Stephenville, Texas 76401 - Phone (817) 968-4144
Nature of Research: The use of wild peanuts for forage.
Progress to Date: Twelve species, three varieties, and one breeding line of Arachis were propagated by seeding and by transplanting from cuttings. Propagation by seed was by planting directly in the field, while propagation by cuttings was started in the greenhouse prior to planting in the field. No harvest was made the first year because of the limited number of plants in each plot. During the second year, all plants were killed by cold temperatures of 15° - 7° F. It is possible that many of these peanut species may survive winters in this area, if planted earlier than June 23, in order for the plant to form rhizomes or set seed before frost. Some species may be planted as early as mid-April. These workers feel that further work is warranted.

Table 1. Identification and method of propagation of wild peanuts grown for forage.

Scientific Name	P. I. No.[1]	Propagation
Arachis batizocae	338212	Seed
Arachis correntina	262808	Seed
	262809	
Arachis rigonni	262142	Seed
Arachis villosa	?	Seed
Arachis species	338453	Seed
Arachis species	338280	Seed
Arachis repens	276199	Vegetative
Arachis species	338304	Vegetative
Arachis species	338261	Vegetative
Arachis species	262812	Vegetative
Arachis species	338277	Vegetative
Arachis glabrata	118457[2]	Vegetative
Arachis glabrata	262839[3]	Vegetative
Arachis glabrata	262817[4]	Vegetative
Arachis glabrata	?[5]	Vegetative
Arachis glabrata	262817	Vegetative

[1]Plant introduction number

[2]Florida variety Arb

[3]Florida variety Arblick

[4]Florida variety Arbrook

[5]Florida breeding line GS-1

Publications: Forage Research in Texas. Departmental Technical Report No. 81-12. Department of Soil & Crop Sciences.
Cultivar Releases: None

Accession User: Ethan C. Holt
Address: Soil and Crop Sciences Department, Texas A&M University, College Station, Texas 77843 - Phone (713) 845-1551
Nature of Research: Evaluation of tropical and warm-season legumes.
Progress to Date: Approximately 50 warm-season legume accessions were established by transplanting rooted seedlings in the field in early July, 1978 at College Station. Primarily, species not previously evaluated were included in this study. Some of the species are native (USA) origin, such as Desmanthus, Rhynchosia, Aeschynomene, and Galactia. Essentially, all of the entries made some seed and a few Rhynchosia reticulata, PI 163098, Alysicarpus rugosus, PI 286530 and PI 189492, Galactia species, PI 206319 produced abundant seed.

Table 2. Preliminary observations in the spring of 1980 indicate poor survival which is surprising since a number of the entries are native perennials. It is recognized that some of the entries are annual types. The 1979-1980 winter was considered milder than average though the minimum temperature was about the same as in 1978-79. The only accession with surviving plants are lsited below:

Species	PI
Desmanthus virgatus	171962 - 1 plant
Pueraria lobata	300095
Pueraria lobata	326583 - 2 plants
Rhynchosia reticulata	163098
Rhynchosia sublobata	300101
Galactia SP	201260
Lespedeza cuneata	286450 - 1 plant
Lespedeza cuneata	310409 - 3 plants

Seedlings volunteered in the spring from:

Species	PI
Rhynchosia minima	322614
Rhynchosia reticulata	163098
Alysicarpus rugosus	286530
Alysicarpus rugosus	189492
Rhynchosia minima	316627
Rhynshosia minima	322615
Desmanthus virgatus	283247

Publications: Forage Research in Texas. Departmental Technical Report No. 81-12. Department of Soil & Crop Sciences.

Cultivar Releases: None

Accession User: Ethan C. Holt
Address: Soil and Crop Sciences Department, Texas A&M University, College Station, Texas 77843 - Phone (713) 845-1551
Nature of Research: Preliminary evaluation of limpograss
Progress to Date: Seven limpograss introductions, including PI 299993, which has been released as Redalta by Florida, were established in plots at College Station and allowed to produce a complete ground cover.
Top growth was removed in mid-July and the plots fertilized with 100 kg N/ha. The plot area was flood irrigated in early September to saturate the root zone.
Accumulated top growth (standing crop) was harvested to a 2 cm height from a 30 cm X 60 cm area on September 22, October 20, and December 1; a different area being sampled on each date. The harvested sample was dried, weighed, ground to pass a 2 mm screen and analyzed IVDMD using the 2-stage in vitro fermentation procedure.
Forage quality was generally high through September and October. PIs 349748 and 365509 being exceptions. There seems to be little relationship between late season growth and late season forage quality. PIs 349748 and 364863 showed excellent growth between October 20 and December 1. Redalta (PI 299993) and PI 364864 with high quality and high production have been selected for further evaluations.

Table 3. Limpograss (Hermathria altissima) production and quality.

PI	Variety Name	Accumulated Standing Crop, kg/ha			IVDMD		
		9/22	10/20	12/1	9/22	10/20	12/1
299993	Redalta	4944	5444	8056	60.3	63.2	59.6
349748	-	4889	5833	8889	52.9	53.6	48.5

349752	-	-	5333	7555	-	64.3	63.9
364344	-	3333	6500	5111	58.4	58.0	54.4
364863	-	5444	7444	11444	62.7	60.9	61.3
364891	-	4333	4933	6000	61.6	58.1	62.0
365509	-	-	11722	12278	-	51.1	50.1

Publications: Forage Research in Texas. Departmental Technical Report No. 81-12. Department of Soil & Crop Sciences.
Cultivar Releases: None

Accession User: Ethan C. Holt and L. D. Allison
Address: Soil and Crop Sciences, Texas A&M University, College Station, Texas 77843 and Texas A&M University Agricultural Research Station - Star Route 2, Box 43C, Beeville, Texas 78102 - Phone (713) 845-1551 and (512) 358-6390, respectively
Nature of Research: Evaluation of subterranean clover in a 760 mm rainfall area.
Progress to Date: 26 plant introductions were planted in single row plots 6 m long, 2 replications, on October 6, 1978, at a seeding rate of 20 kg/ha.
Observations and measurements of plant introductions indicate a range in several characteristics. Plant height near maturity varied from 25 to 58 cm. All of the accessions showed some winter damage from early January, low temperatures. Accumulated production on March 14, which represents fall and winter growth, varied from 100 kg/ha to more than 900 kg/ha. The ability to accumulate growth in winter is important whether that growth represents the ability to grow at low temperatures or to respond to short periods of favorable temperature.

Table 4. The evaluation of subterrenean clover accessions, Beeville, 1979.

P. I.	Height[1] (CM)	Crown[2] Spread (CM)	Winter Survival (%)	Relative Vigor (10=best)	Accumulated Dry[3] Weight G/M^2 3/14	Date	Maximum
158387	58	75	75	7.5	60	5/24	309
168638	40	86	90	8.0	92	5/9	210
184962	43	75	70	6.5	56	4/25	207
190564	44	73	65	6.5	61	5/24	284
190568	39	80	70	7.5	72	5/24	273
190577	27	88	40	4.5	51	5/9	371
209926	42	70	75	6.0	84	5/9	274
209930	41	96	70	6.5	66	5/9	178
233866	43	72	75	6.5	78	5/24	295
233867	38	82	80	7.0	86	5/9	201
233870	46	100	75	6.5	53	5/9	248

239901	54	122	50	7.5	62	5/9	275
239904	42	85	55	6.0	58	5/9	254
239906	39	79	60	6.5	43	5/24	286
239910	36	69	60	6.0	30	5/24	258
241461	38	91	60	6.0	76	5/9	357
277437	38	74	60	7.0	25	4/25	405
277439	37	74	65	6.5	68	5/9	302
279010	35	97	60	6.5	70	5/9	287
287998	55	99	60	7.0	66	5/9	272
302977	<———		Mixed Stand				———>

Publications: Forage Research in Texas. Departmental Technical Report No. 81-12. Department of Soil & Crop Sciences.
Cultivar Releases: None

Accession User: Ethan C. Holt
Address: Soil and Crop Sciences Department, Texas A&M University, College Station, Texas 77843 - Phone (713) 845-1551
Nature of Research: Evaluation of warm-season legumes at College Station, 1979.
Progress to Date: The information gathered is located on Table Number 5.

Table 5. Evaluation of warm-season legumes at College Station, 1979.

Identification	P. I.	Notes
Aeschynomene scabra	296044	Chlorotic, very stemmy
Aeschynomene indica	225551	Tall, stemmy, somewhat chlorotic
Aeschynomene indica	257662	Very erect, woody, stemmy, chlorotic
Alysicarpus rugosus	189492	Fair growth and leafiness, both decumbent and erect stems
Desmanthus virgatus	171962	Upright, 40" tall, leafy
Desmanthus virgatus	283247	Tall, stemmy, not as good as 171962
Lespedeza cyrtobotrya	286480	Very little growth
Pueraria lobata	300095	2 plants, fair growth, long runners
Alysicarpus vaginalis	217904	Very short, fair spread, seeding heavily
Alysicarpus vaginalis	219829	V. decumbent, dense, good spread, good Alysicarpus type
Alysicarpus rugosus	200207	Erect, woody, stemmy
Aeschynomene falcata	364378	V. poor growth, chlorotic
	189080	Somewhat chlorotic, viney, good growth
Calopogonium mucunoides	286288	V. good spread density, v. decumbent, good growth, promising

Alysicarpus vaginalis	322296	Good spread, more erect than most aly.
Galactia sp.	200744	Good color, not much growth, invaded by C. muconoides
Galactia sp.	200745	Not as much growth as R. minima 322615 but better than G. sp. 206316, promising
Rhynchosia minima	322614	Running type, small leaves, dense cover
Rhynchosia minima	316627	Running type, small leaves, dense cover
Galactia sp.	201260	Running type
Galactia sp.	206319	Good color, fair promise, better spread than 207744
Rhynchosia minima	322615	Good density, spread, vigor, good promise
Rhynchosia reticulata	163098	Running type, small leaves, dense cover (may be invasions from R. minima R13-14)
Alysicarpus vaginalis	189493	Bunch type, poor growth
Alyceclover	--	Fair growth and color, more erect than T3 R15-16
Alysicarpus vaginalis	316125	Fair Alysicarpus type
Alysicarpus rugosus	286530	Stemmy, erect
Rhynchosia sublobata	300101	Spreading from few plants, fair growth
Calopogonium mucunoides	281634	Fair spread from few plants, chlorotic
Rhynchosia minima	319487	Small leaf, dense, compact good promise
Galactia jussiaena	322541	Erect, viney type, good seed
Galactia jussiaena	367914	Few, semi-erect viney plants
Pueraria lobata	326583	Erect, viney type, v. broad leaves, no spread from 2 plants
Alysicarpus ovalifolius	316124	Short, dense compact
Rhynchosia phaseoloides	291132	Fair, semi-erect, viney type

Publications: Forage Research in Texas. Departmental Technical Report No. 81-12. Department of Soil & Crop Sciences.

