

**MINUTES OF THE MEETING OF THE
S-9 TECHNICAL ADVISORY COMMITTEE
FOR
PLANT GENETIC RESOURCES CONSERVATION AND UTILIZATION
S-9 MULTISTATE RESEARCH PROJECT**

A Cooperative Research Project Among:

THE STATE AGRICULTURAL EXPERIMENT STATIONS
OF THE SOUTHERN REGION

and the

U.S. DEPARTMENT OF AGRICULTURE AGENCIES:

AGRICULTURAL RESEARCH SERVICE

COOPERATIVE STATE RESEARCH, EDUCATION AND EXTENSION SERVICE

NATURAL RESOURCES CONSERVATION SERVICE

AUGUST 6, 2002

UNIVERSITY OF GEORGIA
COLLEGE OF AGRICULTURE AND ENVIRONMENTAL SCIENCES
GRIFFIN CAMPUS-GEORGIA EXPERIMENT STATION
GRIFFIN, GEORGIA

SUBMITTED BY

CHARLES M. TALIAFERRO, CHAIRMAN

S-9 TECHNICAL ADVISORY COMMITTEE MEETING

August 6, 2002

Griffin, GA

AGENDA

- 8:00 am Introductory remarks by Dr. Arkin, Administrative Advisor and Dr. Taliaferro, Committee Chair
- 8:30 am Remarks by those attending representing the National Plant Germplasm System
- 8:45 am Summary of the year in the Plant Germplasm Resources Conservation Unit and comments about the program by Dr. Gary Pederson, Research Leader
- 9:30 am Break
- 9:45 am Begin tour of PGRCU facilities and plots (with comments by staff at each stop)
- 12:30 pm Lunch at Byron, GA
- 1:00 pm Continue tour of plots in Byron and then return to Griffin to see plots
- 4:30 pm Meeting of TAC members to formulate a report of recommendations
- 5:30 pm Back to motel
- 7:00 pm Informal dinner at the Pavilion on the Griffin campus to visit with attendees and staff

Attendees:**TAC Members:**

Charles Taliaferro, Chair	Oklahoma State University, OK
Gerald F. Arkin, Administrative Advisor	University of Georgia, GA
Fred Allen	University of Tennessee, TN
Ann Blount	University of Florida, (for Ken Quesenberry) FL
David Coffey	University of Tennessee, TN
Mari Marutani	University of Guam, GU
Jorge Mosjidis	Auburn University, AL
Emerson Shipe	Clemson University, SC
H. Thomas Stalker	North Carolina State University, NC
Clarence Watson	Mississippi State University, MS
Thomas Zimmerman	University of the Virgin Islands, VI.

Griffin PGRCU Staff:

Gary Pederson, Research Leader, USDA, ARS
Rob Dean, Geneticist, University of Georgia
Graves Gillaspie, Research Plant Pathologist/Vigna Curator, USDA, ARS
Bob Jarret, Research Horticulturist/Sweetpotato & Vegetable Crops Curator, USDA, ARS
Brad Morris, Agronomist, Special Purpose Legumes & Misc. Crops Curator, USDA, ARS
Roy Pittman, Agronomist, Peanut Curator, USDA, ARS, PGRCU
Merrelyn Spinks, IT Specialist, Seed Storage/Database Management, USDA, ARS
Jim Strickland, Farm Manager, USDA, ARS

Other Attendees:

Allan Stoner, USDA, ARS, Beltsville, MD

1. Call to Order

The Regional S-9 Technical Advisory Committee (TAC) was called to order at 8:00 a.m. on Tuesday, August 6, 2002, by chairman Dr. Charles Taliaferro. The meeting convened in the Redding building conference room on the Griffin Campus of the University of Georgia, College of Agriculture & Environmental Science, Griffin, Georgia.

2. Welcome and Opening Remarks

Dr. Gerald Arkin in his welcome gave an overview of the role of the S-9 Administrative Advisor and the S-9 Project. Dr. Arkin emphasized that the S-9 project is the oldest in the region, having been in place for 53 years and the Southern Association of Agricultural Experiment Station Directors (SAAESD) provide for funding from the top of their budget. Dr. Arkin noted that at the time, Congress had left out the Georgia station in its budget. Due to the economic situation in many states, he stressed that state funding sources are not as reliable as in the past and the

need to investigate other revenue sources. He reminded the group that the S-9 project is up for renewal. He also noted the leadership Dr. Gary Pederson has provided for the Plant Genetics Resource Conservation Unit (PGRCU) in Griffin has been encouraging. Dr. Arkin also mentioned the need for a science writer to convey information in the print media to the general public.

3. National Overview

Dr. Allan Stoner provided an overview of the National Plant Germplasm System and GRIN. He also noted the work of the American Seed Trade Association and their concern for the continued support for plant germplasm preservation. He also referred to the name change of the former National Seed Storage Laboratory to the National Center for Genetic Resources Preservation (NCGRP). Plant germplasm is available for distribution to all but five countries. Overall, the distribution is mainly local, 75% with the remaining 25% going to foreign entities. Dr. Stoner commented that bringing in germplasm from foreign areas is more difficult due to international agreements. Concerns for Intellectual Property Rights resulted in the United States abstaining on a resolution, passed by 113 countries, regarding global food security for important crops. The resolution included 35 plant gene pools. The Plant Exploration Program received ten proposals. He reminded us that an APHIS Phytosanitary Certificate is required for import of plant germplasm from foreign countries.

4. PGRCU Overview

Dr. Gary Pederson gave a presentation for the PGRCU entitled 'Plant Genetic Resources: Current Status and Future Plans' (Appendix 1). The presentation consisted of the mission of the PGRCU, current status of each crop, progress made and plans for the future. Dr. Pederson concluded with a presentation made for the 2002 ASA entitled 'Distribution of Plant Genetic Resources to New Users.'

