

**S-009 Regional Technical Advisory Committee  
Minutes of Annual Meeting July 21-22, 2015**

**The Center for Renewable Carbon  
University of Tennessee  
Knoxville, TN**

**Members present:**

Guam (University of Guam) ..... Mari Marutani [marutani@uguam.uog.edu](mailto:marutani@uguam.uog.edu)  
Kentucky (University of Kentucky) ..... Tim Phillips [tim.phillips@uky.edu](mailto:tim.phillips@uky.edu)  
Louisiana (Louisiana State University) ..... Don LaBonte [dlabonte@agcenter.lsu.edu](mailto:dlabonte@agcenter.lsu.edu)  
Mississippi (Mississippi State University) ..... Brian Baldwin [bbaldwin@pss.msstate.edu](mailto:bbaldwin@pss.msstate.edu)  
North Carolina (North Carolina State University) ..... Tom Stalker [tom\\_stalker@ncsu.edu](mailto:tom_stalker@ncsu.edu)  
Tennessee (University of Tennessee) ..... Fred Allen [allenf@utk.edu](mailto:allenf@utk.edu)  
Texas (Texas A&M University) ..... Gerald Smith [g-smith@tamu.edu](mailto:g-smith@tamu.edu)

**USDA, ARS, PGRCU representatives present:**

PGRCU, Griffin, GA ..... Gary Pederson [gary.pederson@ars.usda.gov](mailto:gary.pederson@ars.usda.gov)  
PGRCU, Griffin, GA ..... Melanie Harrison [melanie.harrison@ars.usda.gov](mailto:melanie.harrison@ars.usda.gov)

**Others present:**

University of Tennessee ..... Amanda Ashworth [aashwor2@utk.edu](mailto:aashwor2@utk.edu)  
University of Tennessee ..... Virginia Sykes [vsykes@utk.edu](mailto:vsykes@utk.edu)

The meeting was called to order at the Center for Renewable Carbon, University of Tennessee, at 1:00 p.m., July 21, by Chair Fred Allen. The meeting began with self-introductions of all those present.

- 1) Fred Allen gave an overview of Tennessee agriculture and a summary of a survey of producers on the "Value of Variety Trials".
- 2) Announcement and suggestion that our meeting be held in Fort Collins, CO next year in conjunction with the PGOC, Curator's Workshop, NPGCC, and other RTACS. Meeting dates are: June 13th (Monday) a travel day, 14th (Tuesday) S-009 meeting during the afternoon, and 15th meeting with PGOC and other RTACS in a joint session in the morning. Suggestion was put to a vote and passed.
- 3) Brian Baldwin will move from Secretary to Chair for the 2016 S-009 meeting. Fred Allen and Brian Baldwin were appointed to a committee to identify candidate(s) for 2016 S-009 Secretary to become S-009 Chair in 2017.
- 4) Minutes of 2014 S-009 meeting were approved as distributed.
- 5) Report by the Interim Administrative Advisor (Clarence Watson) was given by Gary Pederson. Dr. Watson was called to another meeting. Discussion included: 1. W-006 project was only renewed for three years, 2. Interviews for the Associate Dean position at Griffin (Jerry Arkin's old position). An offer was made to one candidate. Agreement could not be reached, so University of Georgia is re-advertising the position. 3. S-009 receives very active support from Clarence Watson and the Southern Directors.
- 6) Report of National Programs - Presentation via telephone by Peter Bretting on the National Plant Germplasm System: 2015 Status, Prospects and Challenges. Number of accessions in the system reached 570,000 in 2014 with 14,700 species. Main focus now is to fill in gaps. Steady funding for 2015. Priorities are acquisition, maintenance, regeneration, documentation and data management. New focuses include tribal nations, genomics and vertical farming/urban

plant growth. Diversity Seek (DivSeek) has a mission of enabling breeders and researchers to mobilize a range of plant genetic variation to accelerate crop improvement. Peter answered several questions:

- a. Will GRIN accept large numbers of molecularly different (progeny from a cross) accessions? We will hold and distribute on demand, but won't regenerate. The guide for long storage and regeneration is if it is a crop for food security.
  - b. Are there quarantine sites at state locations? Individual sites have import/quarantine permits, however most new material should go through Beltsville or APHIS.
  - c. What is the money targeting as vertical farming? Funding to breed crops for this new environment (hydroponic and artificial lighting).
  - d. How do you come up with GMO, conventional, and organic varieties that serve all constituents? Organic is difficult because of requirements for seed increase. GRIN will be preparing to receive its first GM crops as they come off patent.
- 7) Dr. Gary Pederson gave a summary of PGRCU activities for the past year (Appendix 1). The collections at Griffin have increased totalling 92,232 accessions with 89.6% available and 97.9% backed up. A total of 80.9% of the seeded accessions have the bulk of the seed in -18C for better long-term storage. Demand for accessions was the greatest for sorghum (16,153 distributions), peppers (3,283 distributions), and watermelon (3,287 distributions). Sorghum accession availability is at an all-time high with only 239 accessions out of 38,000+ accessions not being available for distribution. The Southern Directors have approved S-009 funding increases for the last three years with an increase of \$14,939 for FY2016. Current staffing is expected to drop significantly in near future due to retirements. Position of S-009 farm manager will remain vacant for the time being. Interviews are currently being conducted for the peanut curator position. There is a probability of two retirements in 2015 and three in 2017. Two curators are currently eligible for retirement.
- 8) Dr. Melanie Harrison gave an update on the switchgrass collection (Appendix 2). In 2003 there were 170 accessions with 124 from South Dakota. In 2008, 84 accessions from New York and Pennsylvania were added to the collection. From 2008 through 2014, a total of 135 accessions have been collected in the Gulf coast, Florida, and the Atlantic coast and added to the collection. A switchgrass collection trip will be conducted in September in the northeastern U.S. including Maine, Vermont, New Hampshire, Connecticut, and Massachusetts.
- 9) A discussion was held on the impact of upcoming retirements on the Griffin program. The S-009 committee was encouraged to actively participate in discussions on hiring the next leadership of the Griffin location to ensure that the focus of the program remains on the genetic resource collection. Future retirements of many experienced personnel of the program will stress operations. The number of personnel is much lower than previous years (39 in 2003 to 25 currently), but with experienced employees operations have continued effectively. When new employees are hired without this level of experience, it will be difficult to keep things operating as well at least initially. S-009 committee members should work with these new employees to help them gain experience in efficient genebank operations. New employees may need to cooperate more with University of Georgia Griffin faculty, especially in entomology and plant pathology, to diagnose pathogen and insect problems in seed regeneration plots.
- 10) Dr. Fred Allen gave a short tour of the Native American Interpretive Garden on the University of Tennessee campus.

The meeting was adjourned and reconvened on Wednesday, July 22, at 8:00am.

- 11) Due to wet conditions, field tours were given from the hill overlooking the University of Tennessee Plant Sciences Unit field plots. Reports were given on germplasm usage by University

of Tennessee-Knoxville scientists for soybean (Dr. Vince Pantalone), corn (Dr. Dennis West), and switchgrass (Dr. Hem Bhandari).

- 12) State reports were given by representatives from Guam (Mari Marutani); KY (Tim Phillips); LA (Don LaBonte); MS (Brian Baldwin); NC (Tom Stalker); TN (Fred Allen); and TX (Gerald Smith). Written state reports were distributed from several S-009 committee members not in attendance. There was a discussion on formatting and what information to present in the state reports.

- 13) Business meeting:

The committee approved the next S-009 meeting location at NCGRP, Fort Collins, Colorado on June 14-15, 2016, in conjunction with PGOC, NPGCC, Curator's workshop, and the other multi-state technical committees. Dr. Tim Phillips, University of Kentucky, was elected as secretary of S-009 in 2016 and chair in 2017. Dr. Brian Baldwin will serve as S-009 chair in 2016.

The meeting was adjourned.

Brian Baldwin  
S-009 Secretary

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

# PGRCU Collection - June 2015

- Total Accessions
  - 92,232
- Total Available
  - 82,637 (89.6%)
- Backed Up
  - 90,307 (97.9%)

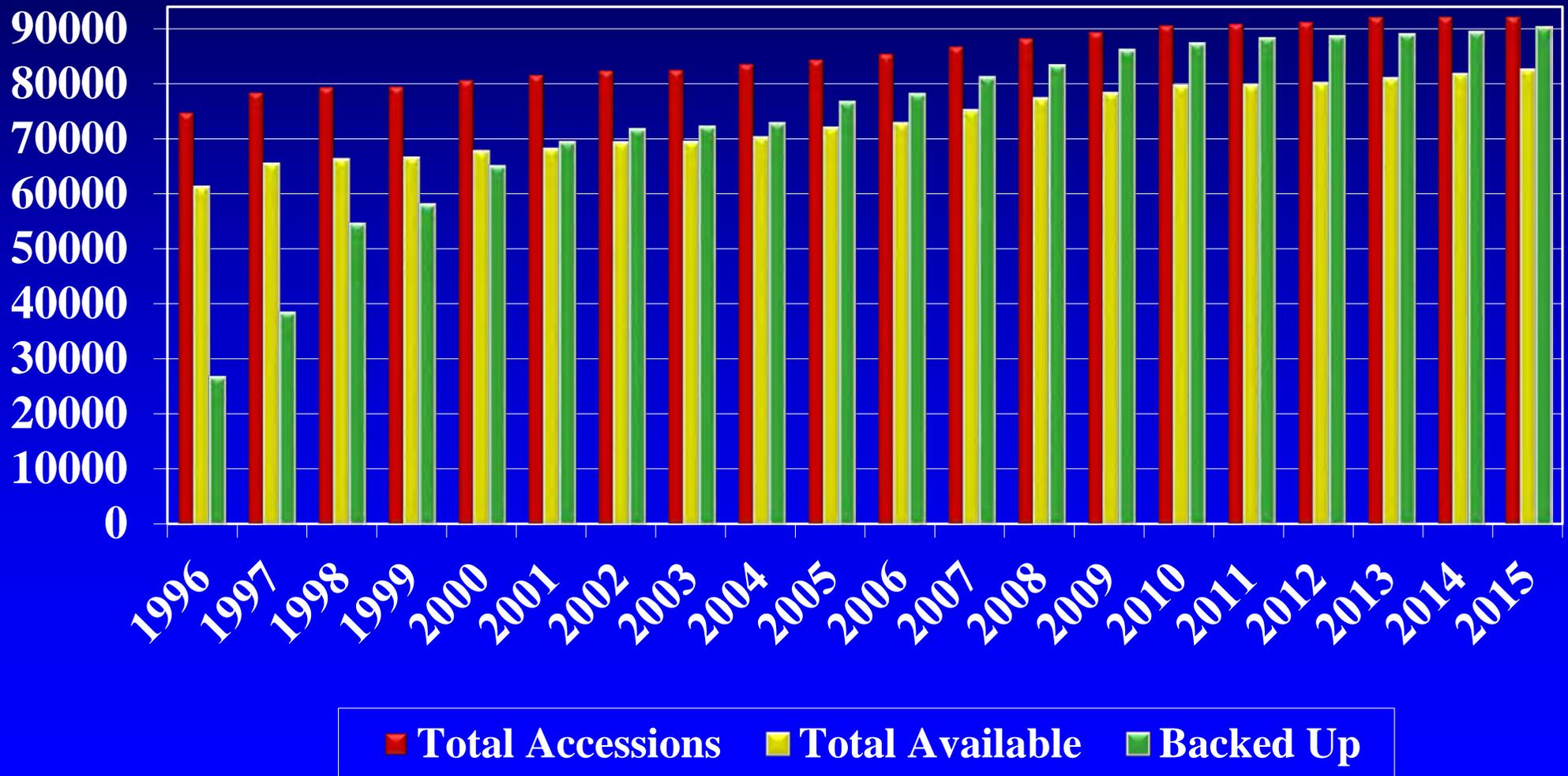
Acknowledgement: Merrelyn Spinks and Lee Ann Chalkley, PGRCU, compiled and summarized all numbers shown in this presentation.