Cultivar Releases: None

Accession User: Ethan C. Holt

Address: Soil and Crop Sciences Department, Texas A&M University, College Station, Texas 77843 - Phone (713) 845-1551

Nature of Research: Performance of experimental selections of kleingrass (Panicum coloratum L.).

Progress to Date: Some 750,000 acres of kleingrass have been planted, primarily in the Edwards Plateau, Rio Grande Plains, Rolling Plains and Blacklands.

Table 6. Forage yield of kleingrass selections[1], University Farm, 1980.

Selection	Pounds dry forage/acre
77-28	2197
77-25	1580
K-75	1948
77-30	
79-35	2291

[1]Test planted April 25, 1980 and harvested September 22, 1980

Publications: Forage Research in Texas. Departmental Technical Report No. 81-12. Department of Soil & Crop Sciences.

Cultivar Releases: "Verde" Kleingrass (Panicum coloratum L.), year 1981. PI numbers involved: 196363, 208000 and 7 plants of other Panicum coloratum introductions of unknown PI numbers. The country of origin is South Africa.

Accession User: E. C. Bashaw

Address: Soil and Crop Sciences Department, Texas A&M University, College Station, Texas 77843 - Phone (713) 845-1551

Nature of Research: The development of a drought-tolerant,warm-season perennial grass that can be propagated by seed.

Progress to Date: Nueces and Llano are new buffelgrass varieties that are drought and heat tolerant.

Table 7. Forage yields - Pounds of dry matter per acre.

Weslaco - 1977-79 (without irrigation)	1977	1978	1979	3-year average
Llano	10,920	13,220	15,280	13,140
Nueces	10,740	13,290	15,210	13,080
Common (T-4464)	9,840	12,990	13,290	12,040
Higgins	8,800	11,970	10,560	10,450

Weslaco - 1977-79 (irrigated)	1977	1978	1979	3-year average
Nueces	14,550	21,780	29,520	21,950
Llano	16,170	20,810	27,170	21,390
Higgins	12,150	19,260	25,340	18,920
Common (T-4464)	13,730	18,700	23,710	18,710

Publications: Registration of Nueces and Llano buffelgrass. Crop Science 1980.

Cultivar Releases: Nueces and Llano Buffelgrass (Cenchrus ciliaris L.) The male parent of these two varieties was a plant introduction from South Africa. The PI number is not available at Texas A&M University.

Accession User: Raymond C. Brigham
Address: Texas A&M University, Agricultural Research and Extension Center, Route 3, Lubbock, Texas 79401 - Phone (806) 746-6101
Nature of Research: Insect and disease resistance in soybeans
Progress to Date: Soybean PIs 340029, 200449, and 229358 are being used in a crossing program for resistance to various insects that attack soybeans.
PIs 227555, 200503, and 342619 are being used in a crossing program for Soybean Mosaic Virus (SMV) resistance.
Publications: None
Cultivar Released: None

Accession User: Gerald W. Evers
Address: Texas A&M University Agricultural Research Station, Box 728, Angleton, Texas 77515 - Phone (713) 849-5708
Nature of Research: Evaluation of Trifolium species for seed production and late maturity.
Progress to Date: Those showing the most promise are listed below.

Table 8. Trifolium species showing the most promise.

Species	P. I. Numbers
T. dasyurum	263248
T. diffusum	120144, 120219, 120218
T. hirtum	311485, 120230
T. pallidum	369070

Publications: None
Cultivar Releases: None

Accession User: J. C. Miller, S. K. O'Hair and R. W. Toler
Address: Departments of Horticulture and Plant Sciences, respectively, Texas A&M University, College Station, Texas 77843*
Nature of Research: Disease reaction of cowpea introductions following infection with the cowpea strain of Southern Bean Mosaic Virus (SBMV).
Progress to Date: 1013 entries of plant introductions were secured from the Regional Plant Introduction Station of Experiment, Georgia.
Land preparation included the addition of 0-46-0 fertilizer broadcast at the rate of 45 kilograms per hectare and the incorporation of trifluralin at the rate of 1.2 liters per hectare to control grasses.
Wide genotype specific variability for reaction to Southern Bean Mosaic Virus; cowpea strain infection was observed. This variability was in part influenced by season. Symptom groups identified and proportion of plants in each group were: Mosaic (81%), vein clearing (21%), leaf distortion (18%), stunting and dwarfing (16%), chlorosis (12%), distinct chlorotic spots (2%), necrotic local lesions (1%), generalized necrosis (1%), and plant spindling (0.2%).

* Phone - (713) 845-7311 and (713) 845-5341, respectively

In 46 percent of the cultivars screened, more than one symptom could be identified.
Previously unreported symptoms associated with SBMV-CS infection were distinct chlorotic spots, entire leaf chlorosis, generalized necrosis and spindling plants.
Seed transmission of the virus ranged from 0-25 percent, with most entries having less than 10 percent.

Publications: Disease Reaction of Cowpea Introductions Following Infection with the Cowpea Strain of Southern Bean Mosaic Virus. MP - 1470 - June 1981 - The Texas Agric. Exp. Sta. - Agricultural Communications Dept., College Station, TX

Cultivar Releases: None

Accession User: Charles N. Bollich

Address: Texas A&M University Agricultural Research and Extension Center, Route 7, Box 999, Beaumont, Texas 77706 - Phone (713) 752-2741

Nature of Research: Short-statured, semi-dwarf long-grain rice development.

Progress to Date: Bellemont, developed at the Texas A&M University Research and Extension Center and released in March, 1981, is the first semi-dwarf long-grain variety released in the United States.
Yield performance of Bellemont and Labelle at 5 locations are listed as follows:

Table 9. Yield in pounds per acre in 1980.

	Bellemont	Labelle
Eagle Lake	6429	6823
El Campo	6510	6223
Bay City	5701	4736
Ganado	4400	4239
Katy	5679	5396

Publications: Bellemont, A Semi-Dwarf Long-Grain Rice Variety - Its Characteristics and Management. MP-1476 - The Texas Agri. Exp. Sta. - March, 1981 - Agricultural Communications Dept. College Station, TX 77843

Cultivars Released: Bellemont (Oryza sativa L.). Year released: 1981 PI number involved: 331581. Country of origin: Taiwan (China)

Accession User: Charles N. Bollich

Address: Texas A&M University Agricultural Research and Extension Center, Route 7, Box 999, Beaumont, Texas 77706 - Phone (713) 752-2741

Nature of Research: Breeding for improved plant types responsive to higher rates of nitrogen in rice (Oryza sativa L.).

Progress to Date: PIs 331581 and 331582 have been used as parents. Many dwarf lines have been selected from the segregating populations.

Publications: None
Cultivars Released: None

PIs received in the state from the Regional Plant Introduction Station at Experiment Georgia were 330 during the period of August 1, 1980 to August 1, 1981.

1981

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: E. A. Borchers
Address: Virginia Truck and Ornamentals Research Station, 1441 Diamond Springs Road, Virginia Beach, VA 23455
Nature of Research: Insect and disease resistance of *Lycopersicon*
Progress to Date: PI 134417 is currently in greenhouse and field trials to determine the degree of resistance to certain insects and diseases.
Publications: None
Cultivar Releases: None

Accession User: R. T. Taylor
Address: Virginia Truck and Ornamentals Research Station, 1441 Diamond Springs Road, Virginia Beach, VA 23455
Nature of Research: Low temperature germination of *Lycopersicon*
Progress to Date: PI 341985 is under study to investigate the relationship of low temperature germination and general cold hardiness of the plant. Plants are being field grown this summer for seed increase.
Publications: None
Cultivar Releases: None

Accession User: M. Rangappa
Address: Virginia State University, Petersburg, VA 23903
Nature of Research: Disease and insect resistance of *Phaseolus vulgaris* and *Brassica oleracea* var. *capitata*
Progress to Date: No report
Publications: None
Cultivar Releases: None

Accession User: R. L. Boman
Address: Southern Piedmont Research and Continuing Education Center, P. O. Box 148, Blackstone, VA 23824
Nature of Research: Evaluation of forage crops for drought-prone regions of Virginia
Progress to Date: No report. (Dr. Boman is no longer with the Center; the status of this program is unknown).
Publications: None
Cultivar Releases: None

Accession User: H. S. Aycock
Address: Department of Agronomy, VPI & SU, Blacksburg, VA 24061
Nature of Research: Study of exotic *Zea mays* germplasm
Progress to Date: Accessions lost
Publications: None
Cultivar Releases: None

Report From the National Coordinator

to NE-9, NC-7, S-9, W-6 Meetings, 1981

Resumé

The last 2 years have seen a dramatic increase of attention given to plant germplasm. This is a world-wide phenomenon, but especially noticeable in the U.S. where it directly impacts on us as participants in the National Plant Germplasm System. While other countries generally consider the U.S. as having the model germplasm system, and we need make no apologies for that system, there is still a great deal of room for improvement. These needs for improvement have been pinpointed in two review reports released within the past year. These reports are well-laced with criticism--in my view, contructive criticism. They have caught the attention of administrators, Congressmen, the Office of Management and Budget (OMB), and the lay conservationists.