5. Tour of Plots

A break was taken after Dr. Pederson's presentation. A tour was provided of the PGRCU facilities in Griffin of the molecular laboratories, seed germination, seed room and GRIN. The group was then transported to Byron, GA. Following lunch, the group toured the caged watermelon plots, peanut field plots, and the bamboo area. Returning to Griffin, tours were given of the cowpea plots, miscellaneous legumes, and clover plots.

6. Old Business

The S-9 Technical Advisory Committee (TAC) reconvened at 4:45 p.m. by chairman Dr. Charles Taliaferro. The committee was reminded that its purpose is to represent the states and the researchers in their respective state by relaying their concerns regarding plant germplasm and making recommendations to the PGRCU. The minutes from the 2001 TAC meeting in Fort Collins, CO were read and approved. It was reaffirmed that the outgoing TAC chair is the representative to review plant exploration proposals.

7. New Business

Dr. Pederson provided a two-page S-9 project proposal summary that needed to be commented on and completed for submission to the SAAESD, then CREES (Appendix 2). The project proposal summary was discussed, areas were clarified and changes recommended by committee members were adopted. The summary will be taken back to the states by TAC members and returned within ten days with comments. Discussion then centered on the development of the complete S-9 project proposal. Previous documents will be used as a source to develop the new project proposal. New project proposals are no longer limited to a five-year maximum duration. Thomas Stalker recommended that the project proposal not be written to encompass over ten years. This time limit was discussed and accepted by the committee. Dr. Pederson would develop a draft of the project proposal by the November ASA meeting in Indianapolis. The deadline for review of the first draft would be February 1st, 2003. Thomas Stalker and Thomas Zimmerman will be reviewers of the proposal.

Jorge Mosjidis was elected as secretary and Thomas Zimmerman as chair of the S-9 TAC for the 2003. David Coffey was complimented for his years of service to the S-9 TAC representing Tennessee and he introduced his replacement, Fred Allen from the University of Tennessee. A letter, drafted by Charles Taliaferro, would be sent to the area director with cc to Peter Bretting, complimenting Gary Pederson and staff for the tremendous advances, as well as improvement in moral, of the PGRCU over the past two years.

Thomas Stalker requested more time be devoted to the TAC meeting the following year. This would allow for issues to be discussed in a timely manner. Discussion centered on budget issues and review of allocations. A financial report summary was requested to get a sense of resource allocations. Concerns were also raised whether the recommendations from the crop germplasm committees were getting to the curators. It was also requested that CGC reports be distributed prior to the meeting. A discussion of the tours focused on the need for the yearly event or scheduling them on a second day. Tours should be scheduled after the TAC has had adequate time to meet and complete their work. The program for the TAC meeting is to be developed by the chair in collaboration with the PGRCU Research Leader. Thomas Zimmerman suggested the next annual TAC meeting be in St. Croix, Virgin Islands. The travel expense to St. Croix was deemed too costly and Griffin will be the location in early August 2003.

Charles Taliaferro adjourned the meeting at 5:50 p.m.

Appendix 1

DR. GARY PEDERSON

PLANT GENETIC RESOURCES:
CURRENT STATUS & FUTURE PLANS

Plant Genetic Resources: Current Status & Future Plans

Gary A. Pederson

USDA, ARS, Plant Genetic Resources
Conservation Unit

Griffin, GA

Outline

- PGRCU mission
- Current status of each crop
- Progress made and plans for future
 - Funding
 - Staffing
 - Equipment
- Distribution to new users
 - ASA 2002 presentation

Acknowledgement

- Merrelyn Spinks and Lee Ann Chalkley, Plant Genetic Resources Conservation Unit, compiled and summarized all numbers shown in this presentation.

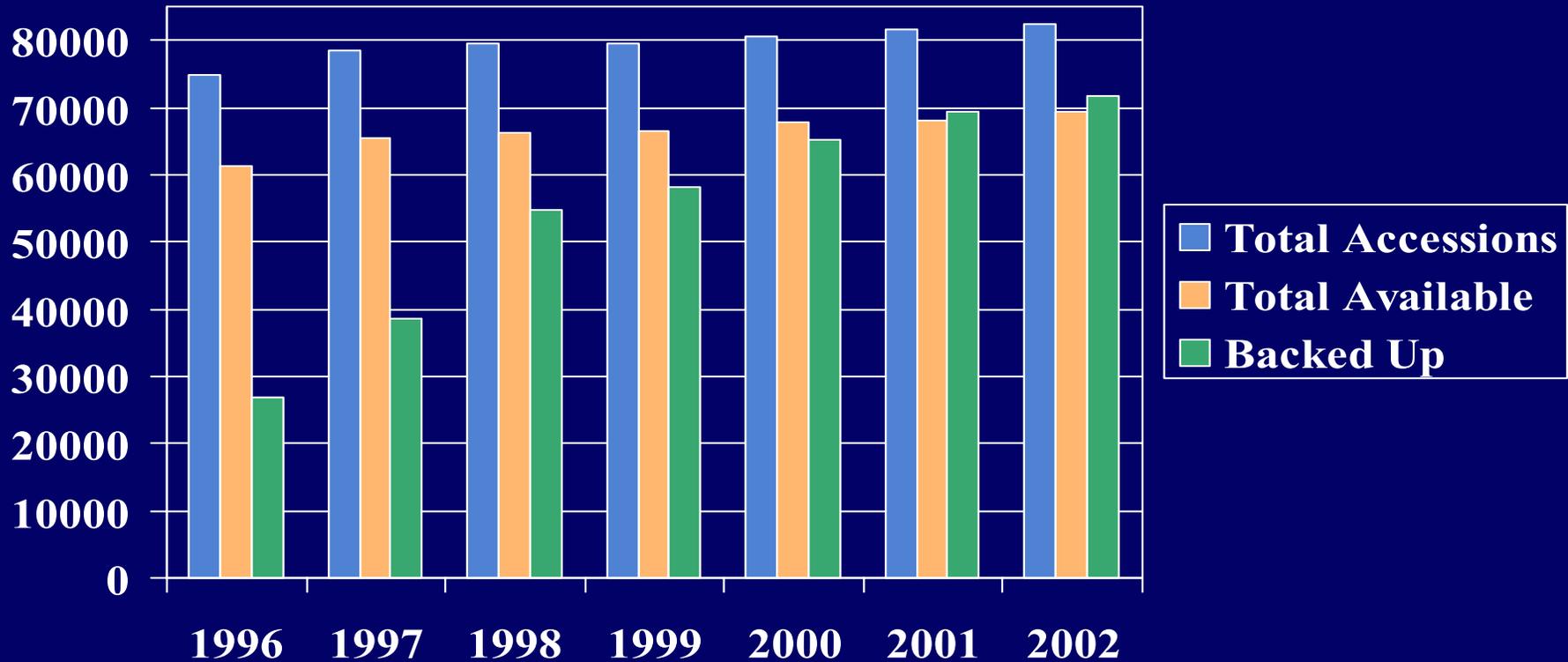
What is the mission of PGRCU?