# PGRCU Collection - June 2015

- Total Accessions
  - 92,232
- Total Available
  - 82,637 (89.6%)
- Backed Up
  - 90,307 (97.9%)

*Merrelyn Spinks: "I've been keeping these summaries for 19 years (1996 to present), and we reached the highest percent available (89.6%) that we've ever had in 19 years, and also the highest percent backed up (97.9%). We also now have 80.9% with a sample in the -18C freezer, and 90.7% of accessions have at least one germ record. We have the second most observation records in the system. NSGC has about twice as many observation records as we do, and the next after us is W6 with roughly a third less than us."*

# PGRCU Collection 1996 - 2015



# Germination Testing

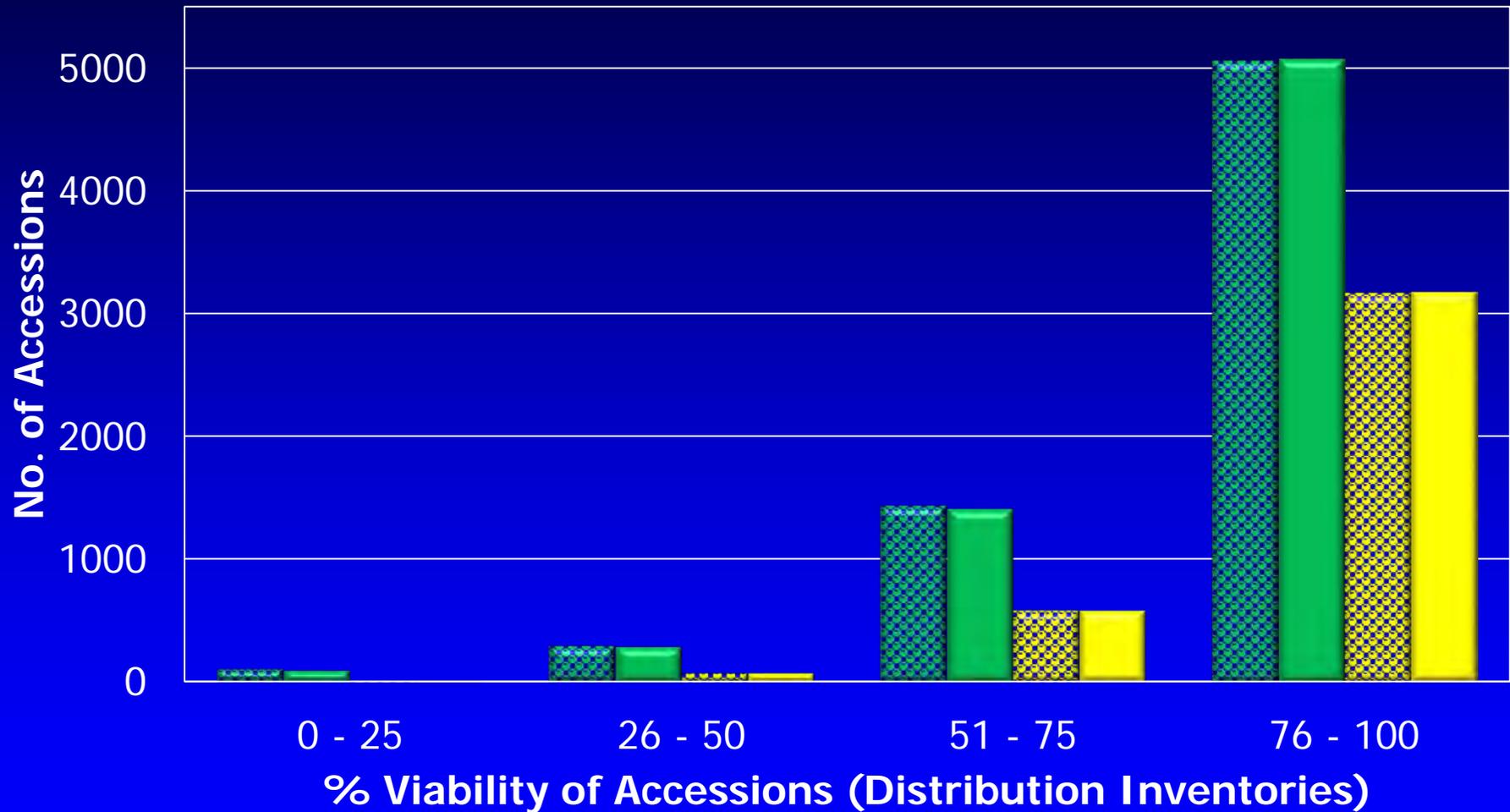
(Accessions with seed only, tested since 2002)

Crop	Accessions	%	Crop	Accessions	%
Sorghum	36,637	95.9	Clover	2,008	89.4
Peanut	8,460	90.8	Okra	1,762	59.2
Cowpea	7,251	87.8	Watermelon	1,767	92.6
Grass	6,525	91.7	Pearl millet	1,294	99.8
Pepper	4,903	99.2	Sesame	1,211	99.6
Mung bean	3,928	92.8	Eggplant	955	93.4
Legume	2,450	79.5	Cucurbit	717	50.5
			<b>TOTAL</b>	<b>81,157</b>	<b>90.7</b>

# Vigna

<b>CURATOR</b>	<b>CROP</b>	<b>TOTAL ACCESSIONS</b>	<b>TOTAL AVAILABLE</b>	<b>NUMBER BACKED UP</b>	<b>ITEMS SHIPPED IN 2014</b>
<b>Brad Morris</b>	Cowpea	8,254	6,887	8,210	1,532
	Mung bean	4,232	3,841	4,232	1,152
	Other Vigna spp.	496	296	353	292

# Cowpea & Mung Bean Accession Viability

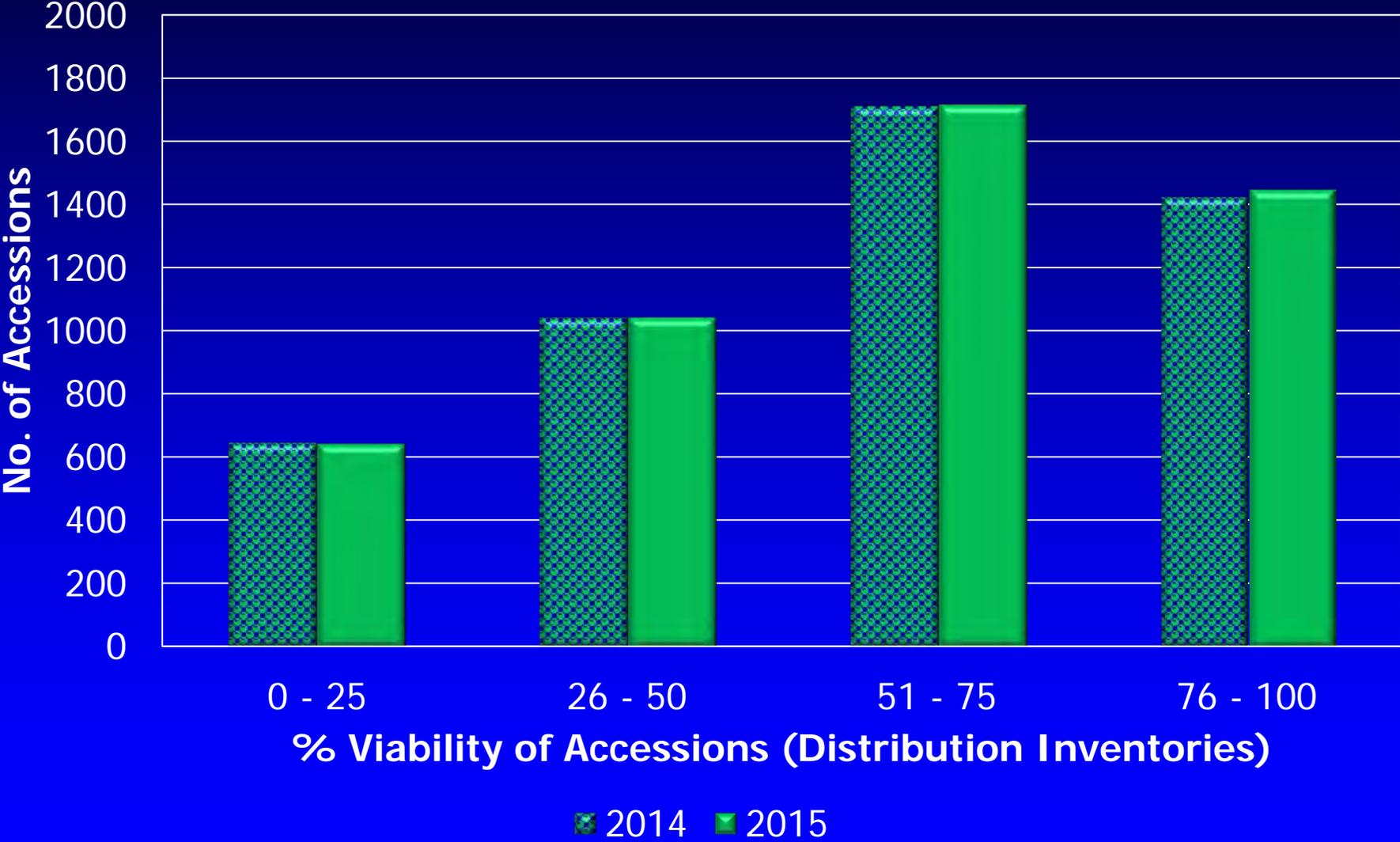


■ Cowpea 2014 ■ Cowpea 2015 ■ Mung Bean 2014 ■ Mung Bean 2015

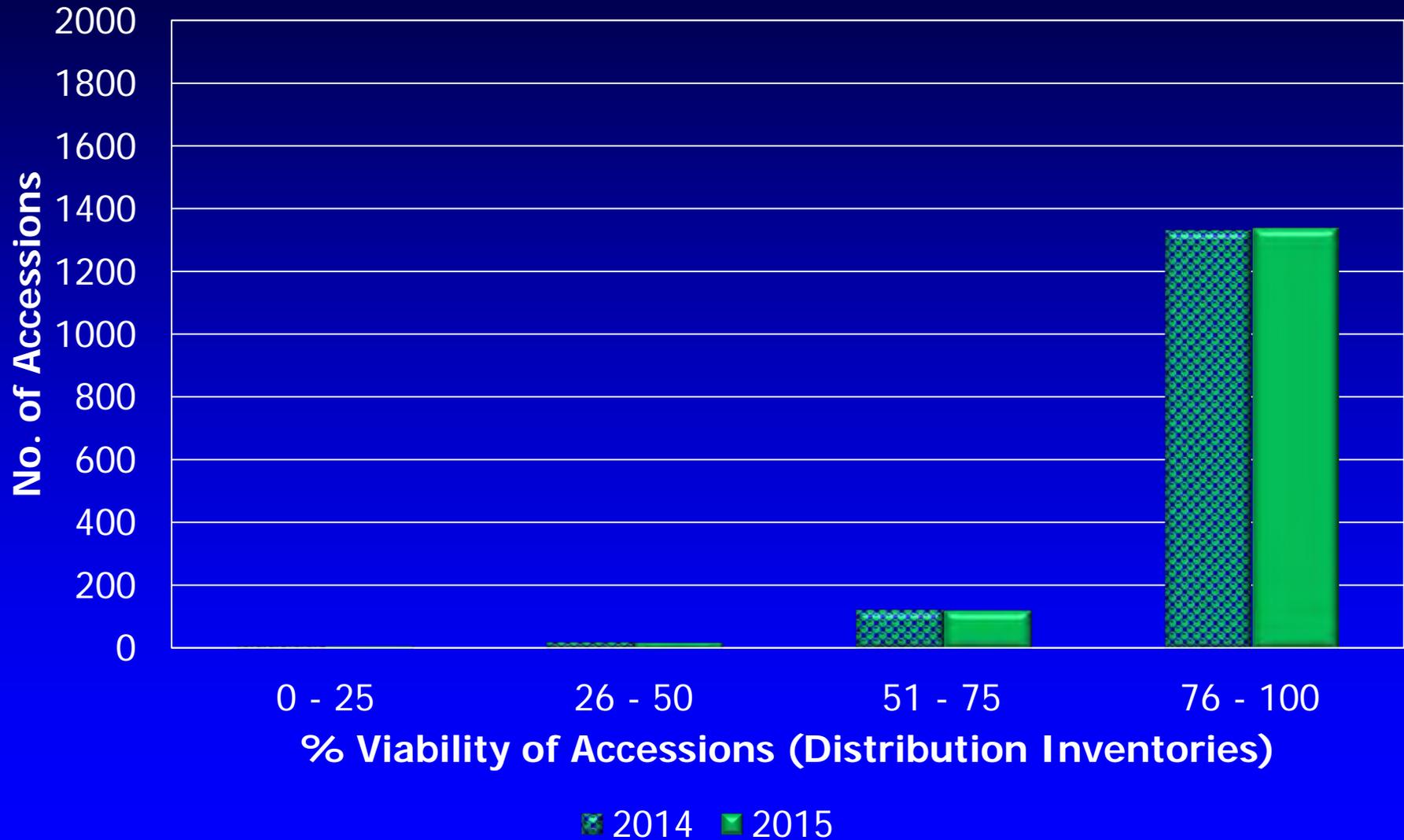
# Vegetable Crops & Sweetpotato

CURATOR	CROP	TOTAL ACCESSIONS	TOTAL AVAILABLE	NUMBER BACKED UP	ITEMS SHIPPED IN 2014
<b>Bob Jarret</b>	Cucurbits	1,419	512	1,309	914
	Eggplant	1,022	918	992	677
	Okra	2,976	1,509	2,938	420
	Peppers	4,941	4,855	4,928	<b>3,283</b>
	Sweetpotato - tissue culture	769	738	<b>714</b>	352
	Other Ipomoea spp.	461	214	406	51
	Watermelon	1,908	1,468	1,875	<b>3,287</b>