The first reaction to a strong spotlight is usually temporary blindness, but as one's eyes adjust, one usually finds that he can see better than he could without the spotlight. In this report, I would like to summarize some results and future implications catalyzed by these reports.

The Reports

The first report was generated by a subcommittee of the National Plant Germplasm Committee (and approved by the full Committee). It was titled "Report of the National Plant Germplasm Committee on the Restructuring of the National Plant Germplasm System" and is dated September 1980.

The second report resulted from an investigation of the NPGS by the General Accounting Office (GAO). It is a report to the Congress of the United States and is titled "The Department of Agriculture Can Minimize the Risk of Potential Crop Failures" and it is dated April 10, 1981. Copies of the GAO report can be obtained from:

U.S. General Accounting Office
Document Handling and Information
Services Facility
P. O. Box 6015
Gaithersburg, Maryland 20760
(Telephone: (202) 275-6241)

(The first five copies are free of charge.)

Actions

1. SEA has established the position of National Coordinator of the National Plant Germplasm System (NPGS) in the office of the Deputy Administrator, SEA-AR.

a. This position carries responsibility for:

- planning,
- monitoring (including reviewing),
- priorities and budget,
- coordination,
- recommending scientific personnel to work in NPGS,
- international liaison with respect to germplasm,
- providing staff services to the NPGS.

b. This position will be supported by:

- delegated authority to call upon SEA members of the NPGS to assist in planning, program assessments, development of budget recommendations and special reports,
- resources to support when necessary a half-time SAES Administrative Advisor (Germplasm),
- assistance in information management and communication provided by SEA staffs as requested by the Deputy Administrator, SEA-AR,
- a full-time Program Assistant (GS 7/9) to organize meetings, conferences, reviews, workshops, travel connected with these; and to assist in preparation of reports, budget documents, newsletters, and other communications,
- NPS staff budget funds required to coordinate activities and to facilite meetings of advisory committees, task groups, special teams,
- backing of authority vested in the Deputy Administrator, SEA-AR, the Administrator, SEA-AR, and the Director, SEA.

2. SEA has approved the Federal component of a restructured National Plant Germplasm Committee (NPGC).

a. The recommended composition of the new NPGC is:

4 Regional Administrative Advisors, SAES
2 Regional Administrators, SEA-AR
1 Assistant to Deputy Administrator (Germplasm), SEA-AR
(ex-officio member and Executive Secretary)
3 Area Directors, SEA-AR
1 SEA-CR
2 Private Industry (field crops, horticultural crops)
2 Foreign Observers (Canada, Mexico)

b. The Committee is expected to perform the following functions for the NPGS:

- provide a national voice and focal point for the System,
- develop and recommend policy,
- coordinate Federal, State, industry interest and objectives,
- implement (for SEA-AR, at least) many of the decisions taken by the Committee or take them to requisite authority in USDA, SAES's, and private industry,
- provide guidance in program reviews, planning, prioritizing, and budgeting.

3. SEA has approved a mission statement for the NPGS:

"The National Plant Germplasm System (NPGS) provides the genetic diversity necessary to improve crop productivity and to reduce genetic vulnerability in future food and agriculture development, not only in the United States but for the entire world. The NPGS acquires, maintains, evaluates, and makes readily accessible to plant scientists a wide range of genetic diversity in the form of seed and clonal germplasm of crops and potential new crops."

4. SEA has made Plant Germplasm Resources a major area of emphasis for the FY '83 budget and it is the subject of a Special Analysis. This is very likely to be a continuing practice for a number of years.

We have been permitted to ask for $1.8 million in FY'82 and $3.5 million in FY '83. We have also submitted a "Real Needs Budget."

5. SEA has made a commitment to fully support implementation of the NPGS-IS, the National Plant Germplasm System's Information System, which will be completed by GRIP at the end of 1982. Implementation is in progress.

6. SEA and SEA-AR, the National Plant Genetic Resources Board, and the National Plant Germplasm Committee all strongly support the use of Crop Advisory Committees in essentially all activities engaged in by the NPGS.

7. There will be an NPGS Operations Coordinating Committee which will address day-to-day activities planning and coordination, information exchange, exploration proposals review and prioritization, etc. This may have to be a rather large committee (15-19) and meet in full session at least once a year and in sub-groups several times a year.

Dr. Quentin Jones
National Coordinator, NPGS, and
Ass't to Deputy Administrator, SEA-AR

1981

S-9 TECHNICAL COMMITTEE REPORT

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

Submitted by: P. K. Soderholm

Address: 13601 Old Cutler Road, Miami, Florida 33158

* * * * * *

Accession User: P. K. Soderholm and R. J. Knight, Jr.

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

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

Progress to Date:

Distributions

During the period of this report over three thousand accesions were distributed (Table 1), 80 percent of which went to cooperators in the United States. One major distribution consisting of 43 species was made during May, 1981.

One hundred fifty-nine collections of leaves, branches, fruit, and in a few cases whole plants, were obtained from Station plants by a botanist from the U. S. Department of Agriculture Economic Botany Laboratory, Beltsville for investigation of anti-cancer activity.

An exchange of seeds was initiated between the Miami Station and two experiment stations in People's Republic of China following a visit to Miami by two botanist from the P.R.C.

A special distribution of Torenia fournieri 'Para Pink' and Chrysothemis pulchella 'Amazon' was made in conjunction with notification of release of the two varieties. 'Para Pink' resembles other forms of Torenia fournieri except that the flower is white with pink petal tips and a bright yellow blotch on the central petal. 'Amazon' is a gesneriad that can be grown as a potted indoor plant or as a ground cover in warm regions. Flowers are yellow with red spots and are borne in a waxy orange-red calyx. It is very showy and produces a nice display of color during most of the summer.

Introductions

Eight hundred fifty-four accessions were added to the collection during this period. Notable among the introductions were 18 coffee cultivars bred for resistance to coffee leaf rust (Hemileia vastatrix), Bactris gasipaes, the pejibaye or peach palm with a nutritious edible fruit, many new pineapple cultivars and Dioscorea spp., seven of which are adible types and 2 hybrids and one species of non-edible, high diosgenin yielding types.

Publications: None

Cultivar Releases: Knight, R. J., Jr. and P. K. Soderholm. 1980. Notice of Release of Chrysothemis pulchella 'Amazon'. USDA, SEA/AR, New Orleans, LA.

Knight, R. J., Jr. and P. K. Soderholm. 1980. Notice of Release of Torenia fournieri 'Para Pink'. USDA, SEA/AR, New Orleans, LA.

* * * * * *

Accession User: R. J. Knight, Jr.

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

Nature of Research: Improving subtropical and tropical fruit crops.

Progress to Date: The largest number of lychee seedlings in the Miami station's history are friuting in 1981 after a cooler-than-normal winter. This affords an excellent opportunity to evaluate the considerable genetic variation in the germplasm collection, and to select outstanding seedlings for evaluation of their varietal potential. Most seedlings are from open pollination of 'Sweetcliff' (P.I. 51471, M-8516), which was selected because of its consistent production under southeasetern Florida conditions. Few of the seedlings closely resemble 'Sweetcliff', which has fruit of quite distinctive character. Fruit of most of the seedlings does resemble that from neighboring trees. This is consistent with observations of flowering here this year, when lychee trees tended to bear flowers of only one sex at any given time, though no tree is exclusively female or male. It thus appears that in Florida differences in time of flowering promote out-crossing as has been observed in India. Approximately 1350 lychee seedlings were originally set in the field, and 381 survive to date.

Hybrids between the maypop (Passiflora incarnata) collected in Maryland and 2 tropical South American species, P. edulis and P. cincinnata

show promise as ornamental vines that produce edible fruit and are winter-hardy to approximately 0^{o} F. In cold climates they freeze to the ground each winter, then re-sprout in spring as the maypop does. None of the F_1 hybrids produce viable pollen, but most of them will fruit when back-crossed to either parent: this suggests the feasibility of interplanting an occasional maypop vine and allowing bumblebees or carpenter bees to effect pollination of diploid hybrids that bear fruit of good quality.

Efforts to restore fertility of pollen-sterile hybrids by treating with colchicine to induce polyploidy appear to be meeting with some success: some degree of pollen fertility has appeared in treated plants of M-26509, 26553, and 26654 (P. incarnata x P. edulis), and of M-26653 (P. incarnata x P. cincinnata). Seedlings from these lines are expected to be stable amphiploids that can be regularly propagated from seed.

Cold weather during January and February 1981 difinitely established the hardiness of plants collected from subtropical parts of Brazil and Argentina in 1981. Eugenia myrcianthes (P.I. 424645) and E. involucrata (P.I. 424756) both survived essentially undamaged in the field where E. uniflora (surinam cherry) and 3 guava species (Psidium friedrichsthalianum, P. guajava and P. guinaense) were injured by cold. Other species from this same region set in the field since February, 1981 but expected to be equally cold-tolerant are Brachychiton populneus (P.I. 424634), Chrysophyllum gonocarpum (P.I. 430577), and Melicoccus lepidopetalus (P.I. 424649).

Publications: Knight, R. J., Jr. and C. W. Campbell. 1980. A industria de manga da Florida e seus cultivares. Anais Do I Simposio Brasileiro Sobre A Cultura Da Mangueira. 182-192.

