

S-009 Regional Technical Advisory Committee
Minutes of the 2008 Annual Meeting, August 4-5, 2008
McKimmon Room, Williams Hall, NCSU Campus
Host: Tom Stalker, Department of Crop Science, NCSU

Members present:

Alabama (Auburn University).....Jorge Mosjidis ([@auburn.edu](mailto:jmosjid@auburn.edu))
Florida (University of Florida)..... Ann Blount ([@ufl.edu](mailto:ablount@ufl.edu)) for Ken Quesenberry
Guam (University of Guam).....Mari Marutani ([@uog.edu](mailto:mam@uog.edu))
Kentucky (University of Kentucky).....Tim Phillips ([@uky.edu](mailto:tphillips@uky.edu))
Louisiana (Louisiana State University).....Don LaBonte ([@agcenter.lsu.edu](mailto:dla@agcenter.lsu.edu))
North Carolina (North Carolina State University).....Tom Stalker, for Tom Isleib ([_isleib@ncsu.edu](mailto:tisleib@ncsu.edu))
South Carolina (Clemson University).....Emerson Shipe ([@clemson.edu](mailto:eshipe@clemson.edu))
Southern Association of Agric. Exp. Sta. Directors.....Gerald Arkin ([@uga.edu](mailto:garkin@uga.edu))
Tennessee (University of Tennessee).....Fred Allen ([@utk.edu](mailto:fal@utk.edu))
Virgin Islands (University of the Virgin Islands).....Tom Zimmerman ([@uvi.edu](mailto:tzimmerman@uvi.edu))

Members absent:

Arkansas (University of Arkansas).....Teddy E. Morelock ([@uark.edu](mailto:teddy@uark.edu))
Florida (University of Florida).....Wilfred Vermerris ([@ufl.edu](mailto:wvermerris@ufl.edu))
Georgia (University of Georgia).....Paul L. Raymer ([@griffin.uga.edu](mailto:praymer@griffin.uga.edu))
Hawaii (University of Hawaii).....Mike A. Nagao ([@hawaii.edu](mailto:mnao@hawaii.edu))
Mississippi (Mississippi State University).....[vacant]
Oklahoma (Oklahoma State University).....Yanqi Wu ([.wu@okstate.edu](mailto:ywu@okstate.edu))
Puerto Rico (University of Puerto Rico).....Bryan R. Brunner (brunner@cca.uprm.edu)
Texas (Texas A&M University).....Gerald R. Smith ([-smith@tamu.edu](mailto:gsmith@tamu.edu))
Virginia (Virginia Polytechnic Inst. and State Univ.).....Richard Veilleux ([@vt.edu](mailto:rveilleux@vt.edu))

PGRCU representatives present:

USDA-ARS-PGRCU, Griffin, GA.....Gary A. Pederson ([.pederson@ars.usda.gov](mailto:pederson@ars.usda.gov))
USDA-ARS-PGRCU, Griffin, GA.....Melanie Harrison-Dunn ([.harrisondunn@ars.usda.gov](mailto:harrisondunn@ars.usda.gov))

Hosts present:

NCARS, Raleigh, NC.....Roger Crickenberger, Assistant Director, NCARS

The 2008 meeting was called to order at 1 pm on Tuesday, August 5, 2008 by Tom Stalker, filling in for Chair Tom Isleib. Roger Crickenberger, Assistant Director of NCARS, welcomed the group to North Carolina, and discussed the important role of germplasm in the release of cultivars recently developed by NCSU breeders. Dr. Gerald Arkin, the administrative advisor for the S-009 RTAC, commented on his 21 years as a liaison for Southern Agric. Directors, and the importance of each member discussing S-009 related activities with our Agricultural Experiment Station Director, among other issues. Next, a discussion on the current and future status of the Hatch system followed. The Specialty Crop Initiative was described.

Minutes of the 2007 meeting were approved as published on the S-009 RTAC website (motion by Jorge Mosjidis, seconded by Fred Allen). The issue of the 'white paper' on plant breeding prepared by Mike Collins and Fred Allen after last year's meeting was brought up, including the topic of distance education (shared courses across states). Emerson Shipe commented on the lack of commitment in replacing breeders by administrators at Land Grant universities, and that shared courses have a 'tuition-sharing' problem that must be addressed. Don LaBonte stated that lack of courses in plant breeding hurts recruitment of graduate students. Jerry Arkin advised us to inform our Deans of Academic Programs about the need and interest in shared courses. The new plant breeding RTAC was mentioned as a more appropriate voice for our concerns about this subject.

No additions to the 2008 meeting agenda were made. An open discussion of the need for committees for officer nominations and time and place determination of the next meeting resulted in Tim Phillips being appointed as secretary for next year, and Griffin, GA on August 4-5, 2009 as the location and time for the next meeting.

Gary Pederson gave his report on the activities at Griffin (Appendix 1). He showed that of the 88,321 accessions at Griffin, 87.6% are available for distribution, and 94.4% have been backed up. Digital images of seed or fruit of many accessions have been recorded. Germination testing of the accessions has been increased. More accessions are in storage at -18C, including 100% of grass accessions.