- Plant Genetic Resources Conservation Unit (PGRCU) exists to conserve plant genetic resources for users today and for future generations.
- Mission statement: “acquire, characterize, maintain, evaluate, document, and distribute genetic resources”.
- This is what the users of the germplasm maintained at this location expect from this Unit.

PGRCU Collection - June 2002

- Total Accessions
 - 82,416
- Total Available
 - 69,350 (84%)
- Backed Up
 - 71,807 (87%)

PGRCU Collection 1996 - 2002



Vigna

CURATOR	CROP	TOTAL ACCESSIONS	TOTAL AVAILABLE	NUMBER BACKED UP	ITEMS SHIPPED IN 2001
Graves Gillaspie	Cowpea	8,030	5,238	5,885	940
	Mung bean	4,196	3,833	4,095	431
	Other Vigna spp.	600	269	298	24

Vegetable Crops & Sweetpotato

CURATOR	CROP	TOTAL ACCESSIONS	TOTAL AVAILABLE	NUMBER BACKED UP	ITEMS SHIPPED IN 2001
Bob Jarret	Cucurbits	2,018	890	1,301	473
	Eggplant	968	892	923	301
	Okra	3,000	1,541	1,919	120
	Peppers	3,913	3,705	3,804	1,224
	Sweetpotato	724	696	81	96
	Other Ipomoea spp.	419	131	148	33
	Watermelon	1,639	1,535	1,620	1,160

Legumes, Grasses, & Others

CURATOR	CROP	TOTAL ACCESSIONS	TOTAL AVAILABLE	NUMBER BACKED UP	ITEMS SHIPPED IN 2001
Brad Morris	Bamboo	97	97	50	111
	Castor bean	373	272	357	325
	Grasses	6,653	5,872	5,963	596
	Kenaf & Roselle	340	292	309	41
	Legumes	3,336	2,649	2,712	378
	Miscellaneous	199	109	140	91
	Pearl millet	1,081	1,048	1,064	59
	Sesame	1,203	1,196	1,203	37

Clover & Sorghum

CLOVER CURATOR/ SORGHUM COORDINATOR	CROP	TOTAL ACCESSIONS	TOTAL AVAILABLE	NUMBER BACKED UP	ITEMS SHIPPED IN 2001
Gary Pederson	Annual Clover	2,091	1,425	1,493	389
	Sorghum	31,699	29,320	29,996	8,057

Peanuts

CURATOR	CROP	TOTAL ACCESSIONS	TOTAL AVAILABLE	NUMBER BACKED UP	ITEMS SHIPPED IN 2001
Roy Pittman	Cultivated Peanuts	9,044	7,768	8,258	1,452
	Wild Peanuts	693	572	188	162