Knight, R. J., Jr. and C. W. Campbell. 1980. Situacao mundial da mangicultura. Anais Do I Simposio Brasileiro Sobre A Cultura Da Mangueira. 193-213.

Knight, R. J., Jr. and J. W. Sauls. 1980. The passion fruit. Fruit Crops Fact Sheet. Fla. Coop. Ext. Serv., Inst. Food Ag. Sci., Univ. Fl. FC-60.

Table I. Distributions of Plant Introductions from USDA/ARS, Miami, Florida from 1 June 1980 through 31 May 1981

Destination	Number	Percent of Total
Florida	1909	62.73
California	55	1.81
Rest of Continental U.S. and Canada	487	16.00
Caribbean Region x/	77	2.53
Mexico and Central America	49	1.61
South America	33	1.08
Europe	35	1.15
Asia	214	7.03
Africa	58	1.91
Pacific Basin z/	126	4.15
Total:	3043	Total: 100.00

x/ Including Puerto Rico and the Virgin Islands

z/ Australia, Guam, Hawaii, New Zealand, Philippines, Pacific Isalnds.

Table II. Germplasm Receipts at USDA/ARS, Miami, Florida, from 1 June 1980 through 31 May 1981

Material	Number of Introductions Received
Miscellaneous ornamentals and shade trees (includes orchids and ferns)	218
Tropical and Subtropical fruits	367
Cacao	177
Coffee	23
Medicinal, Chemurgic, and Tropical Vegetables[z/]	69
Total:	854

[z/] Includes edible palms, nuts and spices

July 1981

Germplasm Resources Laboratory
Report To The
Regional Technical Committees on Plant Germplasm

Laboratory Personnel

Several changes in personnel and research programs have occurred since our last report. Howard Waterworth was appointed Chief of the Laboratory(GRL) nearly a year ago. He is not new to the laboratory having been part of it and the former New Crops Branch since 1964. Most of his research efforts have dealt with viruses from vegetatively-propagated plant introductions. He continues this research at the Glenn Dale Station.

Dr. Bruce Parliman joined the Laboratory in March and is located at Glenn Dale. Our long-standing urgent need for a horticulturist there has been met. He received a Ph.D at Minnesota and then taught and researched on plant propagation at Clemson University for 4 years. For a semester he was on a Fulbright Lectureship in Argentina. He taught a course on evolution at the University in Rosario, and lectured for INTA(Alias USDA) on tissue culture and mutation breeding.

The Federal component of the Germplasm Resources Information Project(GRIP) team was transferred from SEA-AR headquarters staff to the Laboratory in February. This group consists of Dr. Richard Cooper, Leader, Mr. Robert Chen, Mr. John Belt(stationed at Ft. Collins with the LISA Component of the GRIP team) and Ms. Ruth Davis. These persons will be working with you in the years ahead. The GRL now has 11 scientists. Don't hesitate to call upon us if we can be of service to you.

Two other persons you will be hearing more about are Dr. Allan Stoner and Dr. Jerrell Powell. Both have a keen interest in plant germplasm and have dealt with germplasm for many years. Dr. Stoner, new chief of the Plant Genetics and Germplasm Institute is a well-known tomato breeder. He is a member of the tomato crop advisory committee and a consultant to the newly formed GRIP Coordinating Committee. Dr. Powell, new Assistant Director of Beltsville, is a well-known forage grass breeder. He has served on special assignments related to germplasm. He has also served on the OECD, an international body with one member from each participating country, dealing with exchange of certified seed of major crop species. Both attended the special germplasm workshop on March 8-11. The GRL and germplasm related activities have enjoyed their excellent support in spite of very difficult times.

Dr. H. Waterworth, Dr. Dave Smith, Dr. George White and Dr. Richard Cooper attended the germplasm workshop in Peoria in March. The latter 3 gave reports and their impressions on their portion of the germplasm system. The meeting, called by Dr. T. Kinney, AR Administor was attended by many influential administrators both the Federal and State sides as well as leaders from industry. Minutes of this workshop are available.

Plant Introduction and Exchange

The PI documentation system was up and winging in 1980 as 15,081 accessions have associated numbers in the range of 436991-452071. The total includes 2618 native corns from Colombia and Brazil and 1445 soybean samples from Russia. In addition, 624 shipments of 28,962 items including 5000 Solanum lines from Peru and 774 sorghums from IBPGR for NSSL were received from other countries.

Through June 5, 1981, a total of 6772 PI's have been assigned. Of that total, 5414 are sorghums from Ethiopia via grow out in Mexico (to meet U.S. quarantine requirements). About 2400-2500 accessions of the Yemen sorghum collection have been increased in Puerto Rico and will be assigned PI numbers this summer.

Exchanges in 1980 totalled 102,932 items in 1909 shipments to 125 countries. Samples of cotton and cereals for nursery programs accounted for 38,108 items. Further, 175 shipments of 1258 items were sent in response to requests from domestic cooperators. For our AID project, 193 shipments consisting of 2134 items were sent to 60 countries. Plant materials provided through the project are preponderantly U.S. cultivars and larger amounts are sent than through the regular exchange program. We also supply, as available, inoculum with legume seeds that are being sent to AID missions in developing countries. Leucaena for forage and fuelwood proved to be the "hottest" item in 1980 - 127 shipments of three lines.

During 1980, a change in a major print program of the PI computer system significantly reduced printing and editing time and improved readability. Mini-tapes of PI data were prepared by the Grip Project persons at Beltsville and sent to the four RPIS for trial data transferral to their files. The intent in 1981 is to send the tapes and seeds (or other plant materials) at about the same time.

Some recently completed explorations and foreign trips have resulted in the following approximate number of accessions:

Year	Collectors	Countries	Crop Emphasis	No. of Accessions	
1980	Kehr	Chile	Medicago	31	
	Rumbaugh	Canada & U.S.	"	55	
	Wilton & Others	U.S. & Canada	"	138	
	Kehr	U.S.	"	9	
	China Team (Dewey, Orton, Sunderman, Thompson)	PRC	grasses, vegetables & cereals	480	
	Whitaker	Argentina	Cucurbita	86	
	Hymowitz	PRC	Glycine	38	
	Cuk (Yugoslavia) & Others	U.S.	Helianthus	400	(45 species)
1981	Rumbaugh	Peru, Bolivia, & Ecuador	Medicago	224	

The Plant Introduction Office (PIO) provides backup support for all plant explorations. Explorers and travelers expecting to collect or obtain plant germplasm should contact PIO well in advance regarding quarantine, special clearances, contacts, etc.

A Germplasm Task Force has been established to develop a long-range plan for the National Plant Germplasm System (NPGS). Two representatives from GRL are involved with the project, George White as a member of the Task Force and Sharon Kenworthy as a Technical Assistant. Drafts of the first two reports, NPGS - Current Status (1980) and NPGS - Strengths and Weaknesses, have been written. The third report, the actual long-range plan, will be completed by July.

As part of the AID project, Dr. White travelled to Brazil, Costa Rica, and Mexico. CENARGEN, the national center for plant genetic resources in Brasilia, is developing rapidly and has a capable, enthusiastic staff. An excellent seed storage facility should be complete by July 1. Each staff member is responsible for one or more operational activities plus national coordination of the germplasm needs of one to several crops. CATIE, Turrialba, Costa Rica maintains clonal collections of coffee, cocoa, guava, and others. We serve as a "third country quarantine" for coffee but most of the traffic is to CATIE. Mexico has a national plan for plant germplasm but has implemented only segments of it. They are actively collecting germplasm of several crops. White received an excellent overview of activities and objectives of CIMMYT.

White also attended an IBPGR/FAO sponsored Technical Conference as a consultant on Plant Introduction and Exchange.

There are 74 species (including several Prosopis spp.) on or being considered for inclusion on the noxious weed list. Consideration is being given to encompassing many more species, several of which are part of germplasm collections, under a quarantine permit system. Permits for PIO, the four RPIS, and the Small Grains Collection have been requested to handle species presently on the Weed Law and those expected to be included soon. Regional Coordinators will be informed of developments.

Small lots of plant germplasm are fed into the national program by U.S. scientists, travelers, etc. Ideally, these would be routed through a Regional Coordinator. For complete, accurate, and prompt PI documentation, the PIO prefers to have the plant materials as well as all associated information. (White)

"A weed is an honest, independent competition for good materials in the struggle for existence"

The Small Grain Collection

The wheat research computer file now contains 320,000 data for the germplasm collection. Microfiche containing all this information were distributed to 132 wheat researchers upon request. We used the data to identify accessions for use as parents for production of desired germplasm. A set of accessions with multiple resistances was selected, and a microfiche with all the information available for these elite lines was sent to 208 wheat breeders. (Porter)

Extensive renovation of the small grain collection cold storage buiding is nearly completed. Windows have been bricked in, insulation has been installed in the ceiling and walls, new insulated doors and overhead lights have been installed. A new air conditioning unit will be installed this summer.

In the past year we have sent out 520 orders (299 domestic, 221 foreign) made up of approximately 100,000 samples. We have accessioned 1322 new items in the collection, 102 CIs and 1220 PIs.

Functional specifications have been written and submitted for developing a set of blue prints for a new building to house the Small Grain Collection. $100,000 was appropriated for this purpose. (Smith)

Disease Research

As a member of the Collections and Germplasm Committee, American Phytopathological Society, O'Brien participated in the planning for the germplasm symposium to be held at the Society's 1983 meeting. She also participated in the deliberations on preserving major fungal and bacterial collections of crop diseases where the collections are in danger of being lost.

There was an overall increase in disease-resistance/tolerance scores for 20 of the higher-rated eggplant PI lines tested earlier when avirulent isolates from tomato and eggplant were used as inoculum sources singly with the virulent cotton isolate. PI 320504 and 286099 had disease-resistance ratings when avirulent isolates were used in combination as inoculum source. PI 320504 and 'Florida Market' held up well when three avirulent isolates were used as combined inoculum.