Funding continues to be challenging, partly due to the budgets not increasing to cover salary increases. Pederson listed several top needs:

Technical support (peanut field technician, help for forage legumes, HPLC characterization, grass tissue culture, and general field crew help);

Curation: category 4 curator for vigna, watermelon, and curcubits;

Equipment: Reigi weeder and low-gear tractor, cone planter, Weed Badger weeder, no-till drill, ultra-low freezer, peanut thresher, Dual axle truck for hauling equipment, NMR for oil content characterization, light scanner, gas chromatograph, four-row flex planter, moveable storage shelves for 4C room;

Building: addition of 4C cold storage room (allowing existing 4C room to be converted to -18C).

Melanie Harrison-Dunn, curator of warm-season grasses at Griffin, reported on her activities (Appendix 2). She curates a collection of 6,955 accessions comprising 447 species in 102 genera. She maintains 416 vegetative accessions, about half of which are bermudagrass. Her collection contains 95 bamboo accessions from 47 species. She reported 324 new acquisitions, many of which were from NRCS Plant Material releases. Forty accessions of zoysia from China have been received, as well as ~140 accessions of switchgrass from Fort Collins, CO. During 2003-2007, 991 accessions have been regenerated, including finger millets, bahiagrass, black gamagrass, and little bluestem. She has instituted some improvements in the handling of clonal material, such as increasing the number of plants maintained (four pots per accession), dual labeling, and a cooling pad system in the greenhouse.

State reports for Alabama, Florida, Guam, Kentucky, Louisiana, North Carolina, South Carolina, Tennessee, and the Virgin Islands were presented orally (written reports at the NPGRCU website). At 5 pm the meeting was adjourned until 8 am on Wednesday, August 6 where state reports continued until completed.

Old business items included a discussion of the tobacco germplasm collection and its future. The collection currently is housed at Oxford, NC, but likely will be moved to Raleigh. The white paper on plant breeding training concerns will be distributed to members by Tom Stalker.

New business included the incoming secretary position to be filled by Tim Phillips, and the location/time of the next meeting (Griffin, GA, August 4-5, 2009).

Tom Stalker had some questions about the peanut collection. He mentioned that with 9,000 accessions of peanuts, it is not possible to get the botanical variety or market type (it is not listed). He was advised by Gary Pederson to request that this information be added. Pederson mentioned the GRIN-Global beta version. How mixed accessions are dealt with was discussed. They are kept as received, rather than separating them, and the descriptions would include how the mixture is composed (e.g., 20% purple seed, 80% brown seed). Pederson mentioned that the germplasm system doesn't like to distribute original seed, but often an original accession could supply requests for 20 years with no problem.

Tom Stalker commended the Griffin group's efforts; stating that the collection has improved recently due to the good job the curators have done. He thanked them for their excellent work.

There was some discussion about the procedure for scheduling meeting times and locations. It was remarked that it would be good to return to Griffin every several years, with other meetings being rotated among committee members as agreeable to the committee.

The group was adjourned mid-morning for a trip to Clayton, southeast of Raleigh, for a tour of the Central Crops Research Station. We had tours of corn plots with exotic germplasm from Dr. Major Goodman, and then toured corn plots which were part of the GEM project led by Dr. Matt Krakowsky. We were shown around soybean plots by Dr. Tommy Carter, USDA-ARS soybean breeder, and associates. He showed the group soybean lines with a

high percentage of exotic germplasm in their pedigrees. Around noon, the visit to the research farm ended, with members dispersing until the meeting in 2009 in Griffin.

Appendix 1

DR. GARY PEDERSON

PLANT GENETIC RESOURCES:
CURRENT STATUS

Plant Genetic Resources: Current Status

Gary A. Pederson

USDA, ARS, Plant Genetic Resources
Conservation Unit

Griffin, GA

Outline

- PGRCU mission
- Current status of each crop
- Progress made
 - Distributions
 - Funding
 - Staffing
 - Equipment and facilities
- Needs

What is the mission of PGRCU?