Collection of *Arachis* spp. in Paraguay



**Collected 54 wild peanut and 11 cultivated
peanut accessions in May 2002**

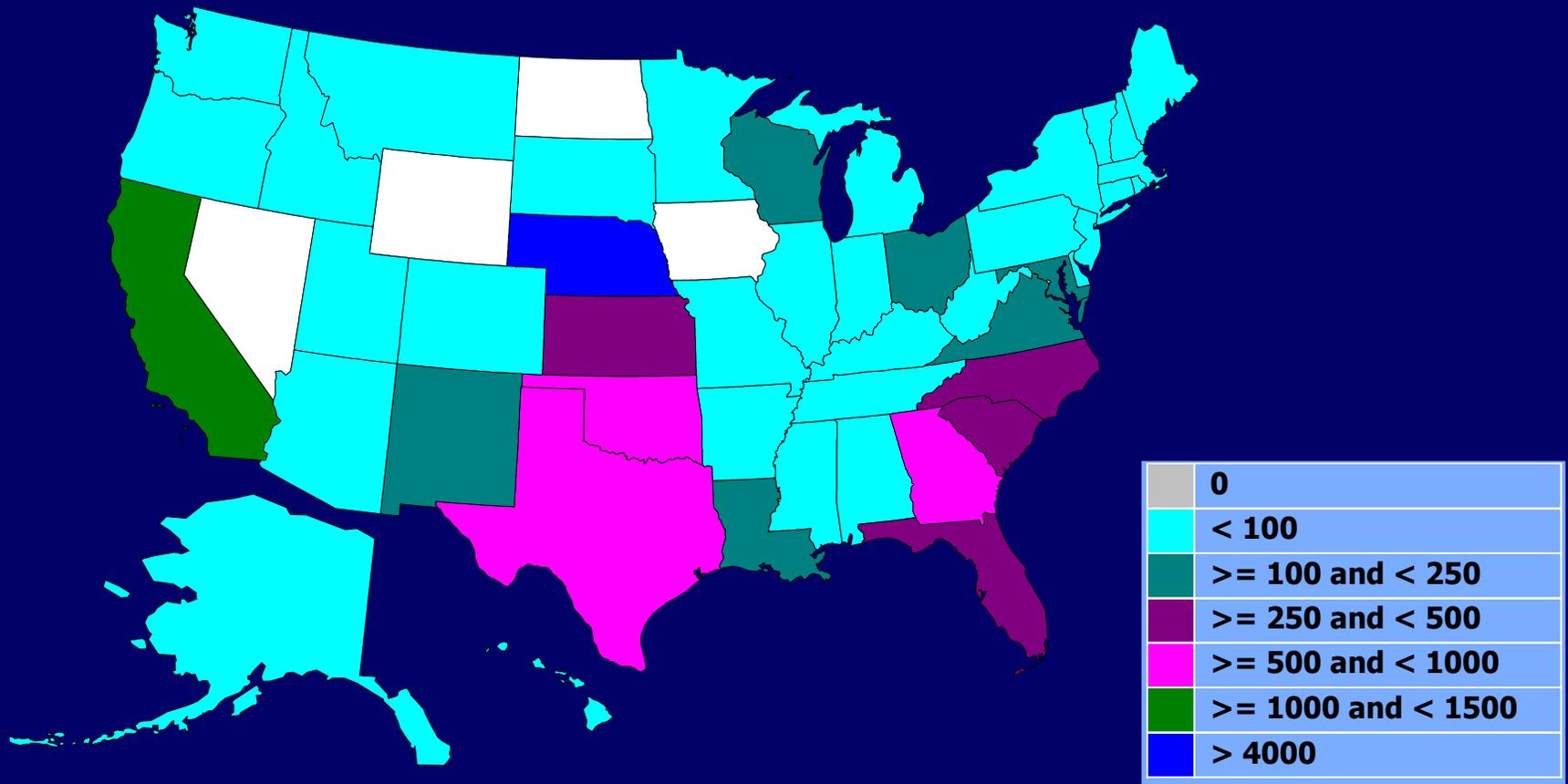
Requested for regeneration FY2002

Crop	# accessions	Crop	# accessions
Cowpea	304	Grasses	34
Sorghum	2098	Kenaf	29
Cucurbit	52	Legumes	276
Clovers	192	Guar	57
Ipomoea sp.	44	Wing bean	8
Okra	10	Misc. crops	14
Peppers	75	Sesame	8
Watermelon	154	Cult peanut	853
Castor bean	36	Wild peanut	14

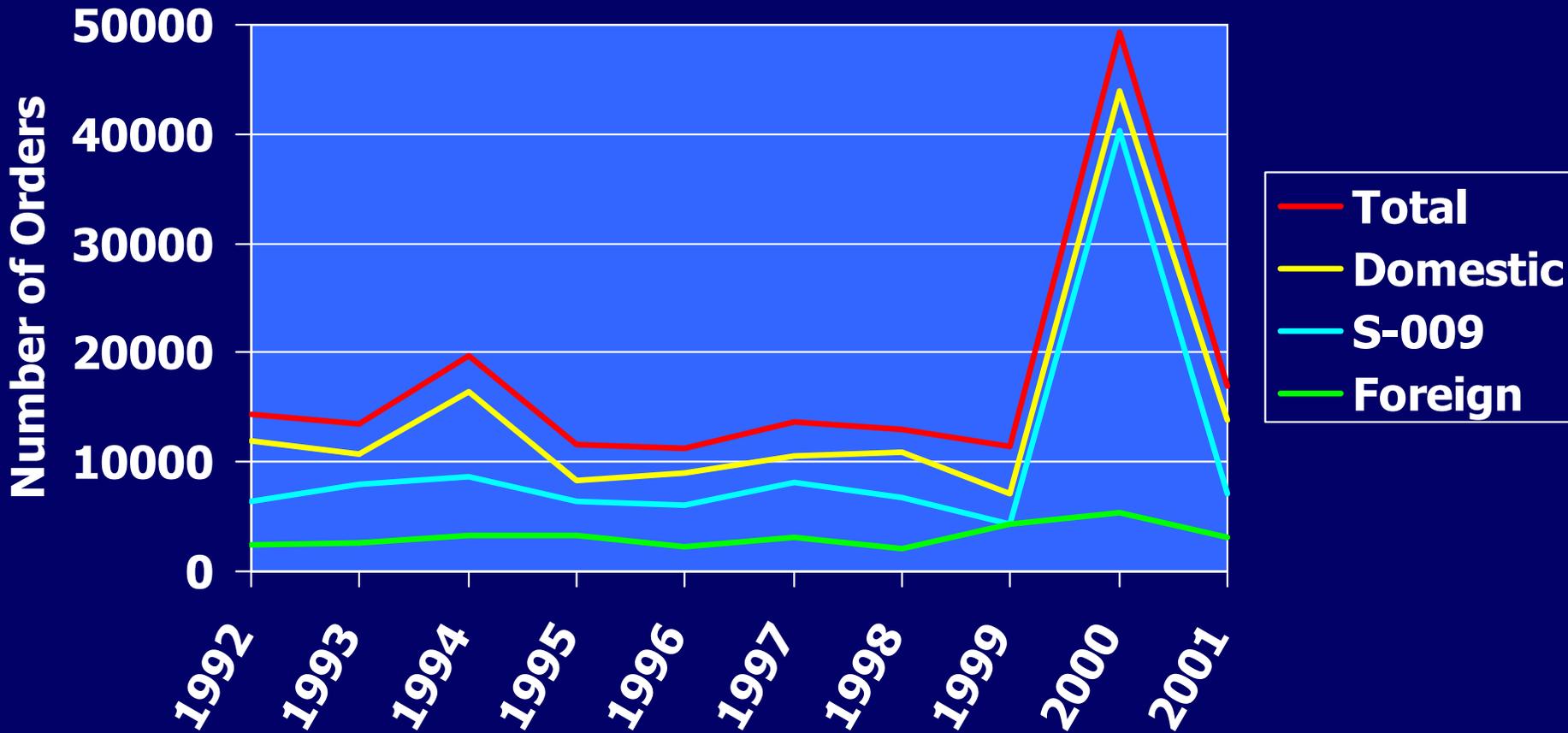
Distributions in CY2001

- Domestic = 13,846 items in 420 orders
 - S-9 region = 7,032 items
- Foreign = 3,072 items in 94 orders
- Total CY2002 distributions = 16,918 items