A major pathogen in the northeastern-Atlantic Coast area on *Crambe* is *Alternaria brassicicola*. In greenhouse tests sown with seed from field-grown plants, the fungus was not isolated from embryos set by the greenhouse-grown plants. This indicates that the fungus, although internally borne in seed, is not systemic in *Crambe* spp. (O'Brien)

The Rice Collection

The inventory of the Beltsville rice germplasm collection has been completed. Computerized copies of the inventory are in preparation for distribution. Work and progress has continued on the *Leucaena* bibliography. Cooperative studies in the assessment of the *Leucaena* collection for winter hardiness continue with plantings in Alabama and Florida. Screening the collection for acid soil tolerance continues in greenhouse plantings. The chromosome content of the limpograss collection was completed in cooperation with the University of Florida and a paper has been prepared. (Oakes)

New Crops Research

Twenty introductions of vegetable Amaranthus were evaluated in the field and by taste panels. A. dubius produced the best yields followed by A. cruentus and A. tricolor. A. tricolor appeared to have the best market potential based on taste panels and several strains were comparable to spinach in acceptance. Seed from 41 Asclepias syriaca and 19 Rhus glabra populations were planted in the field in replicated tests. Significant differences in seedling vigor, stand establishment, dry matter yield, and ability to over-winter were noted. Significant variation in whole-plant % hydrocarbon was also noted among Asclepias populations.

Seed from several Cuphea accessions is being increased in the greenhouse for further evaluation. (Campbell)

GRIP

The Germplasm Resources Information Project (GRIP) team completed the Design Recommendations Working Report in February. A copy may be obtained by contacting Dr. Quentin Jones, NPS.

The Registry Committee held its first meeting in Peoria, Ill on March 12-13. They met to evaluate existing registry/introduction descriptors and to recommend standard descriptors with definitions. Dr. Ray Clark, Ames, Iowa was elected Chairman.

The GRIP Coordinating Committee held its first meeting on May 7-8, at Beltsville. This committee, chaired by Dr. Quentin Jones, acted on the recommendations and policy issues presented in the GRIP Design Recommendations Working Report. Significant actions have been taken so that work on the final Information System will begin.

The National Registry System Prototype has become operational. Several sites have received magnetic tapes of Plant Inventory data from the Plant Introduction Office. There were some difficulties in using the tapes at the sites but in most cases have been overcome. Some site curators have expressed the need to receive both the seeds and the tapes from the PIO at the same time. We have implemented procedures to facilitate the simultaneous transmission of seeds and magnetic tapes.

The GRIP Team will now begin to implement the National Germplasm Information System. All of the information will be centrally stored at Beltsville; both curators and breeders will have access to this information.

Each curator will be asked to maintain his/her portion of the data and will have remote CRT (Screen) computer terminals to update the information accessions at the locations. During the first year only certain curators will be using the system with the assistance of the GRIP Team. (Cooper et al)

Glenn Dale

Accessions received during the year, most of which are potatoes and vegetatively propagated fruits and ornamentals, totalled 590. About 80% must be in quarantine for one to 4 years. About 1/3 must be indexed for a range of viruses, by APHIS personnel, according to quarantine regulations. The station has also served a third - country quarantine role for germplasm moving between two other countries. The primary genera involved are coffee, cocoa, and minor tropical crops.

The three annual distribution lists, ornamentals, tree fruits, and grapes were sent to 210, 60, and 25 cooperators respectively. They listed ca. 44 ornamentals, 25 tree fruits and 18 grape accessions. Unfortunately a substantial percent of new accessions are infested with one or more viruses, e.g. the apples, potatoes, prunus - 50%; citrus and pears - 30%; grapes - 60%; and ornamentals - 15%. The State Quarantine officer in many states will not allow us to ship virus-infected germplasm into their state. Dr. Parliman and a new APHIS hire will expand efforts to eliminate viruses from selected accessions.

With the new Northwest Repository now open for business, we shipped some 300 cultivars and Pyrus species to Dr. O. Jahn in March. We will continue to expend the considerable effort to maintain over 700 or so cultivars of apples until the Geneva and Byron Repositories are functional. Inventories of these two genera were announced in Fruit Varieties Journal during the past year.

Our seed storage collection has had minimal activity for many years. The several thousand items, many of esoteric genera, were assembled from 1955 to 1970. A computer printout of the inventory was distributed to the NSSL and to the Regional Coordinators offering any items they wanted. Thousands remain and are available for research programs.

We have a new collection of ca. 400 pear cultivars. They were collected by Dr. Vander Zwet in Eastern Europe in 1978 and 1980 and are being screened for resistance to fireblight and selected insects. Anyone interested in this germplasm should contact him or Dr. Waterworth.

Dr. Richard Hampton is chairman of a committee and has finished a survey of viruses that are seed-borne in major crops and in germplasm collections. The report will be distributed to agricultural administrators and other policy-making persons. A copy is available upon request.

During the past year viruses from guar, mustard-spinach, passiflora, Lonicera and amaryllis were studied in detail. The guar virus is seed transmitted and was detected in 60% of the seedlings in 4 popular cultivars. It produces no obvious symptoms. The lonicera virus was identified as tobacco streak. Those from mustard-spinach and amaryllis (from So. America) appear to be 'new' viruses. The virus from passiflora was the latent virus. (Waterworth)

Propagation Research

One of our primary objectives at Glenn Glenn Dale will be to decrease time a researcher must wait for requested, asexually-propagated germplasm. Since asexually propagated germplasm introduction procedures are being reviewed, this is an excellent opportunity for cooperators to offer suggestions for changes and improvements in the distribution of asexually propagated germplasm.

In vitro tissue culture program at Glenn Dale has been reactivated. Tissue culture procedures are being used to rapidly clone germplasm and in cooperation with APHIS are designed to eliminate viruses. In vitro research with difficult-to-propagate genotypes, and studies on the action of environment on organogenesis and embryogenesis, have been initiated.

Steps are being taken to reorganize the maintenance, propagation and distribution procedures for woody plants (esp. Prunus species). The objective will be to propagate and maintain new germplasm while it is in quarantine and rapidly distribute newly released material. Since woody tissues arrive at Glenn Dale on any day of the year, a combination of propagation and cultural procedures will likely be effective.

Glenn Dale has large collections of cloned plant material. Work is being done to propagate germplasm which is out of quarantine but has not been distributed. Within the next six months the list of cooperators on the annual distribution lists will be revised. (Parliman)

Selected Publications

Baenziger, P. S., R. A. Kilpatrick, W. M. Porter, and J. G. Moseman. 1980. Wheat Newsletter at Beltsville. Annual Wheat Newsletter 26: 144-146.

Campbell, T. A. and J. A. Abbott. 1981. Vegetable Amaranth (Amaranthus spp) field evaluations of 20 strains. J. of Am. Soc. Hort. Sci. (In Press)

Johnson, J. W., Devine, M. B., White, G. A., and Kleiman, R. 1980. Yield and agronomic characteristics of meadowfoam with planting time and rates. Agron. J. 72(4): 617-619.

Oakes, A. J. 1981. Registration of Winter-hardy limpograss Hemarthria altissima, germplasm. Crop Science. (In Press)

Porter, W. M., and D. H. Smith, Jr. 1980. The wheat evaluation file: A valuable tool for Breeders. Agron. Abst. P. 65.

Quesenberry, K. H., A. J. Oakes and O. Jessop. 1981. Cytological and geographical characterizations of Hemarthria. Canad. J. Gen. & Cytol. (In Press)

Radcliff, R. H, and A. J. Oakes. 1981. Yellow sugarcane aphid resistance in selected Digitaria germplasm. J. Econ. Entom. (In Press)

Smith, D. H. Jr., J. A. Webster and E. H. Everson. 1980. Registration of Six Germplasm Sources of Cereal Leaf Beetle Resistant Hard Red Spring Wheats. Crop Sci 20: 420.

Waterworth, H. E. 1980. Scionwood of apple cultivars, rootstocks, and species available from the Plant Introduction Station. Fruit Vars. Journ. 34(2): 27-33.

Waterworth, H. E. 1981. Scionwood of pear cultivars and species available from the U.S. Plant Introduction Station. Fruit Vars Jour. 35: 71-74.

Waterworth, H. E. 1981. Control of plant diseases by exclusion: Quarantine and disease-free stocks. In: Pest Management, D. Pimentel, editor, CRC Press.

Waterworth, H. E. and G. A. White. 1981. Plant Introductions and quarantine: The necessity for both. Plant Disease 65. (In Press)

Webster, J. A., D. H. Smith, Jr., R. P. Hoxie. 1980. Reduced yield of spring oat cultivars by Cereal Leaf Beetle. AR-NC-6 Oct.

White, G. A. 1980. Importation of bamboo vegetable propagules into United States. J. Amer. Bamboo Soc. 1(3): 32-33.

Porter, W. M. and D. H. Smith, Jr. 1981. Computer-assisted management of the USDA small grain collection. Plant Disease 65. (In Press)

1981 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 a 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 400 visitors from more than 30 states and 18 foreign countries toured the National Seed Storage Laboratory. This includes several grade school, high school, and college classes and many persons who attended the American Society for Horticultural Science Meetings held in Fort Collins in 1980. Deere, Inc. donated to the NSSL two copies of an educational movie on germplasm preservation featuring the National Seed Storage Laboratory and the NC-7 Regional Plant Introduction Station. The movie is available for short-term loan.

During the month of November, Dr. Bass, Director of the NSSL, served as a consultant for FAO on a United Nations development project at the Indian Institute of Horticultural Science in Bangalore. Dr. Bass helped plan the facilities and operational procedures for a germplasm and pollen storage bank for horticultural crops. He also gave several seminars for the Department of Horticulture at the University of Agriculture at Bangalore.