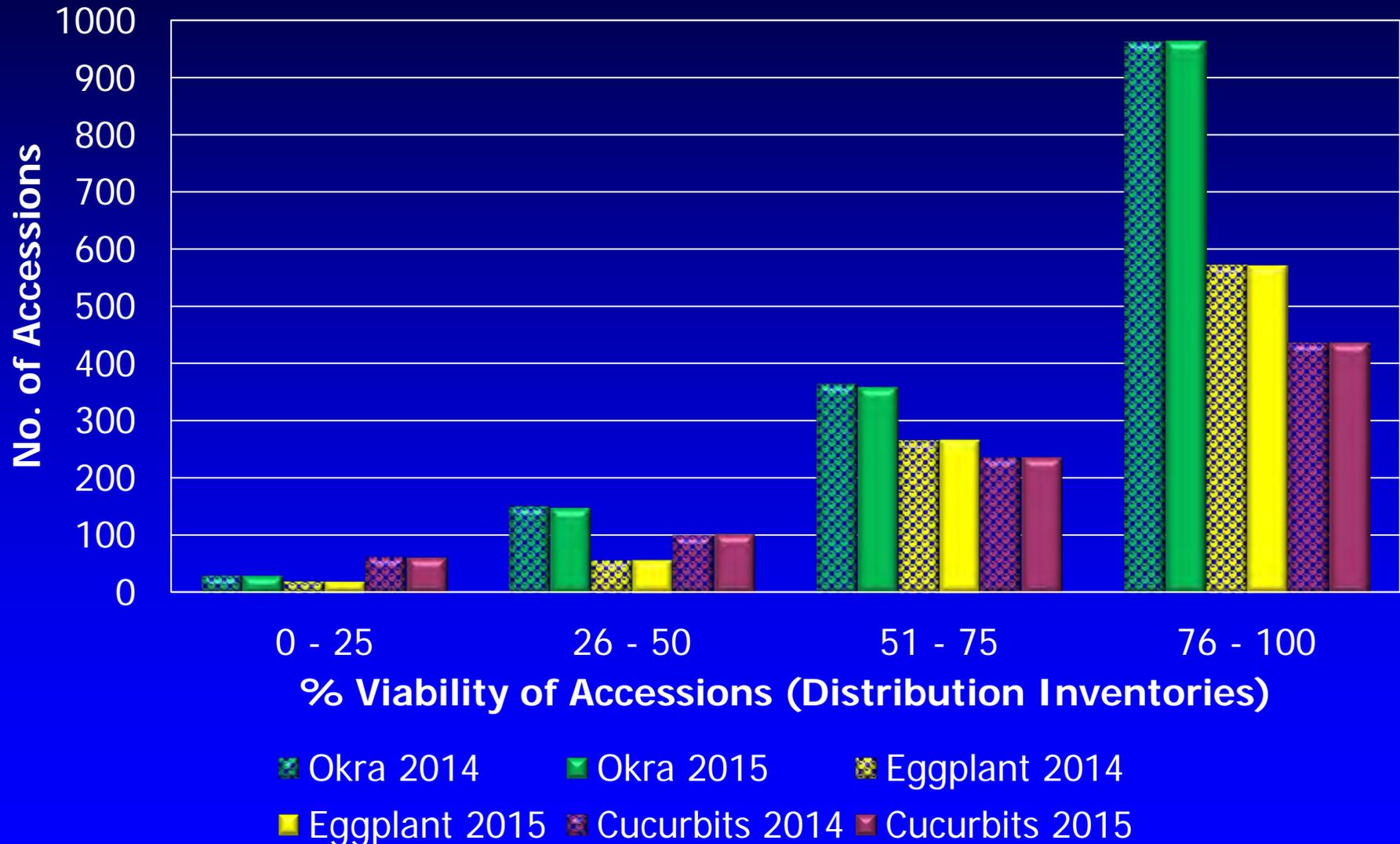
# Pepper Accession Viability



# Watermelon Accession Viability



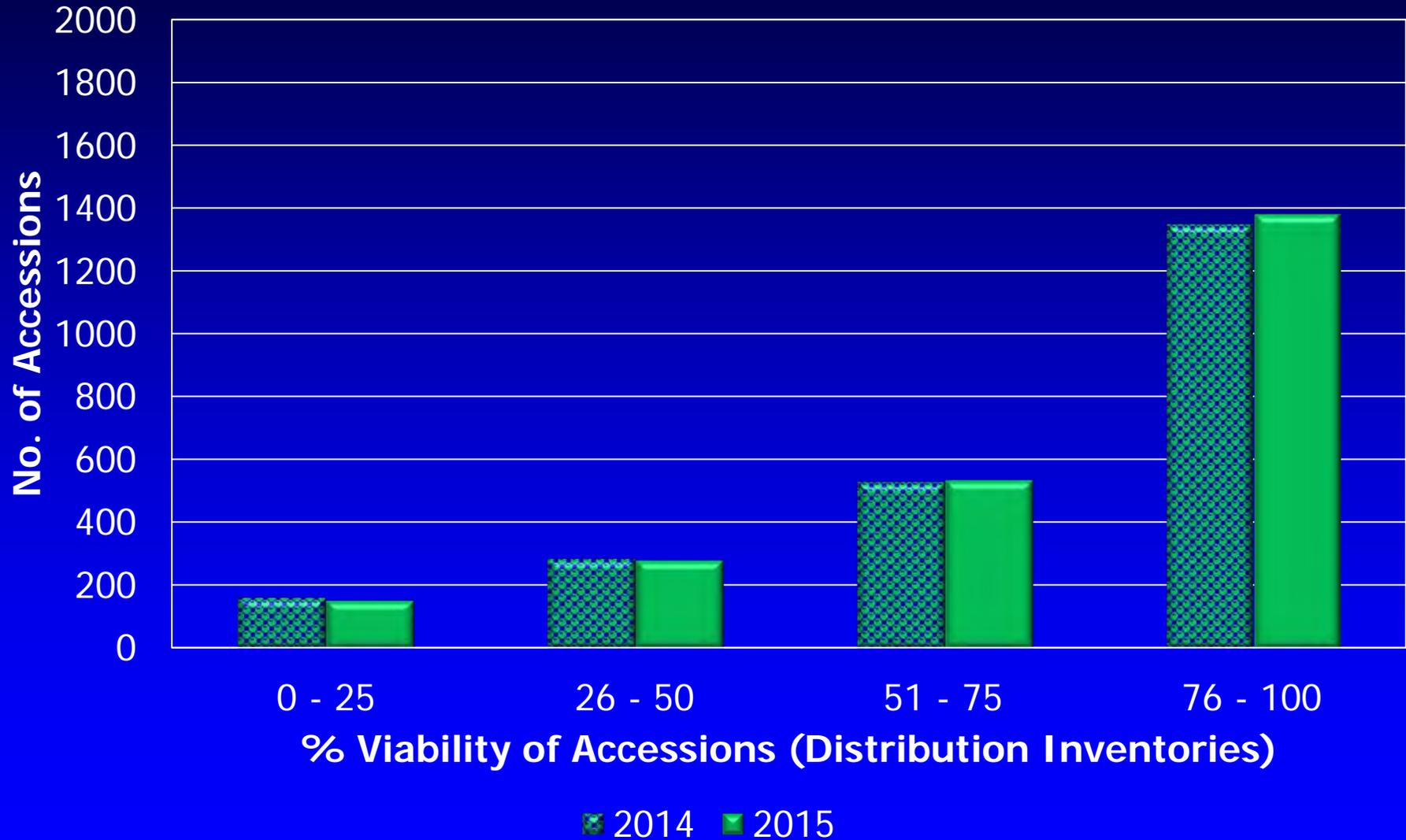
# Okra, Eggplant, & Cucurbits Accession Viability



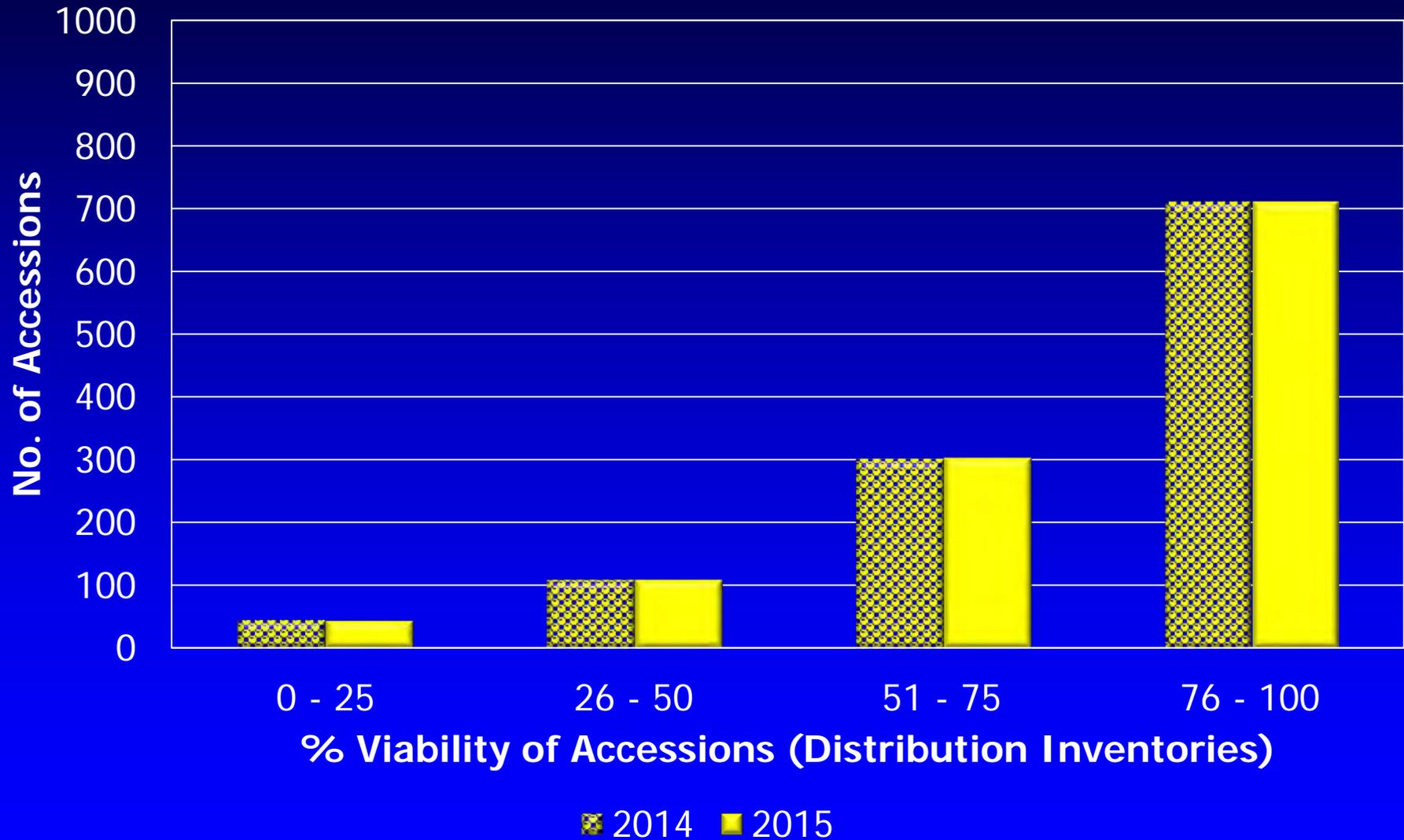
# Legumes and Misc. Crops

<b>CURATOR</b>	<b>CROP</b>	<b>TOTAL ACCESSIONS</b>	<b>TOTAL AVAILABLE</b>	<b>NUMBER BACKED UP</b>	<b>ITEMS SHIPPED IN 2014</b>
<b>Brad Morris</b>	Castor bean	378	161	377	46
	Hibiscus	346	285	344	120
	Legumes	3,083	2,365	2,996	421
	Guar, Winged Bean, Misc	721	564	635	272
	Sesame	1,216	1,173	1,216	712

# Legume Accession Viability



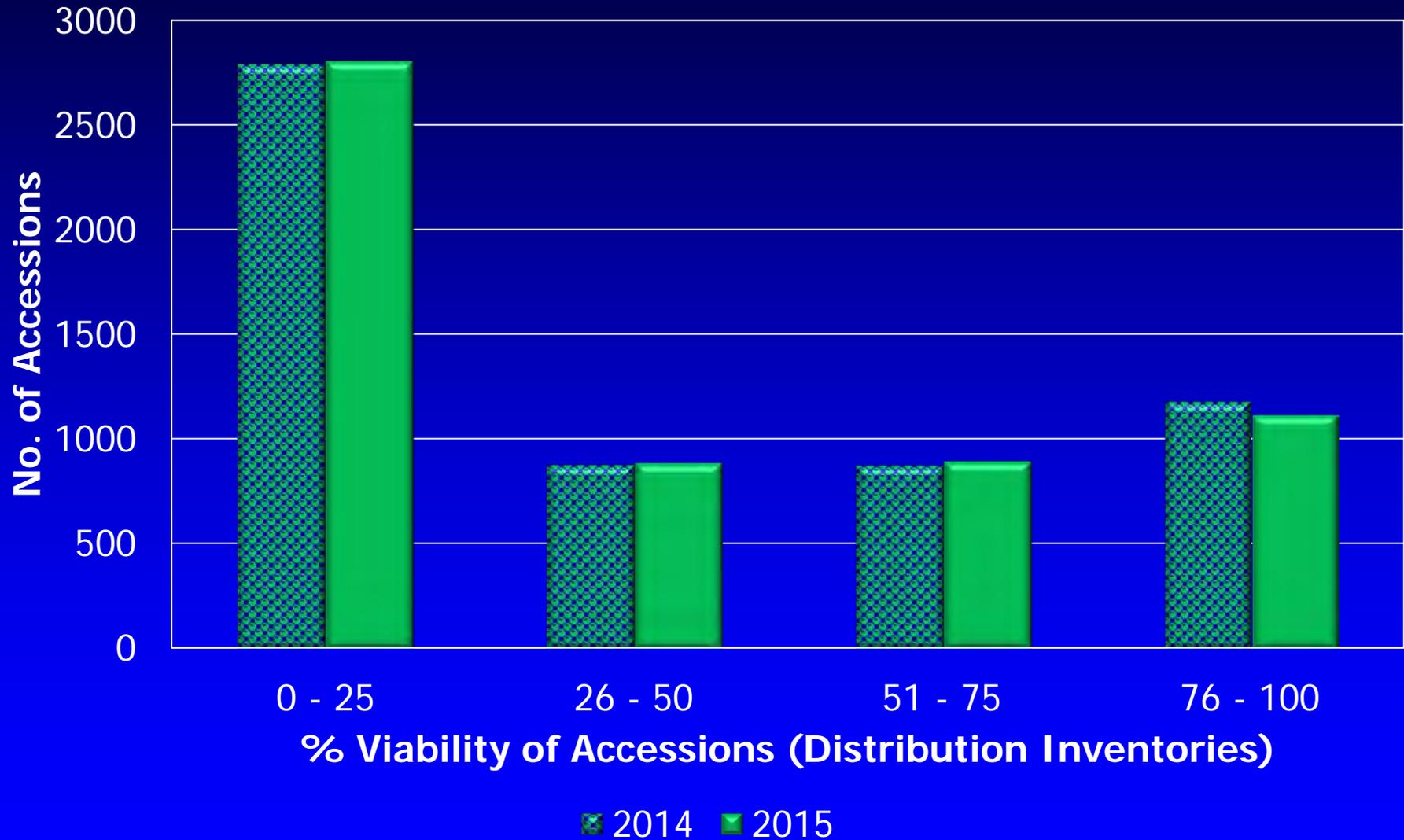
# Sesame Accession Viability



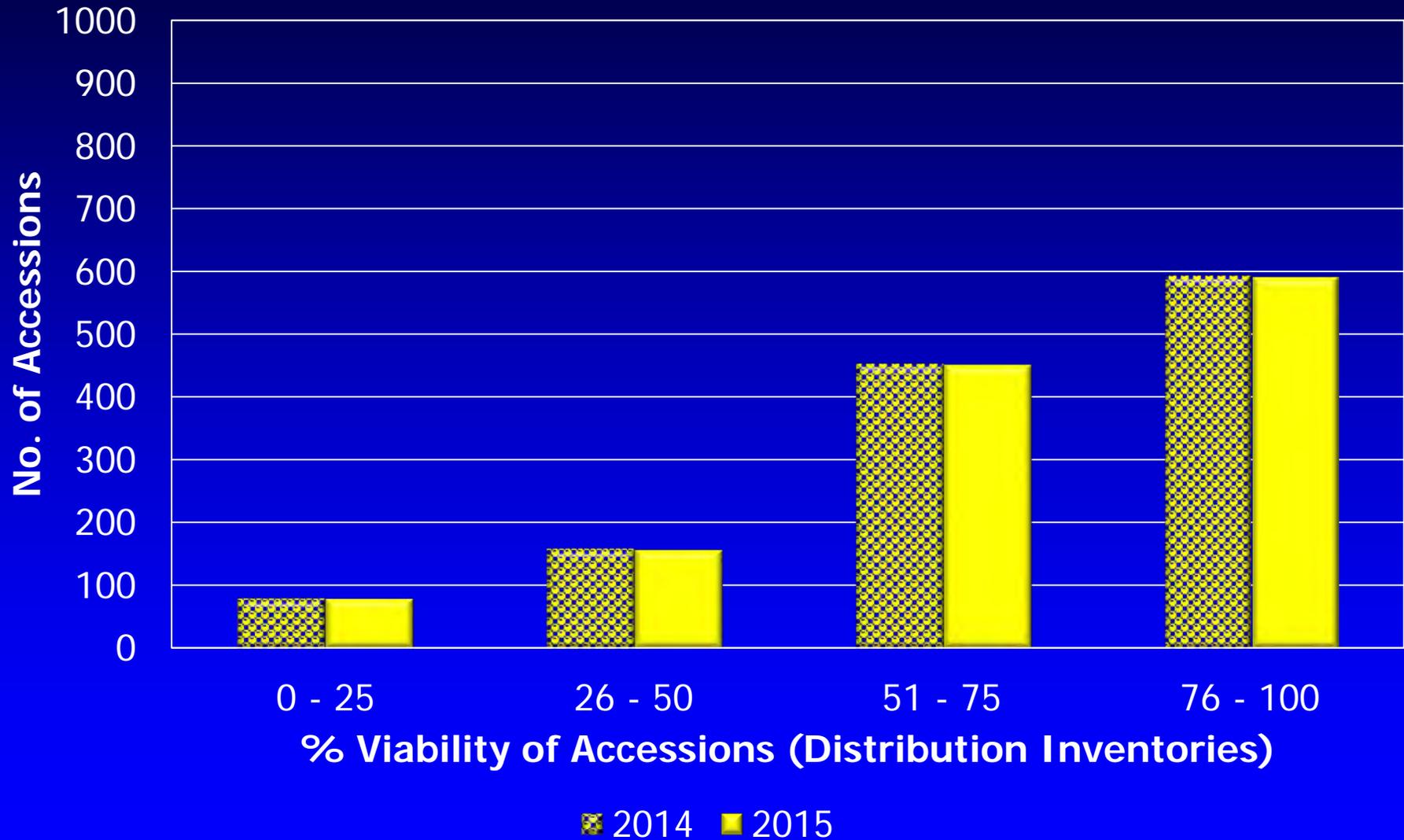
# Warm-Season Grasses

CURATOR	CROP	TOTAL ACCESSIONS	TOTAL AVAILABLE	NUMBER BACKED UP	ITEMS SHIPPED IN 2014
<b>Melanie Harrison</b>	Bamboo	96	96	2	7
	Grasses	7,476	6,143	6,930	601
	Pearl millet	1,297	1,280	1,297	<b>2,554</b>

# Warm-Season Grass Accession Viability



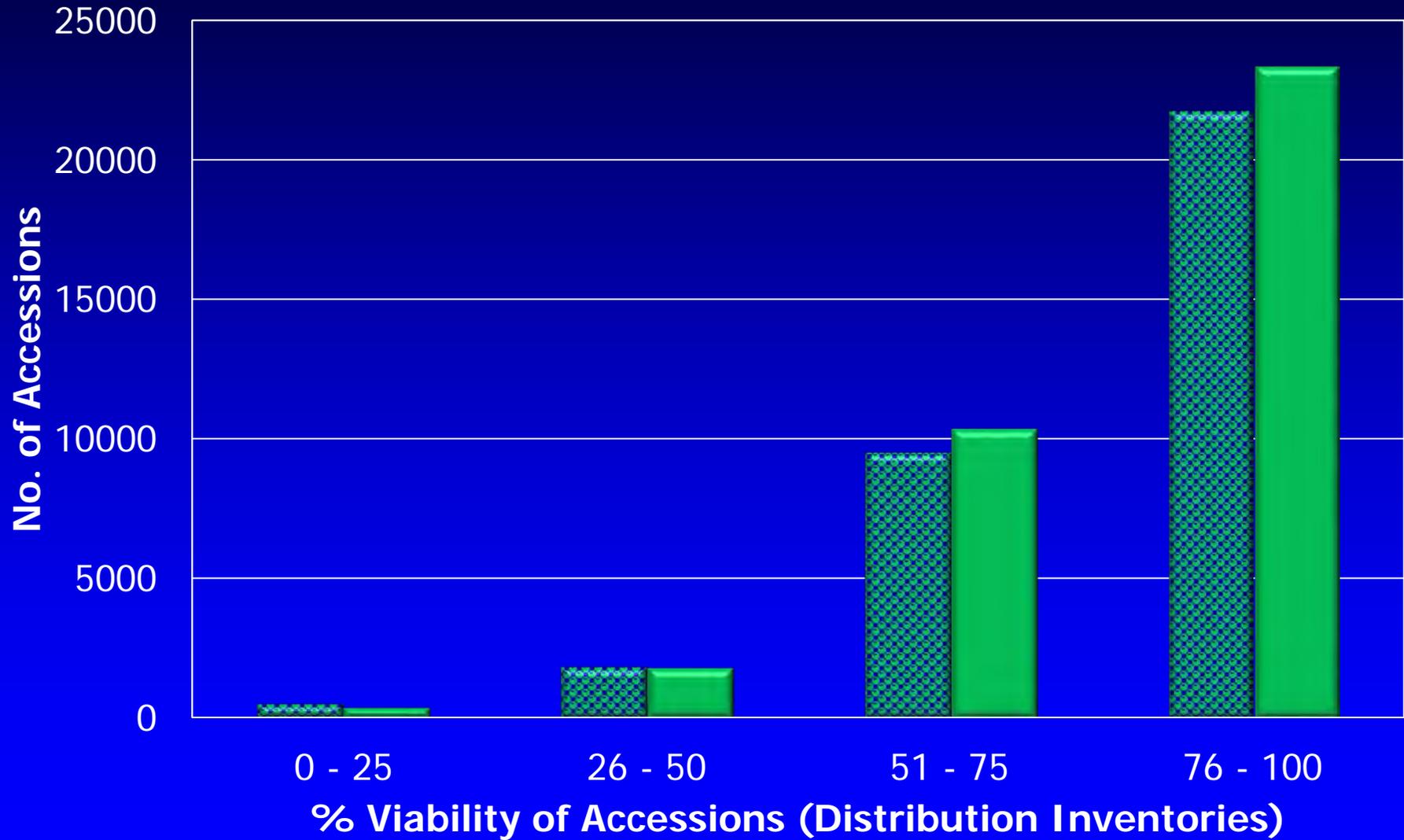
# Pearl Millet Accession Viability



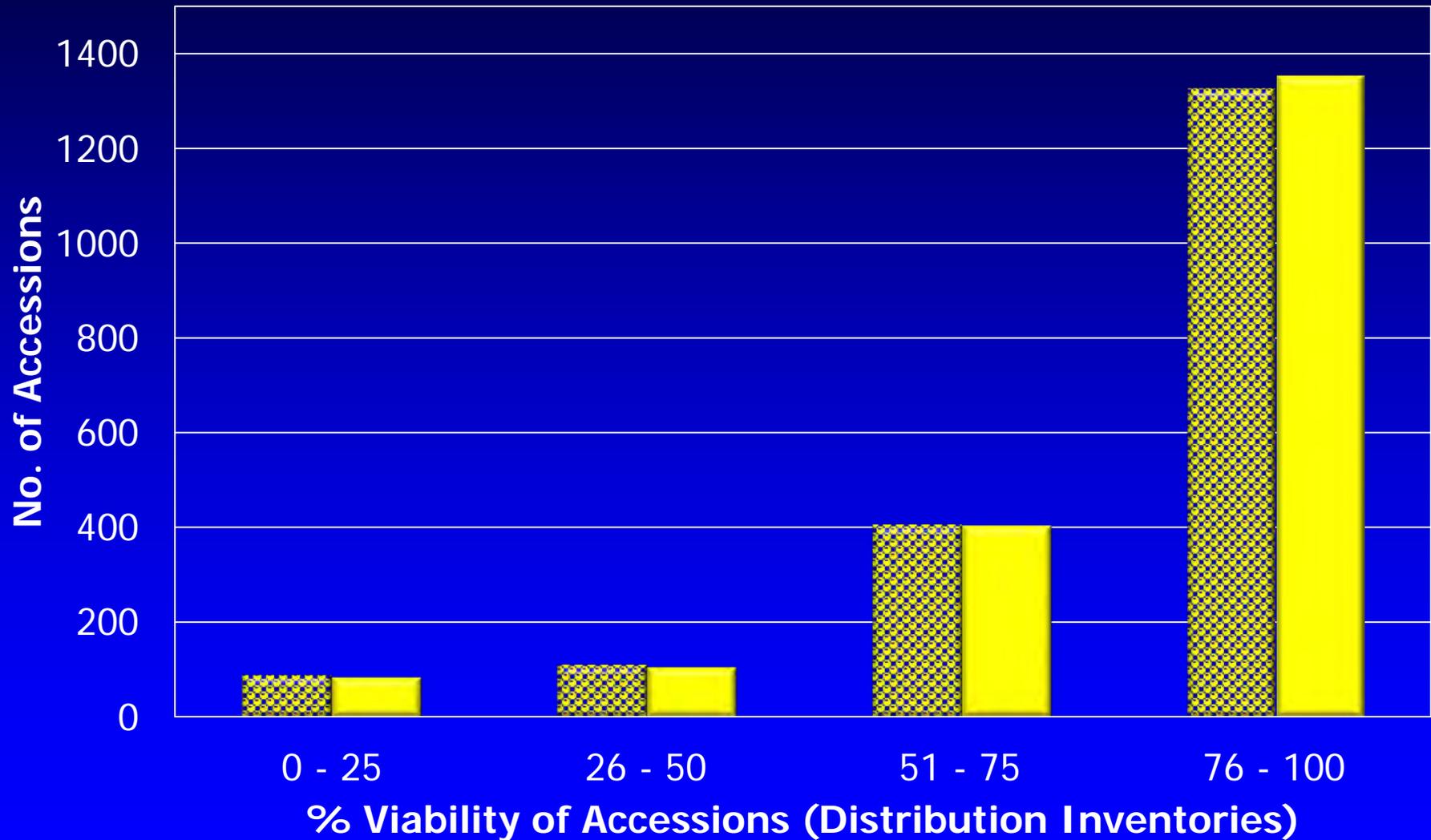
# Clover and Sorghum

CURATOR	CROP	TOTAL ACCESSIONS	TOTAL AVAILABLE	NUMBER BACKED UP	ITEMS SHIPPED IN 2014
Gary Pederson	Annual Clover	2,245	2,018	2,225	596
	Sorghum	38,202	37,963	38,086	<b>16,153</b>

# Sorghum Accession Viability



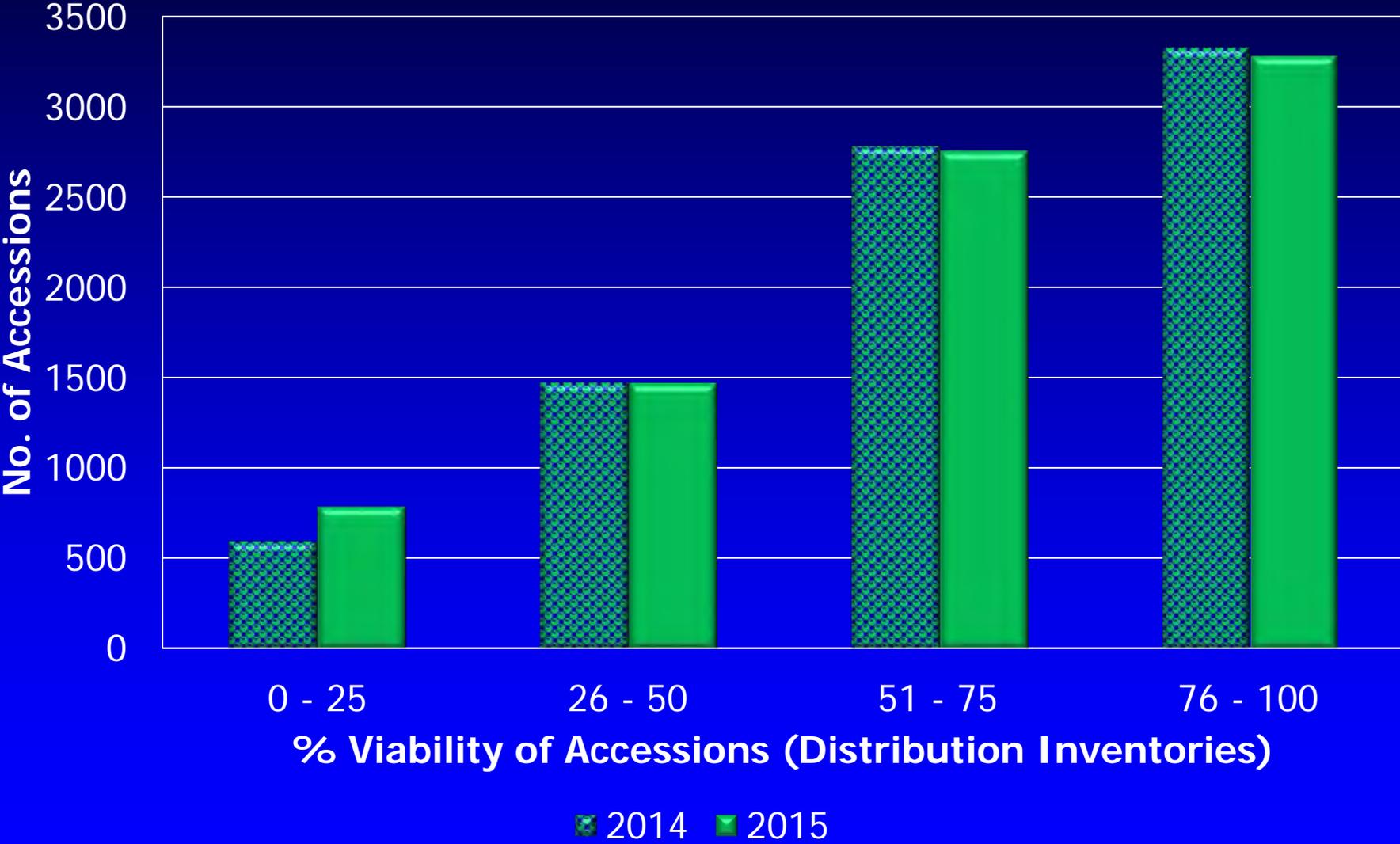
# Annual Clover Accession Viability



# Peanuts

<b>CURATOR</b>	<b>CROP</b>	<b>TOTAL ACCESSIONS</b>	<b>TOTAL AVAILABLE</b>	<b>NUMBER BACKED UP</b>	<b>ITEMS SHIPPED IN 2014</b>
<b>Melanie Harrison</b> (acting)	Cultivated Peanuts	9,313	8,521	9,122	<b>1,128</b>
	Wild Peanuts	619	452	437	121

# Peanut Accession Viability



# Number (and %) of accessions that are unavailable

Crop	2014	2015	Crop	2014	2015
Cowpea	1,341 (16%)	1,367 (17%)	Hibiscus	66 (19%)	61 (18%)
Mung bean	389 ( 9%)	391 ( 9%)	Legumes	741 (24%)	718 (23%)
Cucurbits	908 (64%)	907 (64%)	Sesame	44 ( 4%)	43 ( 4%)
Eggplant	102 (10%)	104 (10%)	Grasses	1,374 (18%)	1,333 (18%)
Okra	1,457 (49%)	1,467 (49%)	Pearl millet	14 ( 1%)	17 ( 1%)
Peppers	75 ( 2%)	86 ( 2%)	Annual clover	241 (11%)	227 (10%)
Sweetpotato (TC)	32 ( 4%)	31 ( 4%)	Sorghum	835 ( 2%)	<b>239 ( 1%)</b>
Watermelon	428 (22%)	440 (23%)	Cultivated peanuts	1,022 (11%)	<b>792 ( 9%)</b>
Castor bean	214 (57%)	217 (57%)	Wild peanuts	156 (24%)	167 (27%)
			<b>TOTAL</b>	<b>10,431 (11%)</b>	<b>9,595 (10%)</b>

# Digital photos

Crop	Images
Sorghum	8,959
Peanut	<b>4,927</b>
Cowpea	2,208
Watermelon	1,824
Pepper	1,789
Grass	1,093
Cucurbit	825
Pearl millet	451
Other crops	806
<b>Total</b>	<b>22,882 (24.8%)</b>

# Accessions in -18 C storage

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

Crop	Accessions	%	Crop	Accessions	%
Sorghum	30,386	<b>79.5</b>	Watermelon	1,900	99.6
Peanuts	9,306	<b>99.9</b>	Cucurbits	1,392	98.1
Grasses	6,871	96.6	Sesame	1,216	100.0
Peppers	4,927	99.7	Eggplant	1,003	98.1
Mung bean	4,074	96.3	Cowpea	838	10.2
Legumes	3,058	99.2	Gourds	474	97.1
Okra	2,969	99.8	Ipomoea spp.	450	97.6
Clover	2,238	99.7	<b>TOTAL</b>	<b>73,495</b>	<b>81.0</b>

# Requested for regeneration in CY2015

<b>Crop</b>	<b># accessions</b>	<b>Crop</b>	<b># accessions</b>
Cowpea	115	Grasses	21
Sorghum	1,260	Legumes	120
Cucurbit	53	Hibiscus	28
Clovers	4	Cult peanut	202
Peppers	19	Wild peanut	32
Sesame	11	Mungbean	2
Ipomoea sp.	29	Castor bean	3
Watermelon	27	Misc crops	29
Eggplant	26	Okra	10

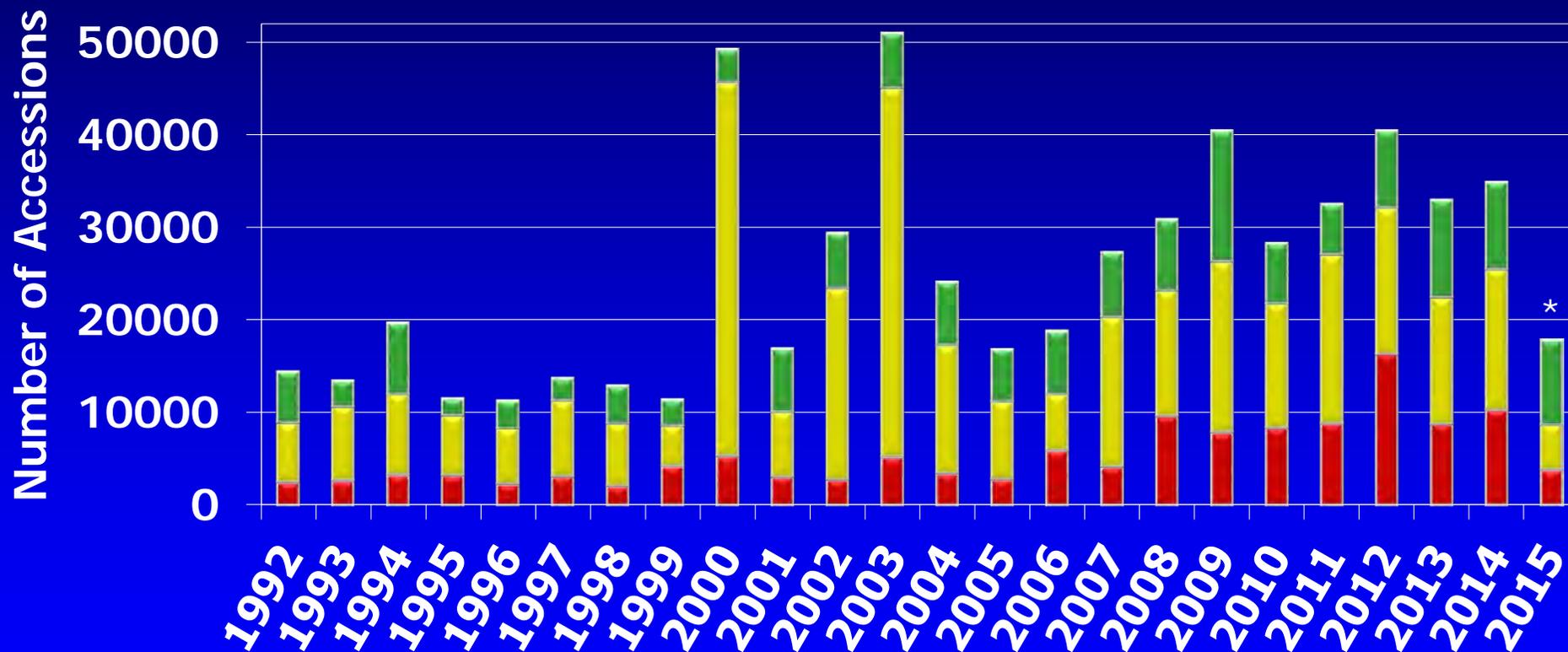
# Regenerations by others (since last S-009 meeting)

- 1 gourd, 1 sweetpotato, and 4 Ipomoea spp. accessions
  - R. Goenaga, USDA, ARS, Puerto Rico
- 1,194 sorghum, 33 legume, and 16 wingbean accessions
  - R. Vasquez, USDA, ARS, St. Croix
- 26 Australian sorghum species accessions
  - APHIS (quarantine), Beltsville, MD
- 1 cucurbit, 2 eggplant, 5 okra, 9 pepper, 36 cowpea, 7 mungbean/Vigna acc.
  - J. Serimian, USDA, Parlier, CA
- 24 watermelon accessions
  - J. Green, Monsanto, Woodland, CA
- 1 watermelon accession
  - T. Wehner, NC State, Raleigh, NC
- 56 switchgrass accessions
  - M. Casler, USDA, Madison, WI
- 661 peanut accessions
  - 261 accessions, G. MacDonald and J. McKinney, Univ. Florida, Citra, FL
  - 92 accessions, T. Isleib, NC State, Raleigh, NC
  - 66 accessions, N. Puppala, N. Mexico State, Clovis, NM
  - 145 accessions, K. Chamberlin, USDA, ARS, Stillwater, OK
  - 97 accessions, M. Burow, Texas A&M, Lubbock, TX

# Distributions in CY2014

- Domestic = 24,607 items in 757 orders
  - S-9 region = 15,172 items
- Foreign = 10,277 items in 207 orders
- Total CY2014 distributions = 34,884 items

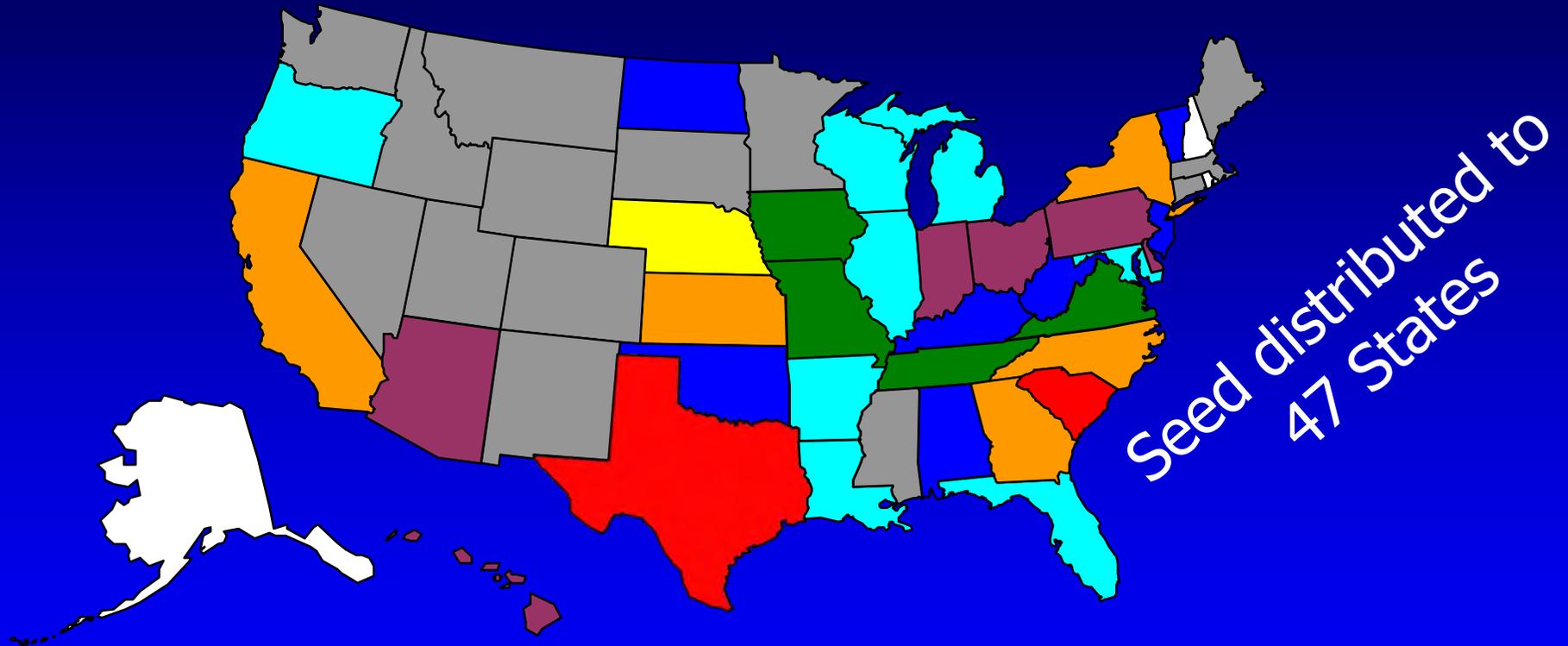
# Distributions



Foreign S-009 Domestic

\* As of June 15, 2015

# Domestic Distributions in CY2014



Total number of accessions by state



# Distributions outside of 50 U.S. states in CY2014

<b>Argentina</b>	<b>China</b>	<b>Greece</b>	<b>Netherlands</b>	<b>South Korea</b>
<b>Australia</b>	<b>Columbia</b>	<b>Hungary</b>	<b>New Zealand</b>	<b>Spain</b>
<b>Belarus</b>	<b>Czech Republic</b>	<b>India</b>	<b>Pakistan</b>	<b>Switzerland</b>
<b>Bhutan</b>	<b>Denmark</b>	<b>Ireland</b>	<b>Philippines</b>	<b>Taiwan</b>
<b>Bolivia</b>	<b>Egypt</b>	<b>Israel</b>	<b>Poland</b>	<b>Thailand</b>
<b>Brazil</b>	<b>Ethiopia</b>	<b>Italy</b>	<b>Portugal</b>	<b>Turkey</b>
<b>Bulgaria</b>	<b>France</b>	<b>Japan</b>	<b>Puerto Rico</b>	<b>United Arab Emirates</b>
<b>Canada</b>	<b>Germany</b>	<b>Mexico</b>	<b>South Africa</b>	<b>United Kingdom</b>

# 2014 Seed & Plant Distributions

## Plant Genetic Resources Conservation Unit, Griffin, GA

21st Century Parks, 858 S. Delnorte, Academia Sinica, Academy for Learning, Academy of Sciences of the Czech Republic (ASCR), Advanced Plant Technology, Advanta US, Inc., Aegean Agricultural Research Institute, Ag Biotech, Inc., Agape Acres at Alpine, Agloe, Agracast, Inc., AgResearch, Grasslands Research Centre, Agricultural Research Organization, The Volcani Center, Agricultural University of Athens, Agriculture and Agri-Food Canada, Agriculture Research Center, Giza, Egypt, Akdeniz University, Alabama A&M University, Alberta Agriculture Food and Rural Development, American Takii, Inc., Andrich Homeschool and Apiary, Angela Hill Photography, Appalachian State University, Arkansas Good Start, Armadillo Seed Company, Arrowhead Aquaponic Community, Assiniboine Community College, Association Aveyronnaise de Permaculture, Athens-Clarke County Landfill, Awbery Arboretum Community Garden, Back Yard Growers For Better Health, Bacon Brothers Food Group, Bakersfield College, Ball Horticulture Company, Bangor University, Barenbrug USA, Inc., BASF Plant Science, LLC, Bee Apiary, Beijing Vegetable Research Center, Bejo Zaden BV, Belarusian State University, Betaseed Inc., BHN Research, Bigelow, Bio-Tech Research Center, SAAS, Birmingham Botanical Gardens, BITS Pilani, Blessed Sariah Ministries, Blue Grass Pepper Growers, Blue Moon Farms, LLC, Blueridge Community College, BM Farm, BMC Durfee High School, Bonham Elementary School, Bowdoin College, Brandywine Seed Farms, LLC, Bridgestone Americas, Inc, Browning Seed Inc., Bugs McHan Pest & Termite, BUHS Vocational Ag, BVC, C.R. Seeds, Caddo Federation of Teachers, Cahaba River HomeSchool, California Native Plant Society, Calvin Horticulture Club, Carnegie Institution for Science at Stanford, Carroll County Health, CDFA, Centro de Tecnologia Canavieira, Ceres, Inc., Cherry Creek High School, Cherry Creek School, Chester County PA Small Farm/Homeschool, Children's Education, China Agricultural University, Chromatin, Inc., Chung-Ang University, Clause Vegetables, Clemson University, CMWV, CNR-IBBR, Coffey Forage Seeds, Inc., Cold Spring Harbor Laboratory, Colorado Plateau Horticulture, Comal & Guadalupe County 4H & Master Gardeners, Commack High School, Common Harvest, Cornell Cooperative Extension, Suffolk County, Cornell University, Creek Side Farms, Crop Research Institute, Prague, Custom Gardens Certified Organic Farm, Danziger Farm, Darkhorse Breeding Systems, Dawley Farms, Dayton Community Masjid, Delaware State University, Dentre of Agricultural Biochemistry and Biotechnology, Department of Agriculture, Food & the Marine, Backweston Laboratory Campus, Clebridge Deruiter Research Espana SL, Desert Research Institute, Deutsche Saatveredelung AG, Dickinson State University, Doc's Organics, Donald Danforth Plant Science Center, Dongbu Farm Hannong Co., Ltd., Dow AgroSciences, DP Seeds, LLC, Drew High School, DTL Farms, DTL Herbs LTD, Duke University, DuPont AgBiotech, DuPont-Pioneer, East Central Alabama Master Gardeners, Eastern Mediterranean Agricultural Research Institute, Eastfield College, East-West Seed Company, Inc., East-West Seed International Ltd., Eckerd College, Eco Sol, Edible Acres, Environmental Technical Services, Enza Zaden Research USA, Inc., Equinom, Essex Place Community Sustainability, ETH Zurich, Everything Precious, LLC, Experimental Farm Network, Fayoum University, FFR Cooperative, Five Oaks Ranch, Flannery Farms, Forschungszentrum Julich, Fort Smith Schools, Frito Lay, Fudan University, Future Farmers Association, Future Life Foundation Fund, G and S Crop Services, LLC, G4 Concepts, Gadbury Seed Farm, Gammay Whammy's Garden, Garden Hoard, Garden of Eden Health, Gautier Semences Company, Genetic Engineering and Biotechnology Research Institute, George Mason University, Georgia Department of Juvenile Justice, GIRL SCOUT TROOP 309, Boise, Idaho, Glory ETP, GNIS, Golden Gardening, Goose Creek High School, Grand Valley State University, Grassland Oregon, Inc., Gray Research Production, Greenwell Plant Farm, LLC, G's Daycare, Hainan Academy of Agricultural Sciences, Happy Endings, Harker Heights High School International Studies Club, Hartford Communities That Care (HCTC), HEART Missionary Training Institute, Heartland Plant Innovations, Heavenly Acre Farm, Hedgewood Hall Farm, Helix Sementes Ltda, Hiroshima University, Historic Westside Village Gardening Association, HM Clause Seed Company, Home School, Horticultural Research Institute, Egypt, Houston Plant Exchange, Huailhua University, Humble Urban Garden Association, Ibaraki University, INIAV, Institute for Plant Genetic Resources, Bulgaria, Institute for Plant Genetics and Crop Plant Improvement, German Institute for Sustainable and Renewable Resources, Virginia, Institute of Archaeology, United Kingdom, Institute of Biodiversity Conservation, Ethiopia, Institute of Biotechnology and Genetic engineering (IBGE), Pakistan Instituto de Agricultura Sostenible - CSIC, Instituto Murciano de Investigacion Agrario y Alimentario, Instituto Murciano de Investigacion y Desarrollo Agrario, IntellActual, International Center for Tropical Agriculture, Cali, Colombia, Invincible Summer Farms, Iowa State University, Ivory Pines Farm, Izmir Institute of Technology, J. Sargeant Reynolds Community College, Japan Grassland, Agriculture, and Forage Seed Association, Jardin Botanique Henri Gaussen, Jasper County Tioch Community Center, Jefferson County Master Gardeners, Johnny's Selected Seeds, Jouffray-Drillaud SA, Kafr El-Sheikh University, Kampong Publications, Kaneko Seeds Company, Ltd., Kansas State University, Karadeniz Tarimsal Arastirma Enstitusu Mudurlugu, Kasetsart University, Kentucky State University, Kinkead Private School, Kirkwood Community College, Knownyou Seed Company, Knox County Health Department, Kolb Homestead LLC, Kopious Designs, Kumamoto Prefectural Agricultural Research Center, Kyung Hee University, Kyushu University, Lahore College for Women University, Lake Speed Racing, Lakelands Master Gardeners - Clemson Extension, Lanherne Farm, Last Exit/Cuddle Coop Farms, Laurel County Kentucky United, Little Environments PLLC, Longwood CSD, Longwood High, Louisiana State University, Loyola University Chicago, MadKat Farms LLC., Mae Valley 4H Club, M-AGRO, Mandolin Creek Farm, Massachusetts Institute of Technology, McGuffins Farms, Meade Farm, Miami University, Michigan State University, Midwest College of Oriental Medicine, Ministry of Agriculture, Giza, Egypt, Minnesota Native Plant Society, Mississippi State University, Missouri State University, Missouri University, Misty Mountain Farms, MMR Genetics, Monsanto Company, Monsanto Vegetable Seeds, Montpellier University, Mount Pleasant Park & Garden, Murdock Farms, Mustafa Kemal University, Nagoya University, Namdhari Siam Seeds Co. Ltd., Namik Kemal University, Nanjing Agricultural University, Narrows High School, National Academy of Agricultural Science, Suwon, South Korea National Agricultural Research and Innovation Centre, Hungarian National Biodiversity Centre, Bhutan, National Bureau of Plant Genetic Resources, New Delhi, National Institute of Crop Science, South Korea, National Seed Herbarium, Saskatoon, Canada, Neoga School, New England Wildflower Society, New Hope Seed Company, New Mexico State University, NewColor Permaculture, Nexsteppe Inc., Nichi Mama Farms, Nidera, NKCDC, North Carolina State University, North Dakota State University, Northern Plains Sustainable Agriculture Society, Nunhems Spain S.A., Nunhems USA, Inc., Ocala Health and Rehabilitation Center, Ohio State University Extension, Oklahoma State University, Old Taylorsville Apiary, Ompompanoosuc Crop Research Collective, Ondokuz Mayis University, One Wish, Oregon State University, Oregon Seeds, Inc., Organic Farm Grow, OST, Pakistan Agricultural Research Council, Pan American Seed Co., Partner Seed, Pellissippi State Community College, Pembroke Mother Plant Project, Pennsylvania State University, Pickett Produce, Plants for Life, Polish Academy of Sciences, PPPA/NWUSPIP, Prairie View A&M University, Private Beekeeper and Blogger, Purdue University, Quail Springs Permaculture, Quaking Bog Botanicals, Radicle Seeds Pty Ltd., Radix Research, Inc., Ramiro Arnedo S.A., Regrow America, Rendeavou, Resteration Operation, R-Farm, Richardson Seeds, Ltd., Rijk Zwaan Breeding B.V., Rock Canyon High School, Rockwood Garden & Research Club, Rockwood School, Rogers County 4H, Roosevelt Elementary School, Rowland Homeschool, Ruby's Green, Rutgers New Jersey Agricultural Experiment Station, S. A. Carneau, Sahib Aquaponics, Saint Joseph Garden Club, Sakata Seed America, Inc., Samsung Seeds Company, Scafati and Company, Scott Seed Company, Seeds of Recovery, Sejong University, Selcuk University, Selected Plants, Selfridge Research Group, SEM West S.R.L., Shanghai Academy of Agricultural Sciences, Shanghai Institute of Plant Physiology and Ecology, Shanxi Agriculture University, Shofine Seed Company, Siess Family Foundation -- Conservation Initiative, Silver Lake Intermediate School, Smallin Civil War Cave, Smithsonian Institution, Smithsonian National Museum of Natural History, Snow Brand Seed Co., Ltd., Society for Integrated Medicine and Healing Arts, South Carolina Connections Academy, Southern Chickens, Spectrum Scouts, Speed Breeders, Spring Valley Science School, SRJC, St Hugh's College, St. Petersburg Homeschool Coop., Stony Creek Colors, Stringfellow Bio, Suffolk Community College, SUNY - Albany, Sustainable Seed Company, Symbiota, Syngenta, Taichung District Agricultural Research & Extension Station, Tainan District Agriculture Research and Extension Station, Taiwan Agricultural Research Institute, Takii Research Station, Tampa Bay Rare Fruit Council, TasGlobal Seeds, TBG, Tekirdag Bagcilig Arastirma Istasyonu Mudurlugu, Tennessee Seed Research Service, Tennessee State University, Territorial Seed Company, Texas A&M University, Texas A&M University - Dallas, Texas Tech University, The Free Church, The Ohio State University, The Rare Vegetable Seed Consortium, The Sainsbury Laboratory, The Salvation Army, The Scripps Research Institute, The Seed Savers, Thiel College, Tobin Company, Tom Wagner Seeds, Trailblazers 4H, Trans Ponic, Tree of Life Gardens, Triple JJJ, Tropic Ventures Research and Education Foundation, True Risk, Tuskegee University, Unigenia Bioscience SLU, Universidad Rey Juan Carlos, Universidad de Almeria, University College London, University of Agriculture, Pakistan, University of Arizona, University of Arkansas, University of Arkansas-Pine Bluff, University of Bern, University of California, University of California - Los Angeles, University of California, Davis, University Of California, Riverside, University of Central Florida, University of Colorado, University of Copenhagen, University of Delaware, University of Florida, University of Georgia, University of Hawaii, University of Illinois, University of Kansas, University of Kentucky, University of Louisiana at Lafayette, University of Missouri, University of Nebraska, University of North Carolina, University of Oklahoma, University of Ondokuz Mayis, University of Sargodha, University of Sheffield, University of South Carolina, University of Southampton, University of Tennessee, University of Texas at Austin, University of the Philippines - Los Banos, University of Toronto, University of Vermont, University of Warwick, University of Wisconsin, University of Zululand, Urban Gardens For The Future, US Agriseeds, USDA, ARS, Utah State University, Vegetable and Fruit Improvement Center, Vegetable Institution of Hunan Academy, Virginia Polytechnic Institute and State University, Virginia State University, Virginia Tech, W.J. Beal Botanical Garden, Washington State University, Weddington High School, West High School, West Mediterranean Agricultural Research Institute, West Virginia State University, West Virginia University, Wheaton College, Whispering Pines 4H, Willow Tree Farms, Women to Woman W.O.W., Woodyholds, World Heirloom Missionary Research, Wright Junior Senior High School, Yale University, Zalma R5 School

# Equipment purchased

- Heavy duty disc harrow
- Dump trailer
- Ford F150 SuperCab truck
  - Purchased one last year and will purchase 1-2 more this year
  - Replacing trucks from 2001-2002
- Protein/nitrogen analyzer for lab
- Fume hood for Jarret's lab (SEA funded)



# Facility Repair and Maintenance

## Items completed

- New dehumidifier for 4C cold room.
- Refurbished bathroom at Byron.
- New storm windows on old PI building.



## Items underway

- New control panel for -18C freezer.
- New roof for Seed Processing/Seed Cleaning building.
- Replace Wadsworth environmental controls for all bays in main greenhouse complex.
- New moveable storage shelves for -18C freezer (SEA funded).
  - All cold rooms and freezers will now have moveable storage shelves.

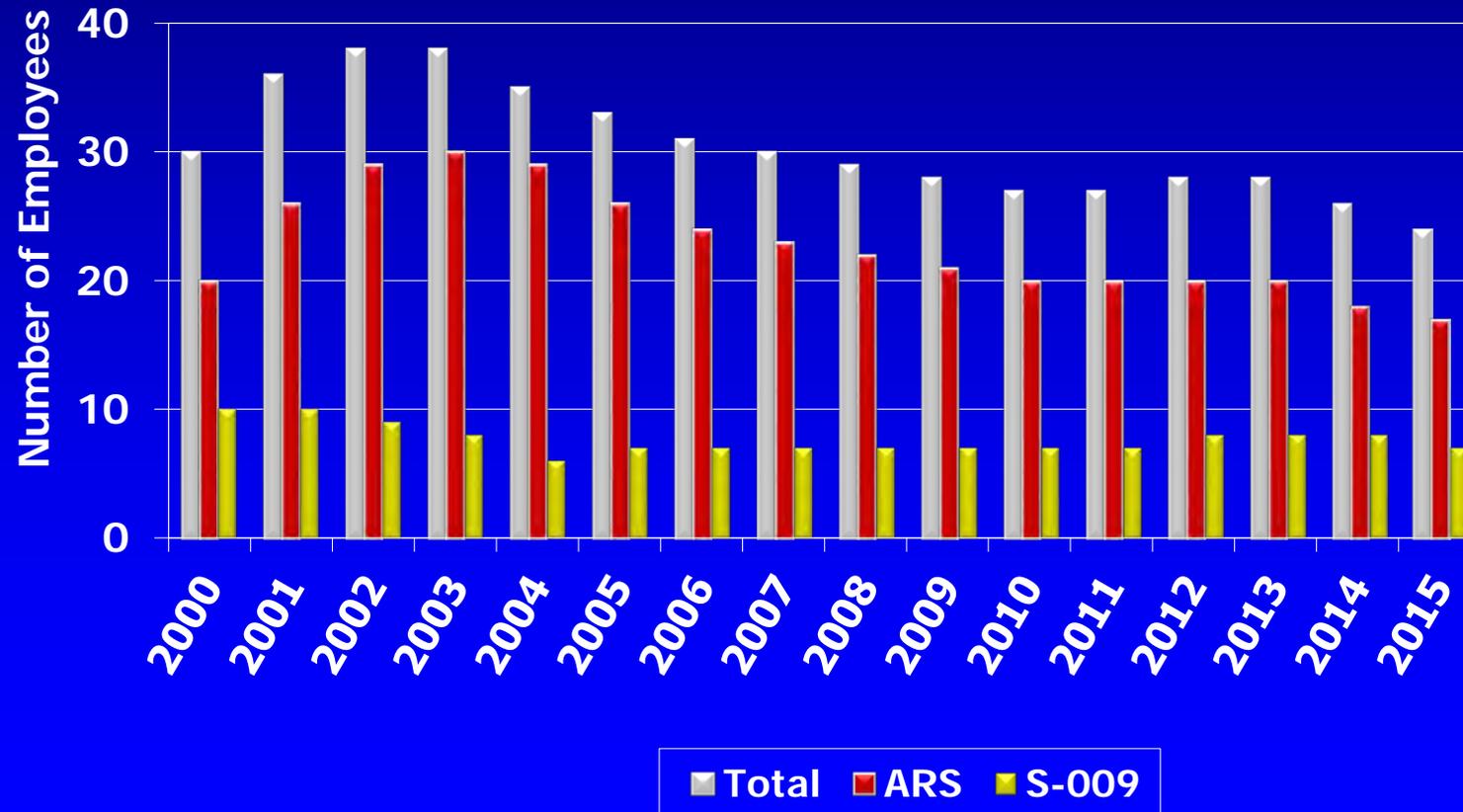


# Total PGRCU Funding

- ARS base funding
  - FY2013 = \$2,140,251 (\$178,689 decrease)
  - FY2014 = \$2,410,251 (\$270,000 increase)
  - FY2015 = \$2,410,251
- S-009 base funding
  - FY2014 = \$431,723 (\$14,000 increase)
  - FY2015 = \$450,625 (\$18,902 increase)
  - FY2016 = \$465,564 (\$14,939 increase)

# Staffing summary

- Current staff is 24 employees (17 ARS and 7 S-009)
  - Federal peanut curator and state farm manager vacant



# Plant Genetic Resources Conservation Unit

17 USDA, ARS  
7 University of Georgia (S-009)



Appendix 2

DR. MELANIE HARRISON

USDA SWITCHGRASS GERMPLASM COLLECTION UPDATE

# USDA Switchgrass Germplasm Collection Update

Melanie Harrison  
Warm-season Grass Curator

S-009 Multistate Research Project Annual Meeting

Knoxville, TN

July 21, 2015

# Switchgrass, *Panicum virgatum*

- Native of the tall grass prairie
- Perennial C4 grass
- Grows 1-3m tall with roots up to 3m deep
- Large, diffuse panicles
- Upland and lowland ecotypes
  - Upland
    - Tetra and Octoploid
    - Finer stemmed
    - Occur on upland, drier sites
  - Lowland
    - Tetraploids
    - Larger stemmed
    - Occur on lowland, wet sites



# Uses of Switchgrass

- Initially developed as a forage
- Used extensively in the Conservation Reserve Program (CRP)
- Excellent riparian buffer
- Provides habitat for wildlife
- Biomass crop
- Biofuel candidate species



Photo: B. Wolfgang Hoffmann

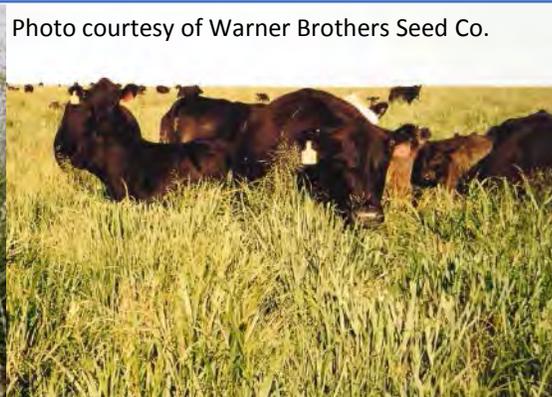


Photo courtesy of Warner Brothers Seed Co.



Photo courtesy of Ernst Seeds



Photo courtesy of Ernst Seeds

# Switchgrass Collection - 2003

- 170 Accessions (124 from S. Dakota)
- Low genetic diversity
- Average distribution of 25 accessions per year (based on 1994-2003)

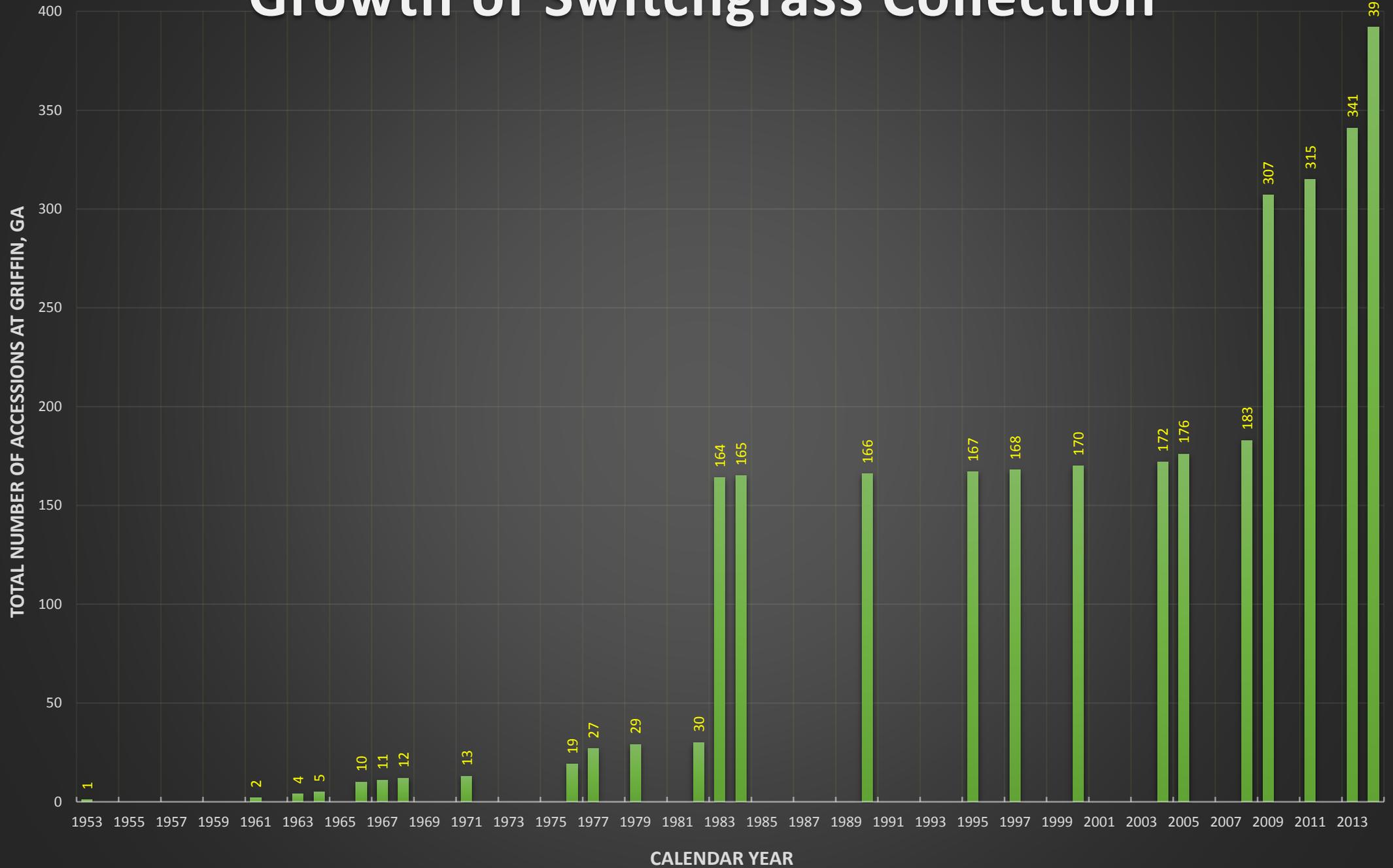
# Expansion of Collection - 2008

- Paul Salon, NRCS New York Plant Material Center
  - 84 accessions donated in 2009
  - Mainly collected in New York and Pennsylvania
- USDA, Plant Exchange Office (PEO) Collection Trips (2008-2014)
  - 135 accessions collected
  - Covered nine states

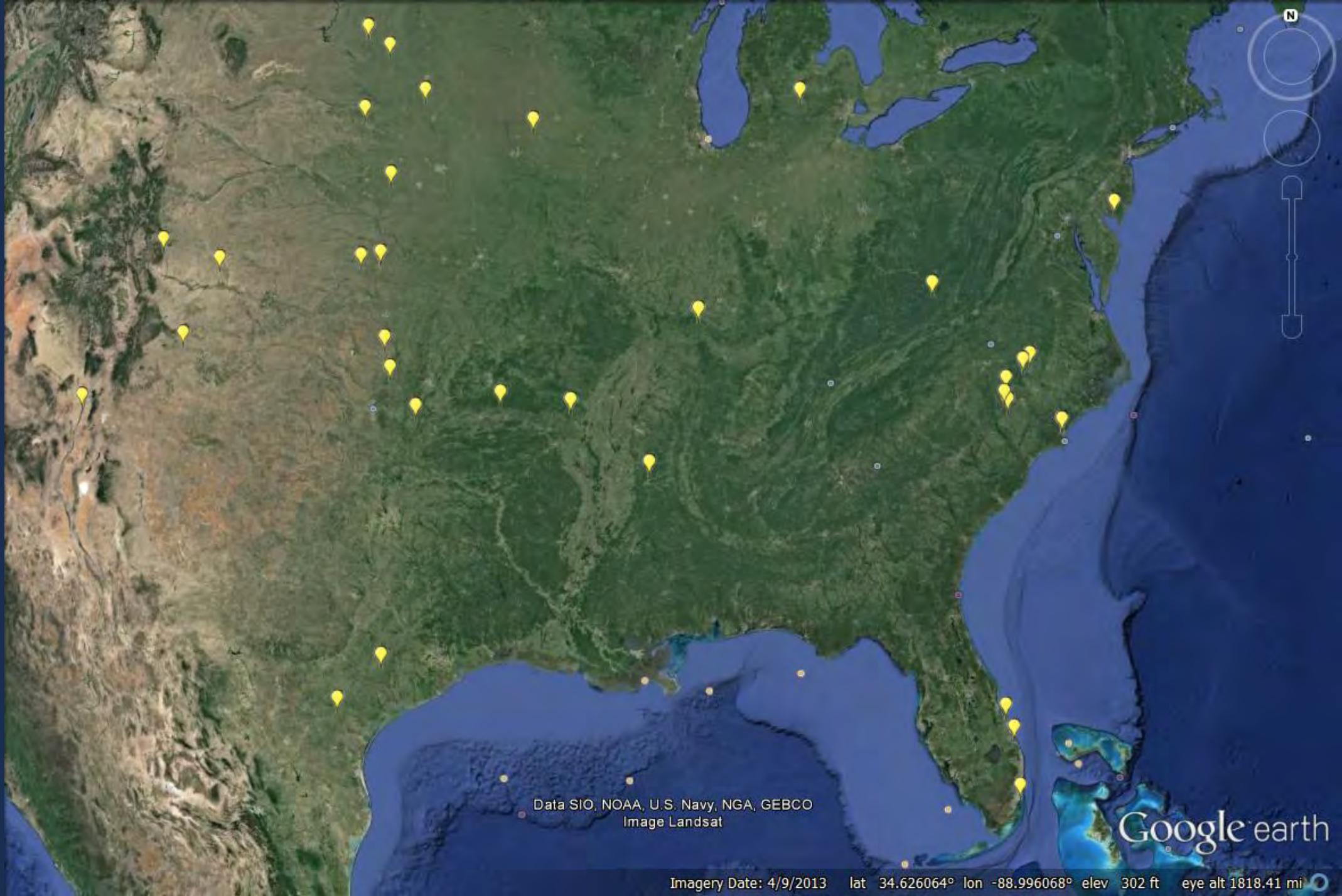
# PEO Funded Collection Trips

<b>Year</b>	<b>Collection Area</b>	<b>Collectors</b>	<b># Sites</b>
2008	Southern Florida	M. Harrison, M. Williams	12
2009	North\Central Florida	M. Harrison, G. Pederson, M. Gonter	46
2012	Georgia, S. Carolina, N. Carolina	M. Harrison, G. Pederson	27
2013	Alabama, Mississippi, Louisiana, Texas, Arkansas	M. Harrison, G. Pederson, M. Casler	47
2014	Alabama, Florida (Recollects)	M. Harrison, G. Pederson	3
2015	New England Area (September 2015)	M. Harrison, G. Pederson, R. Brown	
		<b>Total Sites</b>	<b>135</b>

# Growth of Switchgrass Collection



Switchgrass  
Collection  
Prior to  
2008



Data SIO, NOAA, U.S. Navy, NGA, GEBCO  
Image Landsat

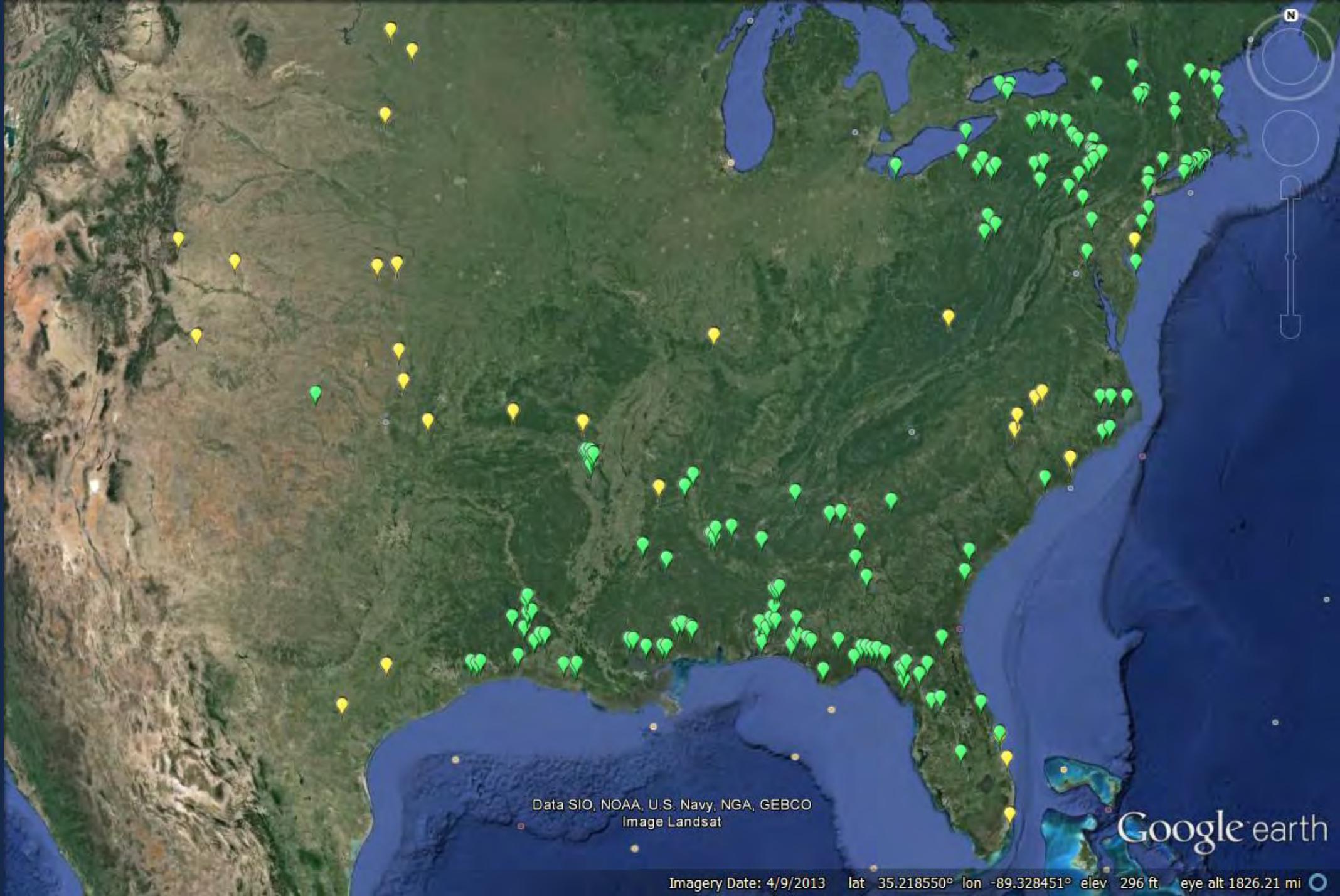
Google earth

Imagery Date: 4/9/2013 lat 34.626064° lon -88.996068° elev 302 ft eye alt 1818.41 mi

# Growth of Collection

 Prior to 2008

 2008 and later



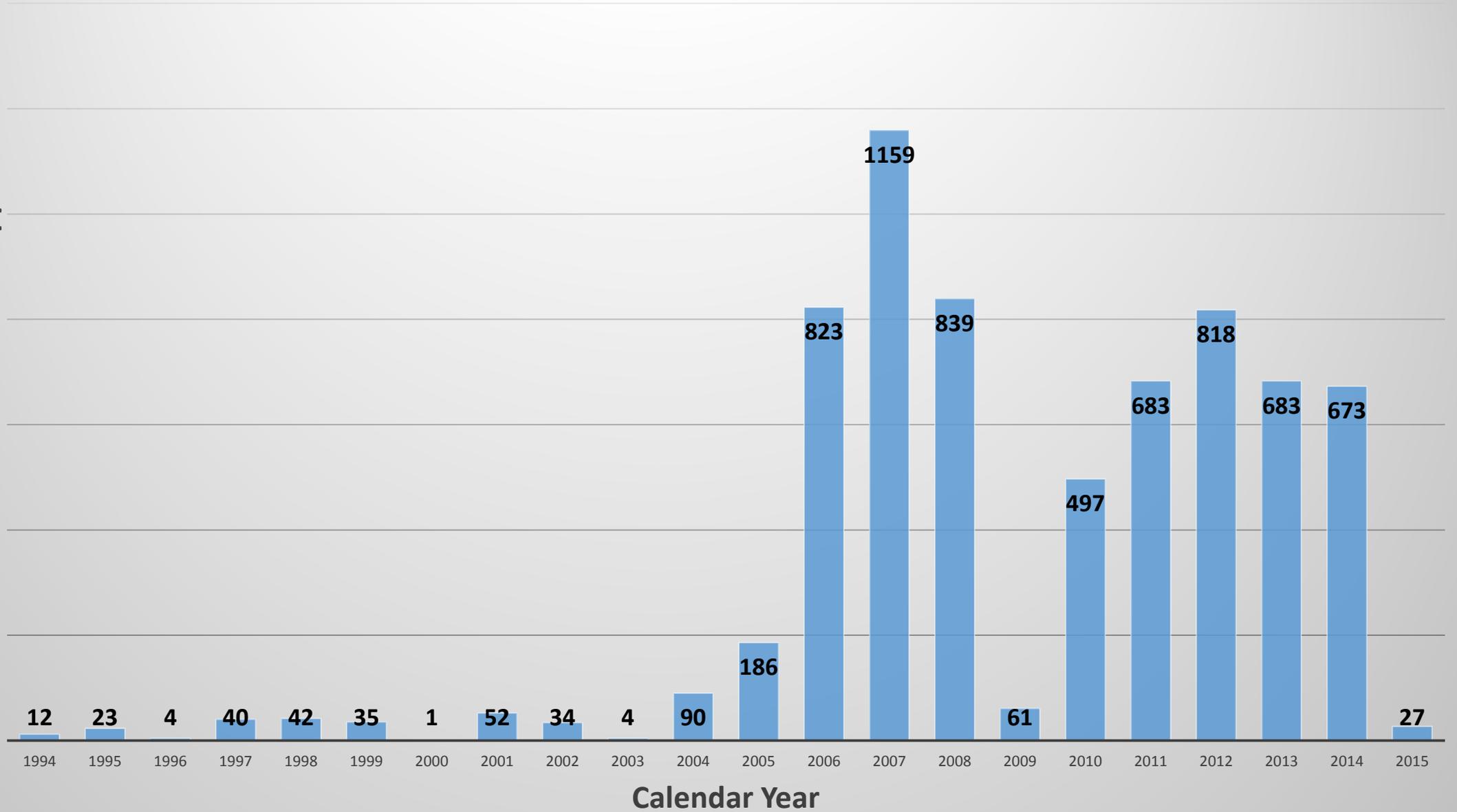
Data SIO, NOAA, U.S. Navy, NGA, GEBCO  
Image Landsat

Google earth

Imagery Date: 4/9/2013 lat 35.218550° lon -89.328451° elev 296 ft eye alt 1826.21 mi

# Switchgrass Distributions

Number of Accessions Shipped



# Priorities for New Material

- Regeneration

- Ernst Seeds, Live Oak, Florida - Calvin Ernst
- USDA-ARS, Madison, Wisconsin - Michael Casler
- USDA-ARS, Byron, GA
- Univ. of Florida, Plant Science Research and Education Unit, Citra, FL

- Characterization

- GPS coordinates estimated for accessions lacking GPS data
- Cytological descriptors
  - **Ploidy Level:** Ploidy level prediction based on estimated nuclear DNA content and/or cytological techniques.
  - **Estimated Nuclear DNA Content:** Nuclear DNA content in picograms/2C estimated by laboratory techniques including flow cytometry.
  - **Chromosome Number:** Number of chromosomes determined by cytological techniques.

# Recent Changes in Collection

- South Dakota and North Dakota material (Arvid Boe) consolidated into two accessions (70SG and 71SG)
- Nulled redundant accessions (e.g. Blackwell). Chose accession with NCBI Nucleotide Link.

# Future Plans

- Collection
  - New England - 2015
  - Northern South Atlantic Area (Maryland, Delaware, N. Carolina) - 2016
- Regeneration
  - New York\Pennsylvania material
  - Southeastern material
  - New England material
- Characterization
  - Cytological data
  - Image data

Little Talbot Island State Park, FL



Cross City, FL



Ponchatoula, LA



Leesville, LA



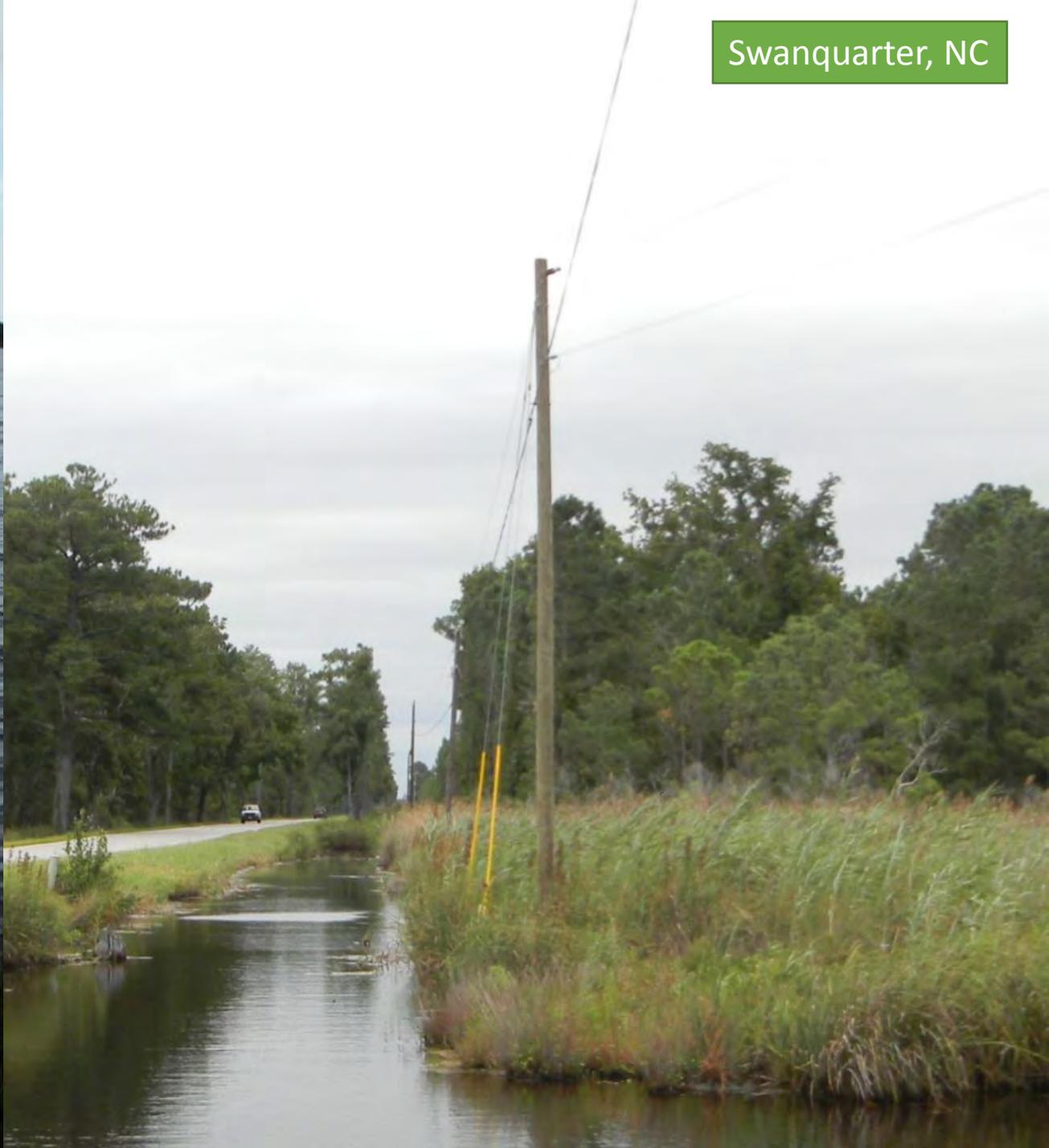
Dade Battlefield State Historic Site, FL



St. George Island State Park, FL



Swanquarter, NC



Questions?