Domestic Distributions in CY2001



Distributions to S-9 Region



Foreign Distributions in CY2001

Argentina	Chile	Hungary	New Zealand	Taiwan
Australia	China	India	Poland	Thailand
Bermuda	Czech Republic	Israel	Puerto Rico	Turkey
Bolivia	Denmark	Italy	Slovenia	United Arab Emirates
Bulgaria	Egypt	Japan	South Korea	United Kingdom
Cambodia	France	Kuwait	Spain	Vietnam
Canada	Germany	Netherlands	Sweden	Zimbabwe

Progress and Future Plans

- Funding
- Staffing
- Equipment

PGRCU Funding

- ARS base funding increases:
 - FY2001 = \$349,370
 - FY2002 = \$225,000
- ARS temporary funding increases:
 - FY2001 = \$12,000 (purchase 2 seed germinators)
 - FY2002 = \$100,000 (purchase 2 DNA sequencers)
- Current House and Senate committee reports suggest no funding increase in FY2003.

Total PGRCU Funding

- ARS base funding:
 - FY2002 = \$2,100,976
- S-9 base funding:
 - FY2002 = \$384,832

Staffing - S-9

- S-9 positions filled in last year
 - Donna Kent (S-9 secretary)
 - Kevin Cardell (Farm crew - Griffin)
 - Brian Wade (Farm crew - Byron)
- Currently have all nine S-9 positions filled.

Staffing - ARS

- ARS positions filled in last year
 - Trudy Brown (Admin support)
 - Kami Colquitt (Clover tech)
 - Stephanie Dunn (Peanut tech)
 - Tiffany Fields (Seed storage tech)
 - Libbie Lancaster (Grass tech)
 - Nancy Tingle (Vigna tech)
 - Phiffie Turner (Germination tech)
 - Gregory Waits (Vegetable tech – starts next week)

Staffing - Students

- ARS Positions filled
 - Eight students were hired during summer months in FY2002 through the ARS STEP program.
 - Ten students will be hired during summer months in FY2003.

Staffing - ARS

- Currently have six ARS positions to fill
 - Agronomist (Cat 4 - Grass curator)
 - » Interviewed 4, no acceptance, currently readvertised
 - Research Geneticist (Cat 1 - Molecular lab)
 - » announcement closed on Aug. 3rd.
 - Molecular Biologist (Cat. 3 replacement)
 - Ag Sci Res Tech (Misc legumes)
 - Biol Sci Lab Tech (Seed storage)
 - Biol Sci Lab Tech (Molecular lab)

Staffing summary

- Current staff is 32 employees (23 ARS & 9 S-9)
- Additional staff includes 10 STEP students and one RSA position (weekend watering)
- When all vacant positions are filled, the full staff will be 38 employees (29 ARS and 9 S-9)
- *Historical perspective: In Jan. 2001, full staff was ~28 permanent employees (18 ARS and 10 S-9)*

Equipment purchased

- Germination
 - 2 new germinators
 - Refurbished office area into germination lab
- Seed storage/processing
 - Temperature and fire alarm system
 - Ordered custom-made seed packet trays for freezer

Equipment purchased

- Field operations

- New JD tractor and Gator for Byron
- New irrigation gun
- Ordered fertilizer spreader

- Clonal preservation

- New backup generator for sweetpotato collection
- New autoclave for media preparation

Equipment purchased

- Molecular lab
 - Two Beckman CEQ-8000 capillary array DNA sequencers
- Information technology
 - New computer server for LAN
 - 13 new computers
- Building repair
 - Replace greenhouse vent strut mechanism
 - Replace cooling pads in greenhouse

Plans for purchasing within next year

- Seed storage/processing
 - New air exhaust system for seed processing
 - Six work stations for seed processing
 - Replace fixed shelves in -18C freezer with moveable shelves to maximize storage space
- Molecular lab
 - Mixer mill to speed DNA extraction
 - Automated plasmid DNA purification instrument

Plans for purchasing within next year

- Information technology
 - Eight computers
 - Additional computer security equipment
- Building repair
 - Replace shingles on headhouse
 - Replace gravel and reseal benches in greenhouse
- Field operations
 - Prefab storage shed for farm equipment