Germplasm Preservation

Arrangements were made for seed increases of approximately 1,350 accessions that were either low in germination or in number of seeds. Seed increase samples received totaled 2,452. Approximately 22,000 germination and 350 special tests were made on stored and incoming seed samples.

Eighty barley genetic stocks were grown and their characteristics recorded. Some 70 genetic stocks for marker genes were grown for seed increase. F_2 and F_3 populations for 25 combinations were grown to isolate double or triple marker stocks. All primary trisomic stocks in two varieties, Betzes and Shin Ebisu 16, all of eight telotrisomics, and several other complicated aneuploids were grown and seed increased. Seeds of 60 genetic stocks and 25 trisomic stocks were distributed. The telocentric chromosomes in all eight telotrisomic lines were identified by Giemsa banding techniques as follows: Telo 1L, 1S, 2L, 2S, 3L, 4L, 5L, and 6S.

Cooperation with GRIP Project

D. C. Clark

The National Seed Storage Laboratory is cooperating with the GRIP project. The maintenance and control programs were revised to accommodate the GRIP Registry System, the serial numbers were amended to include subsequent generations of an accession, and complete mailing addresses were added to the donor file to facilitate generation of mailing labels and seed request letters. Microfiche files were added to the information system and whenever possible are sent in place of computer printouts as inventory listings. An accounting file was set up to keep track of inactive records.

Cooperation with IBPGR

The National Seed Storage Laboratory is cooperating with the International Board of Plant Genetic Resources. During the past year, 1,162 samples of germplasm from 8 countries were received from IBPGR.

Facility Needs

With the increase in rate of acquisition and the additional accessions generated by cooperation with the International Board of Plant Genetic Resources, it appears that the available storage space will be fully utilized within the next 4 to 5 years. At its 1980 meeting, Marriottsville, Maryland, September 3 and 4, 1980, the chairman of the National Plant Germplasm Committee appointed an ad hoc subcommittee to study site selection and facility requirements for the National Seed Storage Laboratory. The subcommittee met at Fort Collins, Colorado on October 15 and 16, 1980 to consider an appropriate site and facility requirements for long-term seed storage.

After discussion, forward planning for 25 to 30 years was considered appropriate. The committee also felt that expansion of the Laboratory would be more efficient than construction of additional facilities even a few miles away. Both the Colorado State University Facility Planning Committee and the State Board of Agriculture Governing Body of CSU have agreed to make land available immediately west of the present building for an addition to the NSSL. Upgrading of the refrigeration system for the remaining two seed-storage rooms is in the planning stage. Hopefully the work will be completed within the next few months. A request for planning and construction funds for an addition to the NSSL has been submitted, but no money has been allocated.

Research Notes

Environmental and Other Factor Effects Upon Seed Viability and Storage

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

Salvia seeds in sealed foil-laminated packages retained their viability well under a variety of temperature/relative humidity conditions. Salvia seeds in paper envelopes showed a marked loss of viability under some conditions and only a minor loss under others. Delphinium seeds showed more variable results than did salvia seeds. Germination tests were not scheduled for other seeds stored under a variety of conditions. Using data from a study on artificial aging of pearl millet seeds, a Fortran computer program was developed to ouput time to 50% viability (P_{50}), variance of P_{50}, r^2 and X^2 (measures of goodness of fit and normality), and the probit-time intercept and slope together with their respective standard errors. Evaluation of these parameters can help determine the suitability of an artificial aging test for predicting seed longevity.

Genetic Changes in Seeds During Storage

E. E. Roos

Cytological examination of root tips from artificially aged seeds at first mitosis and after 3 and 5 weeks of growth revealed that chromosomal aberrations in root tips are eliminated as the plants grow, which indicates that such aberrations induced by aging are of less importance in long-term germplasm preservation than thought previously.

Heterogeneous bean seed populations lose components through selective survival in storage, differential field productivity, and random sample selection for regeneration. All three factors contribute to genetic erosion

or genetic variability within a population; however, the small samples presently used for regeneration probably contribute most to loss of variability. A computer model has been developed to predict changes in variability within heterogeneous populations. However, knowledge of initial variability is needed along with storage and regeneration data to adequately project the size of sample needed for both storage and regeneration.

Of the 22 lines of pearl millet tested, 10 showed altered genetic ratios for the chlorophyll deficient genes after aging at 21°C/70% relative humidity and 11 lines showed altered genetic ratios after aging at 32°C/70% relative humidity. Selfed- and open-pollinated bulk populations of 291 lines of pearl millet were aged under three conditions. The open-pollinated population lost viability more rapidly than did the selfed-population under all storage conditions. It is not known if this is a genetic effect or seed vigor effect.

Cryopreservation of Plant Germplasm

P. C. Stanwood

The National Seed Storage Laboratory has 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 *Psidium cattleianum* Sabine (strawberry guava), *Coffea arabica* L. (Arabian coffee), *Coffea arabica* var. *bourbon* (B. Rodr) Choussy, *Passiflora edulis* Sims Forma *flavicarpa* Deg. (passion fruit), and *Chrysalidocarpus lutescens* (Bory) H. Wendl. (areca palm) were collected and

processed in Hawaii and shipped to the National Seed Storage Laboratory for research.

In initial experiments with recalcitrant seeds, strawberry guava and passion fruit seeds appear to have been frozen in LN_2 with no damage to viability.

In experiments with orthodox seeds, viability of bean, lespedeza, rice, and onion seed was no better after 3 years of storage at -196°C (in LN_2) than after storage at 5°C, -18°C, or -70°C. Critical seed moisture content at or above which freezing damage occurs varied among species ranging from 9.3 $\pm$ 0.5% for sesame seeds, to 14.2 $\pm$ 1.1% for cauliflower, to 27.2 $\pm$ 1.2% for snap bean seeds. Exotherms (killing points) vary for dry and moist seeds. Below the critical moisture content no exotherm was observed for barley, cabbage, cauliflower, clover, cucumber, fescue, onion, pepper, sorghum, and wheat seeds; above the critical moisture content exotherms varied from -7°C for wheat to -28°C for cabbage, with exotherms for most kinds of seeds studied between -21°C to -28°C.

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Bass, L. N. Report of the National Seed Storage Laboratory.

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Clark, D. C. Report of the National Seed Storage Laboratory.

The professional staff gave guest lectures for various classes at Colorado State University during 1980.

6-10-81

Report for 1981 Meetings of the
W-6, NC-7, and S-9 Technical Committees

Northern Regional Research Center

General Developments at NRRC--With the retirement of Dr. H. J. Dutton, former Chief of the Oilseed Crops Laboratory and Research Leader of the Photosynthesis Group, photosynthesis research has now been placed in the Horticultural and Special Crops Laboratory under research leadership of Dr. John A. Rothfus. The move included five scientists, one technician, and several temporary employees, such as 1040 students. The research group has been renamed Plant Biochemistry and Photosynthesis Research. So, the HSC program is undergoing a shift in emphasis with the incorporation of this research on the chemical nature of bio-active carotenoid-chlorophyll complexes, intermolecular energy transfer, plant pigmentation, and the characterization and control of photon-activated processes. These studies dealing with plant molecular biology and biochemistry are thus combined administratively with investigations of the differentiation and control of cellular metabolism via cell and tissue culture techniques and with fundamental studies of chemical interactions that define specific associations and segregating physical properties of biochemical mixtures as occur in differentiating tissue.

The SEA Northern Agricultural Energy Center, which was established at NRRC in January 1980, is now led by Mr. Marvin O. Bagby as Acting Manager. NRRC scientists are assigned to this program under matrix management. This SEA program includes the input of Cooperative Research and Extension Services, and involves Research Program Leader R. M. Peart and Technology Transfer Program Leader S. S. DeForest, respectively. Mr. DeForest completed his tour of duty in June 1981, and the position has already been filled by W. C. Fairbank. Dr. Peart will complete his assignment in July 1981, and his replacement has not yet been named. In addition to the in-house NRRC programs, crop production research at twelve other locations throughout the USA are managed by the Energy Center. These studies include research on sugarcane, sweet potatoes, sugar beets, fodder beets, sweet sorghum, sweet-stalked corn, and potential hydrocarbon-producing plants. DOE pass-through funds have finally been received by USDA, and proposals for research grants from SEA and DOE funds, received in response to the Solicitation of Applications published in the Federal Register of April 7, 1981 (Vol. 46, No. 66, pp. 20972-20976), are now being evaluated by peer review panels.

The NRRC budget for FY 1982 looks good with OMB restoration of the $1.5 million cut that was again proposed by the Carter administration. The new Reagan administration appears not to be willing to wait for such restoration later in the House and Senate deliberations. Of course, the slow but constant reduction in permanent research staff at NRRC and other USDA facilities is detrimental to satisfactory operation and is a problem that needs to be addressed.

The HSC research programs in germplasm characterization and new crops under NRP 20160 have been reviewed in May 1981 by a review team under leadership of Dr. Quentin Jones. Team members included representatives of USDA (Agricultural

Research and Soil Conservation Service), State Agricultural Experiment Stations, National Cancer Institute, universities, and the private sector. Although the final report has not been distributed at this date, it can be expected that recommendations by the team will result in changes that will improve emphasis and efficiency. Such proposed changes will be implemented as soon as possible. Reviews of this nature are needed and desired.

New Crops Screening--Of the new crop species screened for their chemical composition, a number have higher than 25% oil content. The highest of these was *Croton capitatus*, collected in Mississippi, with 62% oil. *Banksia paludosa* had 79% protein (N X 6.25). Many indicated unusual composition by TLC and/or GLC. Of the oils converted to fatty acid methyl esters and analyzed by GLC and TLC, several revealed unusual fatty acid composition. For example, four Asclepiadaceae contain 16:1, up to 18%, two *Callitris* species contain about 20% *cis*-5 C_{20} acids. *Cuphea petiolata*, collected in Illinois, contained 76% 10:0. In-depth characterization of unusual seed oil components revealed about one-fourth of *Cacalia atriplicifolia* seed oil is composed of long chain esters of dammarenediol II. This triterpene has previously been found (unesterified) in the bark of some tropical trees. *Cacalia* is an herb collected in Illinois. A new neolignan, 5,8-epoxy-6,7-dimethyl 2',3',2",3" dimethylenedioxy-4',1"-dimethoxy-1,2:3,4-dibenzo-1,3-cyclooctadiene, was isolated from the petroleum ether extract of *Clerodendron inerme* seed. Three alkaloids were identified in the petroleum ether extract of *Bocconia arborea* seed. They are dihydrosanguarine, dihydrobocconine, and dihydrochelythrine. Four new long chain (22-28 carbons) monoenoic hydroxy acids were characterized from the seed oil of a *Grevillia* species collected in Australia.

Chemical Analyses and Methods Development--Analysis of rapeseed lines grown in Idaho and Washington continued, with erucic acid and glucosinolate content determined on about 150 lines. Methods were developed to analyze for tallow and seed oil in *Sapium sebiferum* (Chinese tallow tree). A collection of 50 samples collected in the wild were analyzed by these procedures.

An HPLC method was developed to separate and quantitate free acids, triglyceride, diglyceride, and monoglycerides. The method utilizes a cyano-bonded Partisil column under gradient elution conditions and an infrared detector. Mass spectrometric methods were developed for the analysis of the natural toxicant falcarinol and for mycotoxins, such as zearalenone, vomatoxin, and ochratoxin. Chemical ionization-mass spectrometry was applied to fatty acid methyl esters and wax esters.

About 13,500 samples were received from public soybean breeders throughout the United States and Canada. These samples were examined for their oil and protein content by the infrared reflectance method.

Fatty acid composition was determined on 5,000 soybean samples. Included in these gas chromatographic analyses were germplasm collection samples from the northern and southern collections. Several samples with linolenic acid content less than 5% were found. The lowest of these was 4.2%. This sample was also unusual in that the 18:2 component was higher than usual (58%). Most samples with decreased 18:3 content are higher in 18:1. Analysis of chemical mutation

samples from Dr. J. R. Wilcox, SEA-AR, Purdue University, yielded no low linolenic acid samples. As a result of the soybean germplasm study, a number of promising low linolenic acid containing lines are being grown out at four locations this summer.

Crambe--Of 1000 acres of crambe planted in Kentucky for commercial use, ca 80% were destroyed by an unusual infestation of aphids. The reason for this infestation may be the rather mild winter and hot early spring weather. The infestation hit within 1 month after the crambe was planted. About 100 acres has been salvaged for seed needed for another commercial attempt next year. Another 30 acres is being used for field scale demonstrations of early Kentucky planting dates in conjunction with a double crop with short term soybeans. Some of this latter acreage has received a variety of insecticide treatments in cooperation with Murray State University--information that will be useful in combatting insect problems in the future.

This spring rain prevented crambe and kenaf plantings on our sludge-amended strip-mine plots until June 1. Performance last year (1980) was good, and we hope for a repeat performance this year, which will be the last year that sludge is applied to the plots. This work is in cooperation with the Metropolitan Sanitary District of Greater Chicago at their Fulton County, IL, site.

Crambe meal will be available as a cattle feed--notice of approval (by FDA) to use crambe meal as a feed additive was published in the Federal Register June 5, 1981.

Vernonia galamensis--Small quantities of seed of Kenyan origin were provided in May to Drs. Skrdla (Ames, IA), Foote (Corvallis, OR), Lessman (Las Cruces, NM), and Beatty (Murray, KY) to see whether or not *Vernonia* will grow at these locations. NRRC will also have a test plot.

Hydrocarbon Crops--This past year our hydrocarbon plant program has emphasized Leguminosae species. Using procedures and criteria previously described, we characterized 94 species. Initial data identified eight species to have multi-use potential. With values ranging from 2.0 to 3.0% and from 0.3 to 0.6% whole plant oil and hydrocarbon contents, respectively, no species are exceptional candidates for extractable energy. However, they might be suitable plant biomass resources. *Cytisus scoparius*, *Lupinus arboreus*, and *Robinia hispida* yielded 21 to 33% apparent protein and 10 to 14% polar components.

Antitumor Screening and Fractionation--During the year, 45 new extracts were prepared and submitted to the National Cancer Institute for tests in their antitumor screen. An extract of 20 pounds of *Diarthron vesiculosum* has shown confirmed activity against PS leukemia and is ready for fractionation to determine the active constituents. Fractions from a previous large-scale extraction of *Sesbania drummondii* are being re-examined. Ethanolic extracts of *Sesbania* show good inhibition of PS leukemia in mice; however, isolation of the active principle has proven to be very difficult.

Taxus wallichiana (Cephalotaxus mannii)--Two additional alkaloids have been isolated and characterized from this plant. These new taxanes, taxuwalline and 10-deacetyltaxuwalline, are closely related to cephalomannine and 10-deacetyl-cephalomannine (reported last year). Members of this series of compounds,

including cephalomannine and taxol, are highly cytotoxic and give good inhibition of experimental tumors in mice.

Trewia nudiflora--The seed of *Trewia nudiflora* (Euphorbiaceae) has proved to be a rich source of antitumor agents, including trewiasine and at least five other previously unknown maytansinoids. Three of these are highly unusual in that they possess an additional macrocyclic ring. The maytansinoids are cytotoxic against KB cells (*in vitro*) and show a wide range of biological activity, including inhibition of PS leukemia in mice, inhibition of crown gall tumors grown on potato discs, and they are effective against a variety of insect pests. Recently, they have been shown to act as antifeedants or repellents for the spotted cucumber beetle (*Diabrotica undecimpunctata howardi* Barber) and the European corn borer [*Ostrina nubilalis* Hübner)]. The maytansinoids are also toxic to the striped cucumber beetle [*Acalymma vittatum* (F.)] and give good control of chicken body lice [*Menacanthus stramineus* (Nitzsch)]. Morphogenic effects on the codling moth [*Laspeyresia pomonella* (L.)] and several other insects have also been noted.

Diploclisia glaucescens--The ethanol extract of *Diploclisia* seed is lethal to corn borer larvae and one of the active materials has been isolated and partially characterized as an alkaloid. Large scale extraction/fractionation (100 pounds) is underway which should provide sufficient material for characterization of the active alkaloids and for further testing as insect control agents.

Thevetia thevetioides--Nearly 200 pounds of *Thevetia* seed is being processed for recovery of neriifolin. This should provide sufficient material to test the effectiveness of neriifolin against the European corn borer in a limited field trial.

Oat Attractants--Certain constituents of oats elicit aggregation and attractancy responses in *Oryzaephilus surinamensis* (L.) (sawtoothed grain beetle) and *Tribolium confusum* (confused flour beetle). Oat extracts have been extensively fractionated and a number of fractions produce good aggregation behavior. However, it has been determined that the true attraction response is probably due to volatile materials from the oats which can be collected on a porous polymer, recovered, and bioassayed in-house. Dr. Wendell Burkholder, Madison, WI is our cooperator.

Lesser Peach Tree Borer--In cooperation with Dr. David Reed, Vincennes, IN, and Dr. Dale Norris, Madison, WI, a project investigating the biologically active components of peach trees affecting the lesser peach tree borer (*Synanthedon pictipes*) has been initiated. Bioassays with the adult moth (Dr. Reed) and with larval stages (Dr. Norris) will be performed on various fractions of peach tree extracts. Volatile materials (of which styrene, and α- and β-pinene have been identified) are also being tested and evaluated as attractants and ovipositional stimulants.

Tissue Culture Research--The reason for low antitumor alkaloid concentrations in tissue cultures of *Cephalotaxus harringtonia* is not due to a lack of alkaloid-storage ability. *C. harringtonia* cultures have been found to take up from culture and to store not only the natural alkaloids found in the plant, but also alkaloids from other plant families as well. In some cases, the concentration

of stored alkaloid was comparable to that of the intact tree. Whole plant studies have disclosed that certain young seedlings in our collection apparently lack the ability to biosynthesize the antitumor alkaloid esters, although unesterified esters are produced. Varying day lengths, including 8, 12, and 16 hours in growth chambers, or ambient window-ledge illumination did not promote ester formation. Such plants will be useful for comparison biochemically and histologically to normal trees.

Quinoa, an arid-land small grain cultivated as a staple food by the Inca indians, has been shown to be highly nutritious and palatable once a bitter principle is removed through water extraction. Cultured quinoa cells taste bitter, suggesting that they retain the ability to biosynthesize the bitter compound. This unknown compound is being identified through cooperation with Purdue University to permit chemical or immunochemical assay. Ultimately the tissue culture studies here will include the selection of variant cells in culture and the regeneration of plants lacking the objectionable (and possibly toxic) bitter principle. If successful, quinoa could become a valuable new food and forage crop for the American West or Southwest.

Natural Toxicants in Vegetables--A new cooperative agreement with Colorado State University (Dr. D. H. Gould) is being initiated. This will provide a pathologist to expand studies on the effects of potential toxicants on laboratory animals, both acute and chronic effects.

An assay method for carrots is now being used to measure levels of myristicin, falcarinol, and falcarindiol in the four cultivars commonly used for commercially grown carrots.

Goitrin is known for its anti-thyroid action; now it appears that it increases liver weight of rats (at 30 mg/kg/day). At slightly higher doses, goitrin acts as a mild diuretic, lowers blood urea, and elevates serum cholesterol. Progoitrin, a major component of most turnip cultivars, was found to be absent from five turnips used as human food. Implications for plant breeding are obvious.

Typical crucifer vegetables from Taiwan and Japan are being surveyed for glucosinolates. These were furnished by the University of Wisconsin and include *Brassica campestris* subspecies *chinensis, rapa, nipponsinica,* and *Raphanus* sp.

A novel glucosinolate has been isolated and characterized as dextrorotatory 2-hydroxy-4-pentenyl glucosinolate.

Diets containing *Limnanthes* meal were analyzed for cooperators at Oregon State University. These were fed to chickens; they contained about 0.5% methoxybenzyl glucosinolate.

L. H. Princen, Chief
Horticultural and Special Crops Laboratory

Recent NRRC Publications

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SOUTHERN REGIONAL PLANT INTRODUCTION STATION
Report to S-9 Technical Committee
July 28-29, 1981

This report covers the primary activities of this Plant Introduction Station for the period of July 1, 1980 through June 30, 1981.

Plant Introduction

Germplasm of 8,028 new introductions was added to the regional plant germplasm collection. These new collections were composed of 42 genera and 93 species from 54 countries. Three genera composed 92% of the total collections. A major collection of Sorghum bicolor from Ethiopia (5,413 PI's) was the most important in number and by priority. A collection of cowpeas (1,800 PI's) was received from the Institute of Tropical Agriculture, Ibadan, Nigeria. The third major genera (291 PI's) was Leucaena, a leguminous tree, now in demand in many of the developing countries and receiving research attention in Hawaii, Florida, and Beltsville.

The collection of Ethiopian sorghums arrived just as two researchers, using different approaches, each completed the screening of the base collection of 3,620 PI's for resistance to a new biotype of the "greenbug" (Schizaphis gramium). Both researchers, Dr. Tom Harvey, Kansas State University, Branch Experiment Station, Ft. Hays, Kansas and Dr. Kenneth Starks, USDA-ARS, Oklahoma State University, Stillwater, Oklahoma, indicated they expected the best level of resistance to be in Ethiopian sorghums. Now our emphasis will be to increase the new collection as quickly as practical.

Seed Increase

A total of 696 PI's composed of 33 genera were included in the 1981 increase planting at the Regional Plant Introduction Station. The crops represented are: Peanuts, 152 PI's; Castor Beans, 69 PI's; Grasses, 23 genera, 103 PI's; Peppers, 100 PI's; Gourds, 48 PI's; Cowpeas, 106 PI's; Watermelons, 101 PI's; Cucurbits, 17 PI's.

The MITA unit (Mayaguez Institute of Tropical Agriculture) is increasing Okra, Sorghum, and Millet for a total of 832 PI's. A project development is underway with MITA in an attempt to increase the new Ethiopian Sorghum collection in a 3-year period.

Other cooperators are:

1. University of Florida

   Dr. Frank Gardner - 200 Peanuts
   Dr. A. E. Kretschmer - 600 Tropical Legumes

2. Auburn University

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

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 24,244 seed packets were distributed. Of this total 10,952 were distributed for basic research and plant breeding; 2,200 were sent to cooperators for seed increase to renew seed inventory; and 1,063 packets of forage legume cultivars as a service function to the Legume Section of the Southern Forage Breeders Work Group were distributed to 10 states in the Southern Region.

Distribution by Regions

S-9 (Total - 14,215)

Alabama	212	North Carolina	10
Arkansas	5	Oklahoma	3678
Florida	3802	Puerto Rico	1006
Georgia	3668	South Carolina	526
Hawaii	69	Tennessee	332
Kentucky	137	Texas	330
Louisiana	191	Virginia	9
Mississippi	240	Virgin Islands	0

NC-7: 4,088 NE-9: 460 W-6: 2,743

In addition to the domestic distribution 2,720 seed packets were shipped to 54 foreign countries.

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

Pepper, Bacterial Spot: All new pepper PI's were screened for resistance to bacterial spot. A total of 329 PI's were included in these tests. No new sources of resistance was found.

Muskmelon, Powdery Mildew: A total of 1846 PI's of muskmelon were tested for resistance to powdery mildew race 1. The preliminary tests indicated that 66 were resistant.

Cowpea Viruses: A pilot study in cooperation with Dr. J. W. Demski, the Virologist of the Georgia Experiment Station, resulted in the detection of cucumber mosaic virus and blackeye cowpea mosaic virus in the seed of PI's. Both of these viruses are endemic in Georgia and are commonly found in commercial seed.

Sorghum Anthracnose: Seedlings of sorghum in the field were not infected by anthracnose following inoculation with conidia of the pathogen because of dry weather.

Seedborne Microorganisms: Rhizoctania sp. (probably R. solani) was isolated from 2 PI's of 82 eggplant PI's tested. Rhizoctonia solani Kuhn is a soilborne pathogen with wide distribution.

Colletotrichum dematium (Pers. ex Fr.) Grove: This pathogen was isolated from one PI. This isolate did not sporulate on sterilized greenbeans and is probably a saprophyte. All other microorganisms isolated from eggplant were saprophytes.

Muskmelon Bacterium: The muskmelon bacterium referred to in the 1979 and 1980 reports was found on seed grown in years other than 1978 when a severe epiphytotic occurred. Consequently all Cucumis melo will be withheld from distribution until the seed can be treated to produce pathogen-clean seed.

Dallas Grass Ergot and Watermelon Anthracnose: Field tests are in progress.

Research Projects - Charles Adamson, Research Agronomist

Legumes: A replicated nursery of 24 Vicia sativa introductions, 10 selections, 5 F_1 hybrids and 1 cultivar was grown and evaluated.

New Crops for Oil and Hydrocarbon Production: Laboratory tests were completed on the 1980 annuals test, 9 entries of 4 species, after completion of tests of the chemical apparatus and procedures. A perennials test, 11 entries of 8 species, was evaluated and samples prepared for analysis at Peoria. The test of gutta-producing grasses, with 21 entries of 4 species, was harvested. Field nurseries were established of Asclepias syriaca, 39 entries; Apocynum sp., 4 entries; Rhus glabra, 7 entries; and Eupatorium sp., 5 entries. A harvest date evaluation test of Ambrosia artemisifolia with 5 entries was established at 2 locations.

Disease Resistance:

a. Bacterial spot of pepper - Evaluation for resistance to Xanthomonas vesicatoria has begun on F_3 lines, BC_1F_2's and parent lines from a set of all possible crosses among 3 resistant lines and one susceptible line.

b. Gummy stem blight on watermelon - Crosses are being made for a study of inheritance of this disease using 2 resistant lines and one susceptible line.

Kenaf and Roselle Work: A kenaf, Hibiscus cannabinus, test of 23 selected lines and a roselle, H. sabdariffa, test of 22 selected lines were established at Savannah, GA for the evaluation of yield on lines selected for high bark percentage, leaf type, and plant type. Cuttings will be taken for seed production of selected lines, completing this project.

Southern Regional Plant Introduction Station Budget

Source of Funds	FY-81	FY-82
Regional Research Funds (Pooled)	$78,901	$88,901
Regional Research Funds (Georgia Station)	29,573	23,706
TOTAL	$108,474	$112,607
Expenditures		
Personal Services	89,496	90,129
Travel	317	317
Supplies & Operating	6,661	6,661
Equipment	-	3,500 1/
Seed Increase (MITA)	12,000	12,000
TOTAL	$108,474	$112,607

1/ $3,500 - Set aside to cover one-third share of FY-82 purchase of Wang Word Processing Unit.

Source of Funds	FY-81	FY-82
SEA-AR (Base)	242,100	236,600
Special Allocations:		
SEA-AR,NPS - Clover Curatorship, KY	5,000	5,000
Tripsacum Curatorship, NC	5,000	5,000
SEA-AR, NPS - Forage Crops Increase	15,000	?
TOTAL	$267,100	$246,600
Expenditures		
Personal Services	168,400	180,300
Travel	3,284	7,000
Construction & Repairs	5,000	1,500
Supplies & Materials	36,219	12,300
Support Equipment	11,197	11,500
Broad Form Cooperative Agreements		
1. University of Georgia (Temp. labor)	13,000	15,000
2. Auburn University	5,000	2,000
3. University of Florida, Gainesville	5,000	2,000
4. " " " Ft. Pierce	5,000	5,000
5. University of Kentucky	5,000	5,000
6. North Carolina State University	10,000	5,000
TOTAL	$267,100	$246,600

Summary Budget for SEA-AR Energy
Allocations from the Northern Agricultural Energy Center

Specific Cooperative Agreement with the Georgia Experiment Station -

Evaluation of New Crops for Hydrocarbon and Oil Production

FY-80 Allocations	$42,570
FY-81 Allocations	42,570
TOTAL	$85,140
FY-80 Expenditures	
Laboratory Equipment	$15,570
FY-81[1/] Expenditures	
Personal Services - ARA II Tech.	2,460
Laboratory Equipment & Supplies	460
FY-82[2/] Expenditures	
Personal Services - ARA II Tech.	13,767
Laboratory Supplies	1,516

With current funds allocated to the Specific Cooperative Agreement (SCA) we can plan to carry out three full growing seasons of production, sampling, and analysis. The termination date for the SCA is being adjusted from April, 1982 to June, 1984.

1/ University of Georgia Fiscal Year: 7/1/80 - 6/30/81

2/ University of Georgia Fiscal Year: 7/1/81 - 6/30/82

Appendix

PLANT EXPLORATION PROPOSALS

1. Collection of Wild Beans (Phaseolus) Species in Mexico - George Freytag, MITA.

2. Peanut Plant Germplasm Exchange with People's Republic of China - Ray O. Hammons, USDA-ARS, Tifton, GA.

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

4. Germplasm Collections of Tropical and Subtropical Forage Legumes in Southern China - Albert E. Kretschmer, University of Florida, Ft. Pierce, FL.