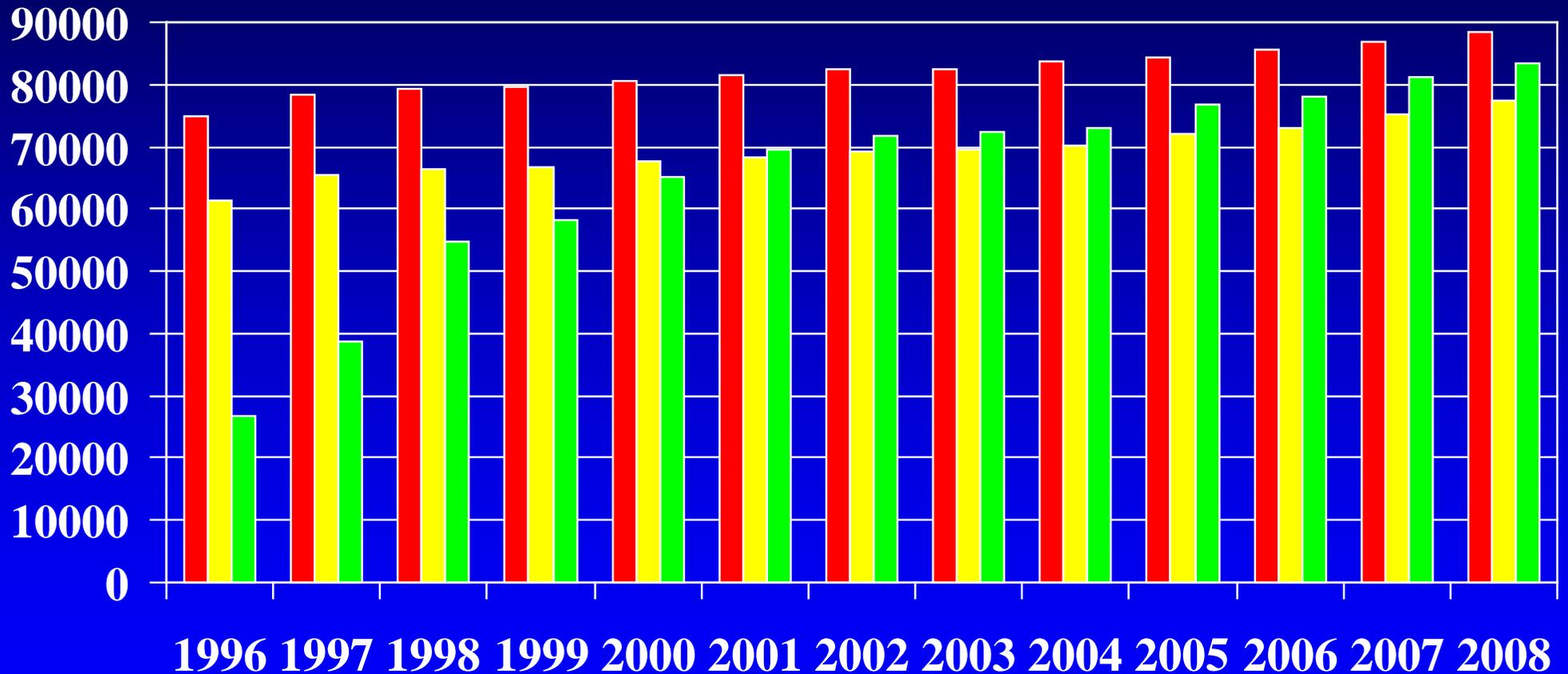
- Plant Genetic Resources Conservation Unit (PGRCU) exists to conserve plant genetic resources for users today and for future generations.
- Mission: "acquire, characterize, maintain, evaluate, document, and distribute plant genetic resources".
- This is what users of the genetic resources maintained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

PGRCU Collection - June 2008

- Total Accessions
 - 88,321
- Total Available
 - 77,373 (87.6%)
- Backed Up
 - 83,396 (94.4%)

Acknowledgement: Merrelyn Spinks and Lee Ann Chalkley, PGRCU, compiled and summarized all numbers shown in this presentation.

PGRCU Collection 1996 - 2008



Total Accessions **Total Available** **Backed Up**

Vigna

CURATOR	CROP	TOTAL ACCESSIONS	TOTAL AVAILABLE	NUMBER BACKED UP	ITEMS SHIPPED IN 2007
Gary Pederson (acting)	Cowpea	8,048	6,209	6,493	1,345
	Mung bean	4,203	3,840	4,105	334
	Other Vigna spp.	599	251	299	77

Vegetable Crops & Sweetpotato

CURATOR	CROP	TOTAL ACCESSIONS	TOTAL AVAILABLE	NUMBER BACKED UP	ITEMS SHIPPED IN 2007
Bob Jarret	Cucurbits	2,044	940	1,873	400
	Eggplant	993	909	990	202
	Okra	2,969	1,550	2,934	116
	Peppers	4,696	4,574	4,687	5,590
	Sweetpotato - tissue culture	762	722	671	493
	Other Ipomoea spp.	472	206	409	165
	Watermelon	1,872	1,678	1,841	831

Legumes and Misc. Crops

CURATOR	CROP	TOTAL ACCESSIONS	TOTAL AVAILABLE	NUMBER BACKED UP	ITEMS SHIPPED IN 2007
Brad Morris	Castor bean	374	206	373	1,155
	Kenaf & Roselle	341	286	338	115
	Legumes	3,645	2,676	3,477	538
	Miscellaneous	136	100	130	24
	Sesame	1,213	1,193	1,213	988

Warm-Season Grasses

CURATOR	CROP	TOTAL ACCESSIONS	TOTAL AVAILABLE	NUMBER BACKED UP	ITEMS SHIPPED IN 2007
Melanie Harrison- Dunn	Bamboo	98	98	3	141
	Grasses	6,956	6,043	6,621	2,196
	Pearl millet	1,091	1,051	1,091	31

Clover and Sorghum

CURATOR	CROP	TOTAL ACCESSIONS	TOTAL AVAILABLE	NUMBER BACKED UP	ITEMS SHIPPED IN 2007
Gary Pederson	Annual Clover	2,140	1,739	2,123	228
	Sorghum	35,716	34,415	34,566	10,557

Peanuts

CURATOR	CROP	TOTAL ACCESSIONS	TOTAL AVAILABLE	NUMBER BACKED UP	ITEMS SHIPPED IN 2007
Roy Pittman	Cultivated Peanuts	9,180	8,040	8,781	1,691
	Wild Peanuts	773	647	378	86

Number (and %) of accessions that are unavailable

Crop	2007	2008	Crop	2007	2008
Cowpea	1,902 (24%)	1,839 (23%)	Kenaf/roselle	51 (15%)	55 (16%)
Mung bean	363 (9%)	363 (9%)	Legumes	935 (26%)	969 (27%)
Cucurbits	823 (59%)	818 (59%)	Sesame	22 (2%)	20 (2%)
Eggplant	86 (9%)	84 (8%)	Grasses	886 (13%)	913 (13%)
Okra	1,431 (48%)	1,419 (48%)	Pearl millet	35 (3%)	40 (4%)
Peppers	175 (4%)	122 (3%)	Annual clover	522 (24%)	401 (19%)
Sweetpotato (TC)	40 (5%)	40 (5%)	Sorghum	1,574 (5%)	1,301 (4%)
Watermelon	199 (11%)	194 (10%)	Cultivated peanuts	1,349 (15%)	1,140 (12%)
Castor bean	140 (37%)	168 (45%)	Wild peanuts	128 (16%)	126 (16%)
			TOTAL	11,590 (13%)	10,948 (12%)

Digital photos

Crop	Images
Sorghum	6,731
Watermelon	1,484
Pepper	1,122
Peanuts	546
Pearl millet	445
Cowpea	382
Cucurbits	273
Bamboo	84
Other crops	119
Total	11,186 (12.7%)

Germination Testing

(Accessions with seed only, tested since 2002)

Crop	Accessions	%	Crop	Accessions	%
Sorghum	21,337	62.0	Okra	1,754	59.1
Peppers	4,636	98.8	Watermelon	1,737	92.8
Mung bean	3,055	72.7	Grasses	1,301	19.5
Peanuts	2,501	27.2	Pearl millet	1,068	97.9
Legumes	2,333	75.9	Eggplant	929	93.6
Cowpea	2,064	25.7	Sesame	839	69.2
Clover	1,807	84.7	Cucurbits	650	46.6
			TOTAL	48,055	56.3

Accessions in -18 C storage

(Accessions with seeds only, seed splitting initiated in 2001)

Crop	Accessions	%	Crop	Accessions	%
Sorghum	22,690	65.9	Watermelon	1,872	100.0
Grasses	6,656	100.0	Cucurbits	1,395	100.0
Peppers	4,694	100.0	Sesame	1,213	100.0
Mung bean	4,044	96.2	Eggplant	993	100.0
Legumes	3,075	100.0	Cowpea	838	10.4
Okra	2,969	100.0	Gourds	485	100.0
Peanuts	2,602	28.4	Ipomoea spp.	451	100.0
Clover	2,134	100.0	TOTAL	58,517	68.5

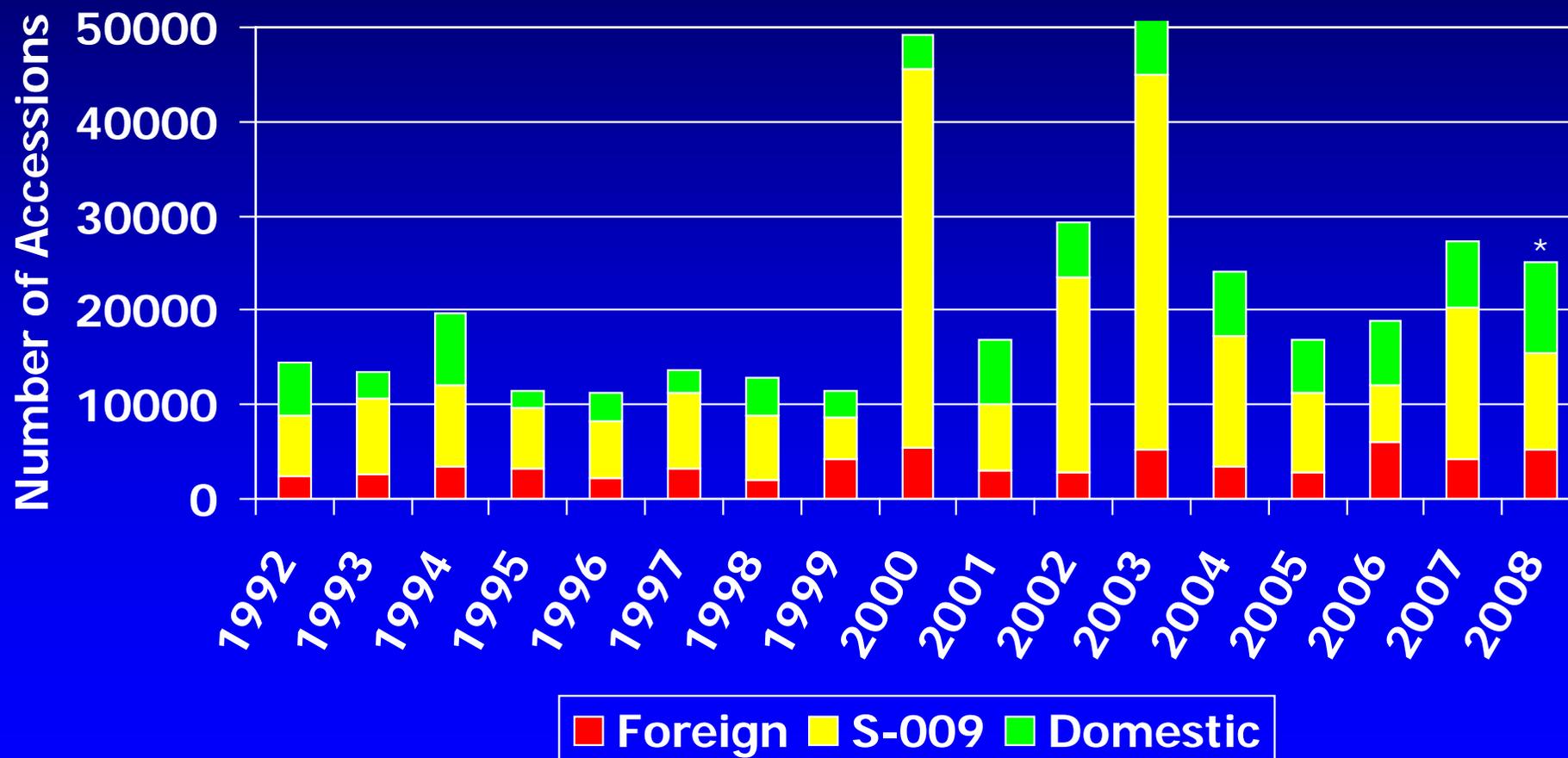
Requested for regeneration in CY2007

Crop	# accessions	Crop	# accessions
Cowpea	102	Grasses	77
Sorghum	2,120	Legumes	230
Cucurbit	19	Wingbean	22
Clovers	105	Sesame	39
Wild peanut	43	Cult peanut	523
Peppers	153	Guar	40
Watermelon	6	Kenaf	28

Distributions in CY2007

- Domestic = 23,161 items in 579 orders
 - S-9 region = 16,156 items
- Foreign = 4,151 items in 142 orders
- Total CY2007 distributions = 27,312 items

Distributions



* As of July 20, 2008

Distributions outside of 50 U.S. states in CY2007

Argentina	Denmark	Italy	Portugal	Tunisia
Australia	Egypt	Japan	Puerto Rico	Turkey
Brazil	Fiji	Mexico	South Africa	United Kingdom
Canada	France	Netherlands	South Korea	U.S. Virgin Islands
China	Germany	New Zealand	Spain	Vietnam
Croatia	India	Niger	Taiwan	
Czech Republic	Israel	Philippines	Thailand	

Total PGRCU Funding

- ARS base funding
 - FY2008 = \$2,180,481
- S-009 base funding
 - FY2008 = \$409,723

PGRCU Funding

- ARS base funding
 - FY2008 = \$15,371 decrease
 - 0.7% rescission and no pay act increase
- ARS temporary funding increases
 - FY2007 = \$40,000 (boiler replacement)
 - FY2007 = \$ 9,000 (router/firewall replacement)
 - FY2008 = \$15,000 (cages)
 - FY2008 = \$30,000 (low-gear tractor)

ARS Project Plan

- National Program 301
- Approved in 2008 for five years
- Minor revision

Staffing - ARS

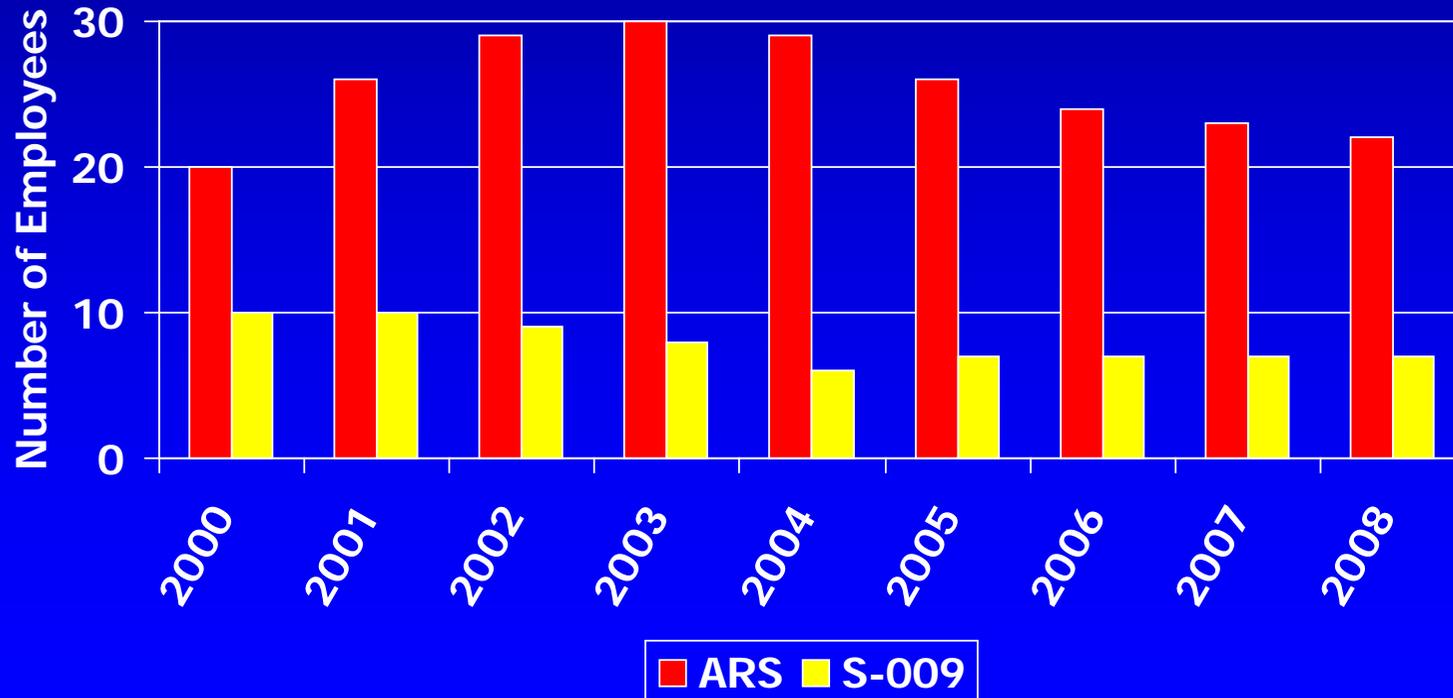
- 22 ARS full-time employees
- One resignation and position terminated
 - Agricultural Research Technician (peanut)

Staffing - S-009

- Seven permanent S-009 employees
- 10 temporary full-time and part-time employees were hired during FY2007 to handle specific labor needs.

Staffing summary

- Current staff is 29 employees (22 ARS and 7 S-009)
- Ten S-009 temporary labor positions



Equipment purchased

- Farm operations
 - Tractor for Byron with low-range gear for Reigi weeder and transplanter
 - Gator



Transplanter



Reigi Weeder

Equipment purchased

- Farm operations
 - Cages for sesame and hibiscus regeneration
 - Enclosed trailer to haul space plants to field
 - Dump trailer
 - Grass seed stripper



Equipment purchased

Laboratory

- Real Time PCR for virus detection and genetic variability determination
- New detector for HPLC to detect sugars



IT equipment

- Router and firewall



Seed storage

- Seed distribution address printer



Facility Repair and Maintenance

- Installed vented vinyl soffit, vinyl siding, and covered eaves and other exposed wood with vinyl coated aluminum trim on Seed Storage, Seed Processing, and ARS Headhouse building.
- Replaced wood doors with metal security doors in Seed Processing building.
- Replaced heating system and root vents in two small ARS greenhouses.
- Replaced the main federal greenhouse and headhouse hot water heater.
- Installed security lights on federal buildings.



Other information



- UGA Student Learning Center under construction on campus
- Leases (5 yr) on UGA buildings used by PGRCU approved by Board of Regents
- UGA service road (Fields M&N)
- PGRCU will host the 3rd Curators workshop, Atlanta, Feb. 2010

Needs

- Technical support
 - Peanut: Field support
 - Forage legumes: HPLC characterization
 - Grass: labor to support grass tissue culture
 - Seed storage: seed processing
 - Field crew: weeding, irrigation, harvesting
- Curation
 - Cat. 4 curator (Vigna, watermelon, cucurbits)

Needs

- Equipment

- Cone planters (peanut) \$ 5,000
- Tissue culture chamber (grasses) \$ 8,000
- Weed badger weeder \$ 9,000
- No till drill \$13,000
- Ultra low temp freezer \$14,000
- Thresher (peanut) \$14,000
- Truck to haul equipment on trailer \$27,000

Needs

- Equipment

- NMR analyzer (measure oil content) \$32,000
- Idaho Tech light scanner (genotyping) \$39,000
- Gas chromatograph \$39,000
(lignin, fatty acid, carotenoid, etc.)
- Four row flex planter \$70,000
- Moveable storage shelves for 4C room \$79,000

- Building

- Addition of 4 C cold storage room \$350,000
(convert existing 4 C to -18 C storage)

Plant Genetic Resources Conservation Unit



April 2007

Appendix 2

DR. MELANIE HARRISON-DUNN

WARM-SEASON GRASS CURATION UPDATE

Warm-season Grass Curation Update

for the Annual S-009 Multistate Research Project Meeting



Melanie Harrison-Dunn

Agronomist\Curator
USDA\ARS\PGRCU



Today's Talk



✦ Overview of the collection

✦ Accomplishments since 2003

✦ Current Projects and Goals



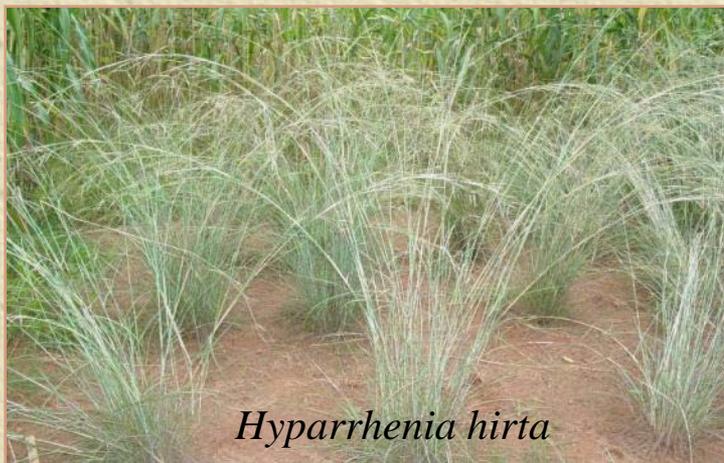
Overview of Collection

Diversity in Collection

✦ **6955** accessions

✦ **447** species

✦ **102** genera



Hyparrhenia hirta



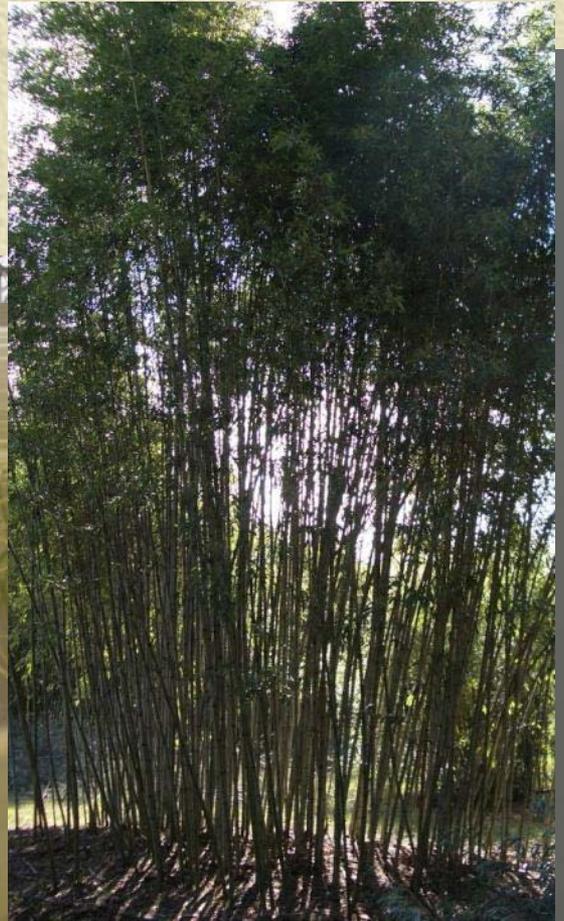
Pennisetum mezianum



Dichanthium annulatum

Forms Maintained

- ✦ seeds
- ✦ vegetative clones in greenhouse
- ✦ tissue culture
- ✦ outdoor field plots





Accomplishments 2003 to Present

Acquisitions

- ✦ 324 acquisitions between 2003 and present
 - ✦ NRCS Plant Material Releases
 - ✦ Zoysia collection from China (40)
 - ✦ Switchgrass from Fort Collins, CO (~140)



Regeneration Numbers

- ✦ 991 accessions have been successfully regenerated 2003 to 2007
- ✦ Collections have been regenerated including finger millet, little bluestem, switchgrass, bahiagrass and black grama



Clonal Collection

-
- ✦ Increased # plants per accession (one → four)
 - ✦ Dual labeled all pots to reduce number of accessions lost due to lack of ID
 - ✦ Updated cooling pad system, acquired new greenhouse space and have plans for mist bench system



Bamboo Collection

- ✦ New signs for all plots
- ✦ “Clean Up Days” with the Southeastern Chapter of the American Bamboo Society has made a significant impact



Bamboo cont.

- ✦ Bamboo has been assigned its own crop
- ✦ Digital images of plots, shoots, canes and flowers has been added to GRIN



Characterization

- ✦ Descriptors have been updated
 - stem diameter replaces stem size
 - inflorescence length and width has been added

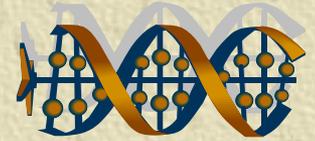


Characterization cont.

- ✦ Digital images have been generated (1191 images total)
- ✦ Core collection has been established for finger millet



Molecular Characterization



-
- ✦ Genetic analysis of bamboo collection using transferred EST-SSR markers (Barkley et al., 2005, Genome 48(4):731-737)
 - ✦ Evaluation of transfer SSR markers in finger millet, seashore paspalum, and bermudagrass (Wang et al., 2005, Plant Genetic Resources 3(1):45-47)
 - ✦ Genetic analysis of seashore paspalum using transfer SSR markers (Wang et al., 2006, Gen Res Crop Evol 53:779-791) and AFLP markers (Chen et al., 2005, ITS Res J 10:543-549)
 - ✦ Preliminary evaluation of transfer SSR markers in little and big bluestem (unpublished data)



Planned Projects & Goals

Regeneration Goals

- ✦ Focus on unavailable accessions with low seed numbers or original only seeds
- ✦ Employ methods to germinate difficult accessions
- ✦ Increase number of plants per accession (target=100)
- ✦ Sample evenly between plants within accessions to reduce genetic drift
- ✦ Ensure adequate isolation of accessions to reduce cross pollination



“Cleaning Up” Collection



- ✦ Assign permanent PI numbers to Grif accessions
- ✦ Identify accessions that need to be nulled
- ✦ Split accessions to increase availability
- ✦ Identify redundant accessions and handle

Grif 16407 – Blackwell – Donated from Kansas in 1961

Grif 16409 – Blackwell – Donated from Kansas in 1974

PI 421520 – Blackwell – Collected from Oklahoma in 1944;
Donated in 1977 by USDA NRCS Kansas PMC

In vitro Maintenance of *Cynodon*

- ✦ Determination of best conditions to maintain *Cynodon* in vitro as affected by storage vessel, pH, media constituents, temperature
- ✦ Goal is to increase establishment rate, reduce need for subculturing, and have back up of material at Fort Collins

Paspalum Germination Study

- ✦ Collaboration with Dave Pinnow, PGRCU
- ✦ Effect of removing palea and lemma during long term storage on germination
- ✦ Effect of removing palea and lemma after storage on germination

caryopsis with
palea & lemma

caryopsis only



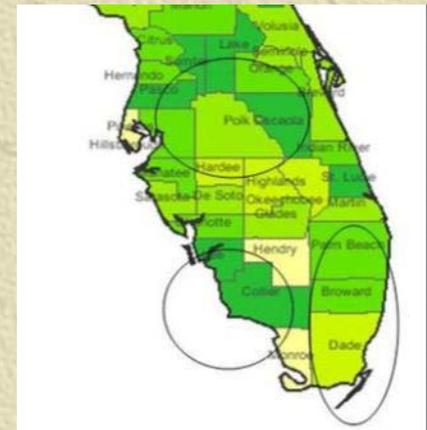
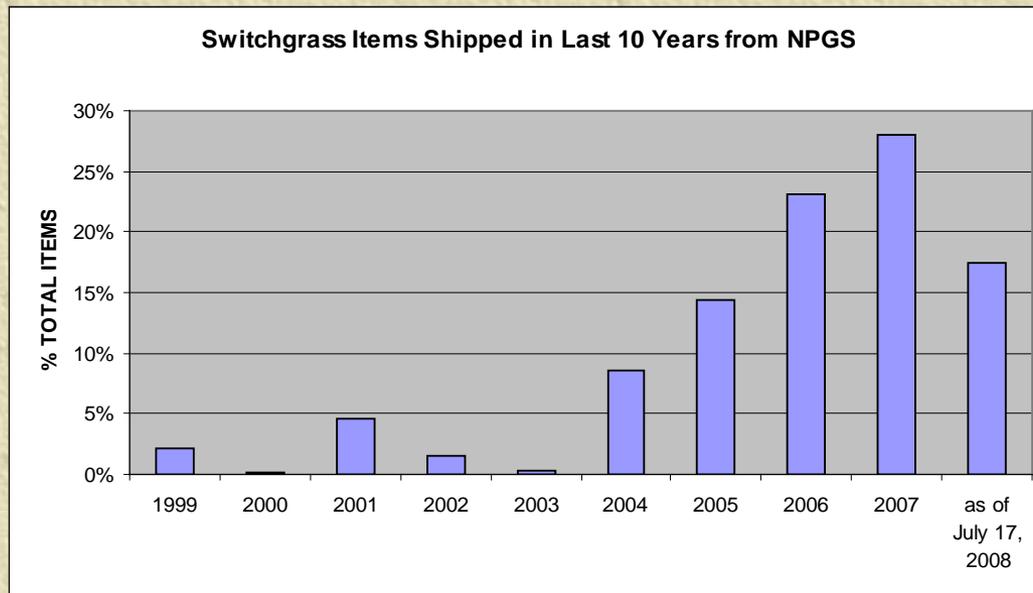
Little Bluestem Ornamental Study

- ✦ Screening little bluestem (*Schizachyrium scoparium*) for ornamental features
- ✦ Collaboration with Dr. Carol Robacker – University of Georgia, Horticulture



Switchgrass Collection Trip

- ✦ Switchgrass is the “in demand” grass
- ✦ Focuses on urbanized areas in south Florida
- ✦ Funded by the USDA Plant Exchange Office
- ✦ Led by myself and Dr. Mimi Williams with NRCS



Hot population growth areas in central and south Florida, 2004-2010 (adapted from Clouser and Cothran, 2005)

Other Projects



- ✦ Screening *Paspalum* spp. for fall armyworm resistance (Drs. Kris Braman & Paul Raymer)
- ✦ Screening clonal material for presence of MDMV, JGMV, PMV (Dave Pinnow)
- ✦ Switchgrass molecular evaluation (Drs. Noelle Barkley & Ming-Li Wang)
- ✦ Development of bamboo descriptors for GRIN



<http://lpm.uga.edu/turf/armyworms.html>

Overall Goal



To make the warm season grass collection more valuable, accessible and viable for the use of stakeholders