Distribution of Plant Genetic Resources to New Users

Gary A. Pederson

Presentation for ASA meeting

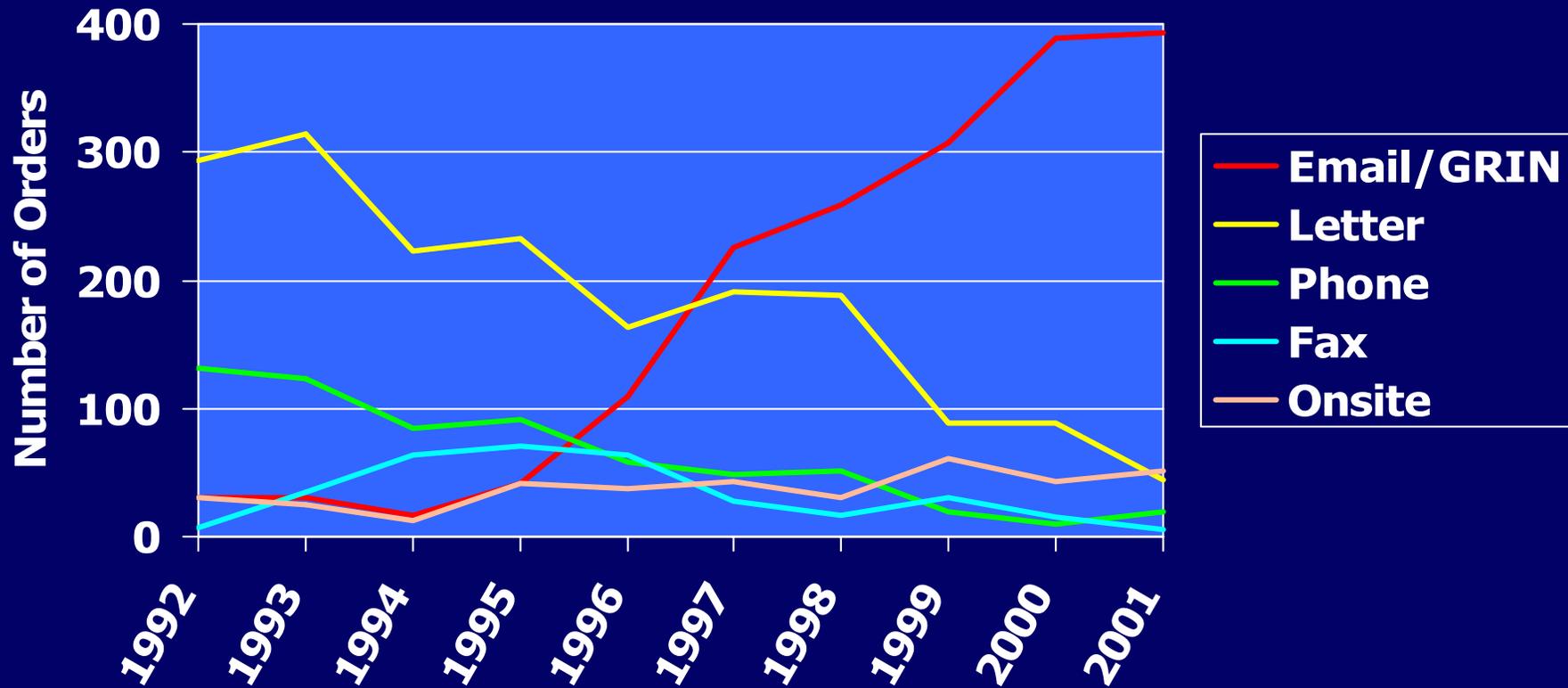
Nov. 2002

Indianapolis, IN

Times are changing

- Access to genetic resources worldwide is becoming more difficult.
- Foreign germplasm exchange and foreign distribution is becoming more difficult.
- Fewer traditional customers (plant breeding programs) for genetic resources.

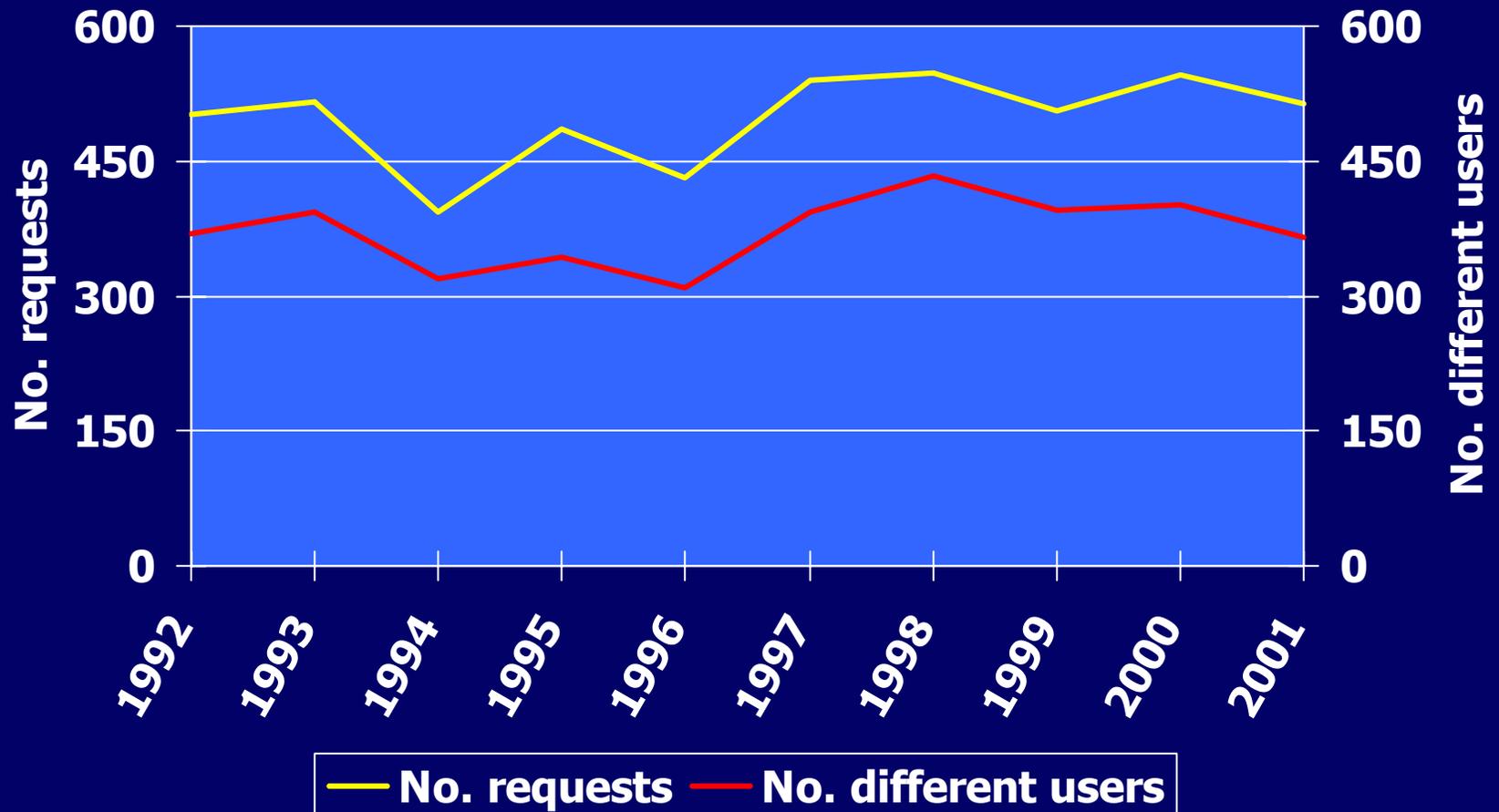
Method of requesting accessions



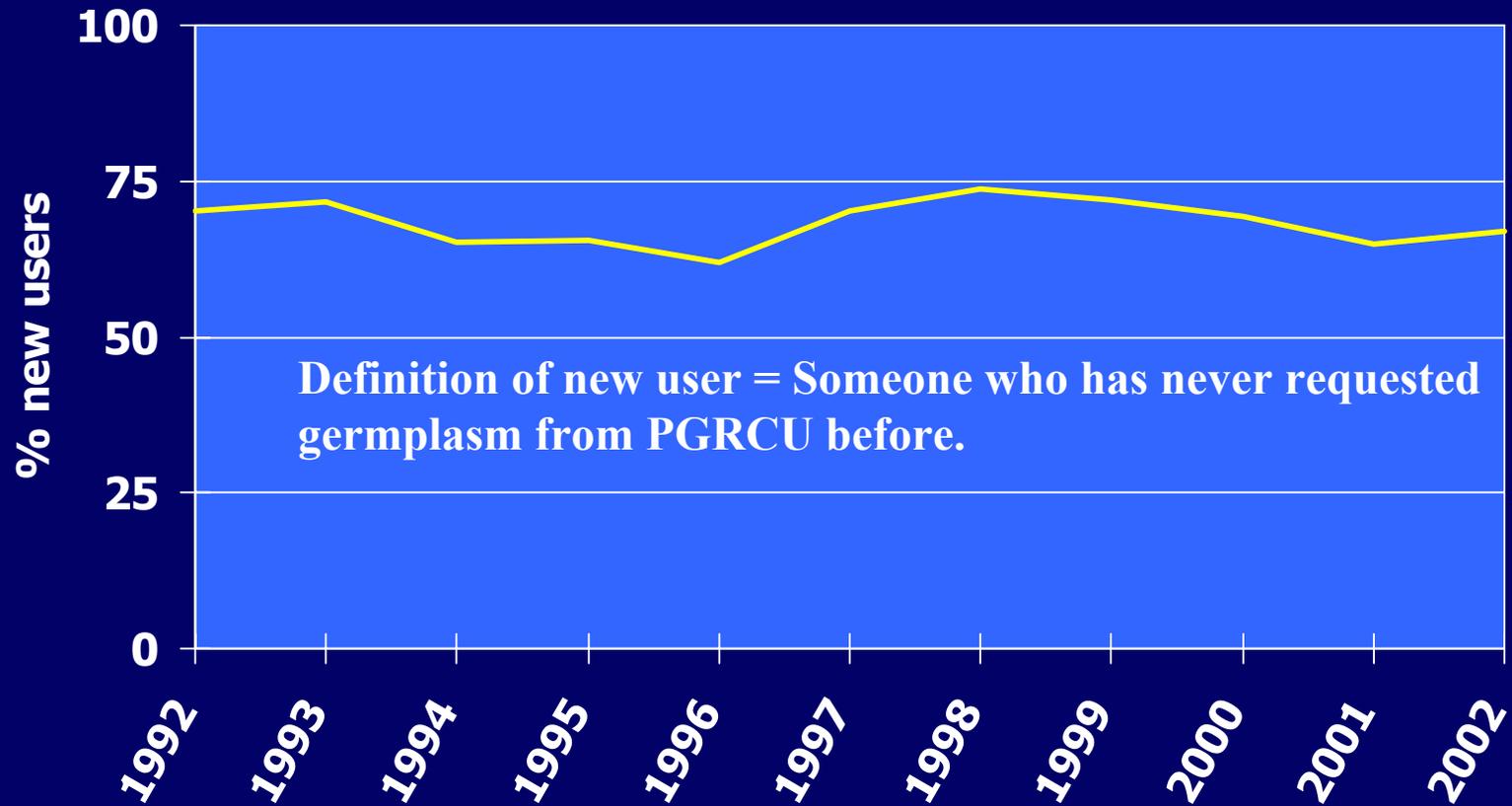
Who is requesting germplasm?

- Traditional users (plant breeders) have retired and positions have not been filled.
- Suggests that fewer people must be requesting plant genetic resources and a greater percentage of the requests must be from new users.
- Good idea --- but not true!

Total requests and no. of different users



% Total users that are new users



Who is requesting germplasm?

- A large number of requests are coming from customers with “non-traditional” uses for plant genetic resources.

Nontraditional uses

- Public demonstrations at Epcot Center
- Department of Defense uses
- Classroom plant and seed identification
- Church demo project (Heifer Project Int.)
- Switchgrass biofuel use
- Archaeobotany and anthropology use (India, Africa, and Asia agricultural origins)
- Sorghum use for paper pulp
- Peanut protein profile to identify allergy reaction differences

Nontraditional uses

- Velvetbean for wildlife management
- Gourmet chile for Pacific Rim cuisine
- Botanical artist painting Solanaceae
- Develop plant cell cultures for drug discovery
- Identification of archaeological specimens
- Bermudagrass adaptability on fields fertilized with animal waste
- Juicing vegetables to help nutrients get into blood stream of cancer patients

Nontraditional uses

- Kenaf for biofiltration research
- Sorghum syrup making
- Seed for baking and candy industry
- Exhibit of plants used for paper making
- Green manure crop in California deserts
- Fish control research
- Fiber and dye plants used by fiber artist
- Phytopharmaceutical and energetic uses

How to recruit new users?

- Let the entire scientific community know that the National Plant Germplasm System (NPGS) exists (i.e. marketing and advertising).
- Includes agronomy, genetics, molecular biology, plant pathology, entomology, botany, anthropology, archeology, medical, pharmaceutical, nutritional, ecology, homeland security, energy, animal science, artistic, aquatic, etc.

Conclusions

- Find ways to advertise NPGS to traditional and non-traditional users.
- Highlight non-traditional uses as well as traditional uses in obtaining support for plant genetic resources conservation.

Appendix 2

DR. GARY PEDERSON

S-9 PROJECT PROPOSAL

I. Title: Plant Genetic Resources Conservation and Utilization

II. Accomplishments: Plant genetic resources collected from throughout the world are a valuable source of genetic diversity for the improvement of agricultural and horticultural crops grown in the U.S. The total germplasm collection maintained at Griffin has increased to 82,400 accessions consisting of 1,429 species and 245 genera of crops including vegetable crops (okra, pepper, watermelon, squash, eggplant, gourds), cowpea, mung bean, legumes (clover, guar, winged bean), peanuts, warm season grasses, bamboo, castor bean, sesame, pearl millet, sorghum, and others. These resources impact current research programs by providing access to a wide range of genetic variation that researchers may subsequently utilize in crop-specific selection, characterization, and evaluation studies. In the last 5 years, more than 2,650 orders containing more than 104,000 accessions have been processed and distributed to users in all 50 states and at least 35 foreign countries. Over 66,000 accessions were sent to users throughout the S-009 region. Associated information for accessions was updated in the GRIN database with over 1.2 million records created and 0.7 million records modified in the last 5 years. Backing up germplasm by maintaining accessions at two sites reduces the risk of losing valuable germplasm. Over the last 5 years, the percentage of germplasm from Griffin backed up at the National Seed Storage Laboratory has increased from approximately 49% to 87%. The number of accessions in the collection has increased by 3,936 accessions in the last five years. Currently, 84% of the accessions in the collection are available for distribution.

III. Statement of Issue and Justification:

A. Conservation and utilization of plant genetic resources is essential for future improvement of U.S. agriculture. Virtually all plant improvement research depends on unique plant germplasm as a source of desirable genes. This project contributes to a number of SAAESD Priority Areas including Goal 1. D. Value-added plant and animal genes in conventional breeding and molecular biology; Goal 1. E. New plant and animal species for agricultural production; Goal 2. A. Food safety; and Goal 4. B. Natural resource and ecosystem management.

B. Plant genetic resources are crucial parts of the agricultural production system that sustains humanity. The stability of the agricultural system of the United States and of the Southern Region is based primarily on non-indigenous crops such as peanuts, sorghum, bermudagrass, and many other crops that were imported years ago. Improvement of these non-indigenous crops depends on acquired genes found in germplasm collections. Many countries are currently restricting access to their native plant genetic resources and the importance of preserving present germplasm collections has greatly increased.

C. The S-009 project has conducted plant genetic resource conservation for more than 50 years. Facilities and personnel are well-equipped to conduct the full range of technical activities involved in germplasm conservation including acquisition of new material, controlled pollinations for seed regeneration, clonal and seed preservation, germplasm evaluation through conventional and molecular techniques, documentation in a public database, and distribution to users throughout the Southern Region and the world.

D. Crop collections of importance to the Southern Region have been supported since 1949 through a joint partnership between the U.S. Department of Agriculture, Agricultural Research Service and the Southern State Agricultural Experiment Stations. A multistate effort enables cooperators to participate in coordinated efforts to acquire, regenerate, maintain,

characterize, evaluate, document, distribute, and utilize plant genetic resources of potential value to the Southern Region.

E. Plant genetic resources impact consumers by direct utilization in improved cultivars, sources of genes with value-added traits for alternative uses, and extensive use in both traditional plant breeding research and non-traditional research in wide ranging areas of science.

F. Customers for plant genetic resources include research scientists in public universities, private companies, foundations, government agencies, international research centers, foreign universities, and foreign companies. The general public is the ultimate customer reaping the benefits of a more abundant and stable food supply.

IV. Objectives:

A. Conserve genetic resources and associated information for a broad spectrum of crops and related species.

B. Develop and apply new or improved evaluation procedures to assess genetic diversity for the plant genetic resources in the collections and evaluate materials for useful traits.

C. Transfer technology to researchers and plant breeders in the Southern Region and worldwide in the form of plant genetic resources and associated information.

V. Procedural Plan: Existing and improved procedures will be used or developed to acquire, identify, increase, and maintain plant germplasm. Seed viability in storage will be maximized through -18C storage and germination testing. Advanced plant and seed regeneration protocols will be developed to improve germplasm availability. Existing and newly developed agronomic, horticultural, molecular, chemical, and botanical methods, including nucleic acid and digital imagery technologies, will be used to obtain phenotypic and genetic characterization data on plant genetic resources. Seeds, in-vitro cultures, plants, rhizomes, and associated information will be sent to researchers and other users in the Southern Region and worldwide in response to their requests.

VI. Internal and External Linkages: S-009 project has been in existence for over 50 years and the current linkages are well-established with user groups. Additional linkages with private seed industry, conservation agencies, and other potential users will be developed when possible.

VII. Performance Goals:

A. Output Indicators - Available and viable plant genetic resources will be conserved for future use and distributed for current needs to researchers throughout the Southern Region and the world. The resources will be backed up at other sites to prevent loss of these valuable materials. Conservation status and utilization of the collection will be reported annually.

B. Outcome Indicators - Impact of these plant genetic resources on American agriculture will be shown through cultivar and germplasm release, publications, and other documentation.

VIII. Education Plan: All plant genetic resources are distributed freely for research purposes to users including those under-served or under-represented consumers. Requests for seed may be made and associated information on the germplasm collection obtained easily through the GRIN database (<http://www.ars-grin.gov/npgs>).

IX. Governance (Officers):

X. Origin of the Request: