S-009 Regional Technical Advisory Committee
Minutes of Annual Meeting, August 2-3, 2011

University of Georgia Research and Education Garden Building
Griffin, GA

Members present:
Florida (University of Florida) .....Kevin E. Kenwothy (kkenworthy@ufl.edu)
Georgia (University of Georgia) .....Paul L. Raymer (praymer@griffin.uga.edu)
Guam (University of Guam) .....Mari Marutani (marutani@uguam.uog.edu)
Louisiana (Louisiana State University) .....Don LaBonte (dlabonte@agctr.lsu.edu)
North Carolina (North Carolina State Univ) .....Tom Stalker (tom_stalker@ncsu.edu)
South Carolina (Clemson University) .....Emerson R. Shipe (eshipe@clemson.edu)
Tennessee (University of Tennessee) .....Fred Allen (allenf@utk.edu)
Virgin Islands (Univ. of the Virgin Islands) .....Thomas W. Zimmerman (tzimmer@uvi.edu)
Southern Assoc. Agric. Exp. Sta. Directors.....Gerald Arkin (garkin@uga.edu)

USDA, ARS, PGRCU representatives present:
USDA-ARS-PGRCU, Griffin, GA .....Gary A. Pederson (gary.pederson@ars.usda.gov)
USDA-ARS-PGRCU, Griffin, GA .....Noelle Barkley (elle.barkley@ars.usda.gov)
USDA-ARS-PGRCU, Griffin, GA .....Melanie Harrison-Dunn (melanie.harrisondunn@ars.usda.gov)
USDA-ARS-PGRCU, Griffin, GA .....Roy N. Pittman (roy.pittman@ars.usda.gov)
USDA-ARS-PGRCU, Griffin, GA .....Robert Jarret (bob.jarret@ars.usda.gov)
USDA-ARS-PGRCU, Griffin, GA .....John B. Morris (brad.morris@ars.usda.gov)
USDA-ARS-PGRCU, Griffin, GA .....Ming Li Wang (mingli.wang@ars.usda.gov)
USDA-ARS-PGRCU, Griffin, GA .....Lee Ann Chalkley (leeann.chalkley@ars.usda.gov)
USDA-ARS-PGRCU, Griffin, GA .....Merrelyn Spinks (merrelyn.spinks@ars.usda.gov)
USDA-ARS-PGRCU, Griffin, GA .....Phiffie Vankus (phiffie.vankus@ars.usda.gov)
USDA-ARS-PGRCU, Griffin, GA .....Libbie Hudson (libbie.hudson@ars.usda.gov)
USDA-ARS-PGRCU, Griffin, GA .....Kami Lindberg (kami.lindberg@ars.usda.gov)

Others present:
USDA-ARS, SAA, Athens, GA .....Deborah Brennan (deborah.brennan@ars.usda.gov)

The meeting was called to order by Paul Raymer (Chair) at 1:07 pm on August 2, 2011 on the University of Georgia, Griffin, GA campus at the University of Georgia Research and Education Garden building. Paul welcomed attendees and introductions were done around the room. Kevin Kenworthy, Secretary, took the minutes.

Dr. Gerald Arkin, the administrative advisor for the S-009 RTAC and Associate Dean of the UGA Griffin Campus, welcomed the group to the Griffin Campus. He was excited to have the group back on campus and stated that he remains committed to the program as it relates to the plant industry, the conservation of germplasm and making germplasm publically available. He stated that progress has been made in the Griffin program and that the quality of the preserved material has improved. In particular, he noted that the collection is in great shape despite the current uncertainties surrounding their budget. He shared some comments from the National Plant Germplasm Coordinating Committee which had raised the question, "Should NPGS charge for requested material?" It was deemed that this

was impractical and that the germplasm system would be worse off if charges were imposed. He further commented that both the UGA Deans and the southern directors appreciate the program.

Paul Raymer asked for a motion to approve the 2010 minutes which was made and seconded. The motion was approved. He also asked for any additions to the agenda. There was a request to have comments from the Unit's molecular geneticist and pathologist to relate their activities with use of the germplasm. An update and presentation on the webpage was also requested. These items were added to the end of the agenda. Fred Allen and Tom Zimmerman were appointed to nominate a secretary and location for next year.

Gary Pederson provided a report on the National Program staff and noted some changes in personnel. He discussed website development and that a new version of GRIN is in the works.

Gary gave a presentation (Appendix 1) that provided a summary of PGRCU for the year and the current status of collections, the size of collections, the number of available accessions and the number of backed up accessions. He noted that all numbers continue to increase and that germination testing has increased in the last year for sorghum, cowpea, peanuts, grasses and that 77% of the overall collection has been tested for germination. An update of storage capabilities was provided and he noted that current -18 C storage is full. The distribution of accessions went to 49 states (none to Alaska) and 47 other countries (and U.S. territories). A comment was made that U.S. territories should be included with the states. Gary states that these figures are provided by GRIN and that including territories with the states would require a change in GRIN. Gary concluded the PGRCU report with an update on funding, staff numbers (soon to advertise a peanut S-009 technician position), curator changes and building construction.

A written regeneration plan was provided for all in attendance and each curator made a presentation on status of their collection, regeneration and characterization in 2011, and regeneration of the entire collection. Reports were given by Gary Pederson (Appendix 2) on the clover and sorghum collections, Brad Morris (Appendix 3) on the miscellaneous legumes collection, Bob Jarret (Appendix 4) on the vegetable crops collection, Roy Pittman (Appendix 5) on the Vigna collection, Melanie Harrison-Dunn (Appendix 6) on the warm season grass collection, and Noelle Barkley (Appendix 7) on the peanut collection.

Ming Li Wang provided a verbal report on his activities investigating chemical characterization of germplasm with different curators. David Pinnow provided a verbal report on virology activities and noted the recent completion of a 20 year project to screen for viruses in the sweet potato collection. At 5:00pm the meeting was adjourned until 8:00am August 3rd.

August 3, 2011

The meeting re-convened at 8:00am at the University of Georgia Research and Education Garden building, Griffin, GA and departed for a tour of PGRCU facilities. We were able to see field facilities, a new equipment storage pole barn, many of the collections, tour the cold storage facilities and see the construction progress on a new 4 C storage unit that will enable a previous 4 C storage facility to be changed to -18 C storage. At 10:00am, the committee returned to the University of Georgia Research and Education Garden building, Griffin, GA.

State reports were presented by Tom Zimmerman (University of Virgin Islands), Emerson Shipe (South Carolina), Kevin Kenworthy (Florida), Fred Allen (Tennessee), Tom Stalker (North Carolina), Mari

Marutani (Guam), Don LaBonte (Louisiana), and Paul Raymer (Georgia). Written reports were distributed for Alabama, Hawaii, Kentucky, Oklahoma, Texas, and Virginia.

The 2012 S-009 meeting will be held in Griffin, GA. The dates of August 1-2 or 8-9, 2012 were discussed and the dates were tentatively set for July 31 – August 1, 2012 starting at 1:00 pm on July 31st. The incoming S-009 Chair will be Kevin Kenworthy. Mari Marutani was nominated to be the incoming S-009 secretary. There were no other nominations and Mari was elected.

Tom Stalker thanked the staff for presentations and for showing the plans for regeneration. He recommended that the group report back to their respective Deans and Directors to enforce the importance of the National Plant Germplasm System.

Paul Raymer thanked everyone for their participation. Tom Stalker motioned to adjourn the meeting and Fred Allen seconded the motion. The meeting was adjourned at 11:25am.

Kevin Kenworthy
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

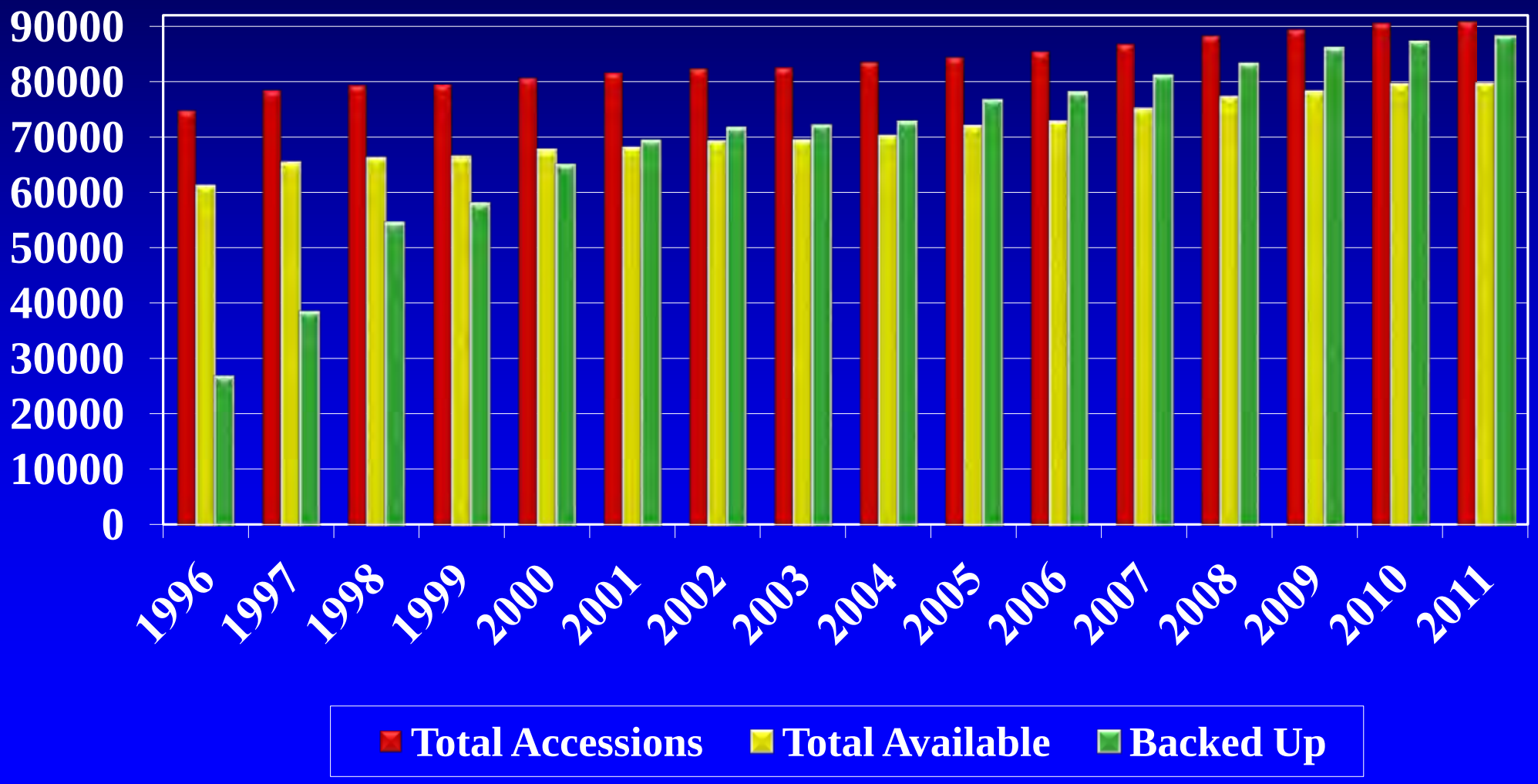
Griffin, GA

PGRCU Collection - June 2011

- Total Accessions
  - 90,942
- Total Available
  - 79,792 (87.7%)
- Backed Up
  - 88,319 (97.1%)

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

PGRCU Collection 1996 - 2011



Digital photos

Crop	Images
Sorghum	8,867
Cowpea	2,047
Watermelon	1,812
Pepper	1,806
Grasses	549
Peanuts	549
Pearl millet	445
Cucurbits	303
Other crops	447
Total (+2,110)	**16,825 (18.5%)**

Germination Testing

(Accessions with seed only, tested since 2002)

Crop	Accessions	%	Crop	Accessions	%
Sorghum	30,214	80.4	Clover	1,908	86.1
Cowpea	6,804	84.6	Okra	1,756	59.1
Peanuts	6,128	65.8	Watermelon	1,746	91.8
Peppers	4,659	99.0	Pearl millet	1,297	98.3
Mung bean	3,899	92.8	Sesame	1,211	99.6
Grasses	3,563	48.4	Eggplant	937	92.0
Legumes	2,361	76.6	Cucurbits	681	48.0
			TOTAL	**69,556**	**77.7**

Accessions in -18 C storage

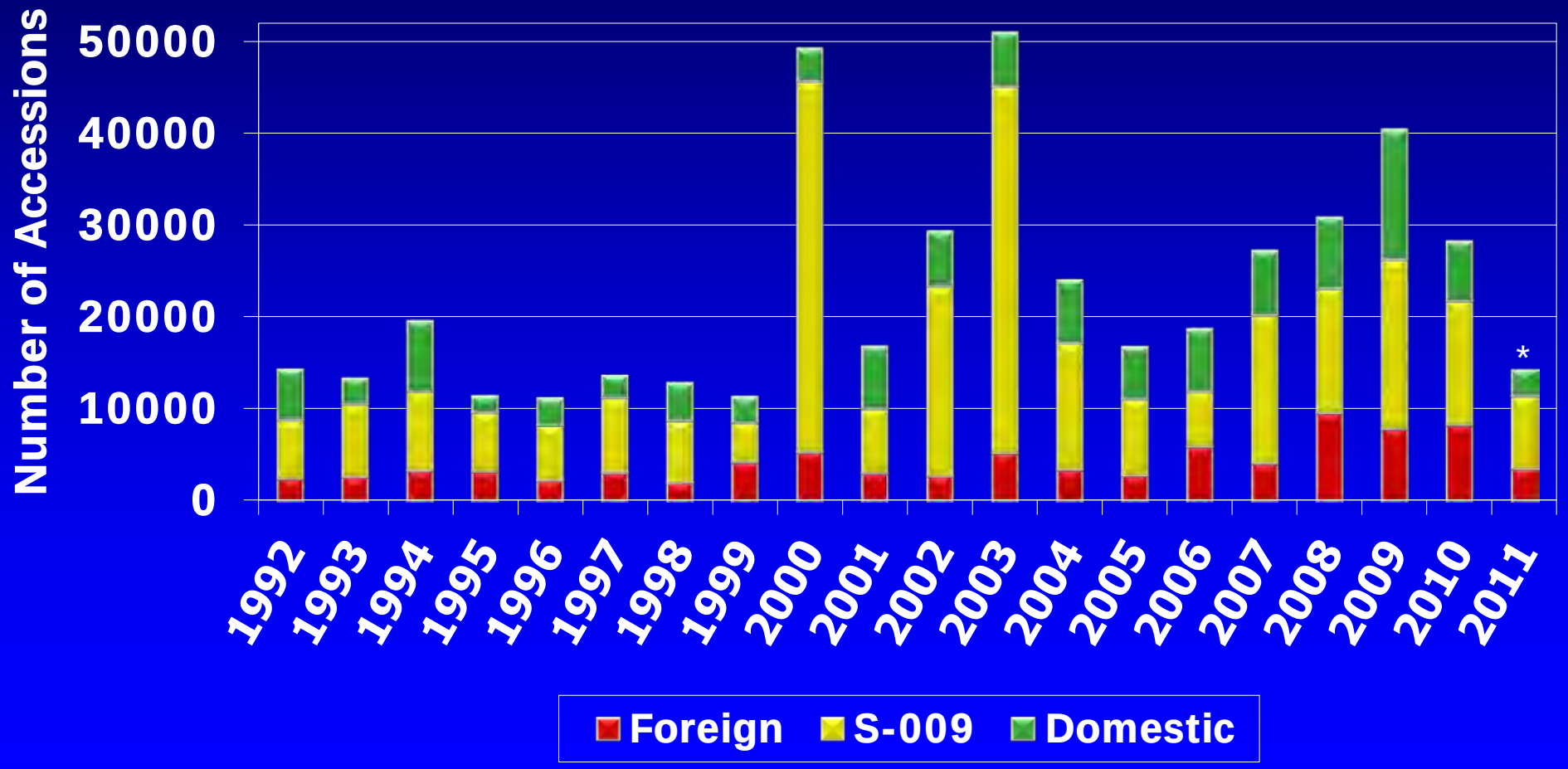
(Accessions with seeds only, seed splitting initiated in 2001)

Crop	Accessions	%	Crop	Accessions	%
Sorghum	27,204	72.4	Watermelon	1,899	99.8
Grasses	6,867	93.3	Cucurbits	1,413	99.6
Peanuts	6,208	66.7	Sesame	1,216	100.0
Peppers	4,696	99.9	Eggplant	1,016	99.8
Mung bean	4,045	96.2	Cowpea	838	10.4
Legumes	3,079	99.9	Gourds	486	99.4
Okra	2,971	100.0	Ipomoea spp.	456	99.1
Clover	2,195	99.1	**TOTAL**	**66,995**	**74.8**

Distributions in CY2010

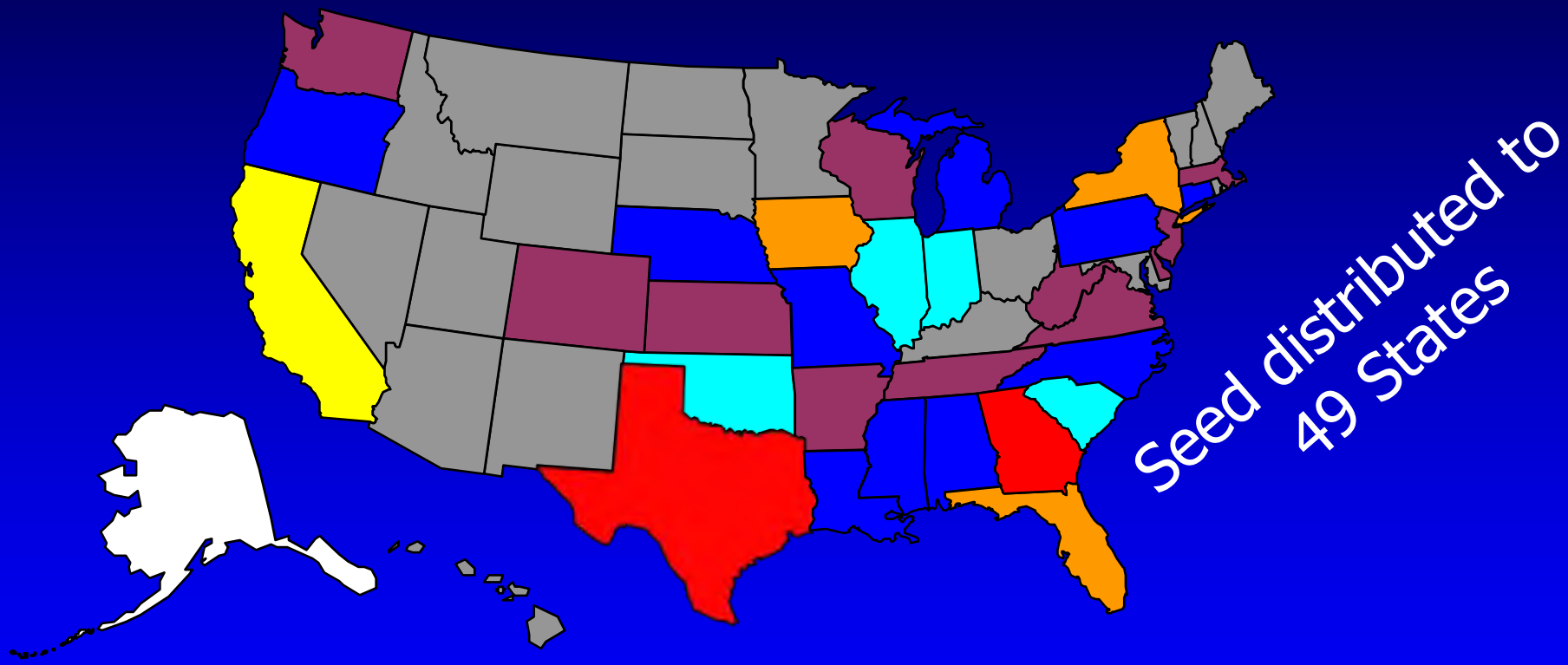
- Domestic = 19,989 items in 710 orders
  - S-9 region = 13,477 items
- Foreign = 8,319 items in 215 orders
- Total CY2010 distributions = 28,308 items

Distributions



* As of June 13, 2011

Domestic Distributions in CY2010



Total number of accessions by state

2,500 to 7,500	500 to 749	50 to 99
1,000 to 2,499	250 to 499	1 to 49
750 to 999	100 to 249	0

Distributions outside of 50 U.S. states in CY2010

Argentina	Finland	Italy	Romania	Taiwan
Australia	France	Japan	Russian Fed	Tanzania
Belgium	Germany	Kenya	Senegal	Thailand
Bolivia	Ghana	Mexico	Serbia	Trinidad and Tobago
Brazil	Guam	Morocco	Singapore	United Kingdom
Canada	Hong Kong	Netherlands	South Africa	U.S. Virgin Islands
China	Hungary	New Zealand	South Korea	
Columbia	India	Pakistan	Spain	
Czech Rep	Ireland	Poland	Sweden	
Egypt	Israel	Puerto Rico	Switzerland	

Total PGRCU Funding

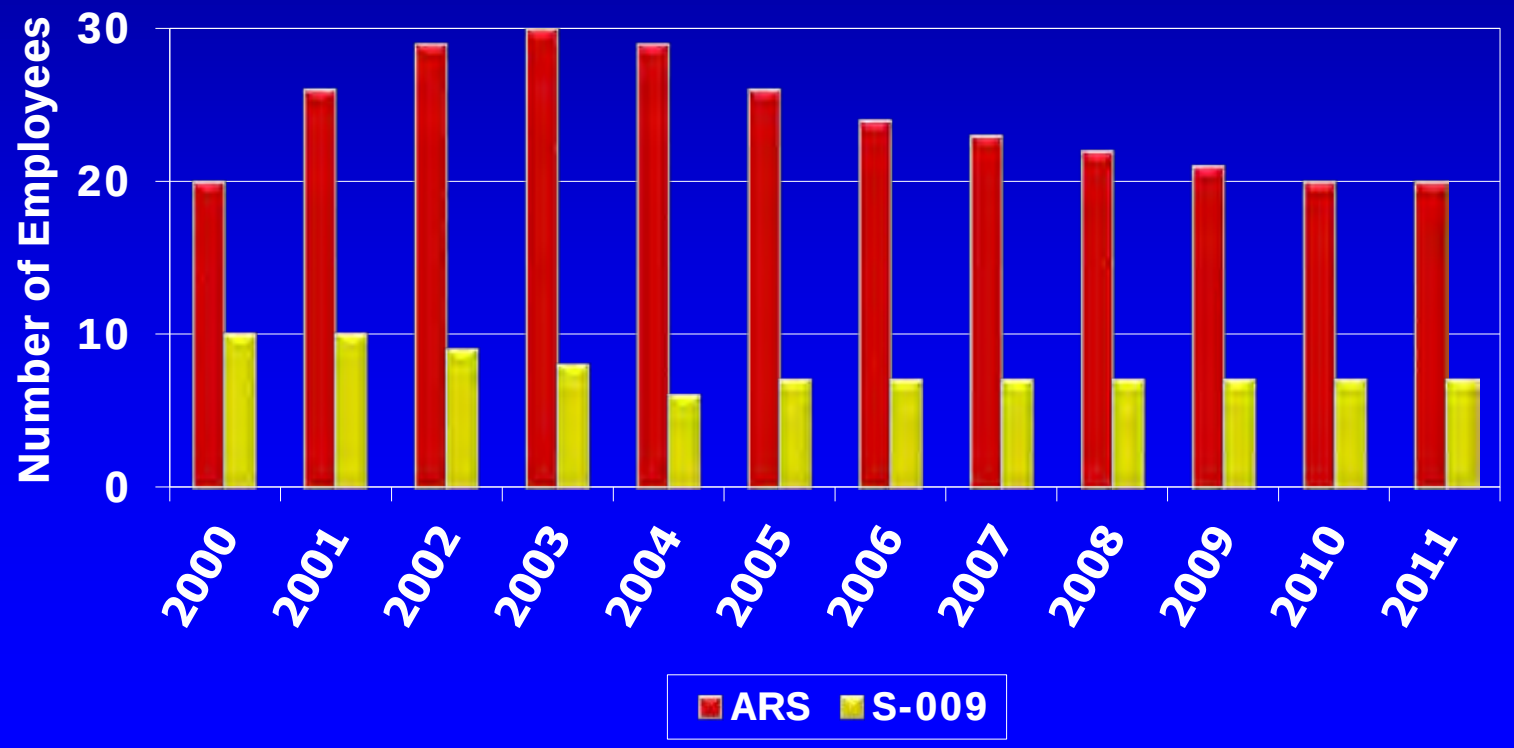
- ARS base funding
  - FY2011 = $2,293,457
- S-009 base funding
  - FY2011 = $417,723

PGRCU Funding

- ARS base funding
  - All base funding reduced 1.3% for FY2011
  - All salaries frozen in FY2011 and FY2012
  - Travel reduced 20% from FY2010 travel amounts
- ARS temporary funding increases
  - FY2010 = $79,685 (building addition to ARS Seed Processing building for 4 C cold room)
  - FY2011 = $86,000 (4 C cold room)

Staffing summary

- Current staff is 27 employees (20 ARS and 7 S-009)
- Sixteen S-009 temporary labor positions



Staffing – ARS curator changes

- Sorghum
  - Gary Pederson serving as acting sorghum curator.
- Peanut
  - Noelle Barkley is the peanut curator.
  - Molecular support scientist position terminated.
- Vigna
  - Roy Pittman is the Vigna curator.
- All curator positions have promotion potential to GS-14. Traditionally, all curator positions have been GS 11/12.

Building Construction

- S-009
  - Pole barn (50 x 50’) – located on Westbrook Farm next to existing S-009 machine shed

- ARS
  - Addition to ARS Seed Processing building
    - Will contain new 4 C cold room (20 x 30’)
    - Existing 4 C cold room in State Seed Storage building will be converted to -18 C
    - Current -18 C seed storage space of 1,061 sq ft will be increased to 1,897 sq ft to house bulk seed of entire Griffin collection in -18 C

2010 Seed and Plant Distributions

Plant Genetic Resources Conservation Unit, Griffin, GA

Abbott & Cobb, ACL Enterprises, Adgentech, Advanced Ordinance Supply, Ag Biotech, AgResearch Consultants, AgriLife Research, Alabama A&M Univ., Alabama Cooperative Extension, Alcorn State Univ., Ames High School, Argo Farms, Arizona Department of Corrections, Auburn Univ., Augutis Property Management, Ball Horticultural Company, BAS Genetics, BASF Plant Science, Bexar County Master Gardeners, BioDiagnostics, Biovision, BJEE, Boyce Thompson Institute, Brookhaven National Laboratory, Brown Mink Gardens, Brown Univ., Brummett Farms, Cache County Master Gardeners, California Institute of Technology, California State Univ., Fresno, Campbell Soup Supply Company, Capsicum Breeding & Preservation Club, CAREnergy, Center for Disease Control and Prevention, Century City Neighborhood Association, Century College, Ceres, Chickadee Nursery, Chromatin, Clemson Univ., Clover Patch, Coffey Forage Seeds, Cold Springs Farm, Colorado State Univ., Connection Church, Cornell Univ., Creative Expression, DAS, Dayton Lab, Donald Danforth Plant Science Center, Dow AgroSciences, DSH Soytek Company/USSEC, Duke Univ., DuPont Experimental Station, East West Seeds International, Eastex Farms, Ecology Action/Golden Rule Garden, Elon Univ., EMD Cropbioscience, Enchanted Forest Tree & Game Farm, Enza Zaden Research USA, Eurofins STA Laboratories, Evolutionary Genomics, F and C Farm, Florida Parishes Pepper Growers, Foothill College, G and S Crop Services, GABO, Garden Monster, Gleckler Seedmen, Global Seed Company, Gold Seed Company, Gordon College, Grassland Oregon, Grasslands, Gray Research Production, Green Clean, Grote Organics, Guilford Elementary Middle School, Handley House, Harvard Univ., HCC, Heligene, Heritage Wheat Conservancy, HF Industries, High Plains Oilseed Development, HM Clause, Independence Acres Market Garden, Indiana Univ., International Sustainable Development Studies Institute, Invincible Summer Farms, Iowa State Univ., IPB, Jacklin Seed by Simplot, Jesse' Garden, Johnny's Selected Seeds, Kampong Publications, Kansas State Univ., Kellogg Biological Station, Kemin Industries, Kentucky State Univ., Louisiana State Univ., May Seed Agro, McElderry Farms, Meskwaki Tribe of Iowa, Michigan State Univ., Midwest Research Institute, Mississippi State Univ., MMR Genetics, Monsanto Company, Montana State Univ., Mother Earth Gardens, Mount Holyoke College, NAVPenn, New Avenue Productions, New Mexico State Univ., New World Crops, NexGen Turf Breeder, North Carolina State Univ., North Dakota State Univ., North Star Farms, Northwest Missouri State Univ., OAKs Foundation, Ohio State Univ., OK Cooperative Grain Company, Oklahoma Association of Extension Ag Agents, One Seed, Oregon State Univ., Overlook Hospital, Parker Organics, Patriot Seed Company, Peace Seeds/Seeds of Change, Peaceful Acres Organics, Pennsylvania State Univ., Pepper Lovers, Perishing High School Agriculture Department, Pioneer Hi-Bred International, Plant Sciences Gardeners of Atlanta, Prairie Heritage Farm, Prairie Road Organic Farm, PSU Cooperative Extension, Ptec Agro, Purdue Univ., Puyallup School District, Q PhytoResearch, Queens College of CUNY, Rahm Farm, Rare Vegetable Seeds Consortium, Regal Peppers, Reimer Seed Company, Rice Univ., Rijk Zwaan Breeding, Ripley High School, Rutgers, Sakata Seed America, Save our World, Seed Savers Exchange, Seminis Vegetable Seeds, Seneca Foods Corporation, Shamrock Seed Company, Shelton Elementary School, Shelton Farms, Smith College, SOGPG, Song Bird Farm, South River Miso Company, Southeastern Louisiana Univ., Special Sprouts, SRC, SSC Self Sustainment Collection, St. Henry's School, St. John Bosco Academy, Sugar Sand Farms, Sustainable Seed Company, Syngenta Seeds, Synthetic Genomics, Taproot Farms, Terrell Seed Company, Texas A&M Univ., Texas A&M Univ.-Corpus Christi, The Agricultural Science Club of Fort Wayne, The Boondockers Farm, The Connecticut Agricultural Experiment Station, The Flying Apple Seed Company, The Samuel Roberts Noble Foundation, The Wellness Farm, Thoughts Organic Garden, Tomato Junction, Triumph Seed, Tuskegee Univ., Union Agricultural Institute, United Genetics, Univ. of Alabama at Birmingham, Univ. of Arkansas, Univ. of California, Univ. of California - Los Angeles, Univ. of California - Merced, Univ. of California - Riverside, Univ. of California - Santa Barbara, Univ. of Chicago, Univ. of Connecticut, Univ. of Delaware, Univ. of Delaware - Botanic Gardens, Univ. of Florida, Univ. of Georgia, Univ. of Hawaii at Manoa, Univ. of Illinois, Univ. of Kentucky, Univ. of Louisiana, Univ. of Minnesota, Univ. of Missouri, Univ. of Missouri - St. Louis, Univ. of Missouri-Columbia, Univ. of Nebraska, Univ. of Nevada, Univ. of South Carolina, Univ. of South Florida, Univ. of Tennessee, Univ. of Texas at Austin, Univ. of the Virgin Islands, Univ. of Vermont, Univ. of Wisconsin, Univ. of Wisconsin - Madison, Urban Farms, USDA, APHIS, USDA, ARS, USDA, NRCS, Ute Indian Museum, Vilmorin, Virginia State Univ., Virginia Tech, W. J. Beal Botanical Garden, Walters Gardens, Inc., Warren's Farm, Washington State Univ., Washington Univ. in St. Louis, Weavers Way Farm Community Programs, Wehah-Lundberg, West Virginia State Univ., Western State College, Whatcom Garden Mentors, Wild Meadows Farm, Windy Corners Farm, Y.G.A.H., Yale Univ., Yazoo City High School, York College, The City Univ. of New York

Appendix 2

DR. GARY PEDERSON

ANNUAL CLOVER AND SORGHUM COLLECTIONS CURRENT STATUS AND REGENERATION PLAN

Annual Clover Collection

Current Status and Regeneration Plan

Gary A. Pederson

Curator

USDA, ARS, Plant Genetic Resources Conservation Unit

Griffin, GA

Acknowledgement

Merrelyn Spinks and Lee Ann Chalkley, PGRCU, compiled and summarized all numbers shown in these presentations.

Status of Annual Clover collection

Crop	Number of Species	Total Number of Accessions	Number of Accessions available	Accessions at NSSL only
Clover (*Trifolium*)	129	2,215	1,820 (82%)	56

Status of Annual Clover collection

Crop	Number of Accessions Backed Up	Number of Accessions in -18 C	Germination tests
Clover (*Trifolium*)	2,198 (99%)	2,195 (99%)	1,908 (86%)

Norman Taylor
University of Kentucky
Clover Collection

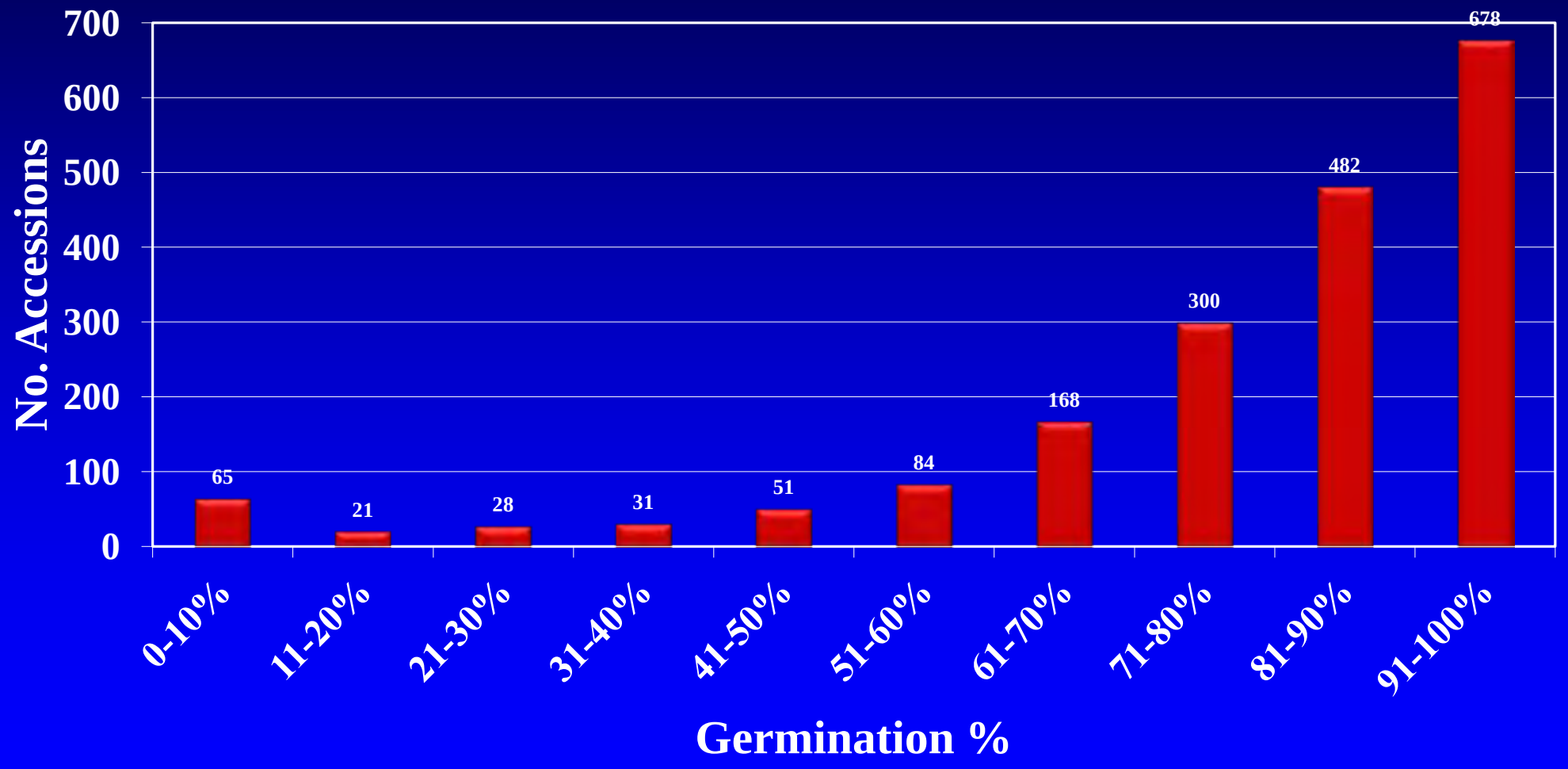
Established as a Special Collection within NPGS in 2011 with annual species at Griffin and perennial species at Pullman.

Clover (*Trifolium*)	Number of *Trifolium* Species	Number of Accessions	Number of Inventories
Annual species	127	675	1,182
Perennial species	75	505	658

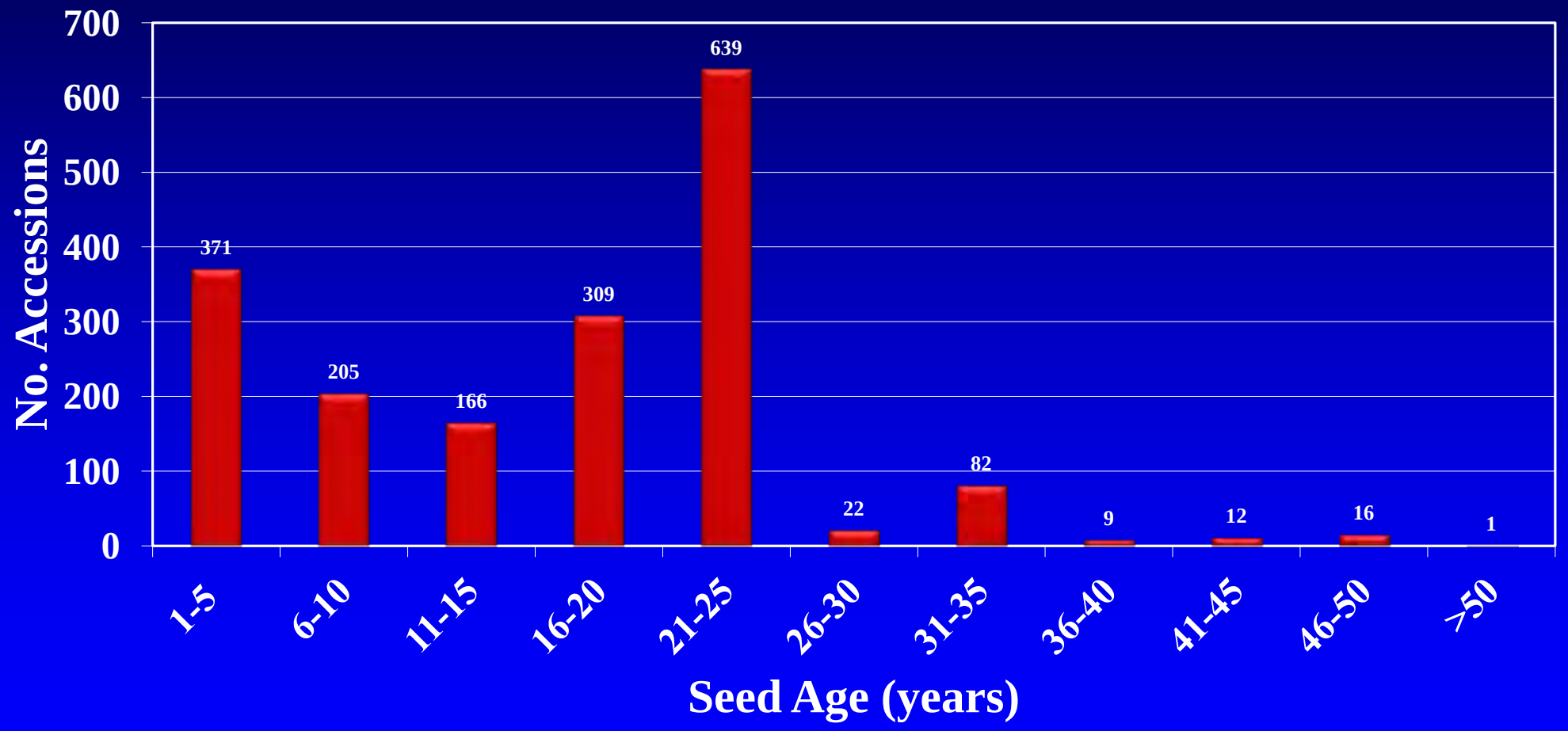
Longevity (P50) of Annual Clovers in -18 C

Trifolium species	P50 (years)
T. alexandrinum	70
T. campestre	633
T. dubium	59
T. hirtum	110
T. incarnatum	59
T. lappaceum	50
T. nigrescens	196
T. purpureum	291
T. resupinatum	199
T. striatum	225
T. subterraneum	73
T. variegatum	146
T. vesiculosum	46

Annual Clover – Viability



Annual Clover – Seed Age



Annual Clover Collection Regeneration

- Most accessions in Annual Clover collection do not need regeneration at this time.
  - Clover seed lasts for decades or centuries in -18 C.
  - Most accessions have been regenerated in last 25 years.
  - Utilization is not greatly depleting the seed supply.

- African short-day species need regeneration.
  - Greenhouse space is limited.

- Taylor special collection requires immediate attention.
  - Many accessions have few seeds.
  - A number of species are either not in the NPGS collection or have few accessions.

Sorghum Collection

Current Status and Regeneration Plan

Gary A. Pederson

Acting Curator

USDA, ARS, Plant Genetic Resources Conservation Unit

Griffin, GA

Status of Sorghum collection

Crop	Number of Species	Total Number of Accessions	Number of Accessions available	Accessions at NSSL only
Sorghum	15	37,541	36,069 (96%)	7,449

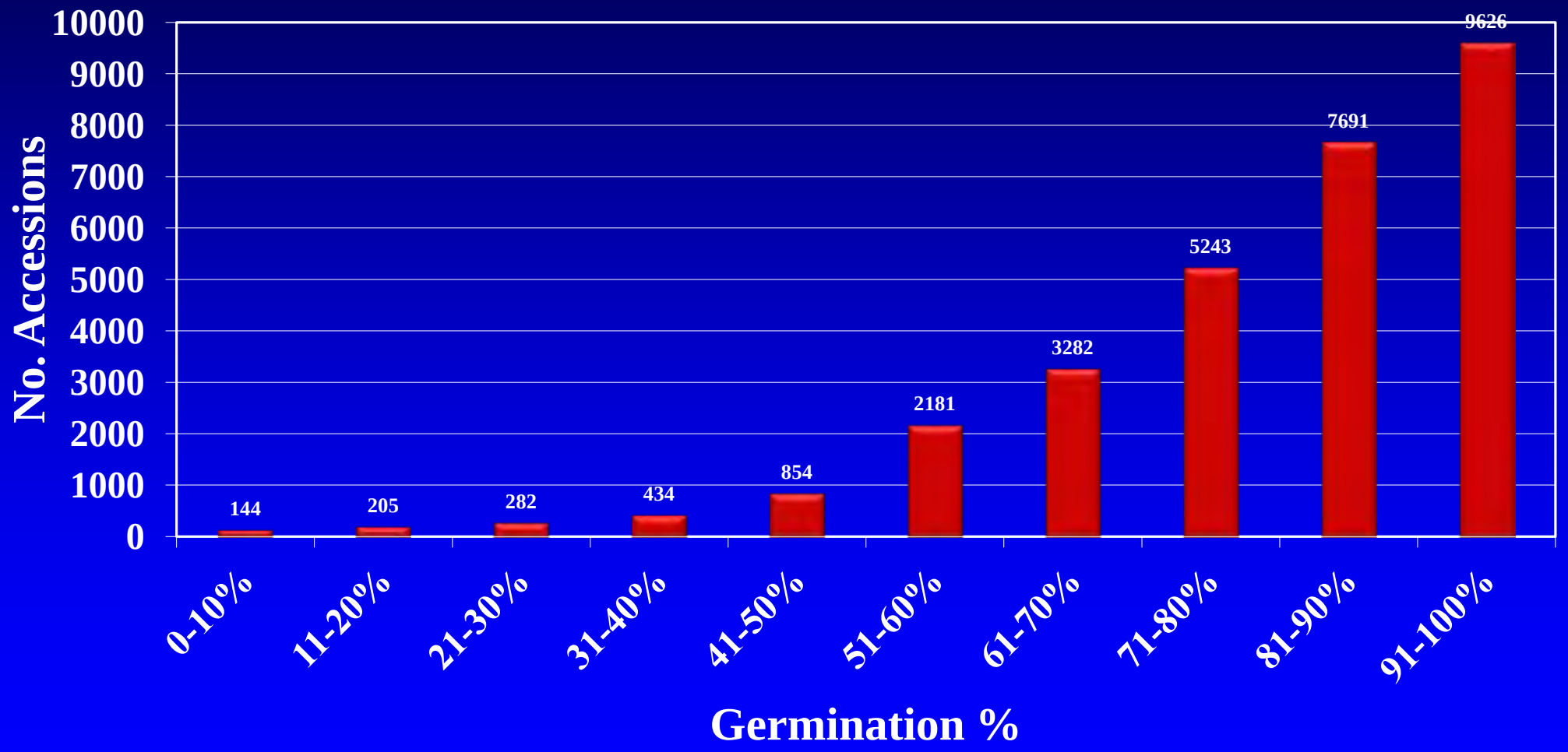
Status of Sorghum collection

Crop	Accessions Backed Up	Accessions in -18 C	Germination tested
Sorghum	36,655 (98%)	26,674 (71%)	29,942 (82%)

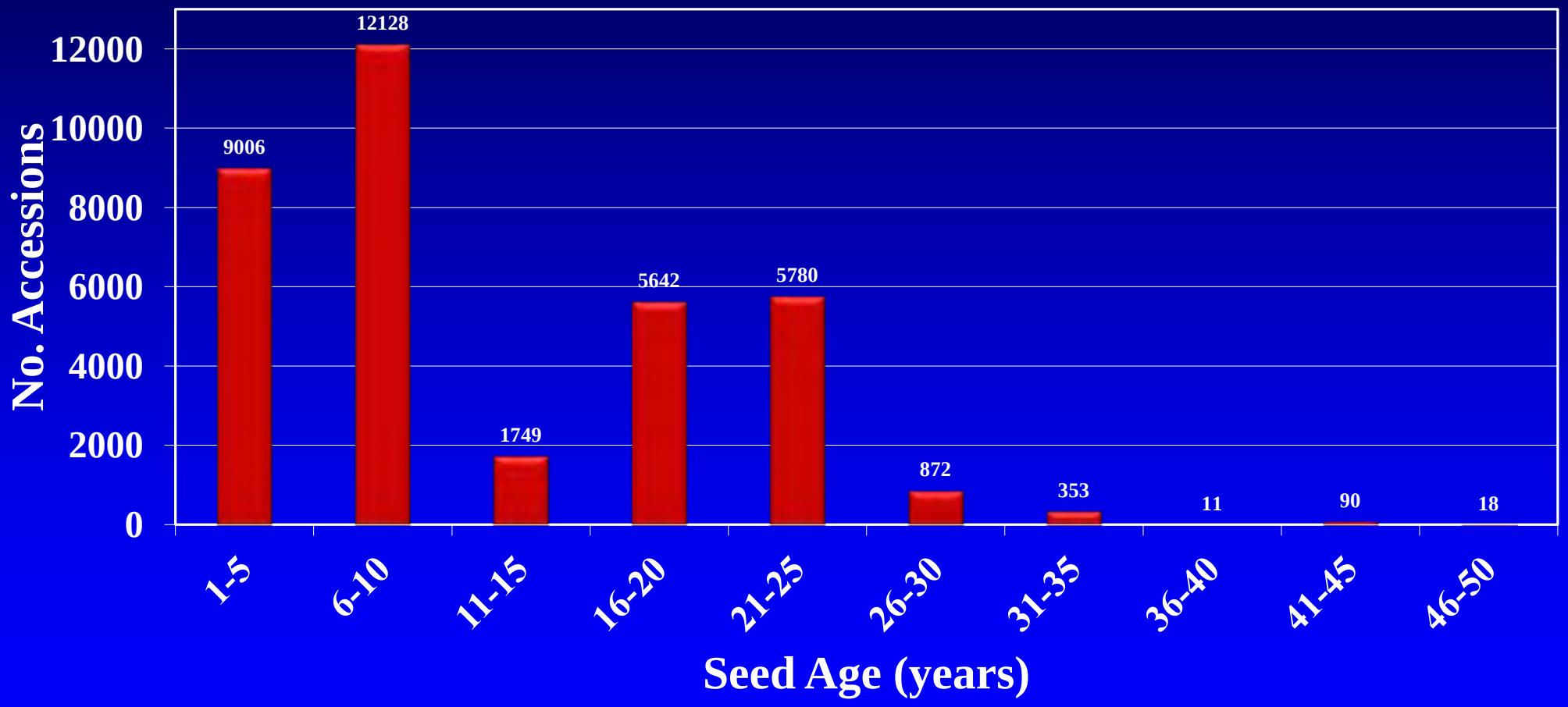
Longevity (P50) of Sorghum in -18 C

Sorghum species	P50 (years)
S. bicolor	53

Sorghum – Viability



Sorghum – Seed Age



Sorghum regeneration in St. Croix

Sorghum Collection Regeneration

- Most accessions in Sorghum collection do not need regeneration at this time.
  - Sorghum seed lasts for decades in -18 C.
  - 57% of collection was regenerated in the last 10 years.
  - The extensive utilization of sorghum collection may deplete the supply of some accessions.
- St. Croix regenerations in next 3-4 years will meet immediate regeneration needs.
  - 1,632 Griffin accessions
  - 1,060 NSSL-only accessions
  - Some of 5,140 Griffin accessions with adequate seed and unknown germination.
- NSSL-only material will be added to the Griffin collection in next few years.
- Quarantine growouts will continue as new accessions are added to collection.

Appendix 3

DR. BRAD MORRIS

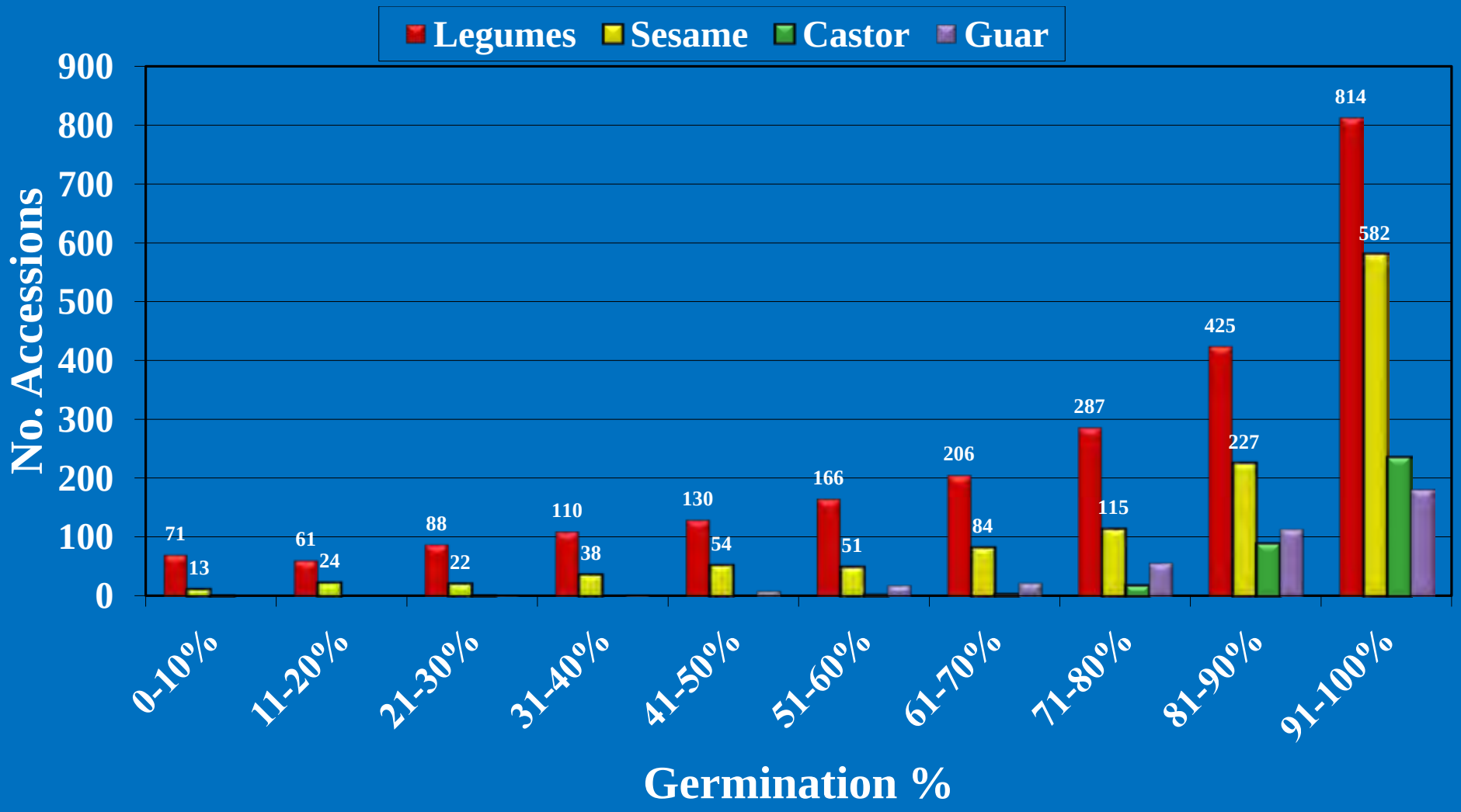
LEGUMES, HIBISCUS, SESAME, CASTOR, AND MISCELLAENOUS CROPS

Legumes, Hibiscus, Sesame, Castor, and Miscellaneous Crops

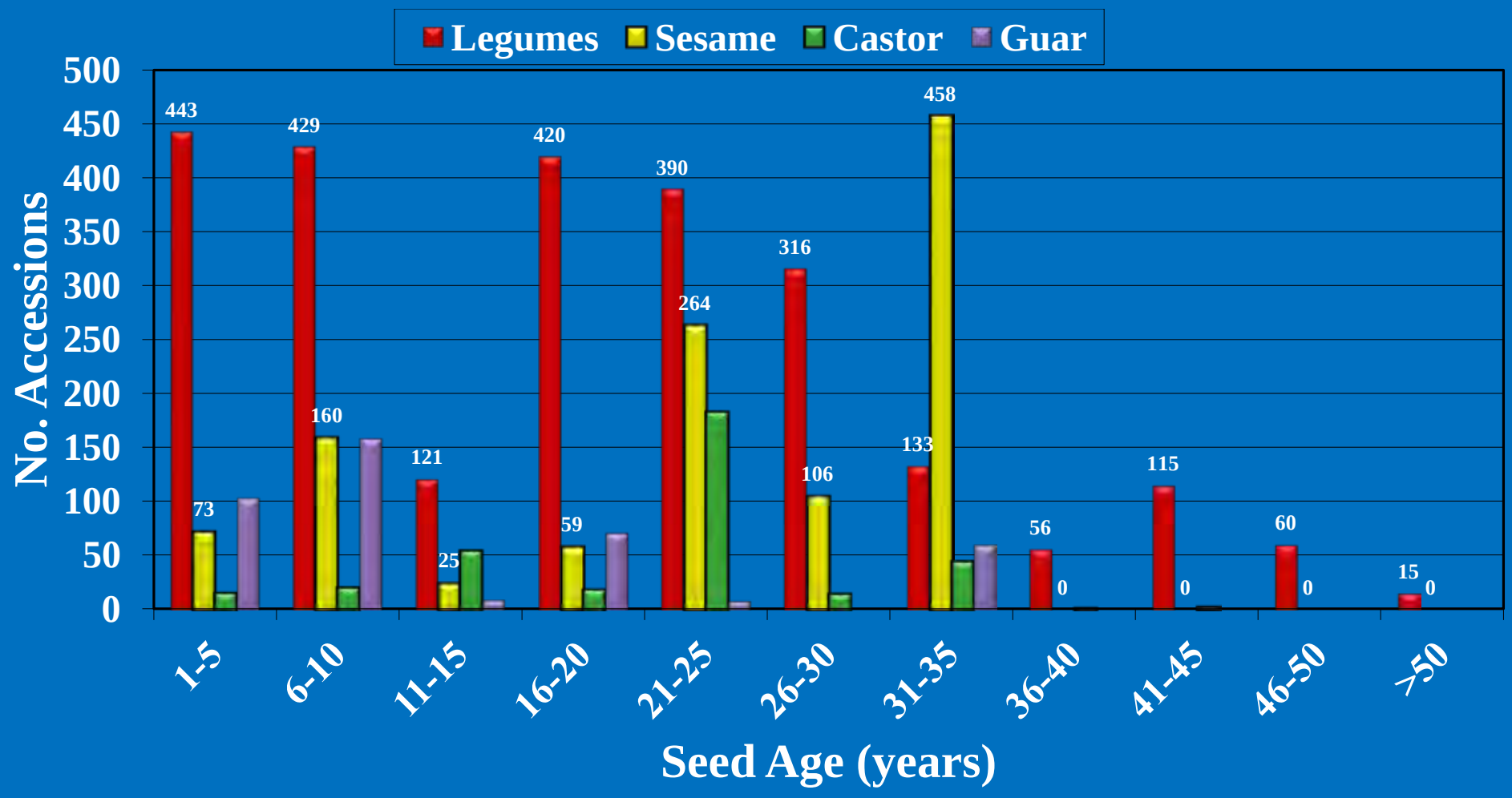
Status

SITE CROP	# OF GEN/SPP	TOTAL ACC.	NUM. AVAIL	NOT AVAIL	BACKED UP	IN -18°	GERMS	IMAGES	OBS DATA	NSSL ONLY
Castorbean	1 / 1	374	174	200	373	374	353	0	2,458	669
Guar	1 / 3	411	402	9	411	411	406	3	3,949	889
Hibiscus	2 / 31	340	286	54	338	340	307	1	158	382
Legumes	59 / 374	3,083	2,267	816	2,995	3,080	2,358	35	11,190	91
Miscellaneous	23 / 31	137	101	36	130	131	96	2	1,247	37
Sesame	2 / 5	1,216	1,195	21	1,216	1,216	1,211	0	10,242	22
Winged bean	1 / 3	159	37	122	79	159	40	1	130	0

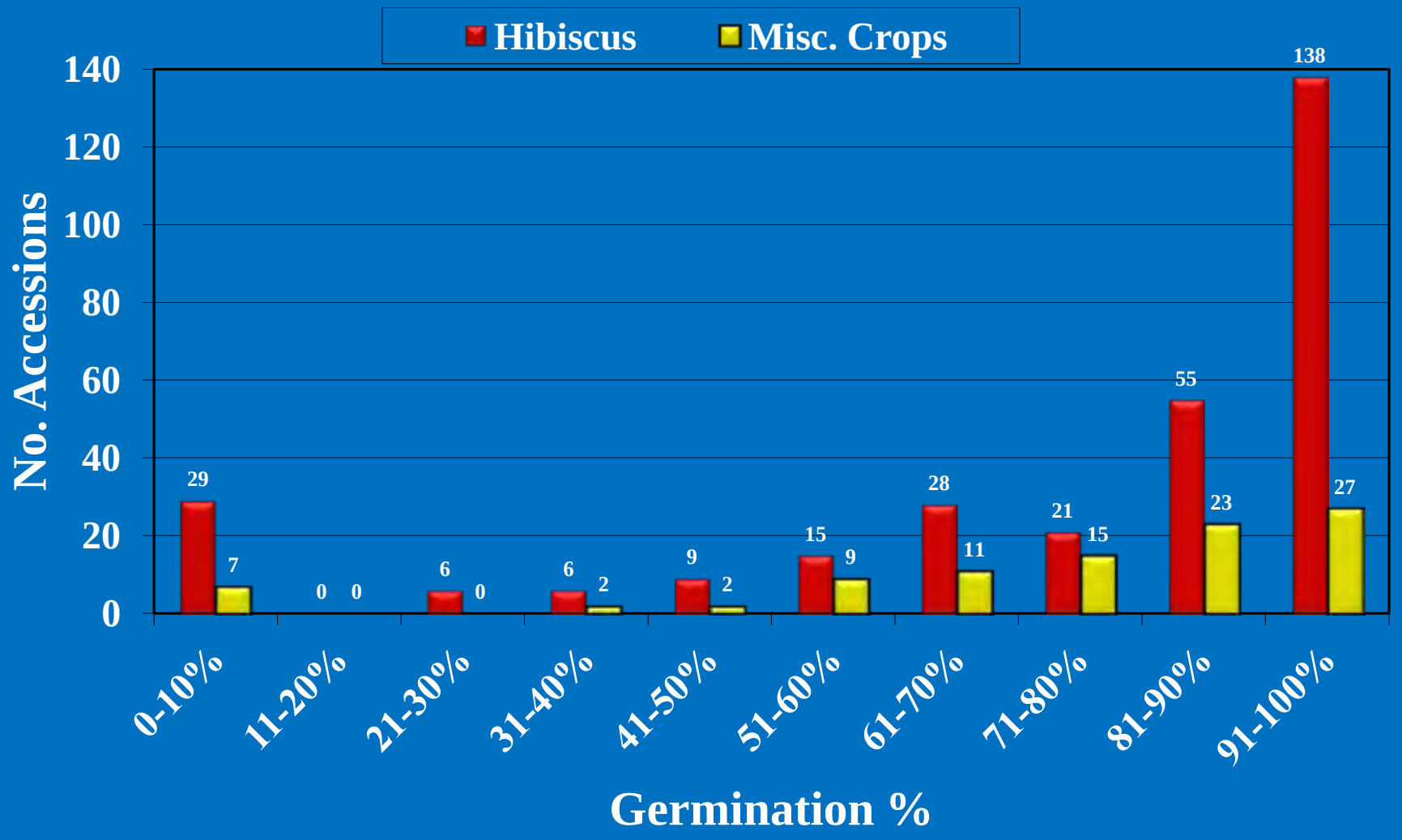
Legume, Sesame, Castor, Guar – Viability



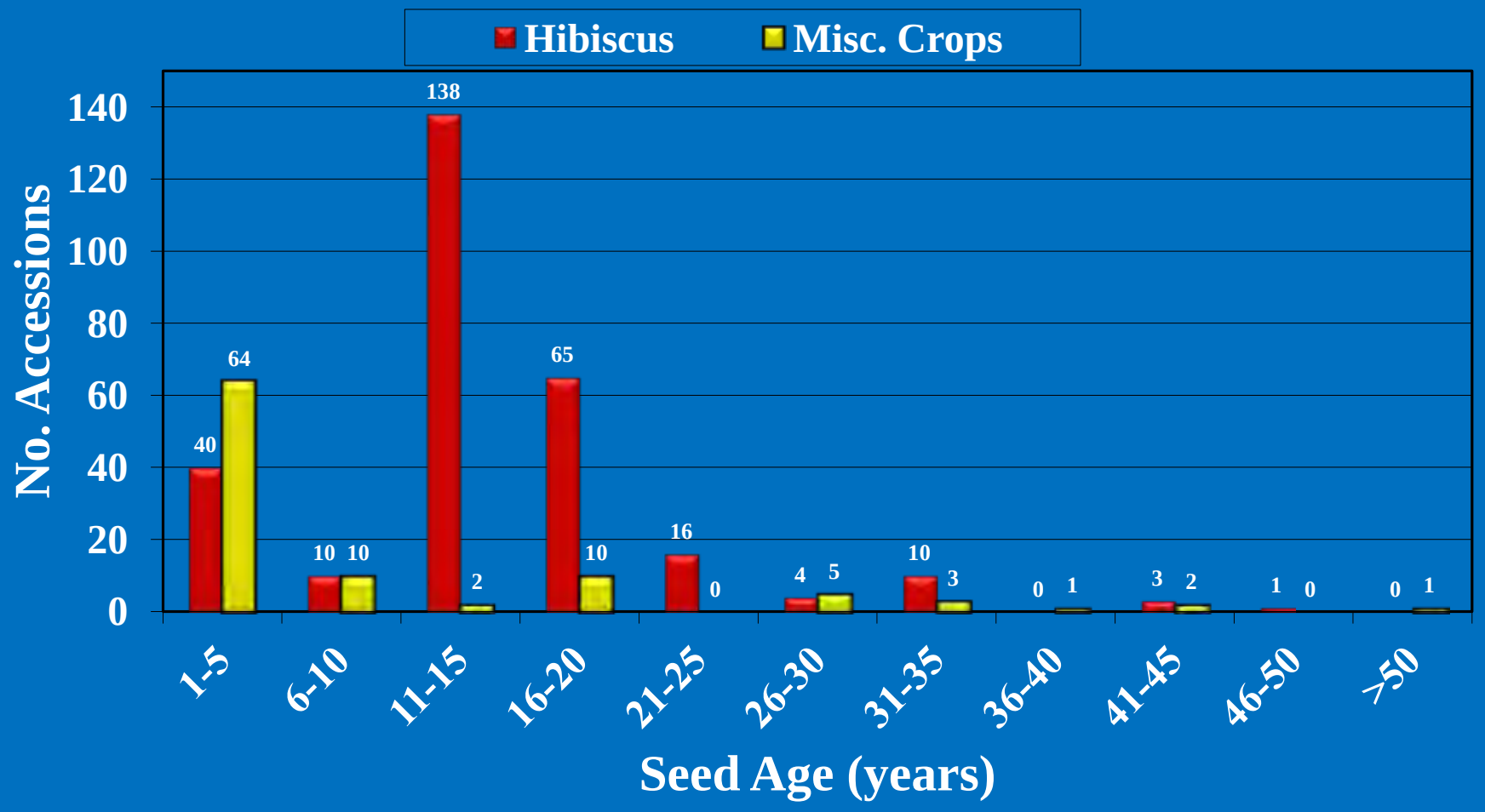
Legume, Sesame, Castor, Guar – Seed Age



Hibiscus and Misc. Crops – Viability



Hibiscus and Misc. Crops – Seed Age



Regeneration – 2011 (349 total accessions attempted)

Legumes, Field

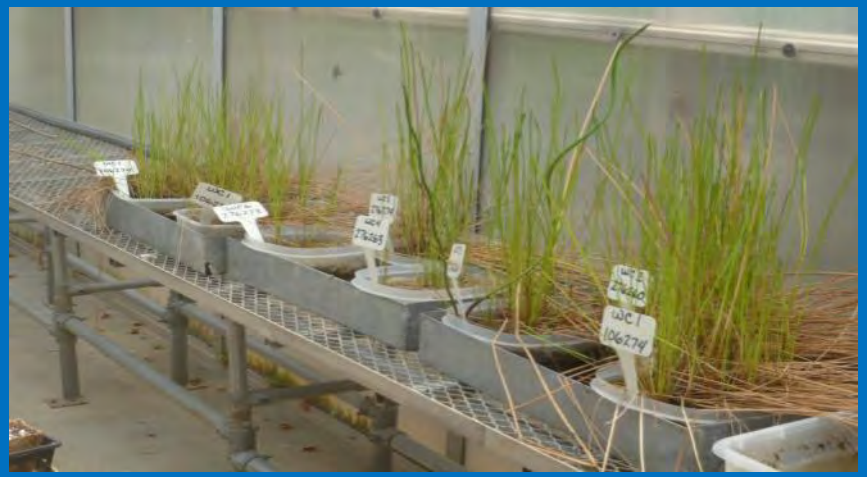
40 *Leucaena leucocephala* and winged bean @ St. Croix.

Field
Castor

Field
Sesame and Miscellaneous

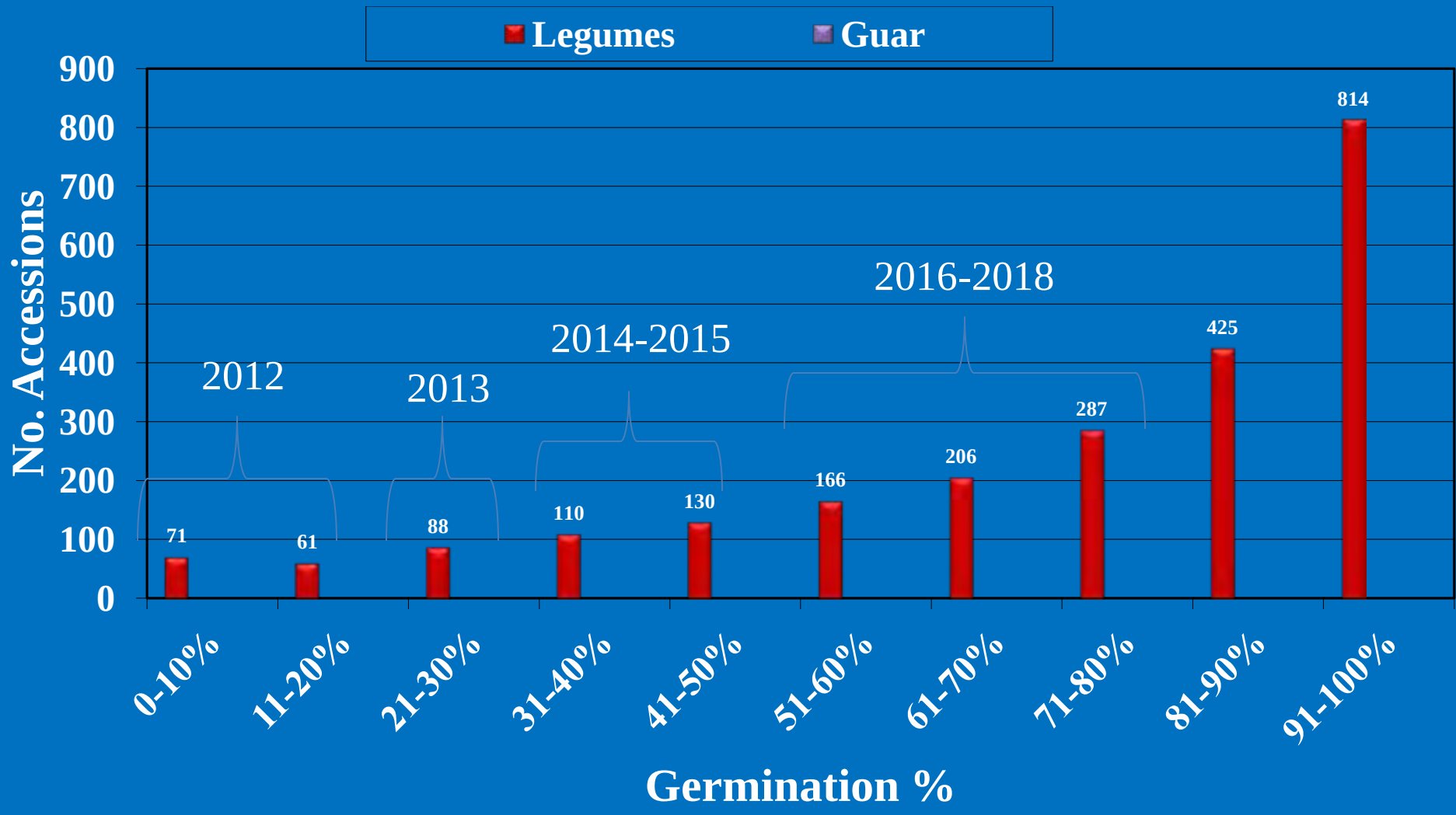
Greenhouse (legumes and *Hibiscus*)

-*Teramnus labialis*, *T. uncinatus*, N*eonotonia wightii*. water chestnuts, and *Hibiscus sabdariffa.*

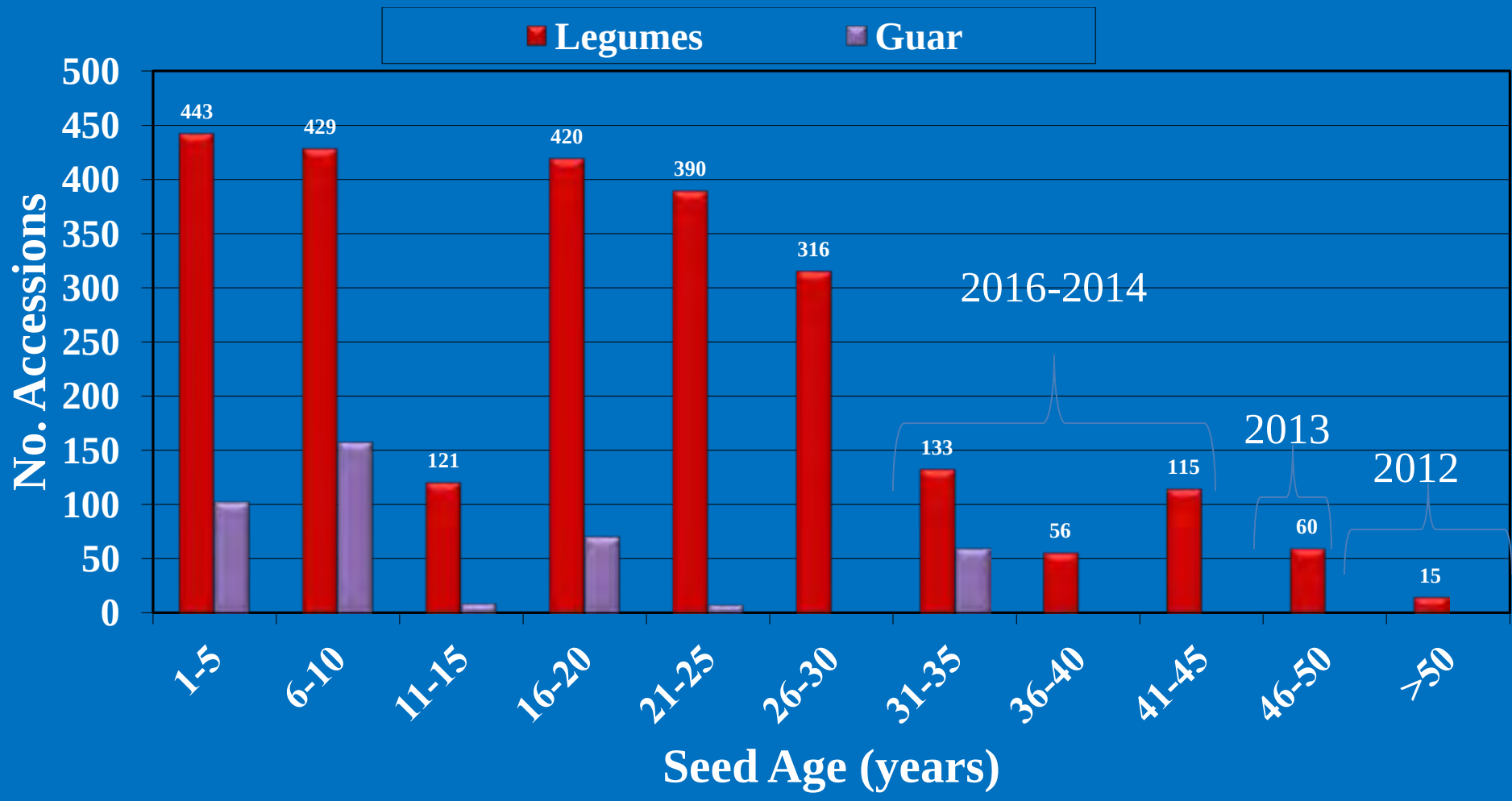


Regeneration of Entire Collections

Legume (including wing bean) and Guar – Viability - 225 acc./yr



Legume (including wing bean) and Guar – Seed Age



Legumes – completed by 2016

-seed longevity @ -18ºC is ~50 years.

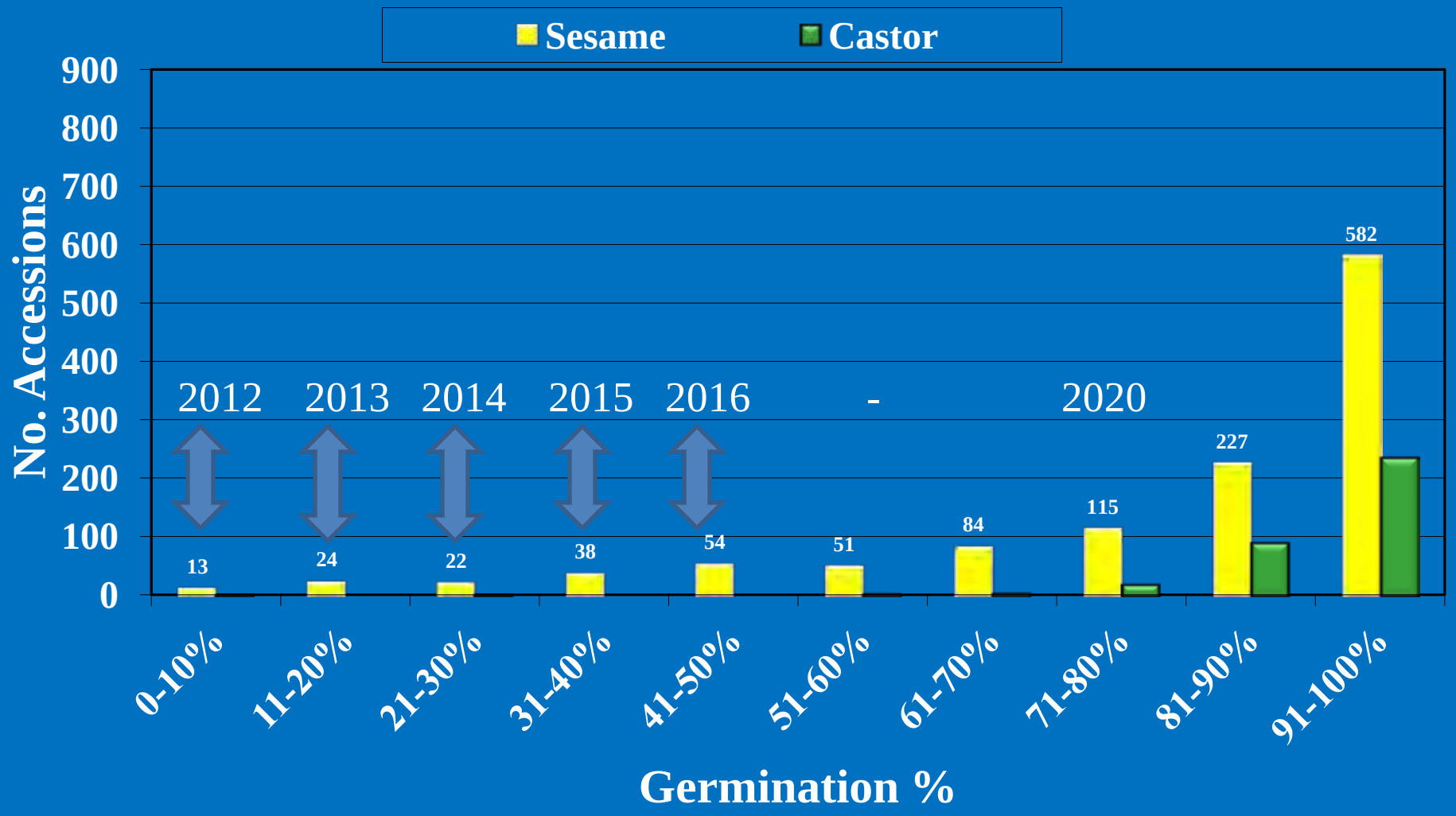
-Forage, pasture, nutraceuticals, pharmaceuticals, food, cover cropping, and green manure.

-13,176 acc. distributed since 1988.

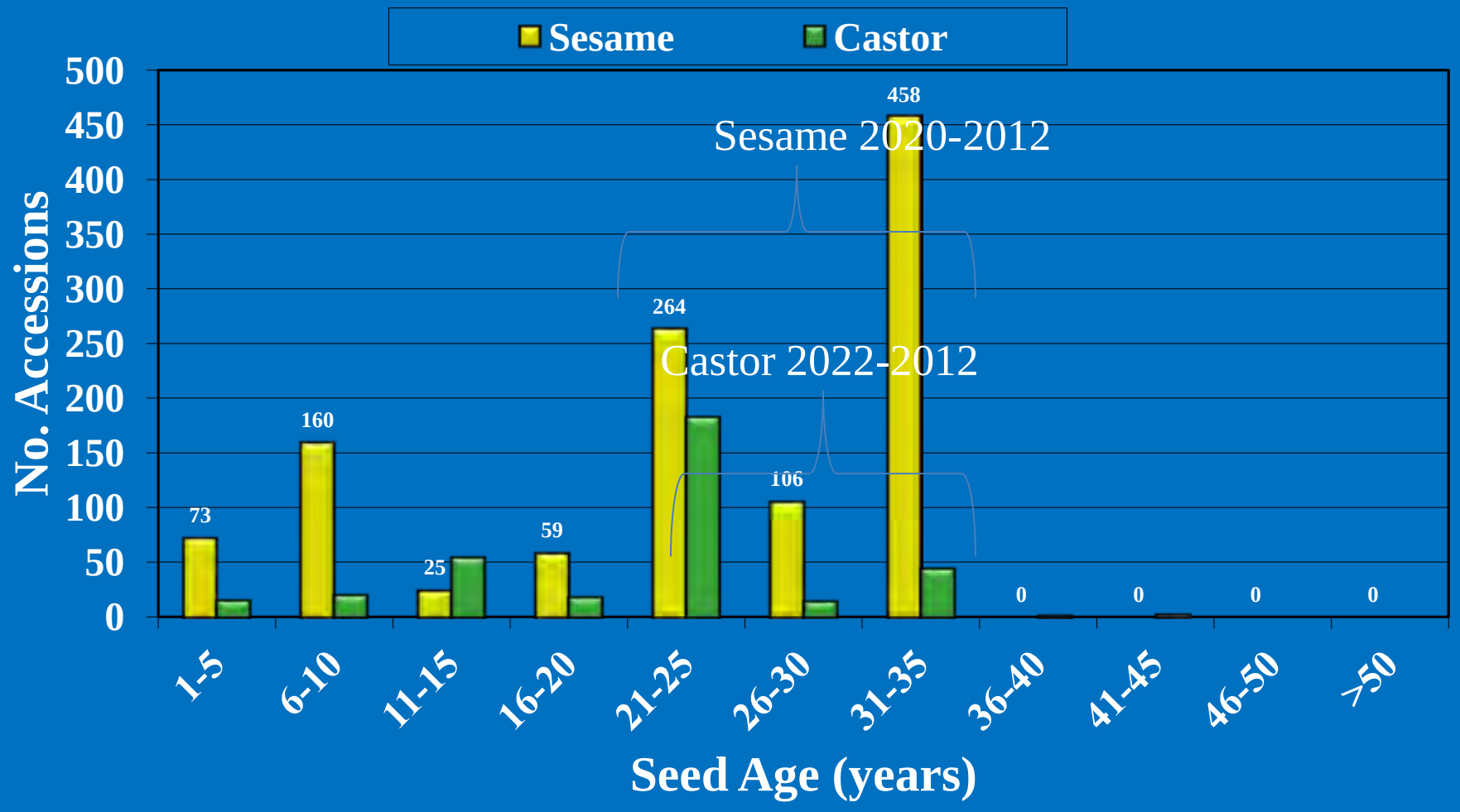
-The most requested guar was requested 26 times, while all top 10 legumes had >48 requests.

-NRCS, ARS in Puerto Rico will help regenerate legumes.

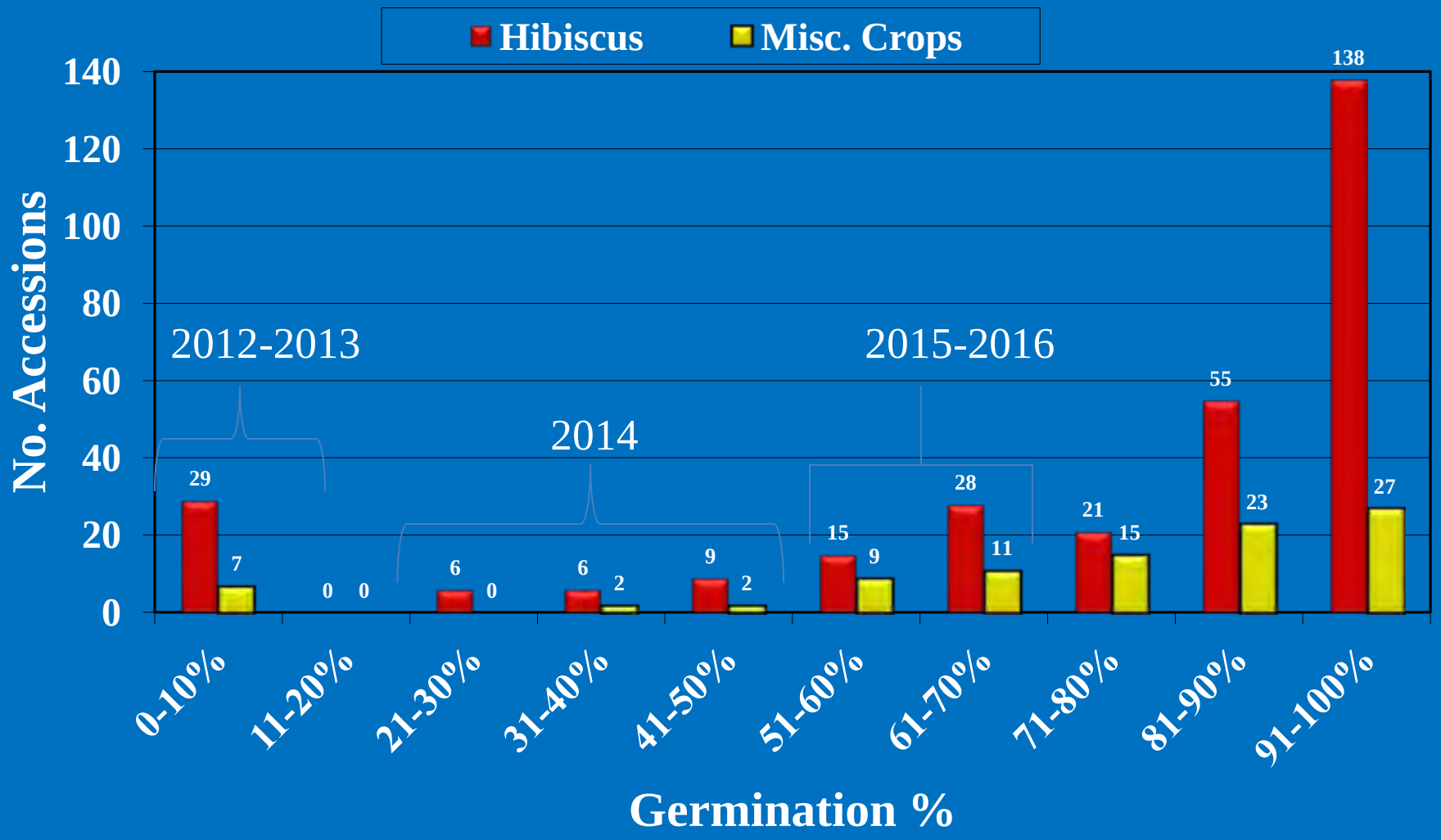
Sesame (20 acc/yr) and Castor (20 acc/yr) – Viability



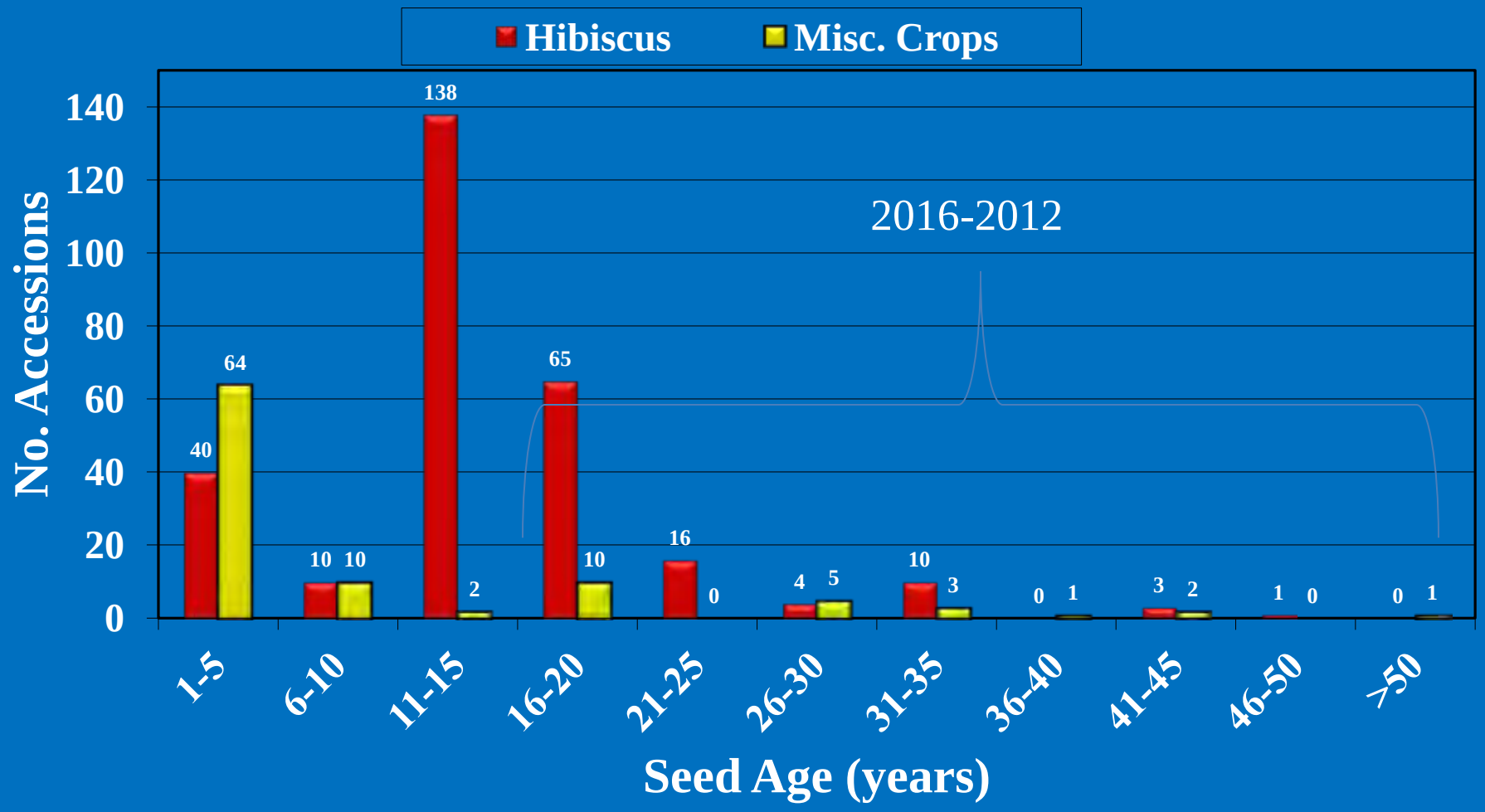
Sesame and Castor – Seed Age



Hibiscus (15 acc/yr) and Misc. Crops (20 acc/yr) – Viability



Hibiscus and Misc. Crops – Seed Age



Castor (2022), Hibiscus (2013), sesame*(2015), and miscellaneous (2015)– (75 total acc./yr)

-Estimated seed longevity at -18C is about 25 yrs for all these crops.

-Uses: medicinally, for automobile oil, food, nutraceuticals, pharmaceuticals, ornamental, and potential biodiesel.

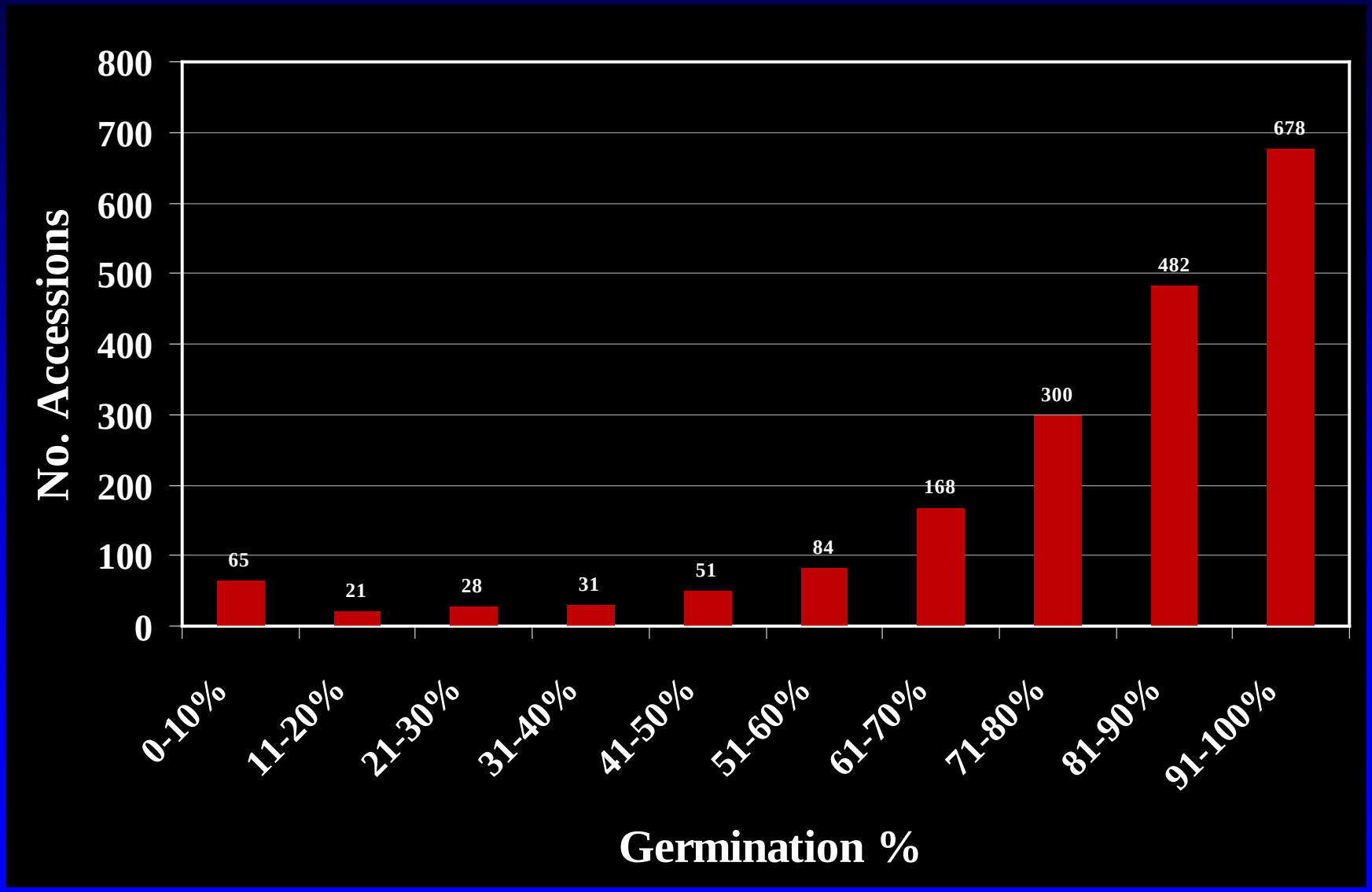
-13,660* sesame accessions have been distrubted since 1988.

Appendix 4

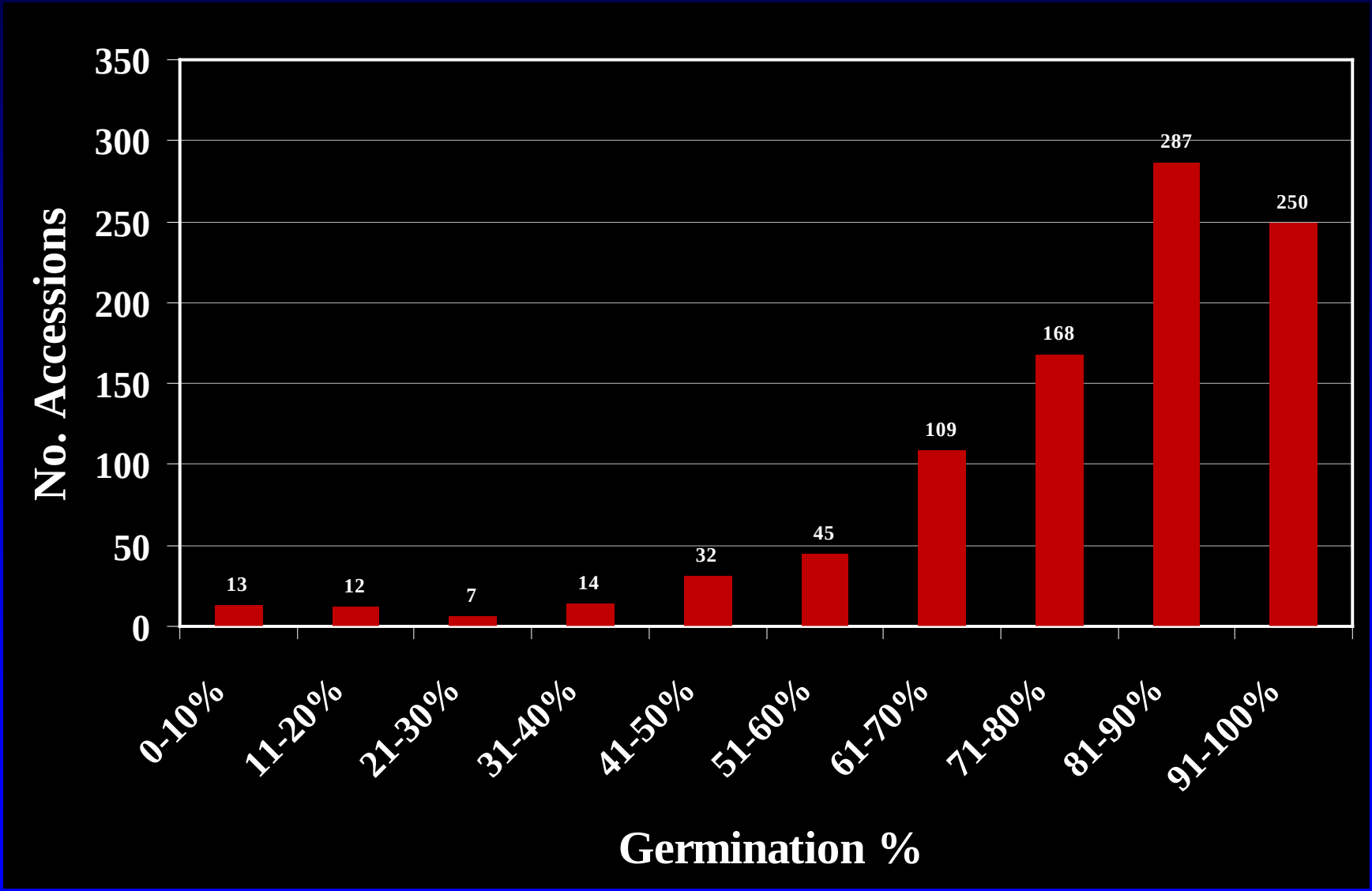
DR. BOB JARRET

VEGETABLE CROPS
CUCURBITS, EGGPLANT, GOURDS, IPOMOEA SPP.,
LUFFA, OKRA, PEPPERS, AND WATERMELON

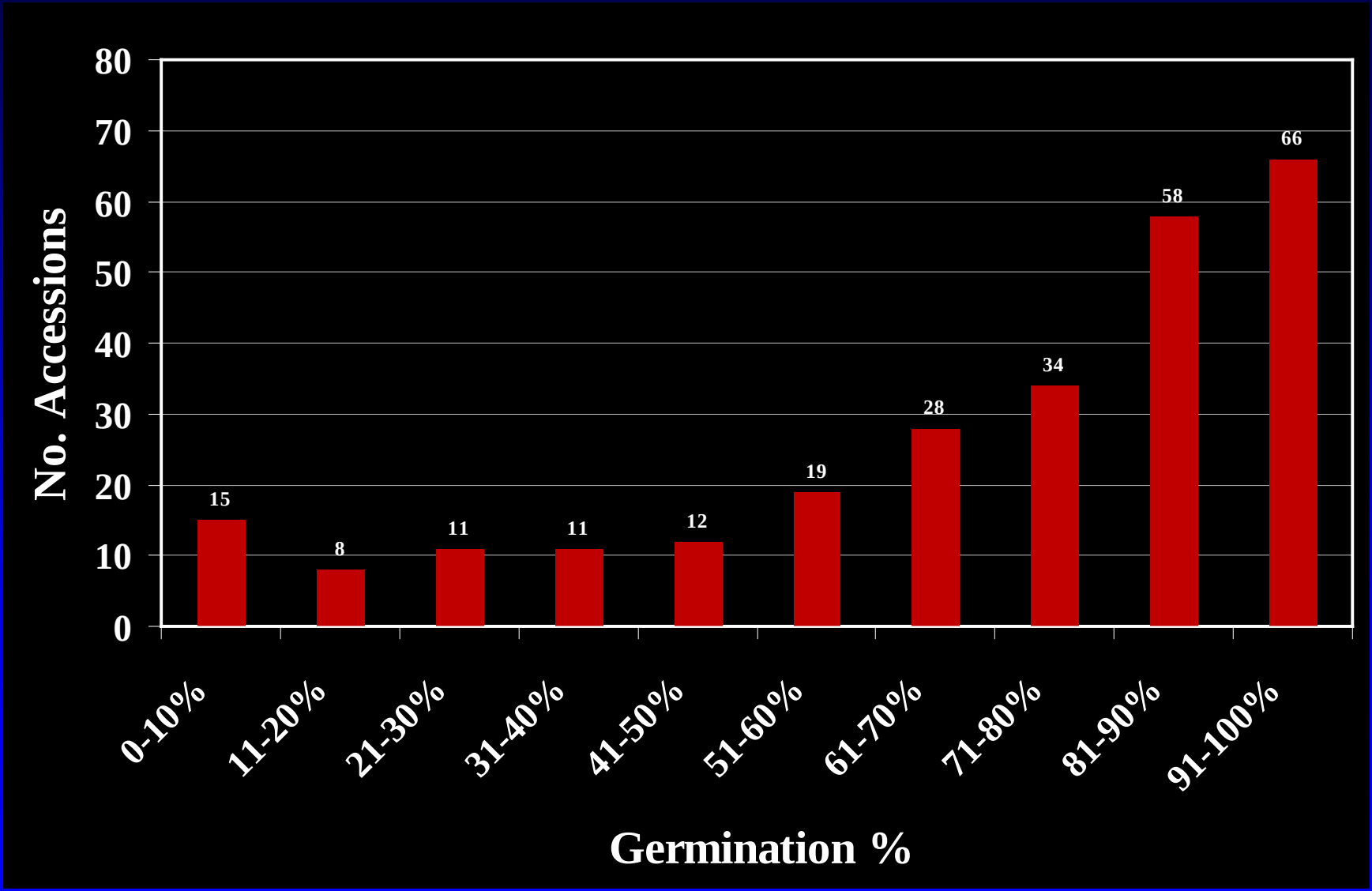
Cucurbits – Viability



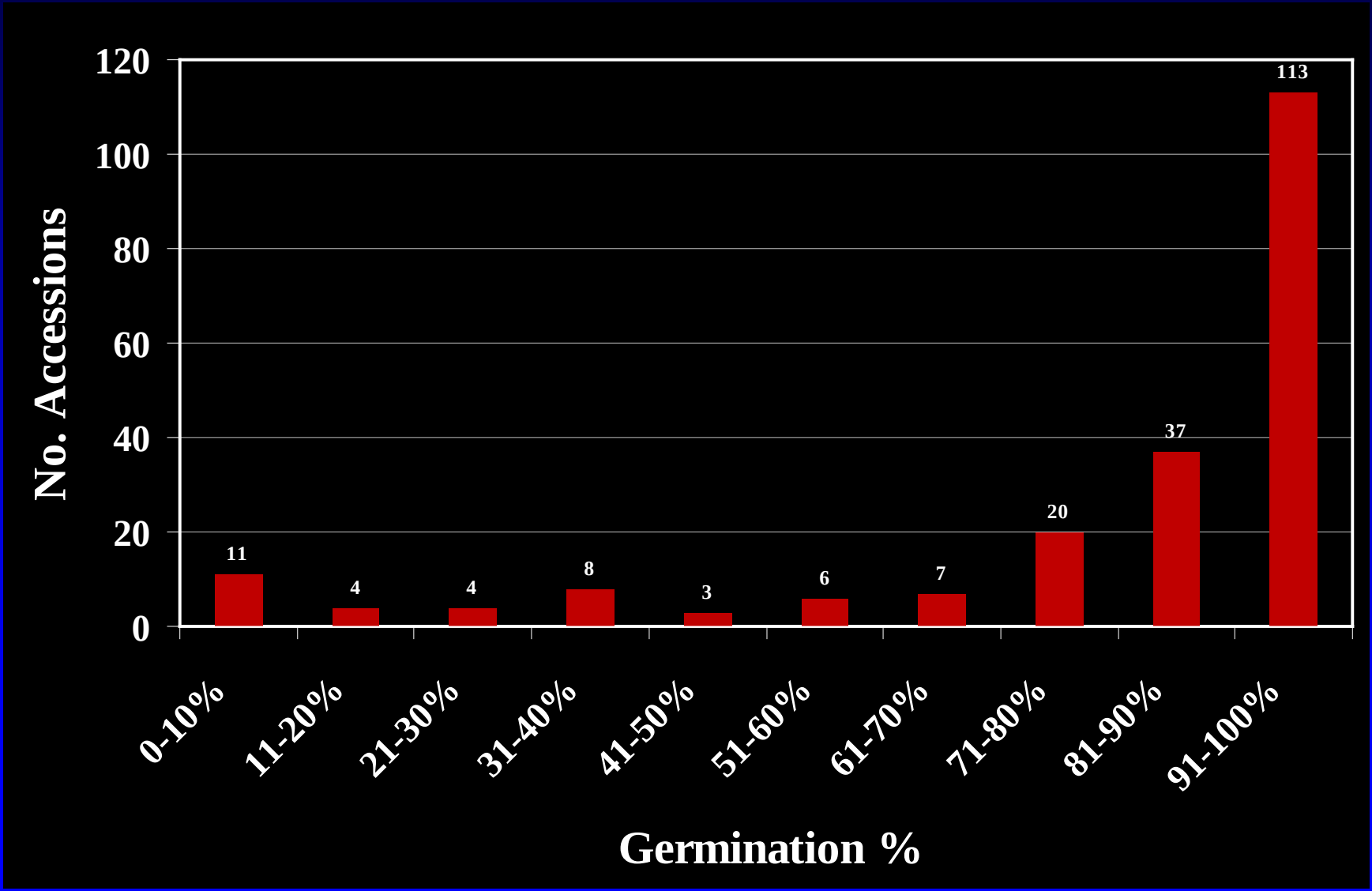
Eggplant – Viability



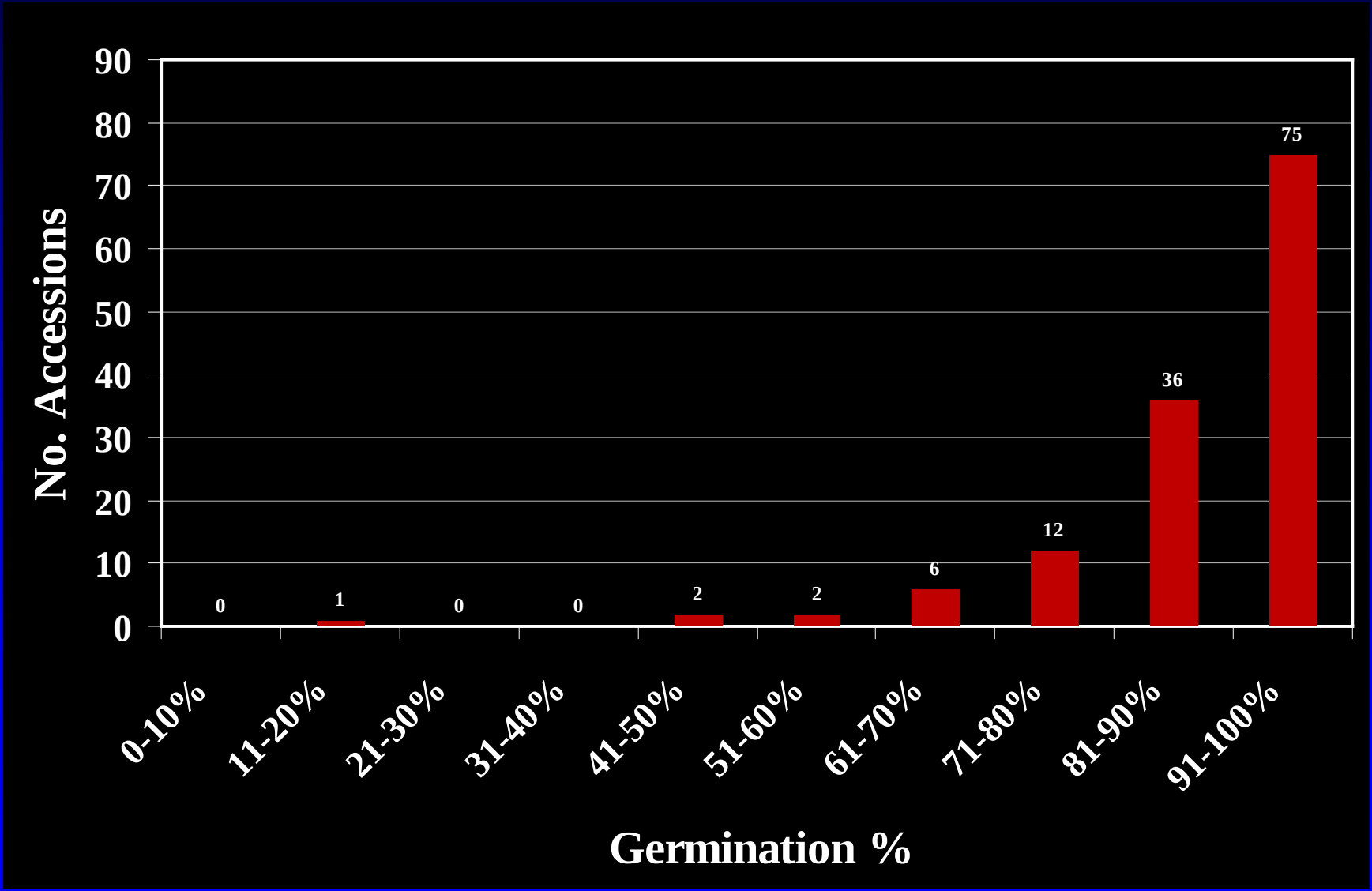
Gourds – Viability



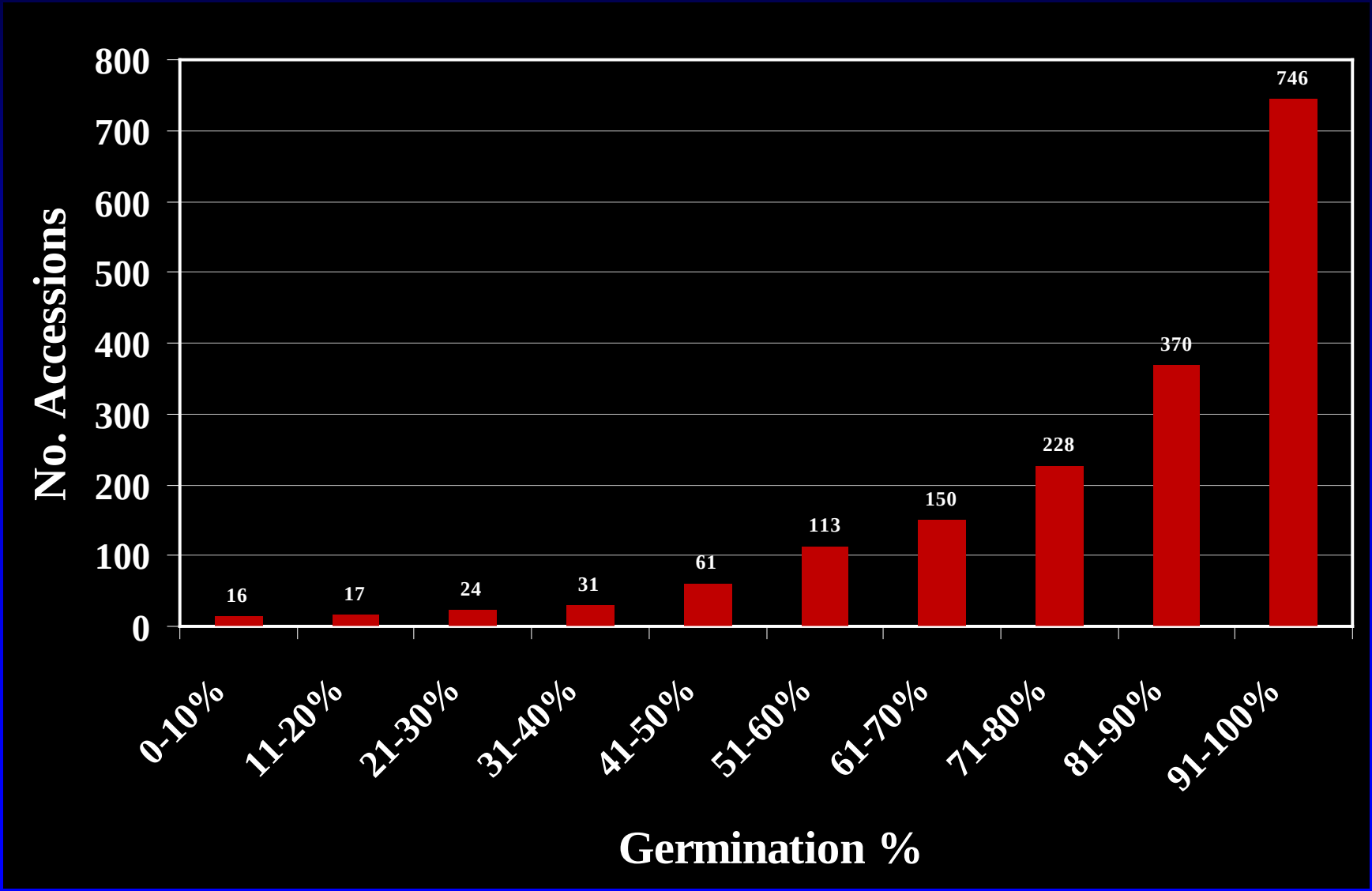
Ipomoea spp. – Viability



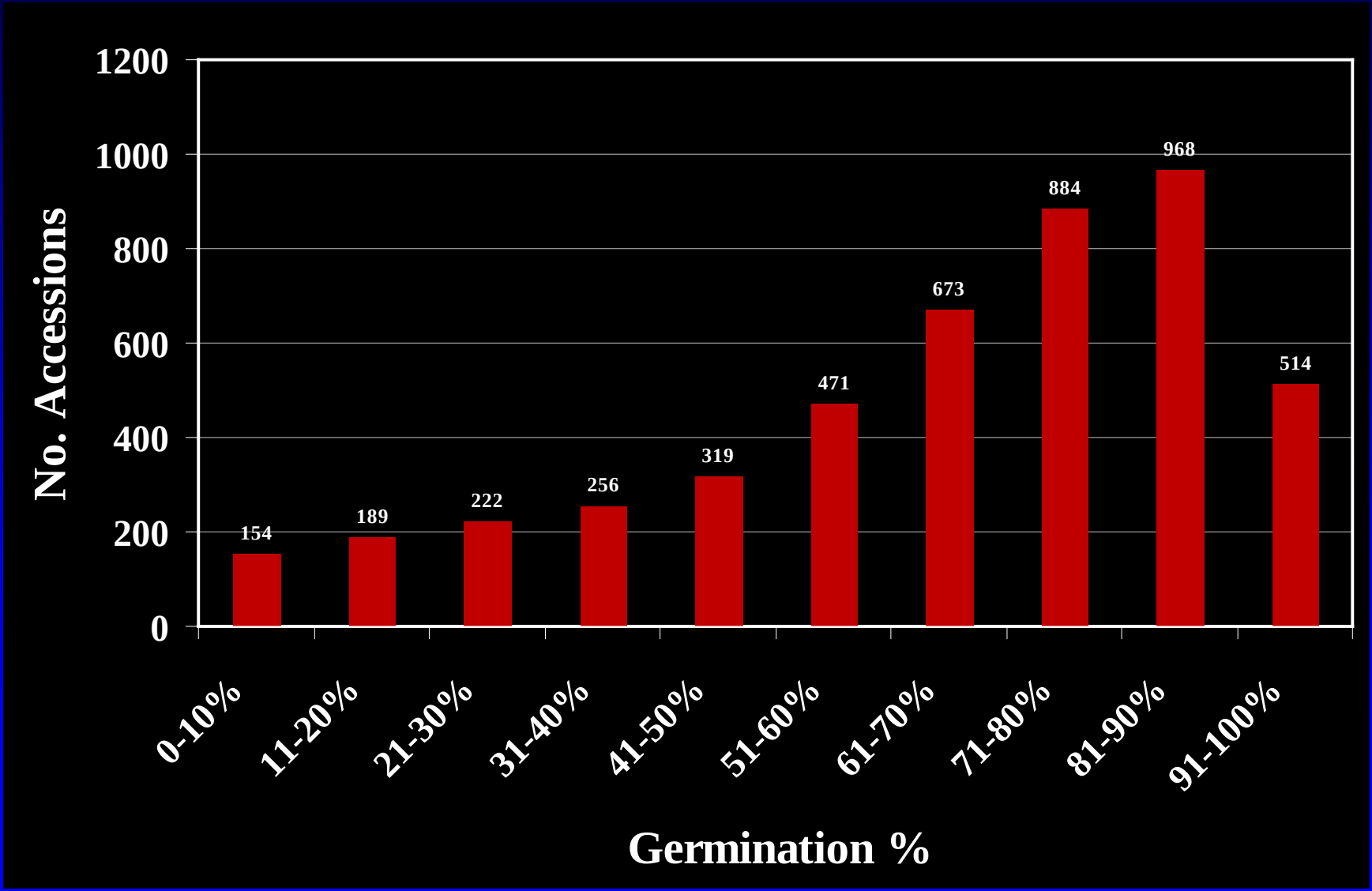
Luffa – Viability



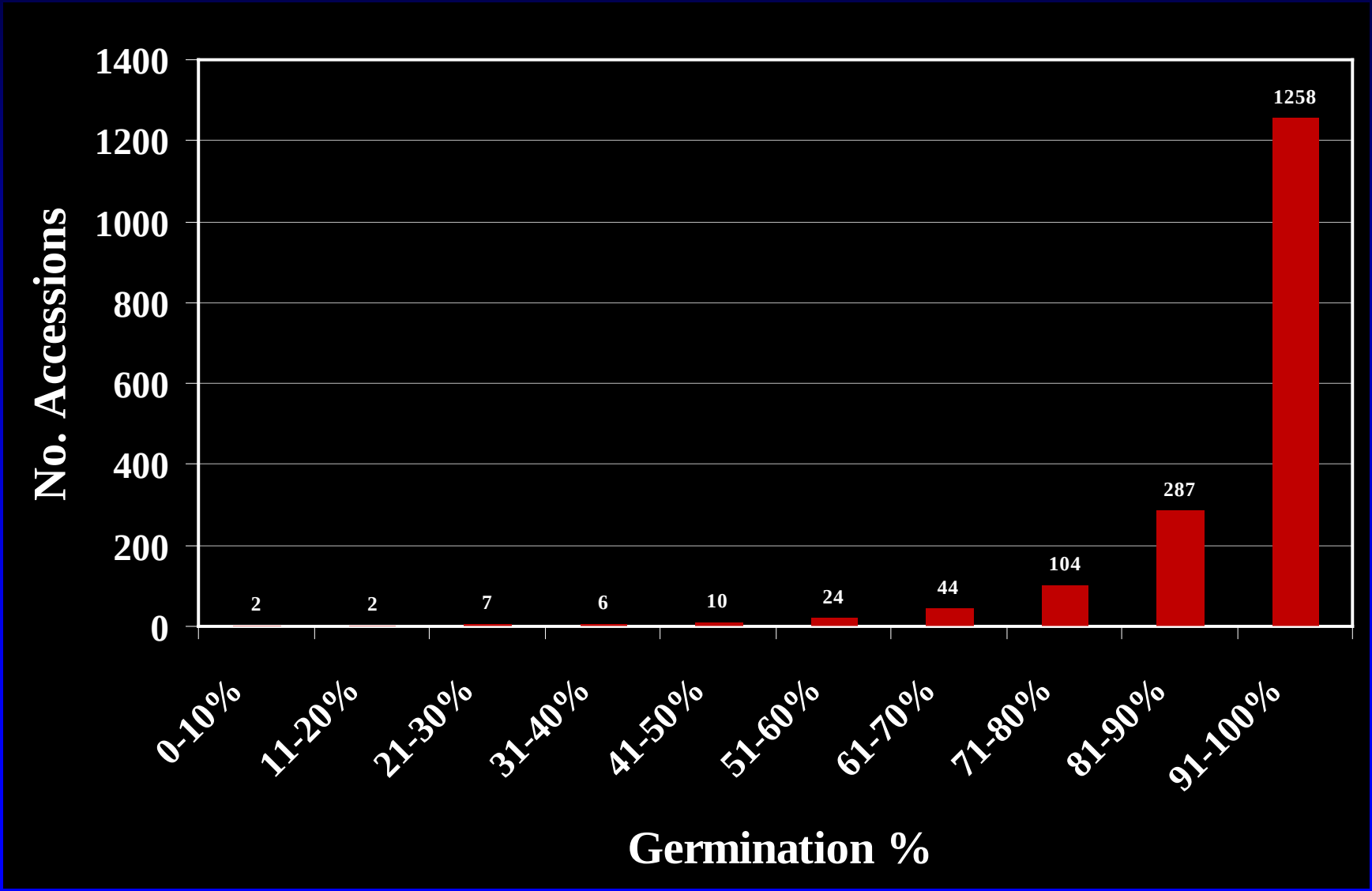
Okra – Viability



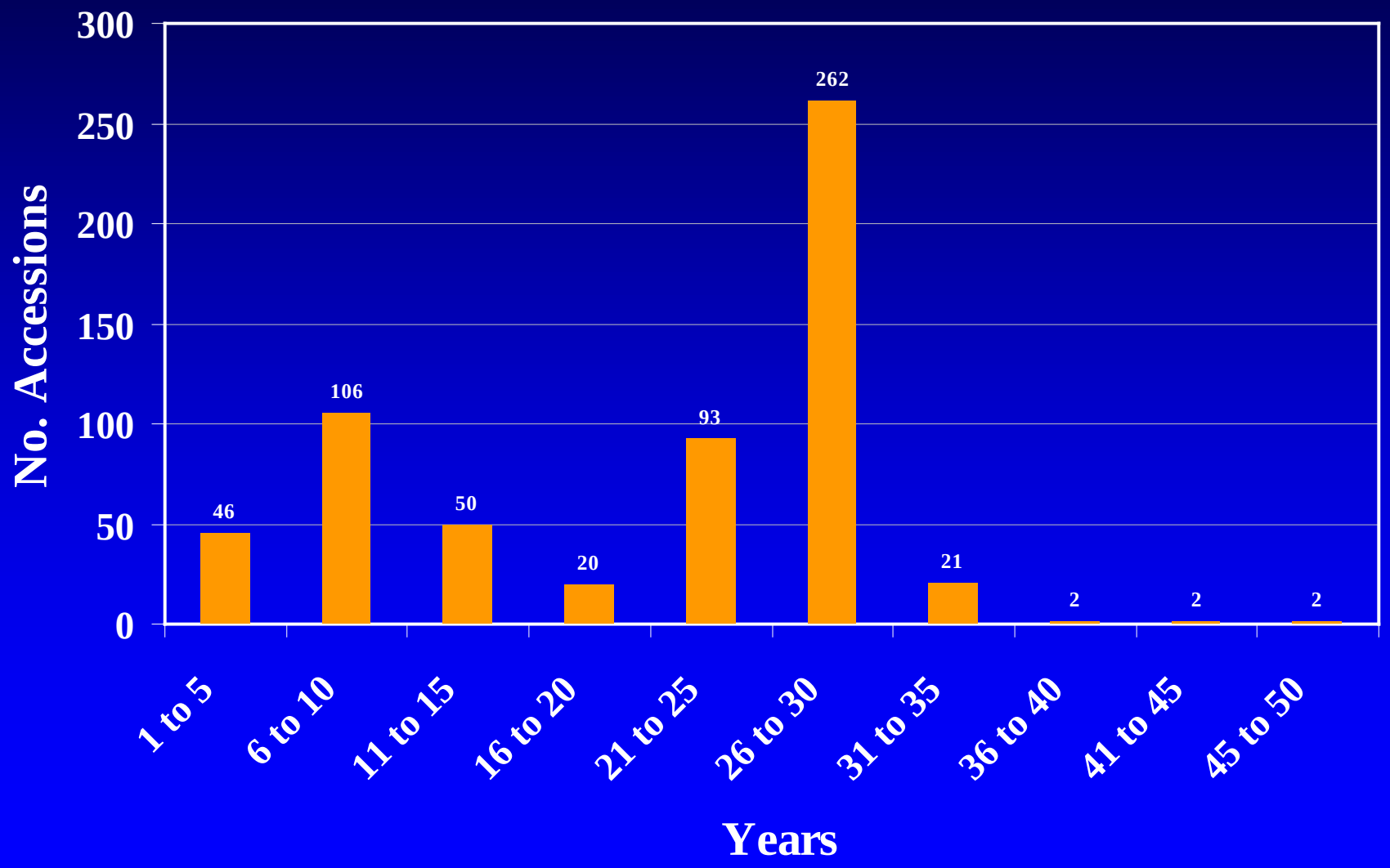
Pepper – Viability



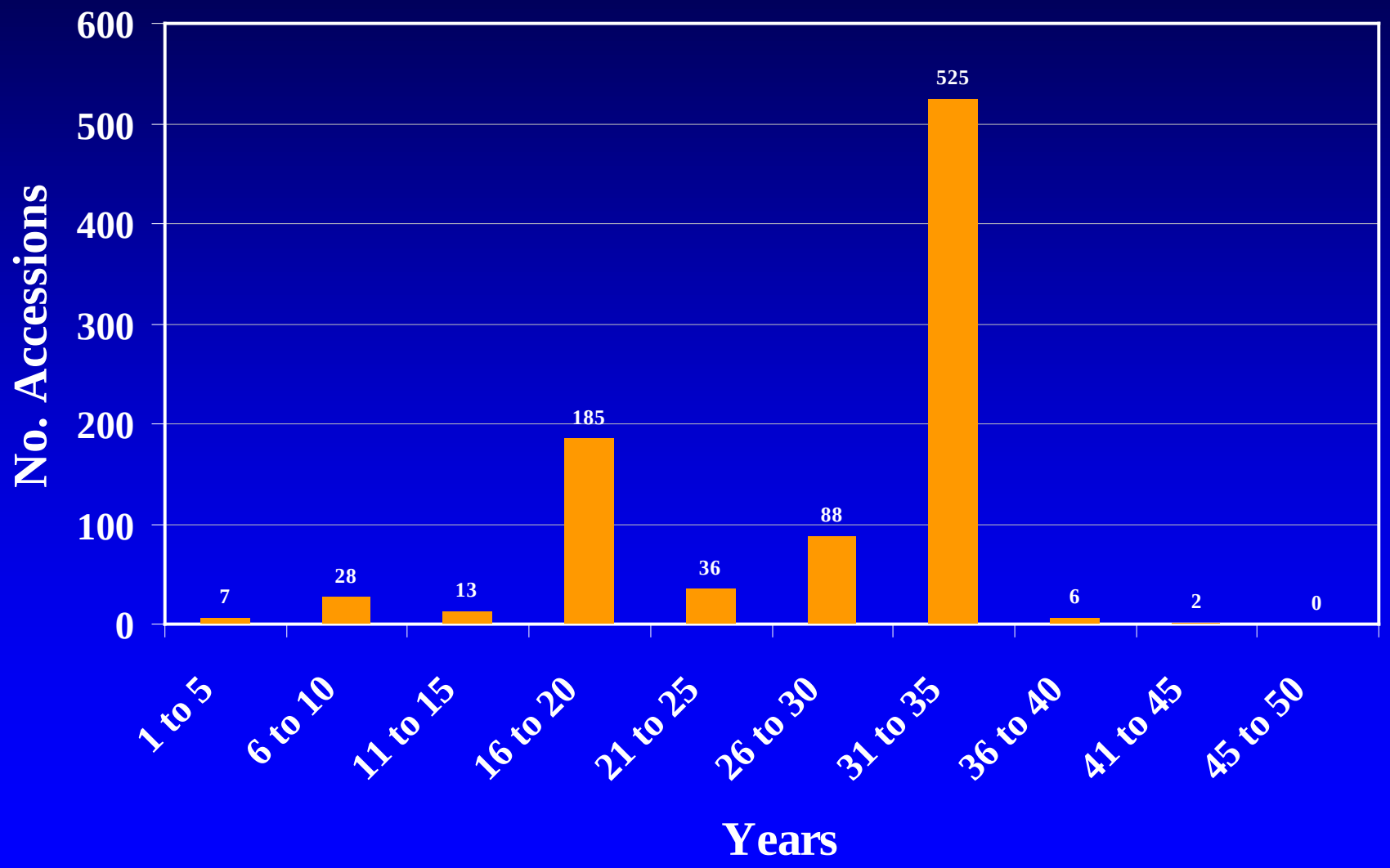
Watermelon – Viability



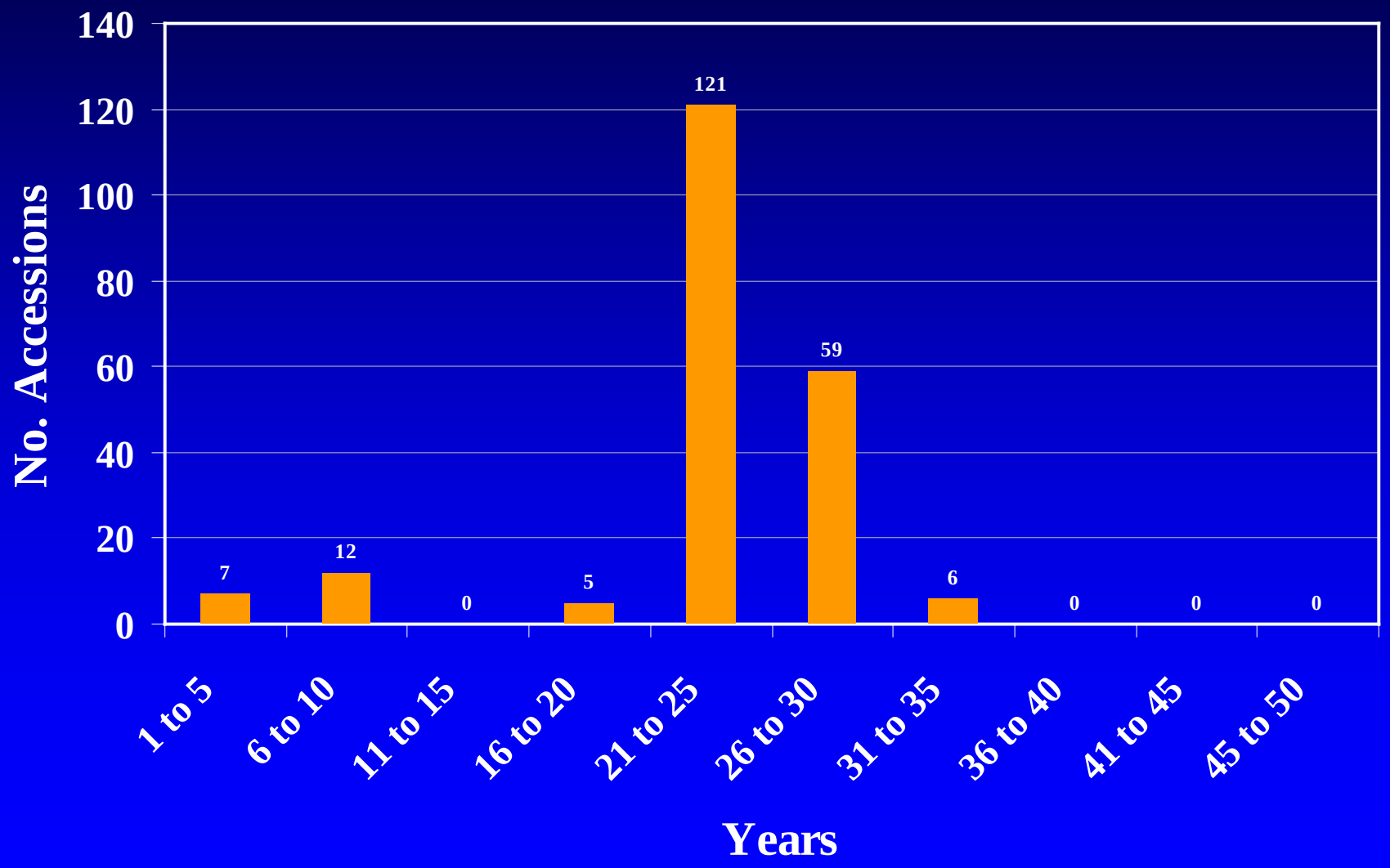
Cucurbits – Age of Seed



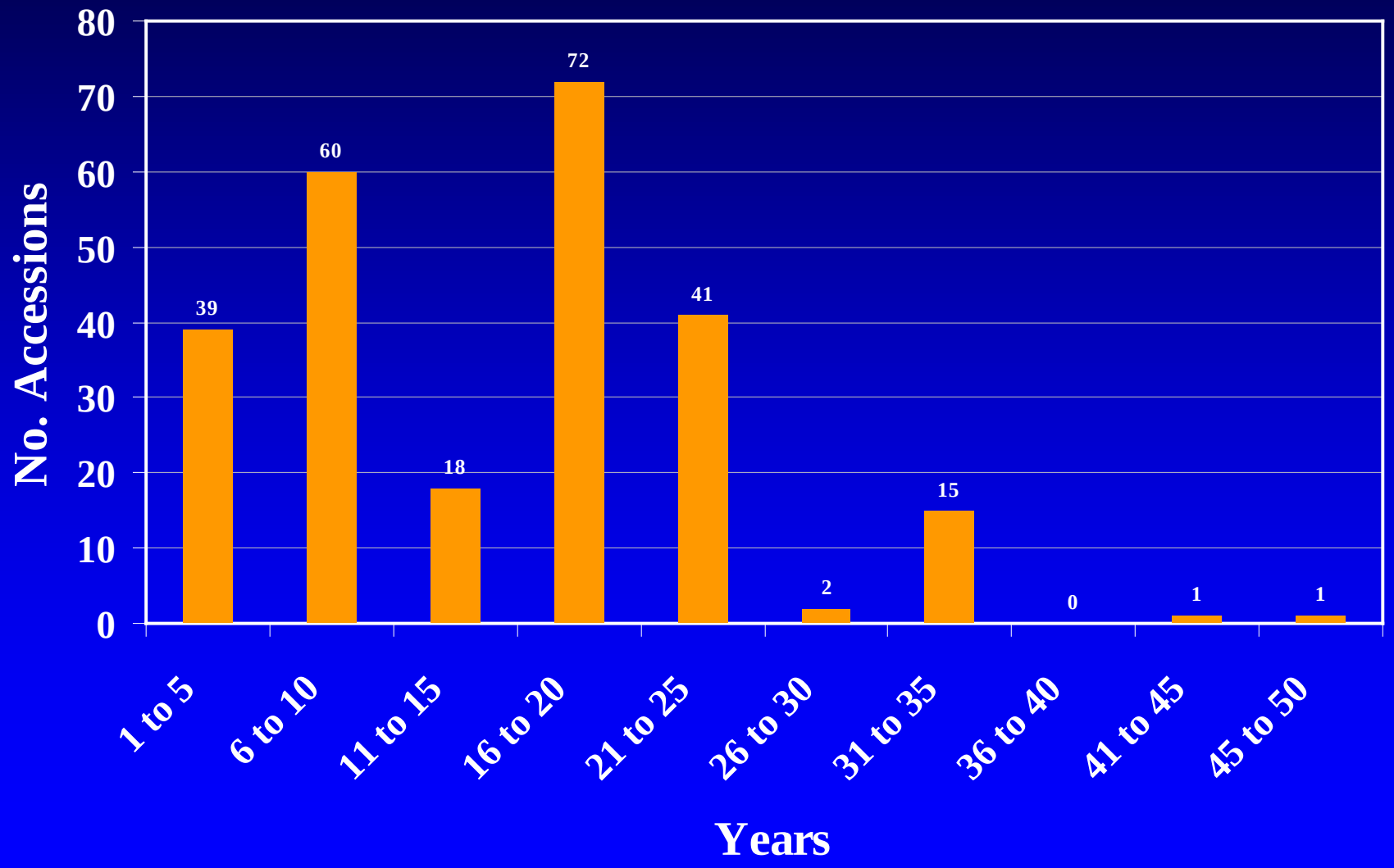
Eggplant – Age of Seed



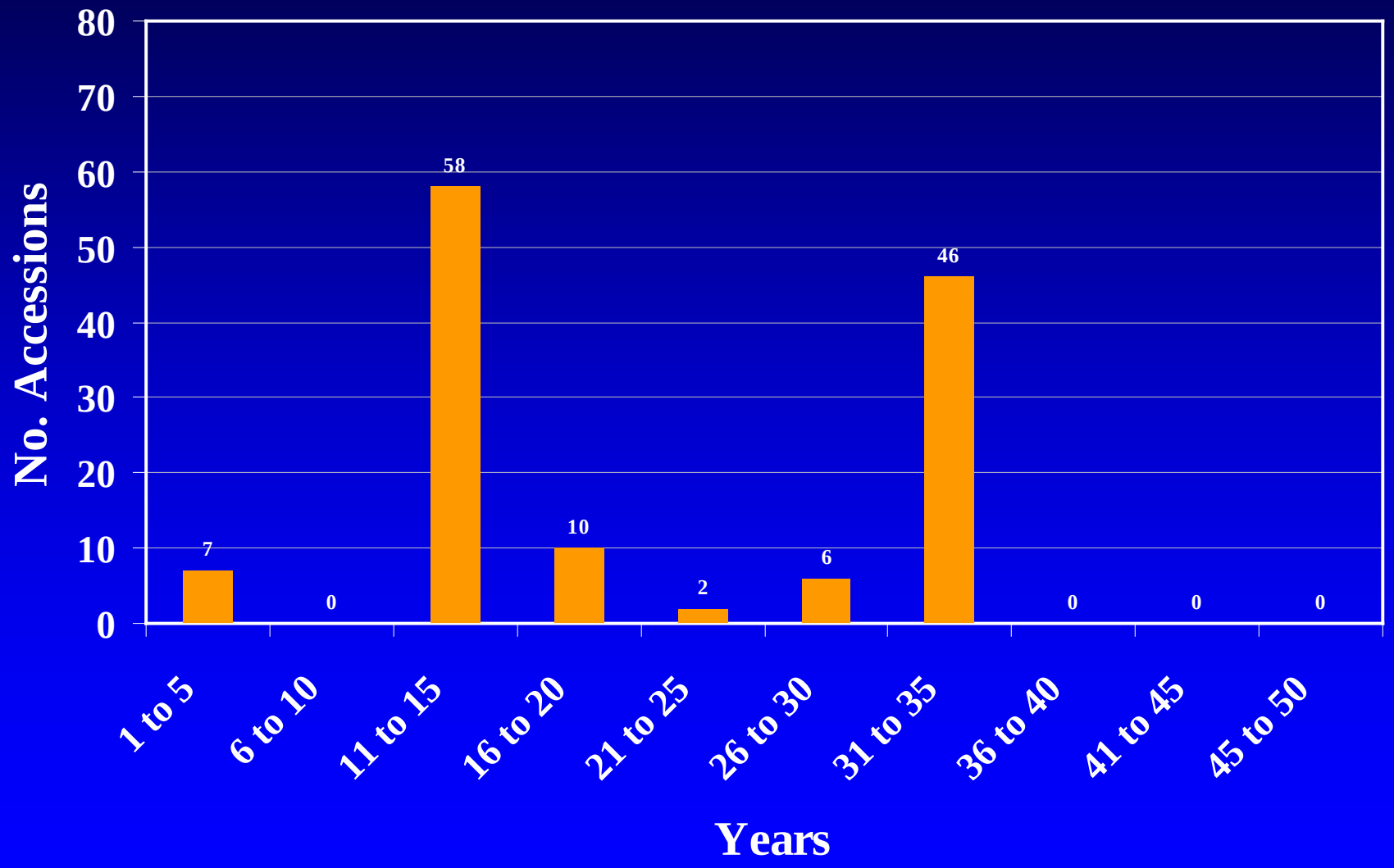
Gourds – Age of Seed



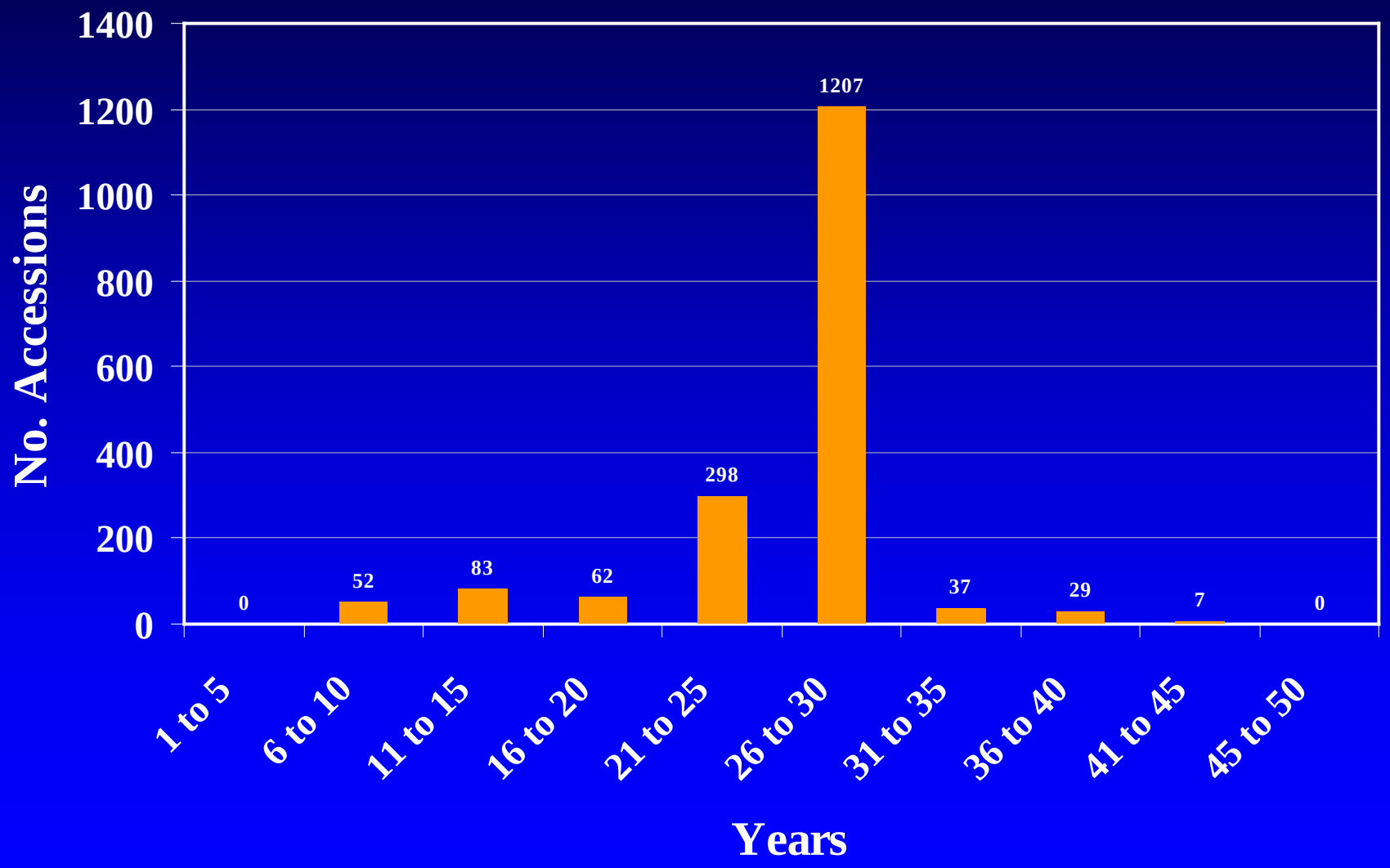
Ipomoea spp. – Age of Seed



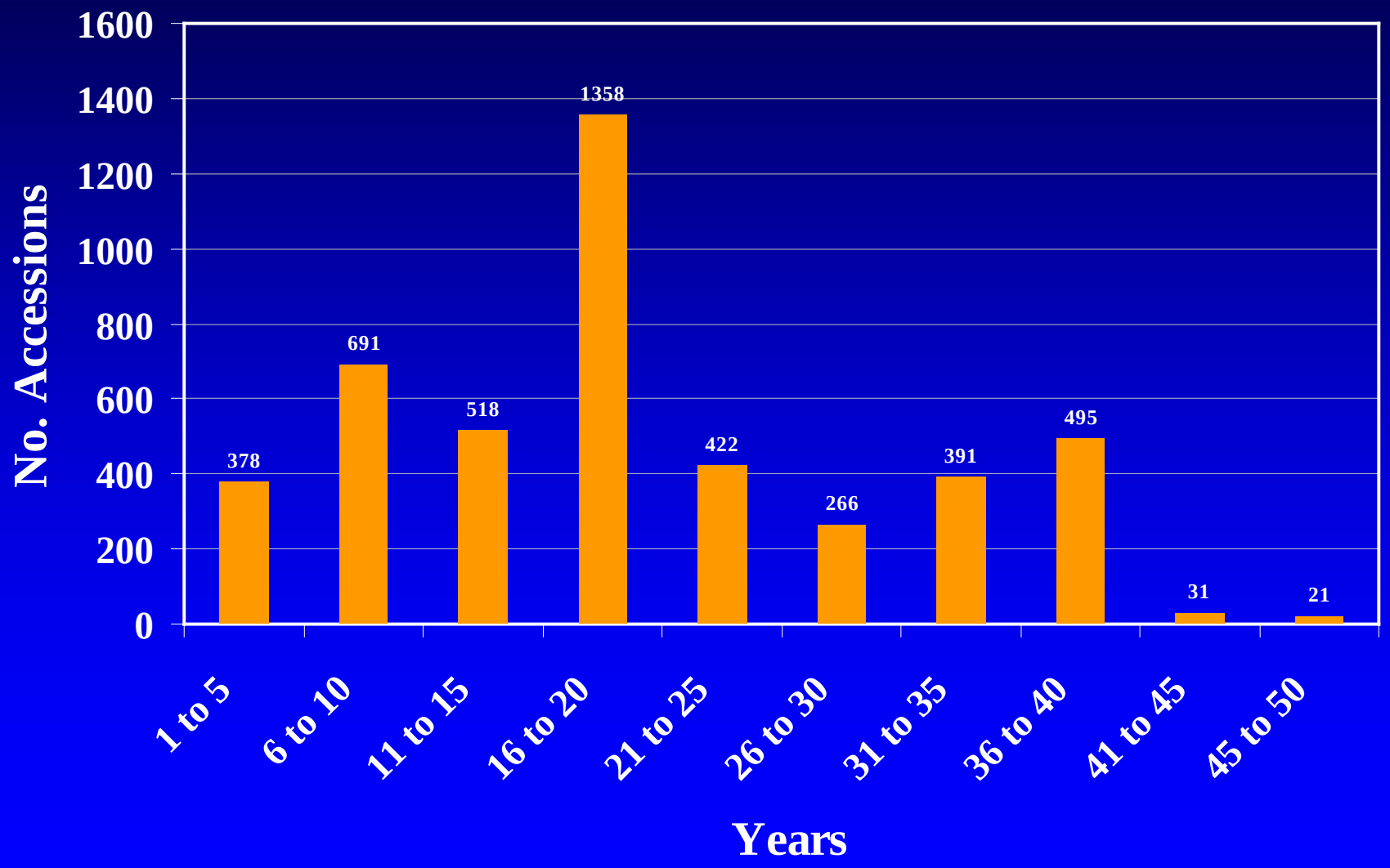
Luffa – Age of Seed



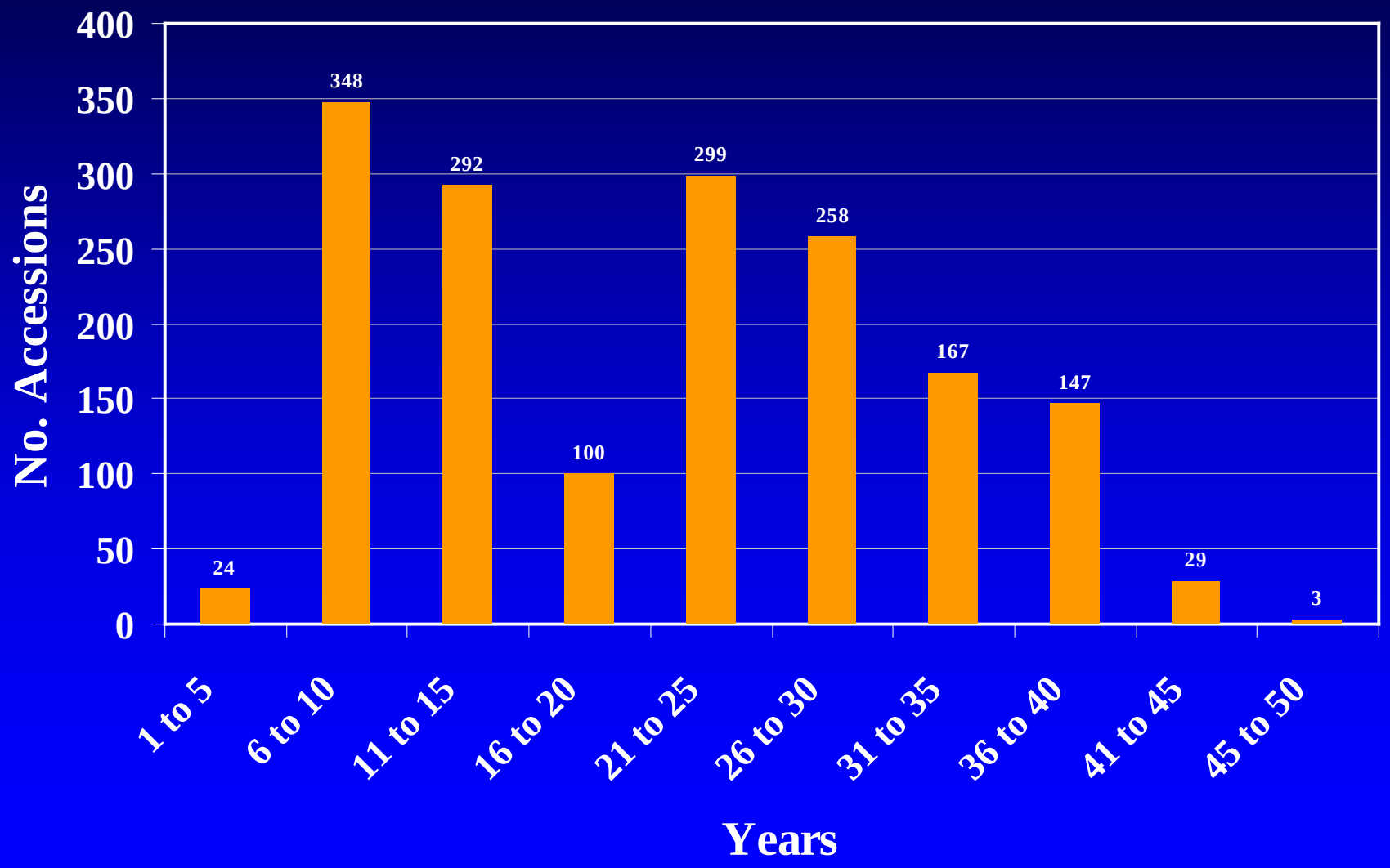
Okra – Age of Seed



Pepper – Age of Seed



Watermelon – Age of Seed



Appendix 5

DR. ROY PITTMAN

VIGNA COLLECTION STATUS

Vigna Collection Status 8/11

Group	# of Gen/spp	Total	# Avail	Not Av.	Backed Up	NSSL Only	NSSB Only
Bambara Groundnut	1/1	104	48 (46%)	56 (54%)	100 (96%)	0	0
Cowpea	1/7						
Mung Bean	1/5						
Other Spp	1/23						
Totals							

Vigna Collection Status 8/11

Group	# of Gen/spp	Total	# Avail	Not Av.	Backed Up	NSSL Only	NSSB Only
Bambara Groundnut	1/1	104	48 (46%)	56 (54%)	100 (96%)	0	0
Cowpea	1/7	**8,043**	**6,430 (80%)**	**1,613 (20%)**	**8,019 (100%)**	**233**	**13**
Mung Bean	1/5						
Other Spp	1/23						
Totals							

Vigna Collection Status 8/11

Group	# of Gen/spp	Total	# Avail	Not Av.	Backed Up	NSSL Only	NSSB Only
Bambara Groundnut	1/1	104	48 (46%)	56 (54%)	100 (96%)	0	0
Cowpea	1/7	8,043	6,430 (80%)	1,613 (20%)	8,019 (100%)	233	13
Mung Bean	1/5	**4,203**	**3,822 (91%)**	**381 (9%)**	**4,203 (100%)**	**39**	**0**
Other Spp	1/23						
Totals							

Vigna Collection Status 8/11

Group	# of Gen/spp	Total	# Avail	Not Av.	Backed Up	NSSL Only	NSSB Only
Bambara Groundnut	1/1	104	48 (46%)	56 (54%)	100 (96%)	0	0
Cowpea	1/7	8,043	6,430 (80%)	1,613 (20%)	8,019 (100%)	233	13
Mung Bean	1/5	4203	3,822 (91%)	381 (9%)	4,203 (100%)	39	0
Other Spp	1/23	**495**	**303 (61%)**	**192 (39%)**	**352 (71%)**	**1**	**1**
Totals							

Vigna Collection Status 8/11

Group	# of Gen/spp	Total	# Avail	Not Av.	Backed Up	NSSL Only	NSSB Only
Bambara Groundnut	1/1	104	48 (46%)	56 (54%)	100 (96%)	0	0
Cowpea	1/7	8,043	6,430 (80%)	1,613 (20%)	8,019 (100%)	233	13
Mung Bean	1/5	4,203	3,822 (91%)	381 (9%)	4,203 (100%)	39	0
Other Spp	1/23	495	303 (61%)	192 (39%)	352 (71%)	1	1
Totals		**12,845**	**10,603 (83%)**	**2,242 (17%)**	**12,674 (99%)**		

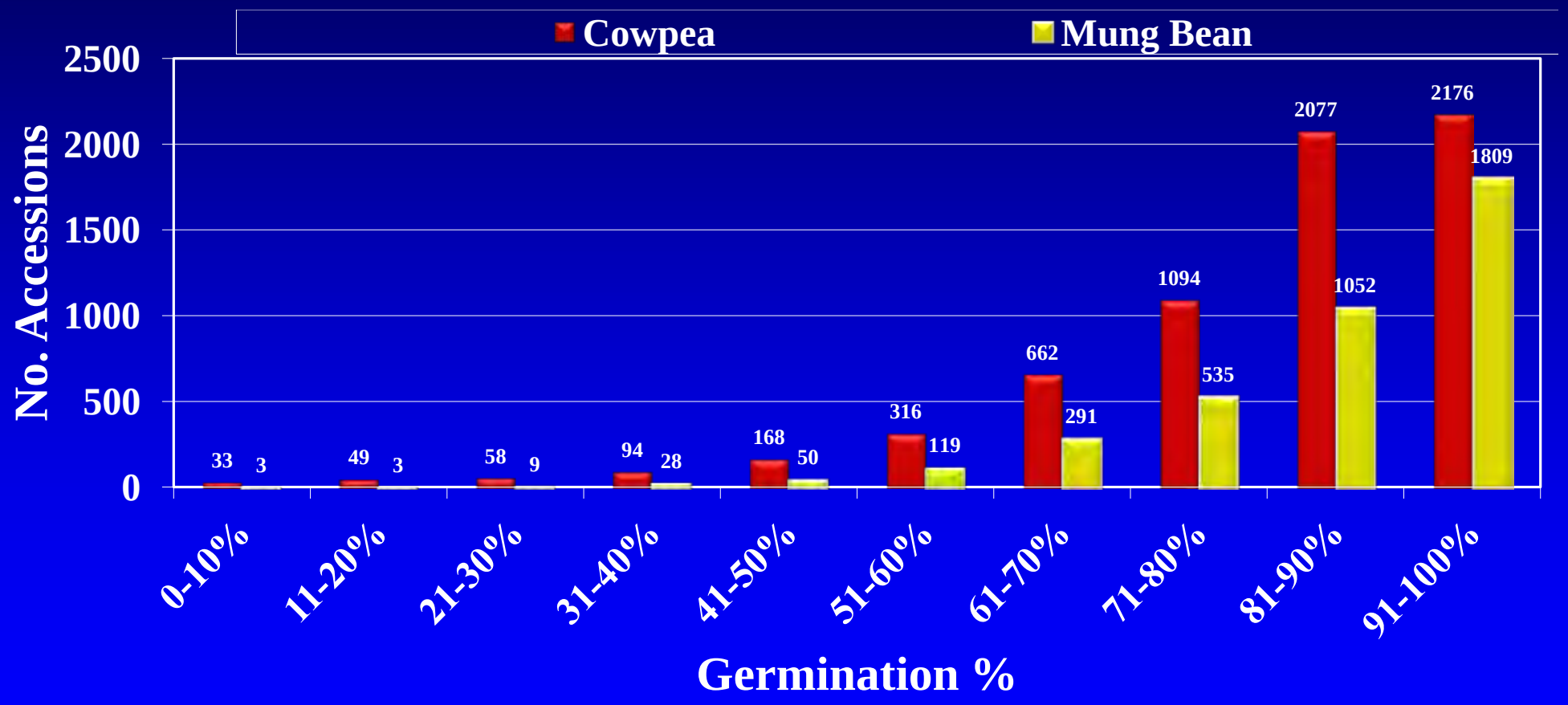
Materials at NSSL and NSSB?

- NSSB – One accession for Millennium Seed Bank Project. Twelve are PVPO.
- NSSL – 263 are expired PVP's which will be moved.

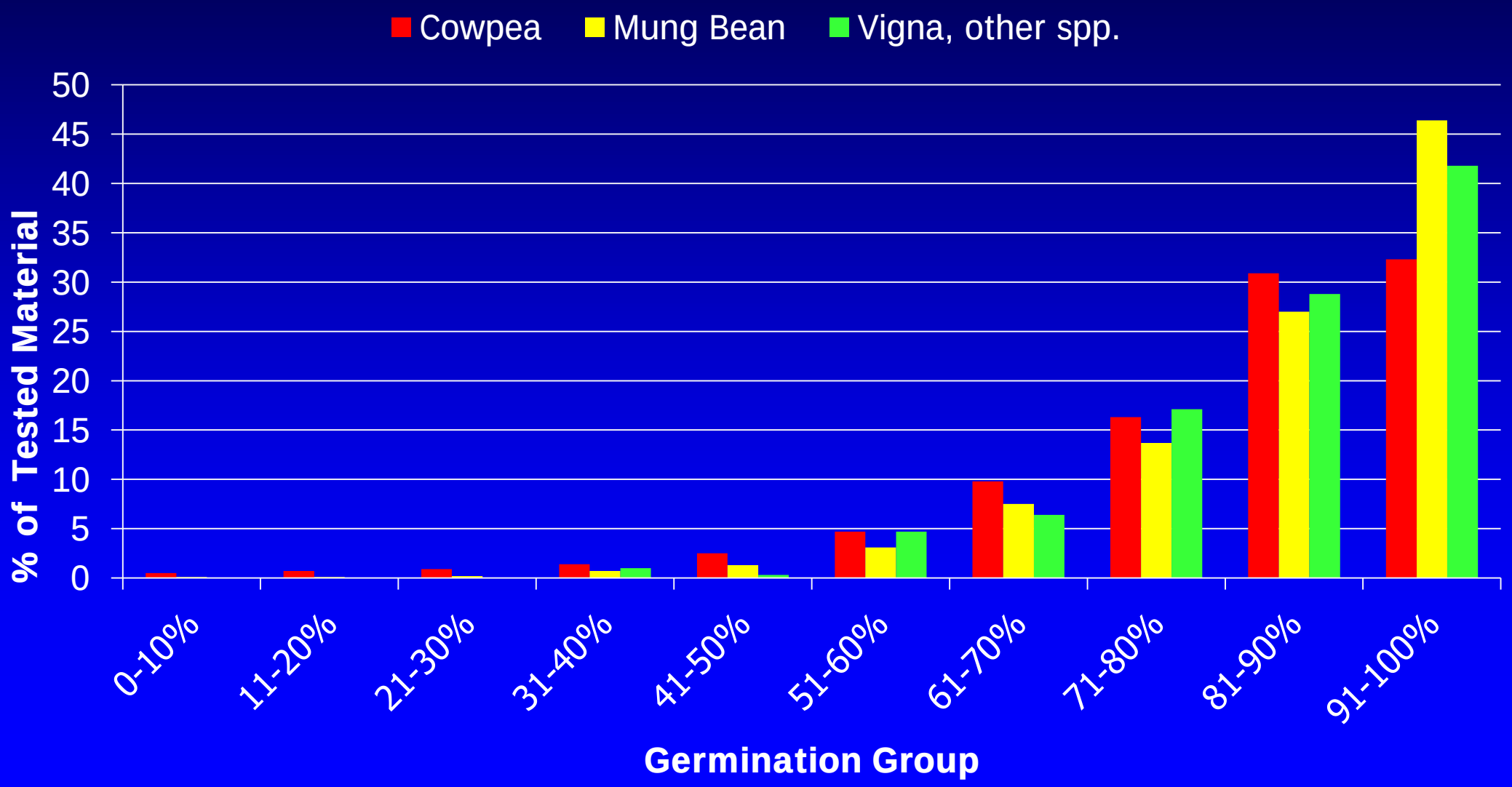
Vigna Storage Conditions

Group	Total Acc.	4C	-18C
Bambara Ground nut	104	45 (43%)	59 (57%)
Cowpea	8,043	7,205 (90%)	838 (10%)
Mung Bean	4,203	158 (4%)	4,045 (96%)
Other Vigna Spp	495	0 (0%)	495 (100%)

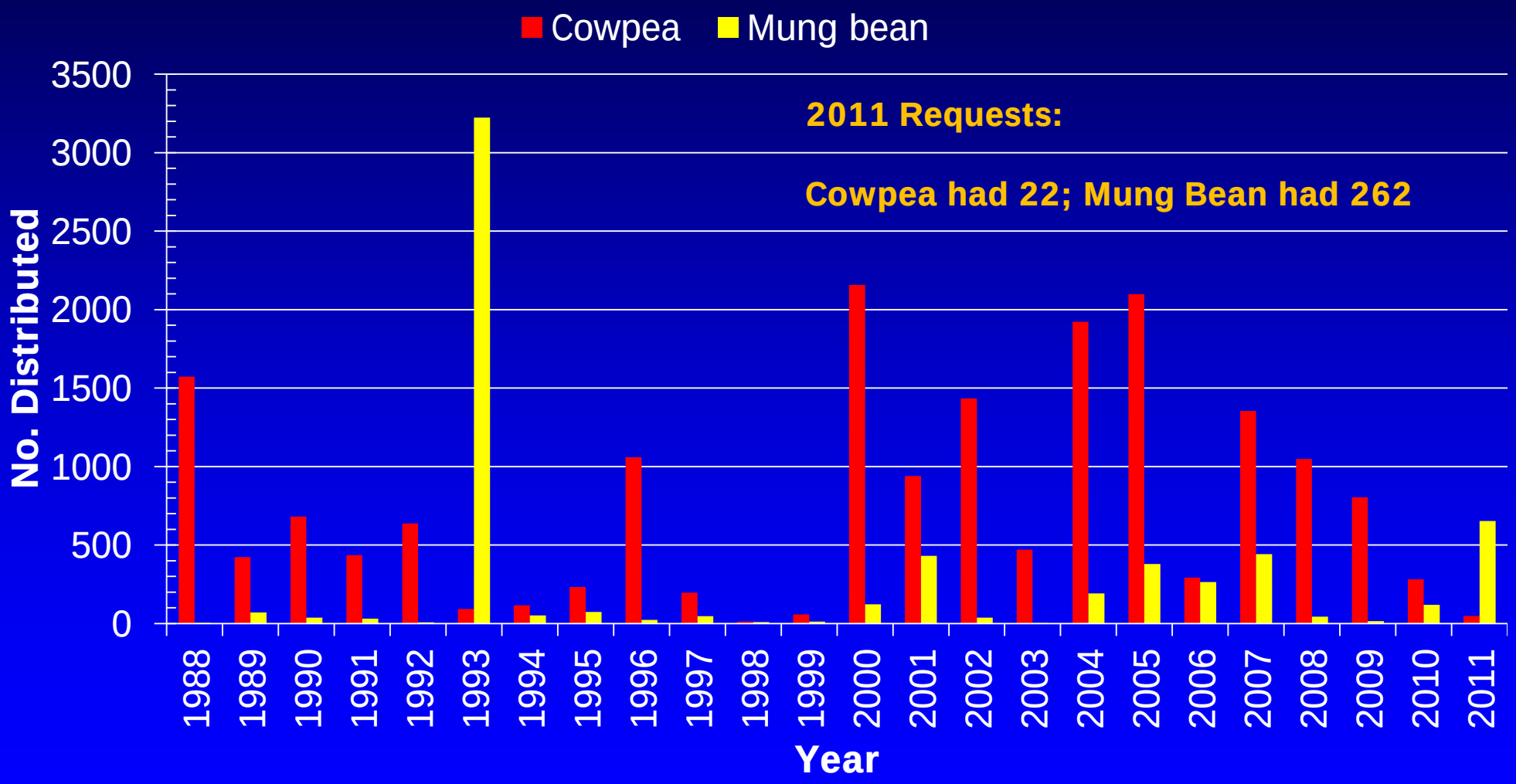
Vigna – Viability



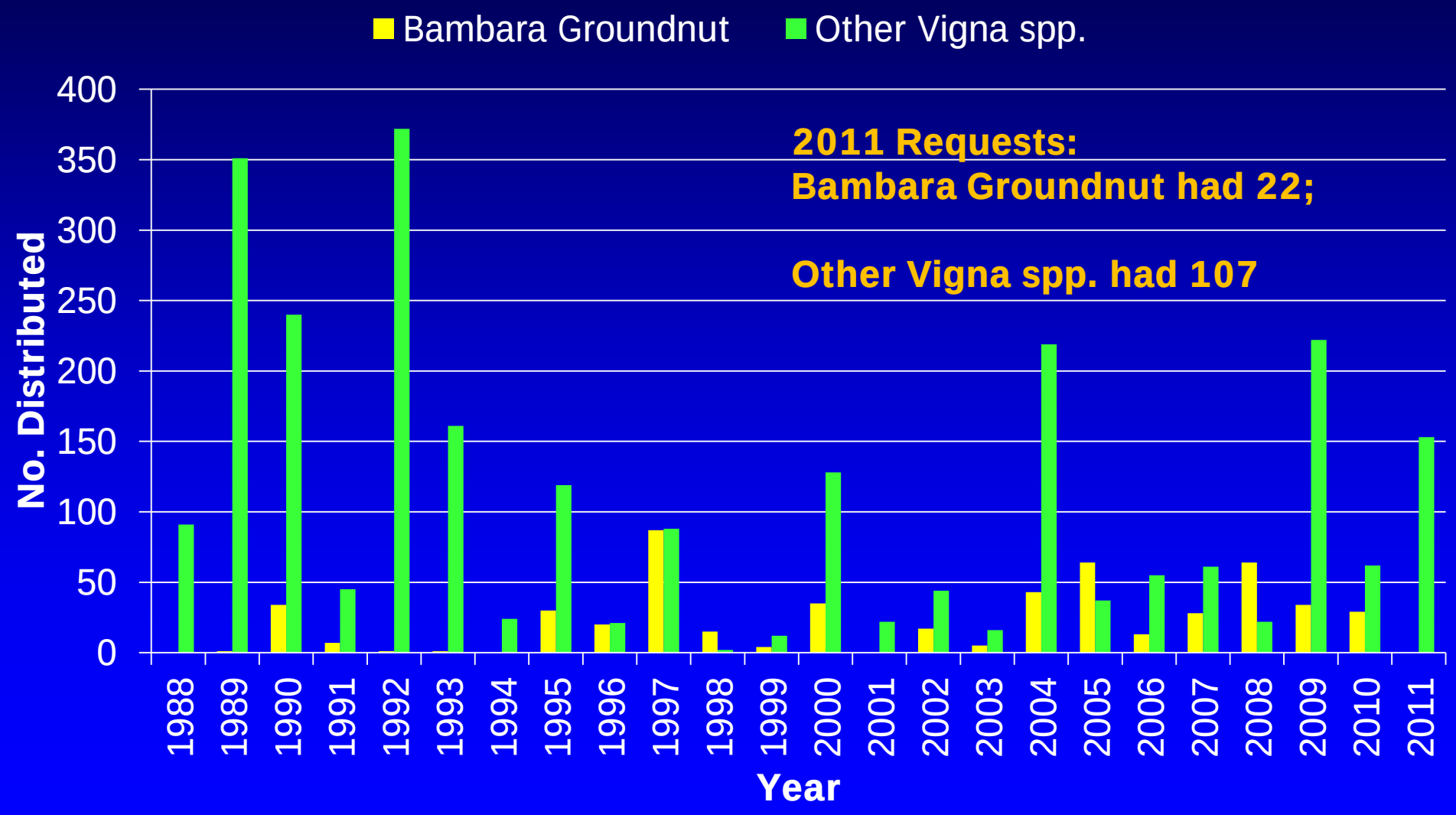
Vigna – % Viability



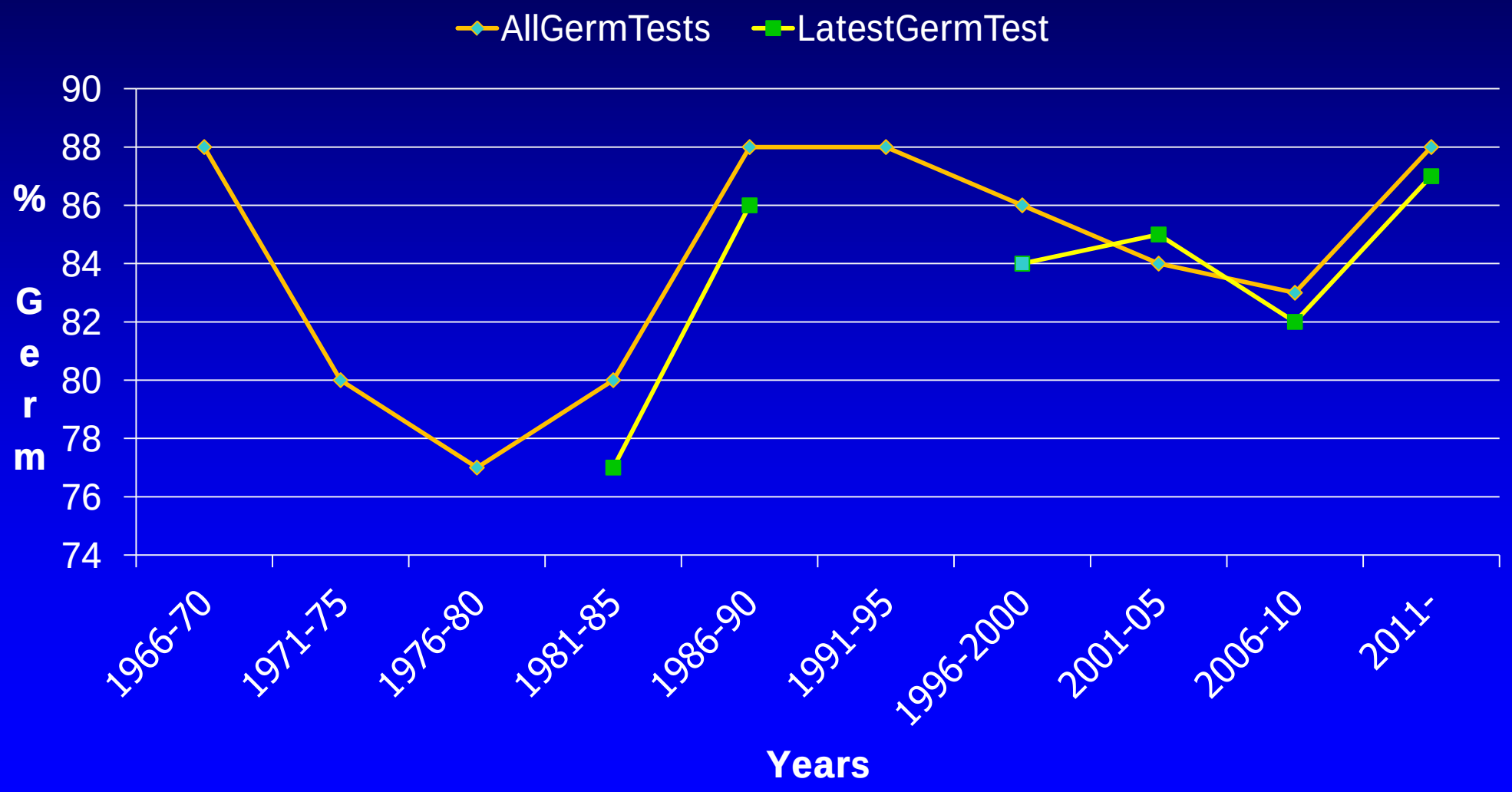
Vigna – Utilization of Accessions 1988-2011



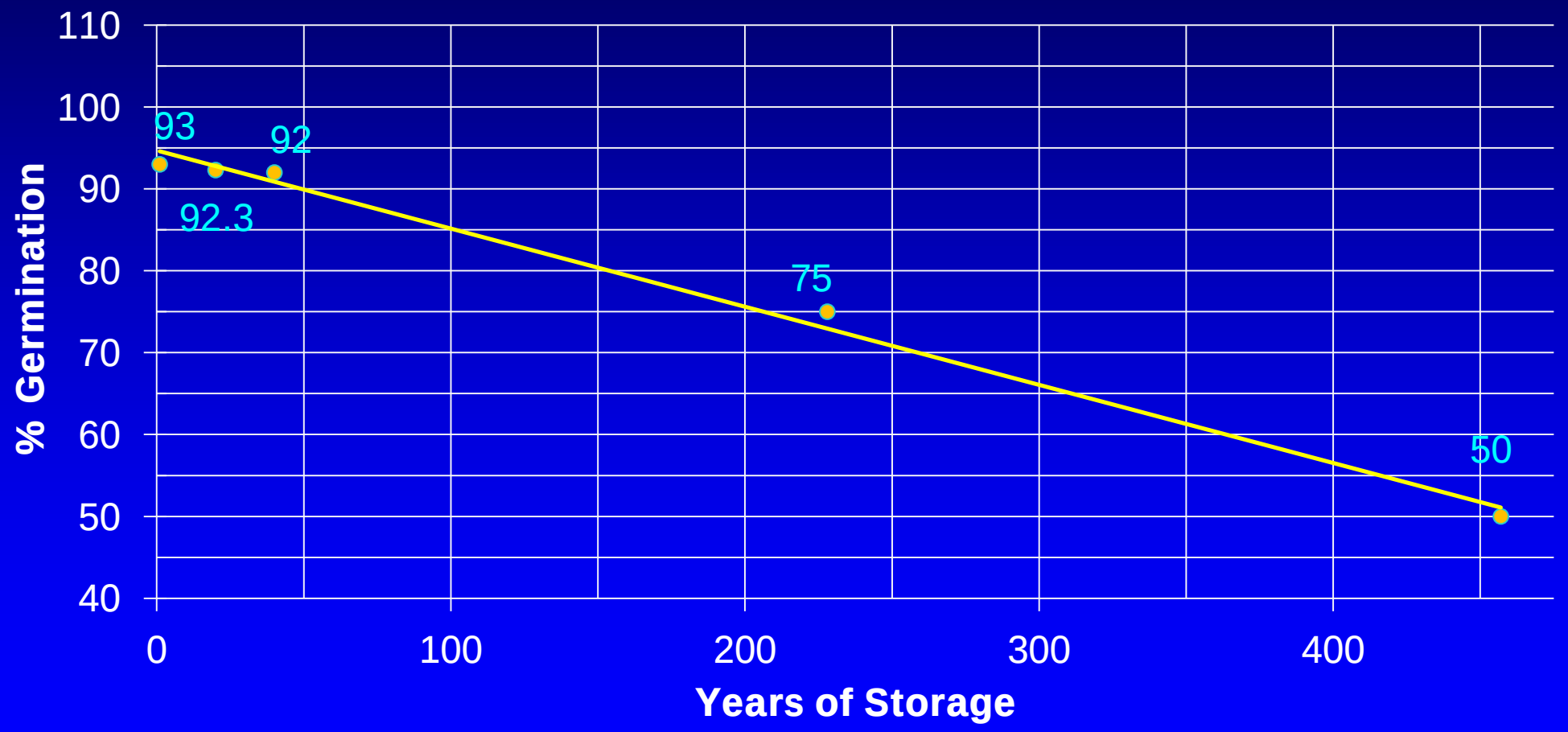
Vigna – Utilization of Accessions 1988-2011



Average Germination Grouped by Years



Longevity of *Vigna radiata* (181) Mung Bean



How many accessions should be increased per year?

- **Approximately 13,000 accessions in collection**

How many accessions should be increased per year?

- Approximately 13,000 accessions in collection
- **If one regenerated material when germination reached 80%, regeneration would be every 150 years. If the number of seeds on hand became low, you would regenerate earlier.**

How many accessions should be increased per year?

- Approximately 13,000 accessions in collection
- If one regenerated material when germination reached 80%, regeneration would be every 150 years. If the number of seeds on hand became low, you would regenerate earlier.
- **Each year one would need to be regenerating –**

  13,000/150 = 87 accessions

In Summary: We Regenerate

- **50 accessions in the field**

In Summary: We Regenerate

- 50 accessions in the field
- **32 accessions in the greenhouse**

In Summary: We Regenerate

- 50 accessions in the field
- 32 accessions in the greenhouse
- 50 accessions at Puerto Rico

In Summary: We Regenerate

- 50 accessions in the field
- 32 accessions in the greenhouse
- **50 accessions at Puerto Rico**

In Summary: We Regenerate

- 50 accessions in the field
- 32 accessions in the greenhouse
- 50 accessions at Puerto Rico

We might actually be in front for maintaining collection

Questions: J

Vigna Descriptors Collected

- Chemical
- Disease
- Growth Habit
- Insect
- Morphology
- Seed Characters
- Phenology
- Production
- Stress

Proposed New Root Descriptors:

- **Chemical**
- **Root Color**
- **Root Diameter**
- **Root Length**
- **Root Weight**

Summary of Root Modifications

Underground roots for storage		Aerial roots for various functions
Tap roots	Adventitious roots	
1. Fusiform root e.g., Raddish	1. Tuberous roots e.g., Sweet potato	A. For mechanical support 1. Prot roots e.g., Banyan 2. Stilt roots e.g., Pandanus 3. Climbing roots e.g., Betel
2. Napiform root e.g., Beetroot	2. Fasciculated roots e.g., Dahlia	B. Sucking roots e.g., Cuscuta
3. Conical root e.g., Carrot	3. Nodulose roots e.g., Mangoginger	C. Respiratory roots - Pneumatophores e.g., Aricennia
	4. Moniliform root e.g., Momordica	D. Floating roots e.g., Jussiea
	5. Annulated roots e.g., Ipecacuanha	E. Epiphytic roots e.g., Vanda

Cultivated Cowpea Tuber

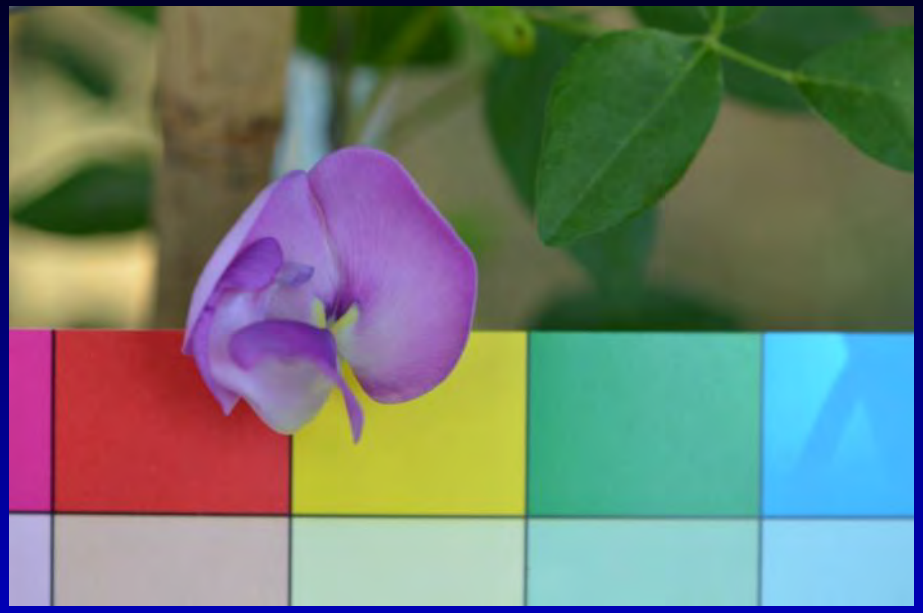
Regeneration Locations in Griffin

Greenhouse

Field

Examples of Descriptors Collected

Leaf Shapes



Questions: J

Appendix 6

DR. MELANIE HARRISON-DUNN

CURATION REPORT
WARM SEASON GRASSES, PEARL MILLET, BAMBOO

Curation Report

Warm Season Grasses
Pearl Millet
Bamboo

Melanie Harrison-Dunn
S-009 Meeting
August 2011

WS Grasses – Status of Collection

- 7,268 accessions
- 102 genera, 482 species
- 6097 (84%) available
- 6888 (95%) backed up
- 6870 (95%) @ 18C

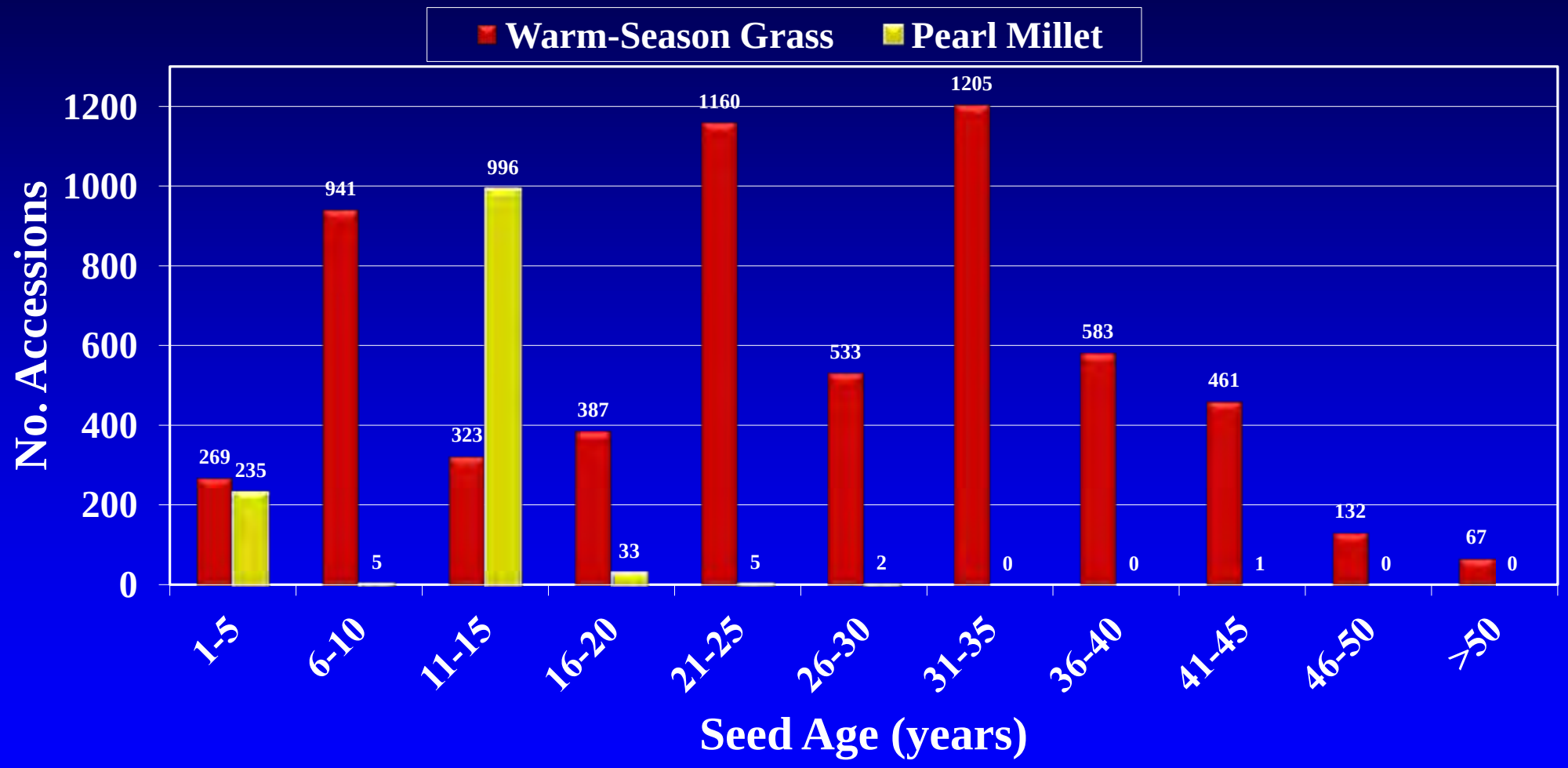
Pearl Millet – Status of Collection

- 1319 accessions
- 1270 (96%) available
- 1319 (100%) backed up
- 202 (15%) @ 18C

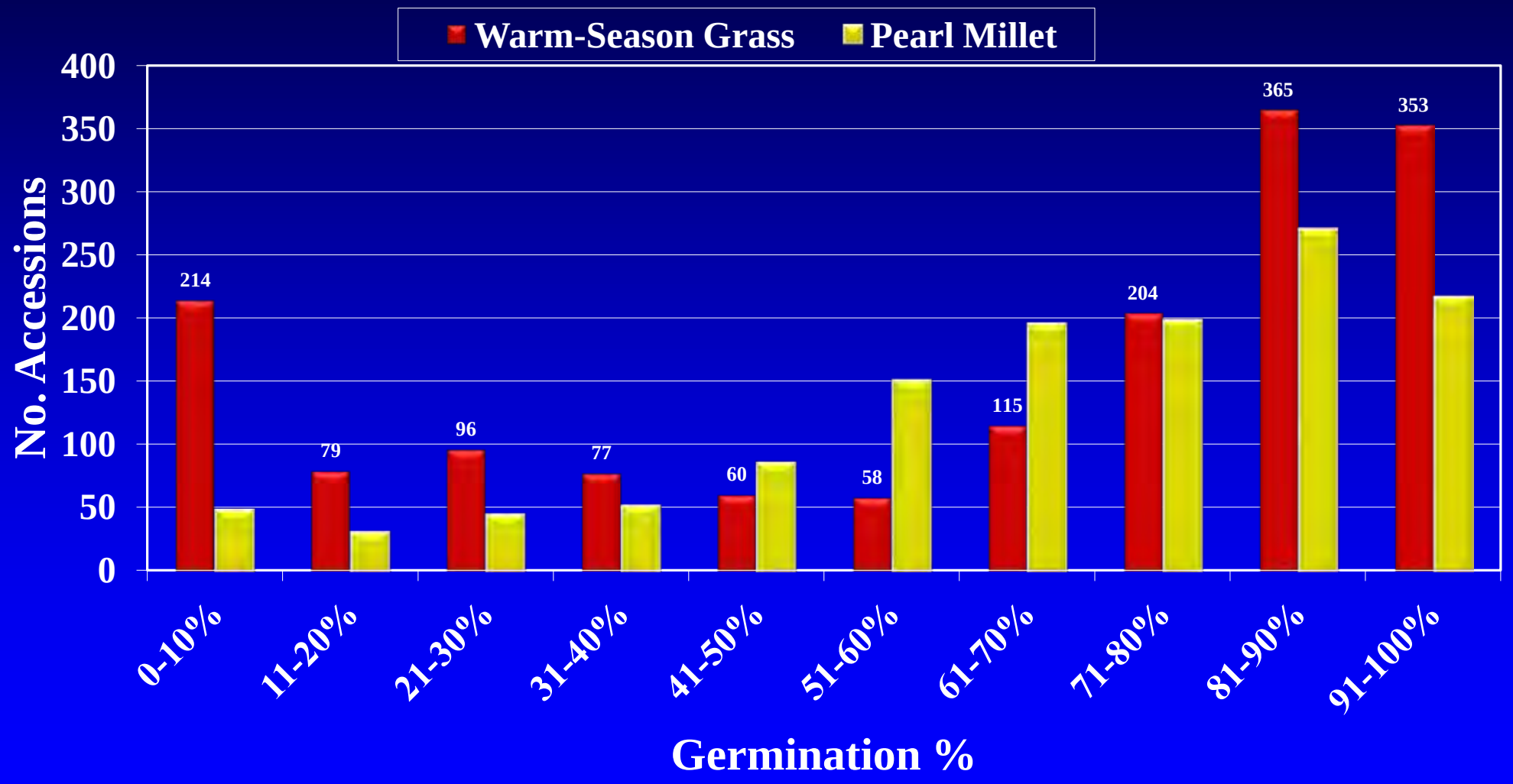
Bamboo – Status of Collection

- 96 accessions
- 10 genera, 48 species
- 96 available
- 2 backed up (Puerto Rico)

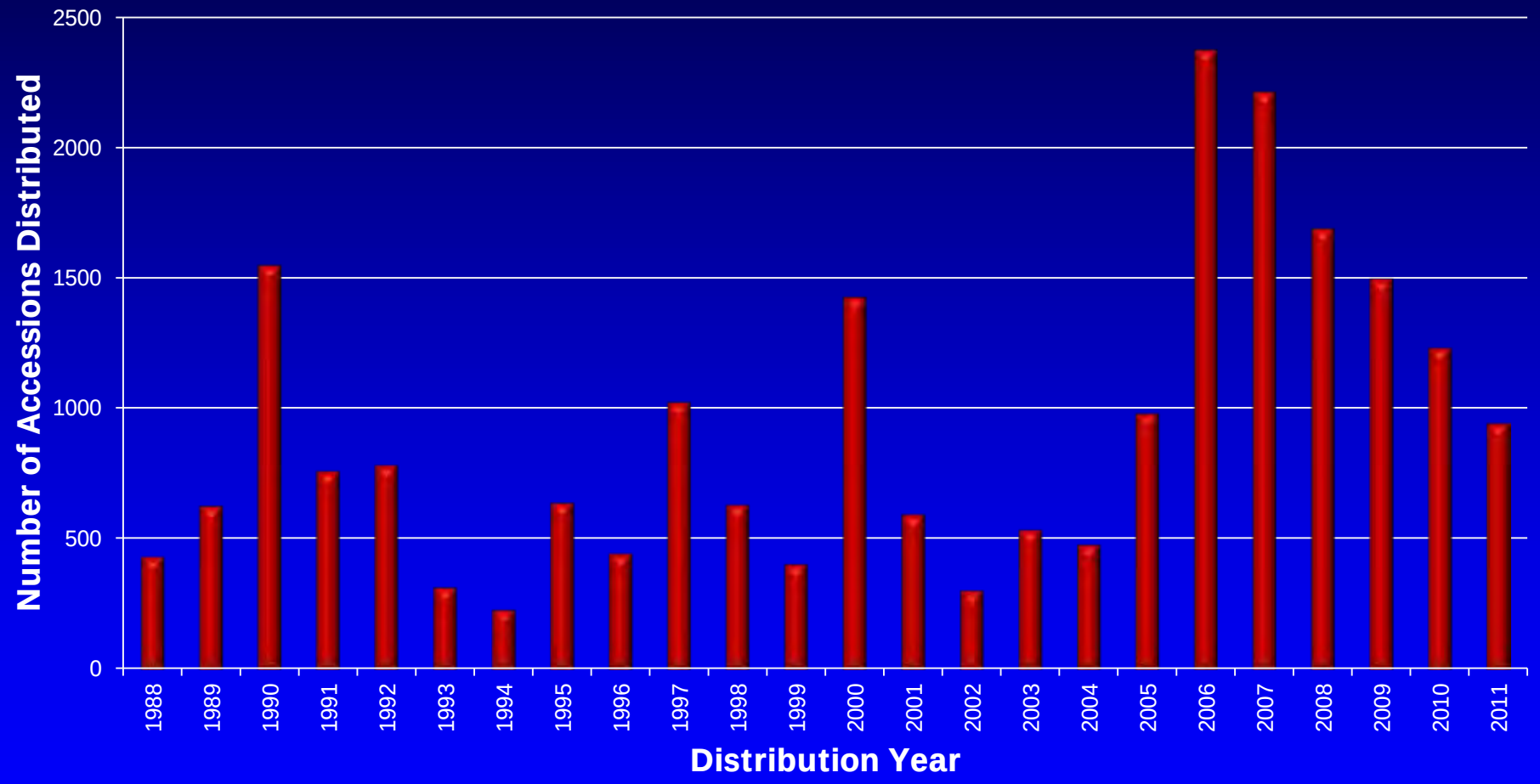
Grass & Pearl Millet – Seed Age



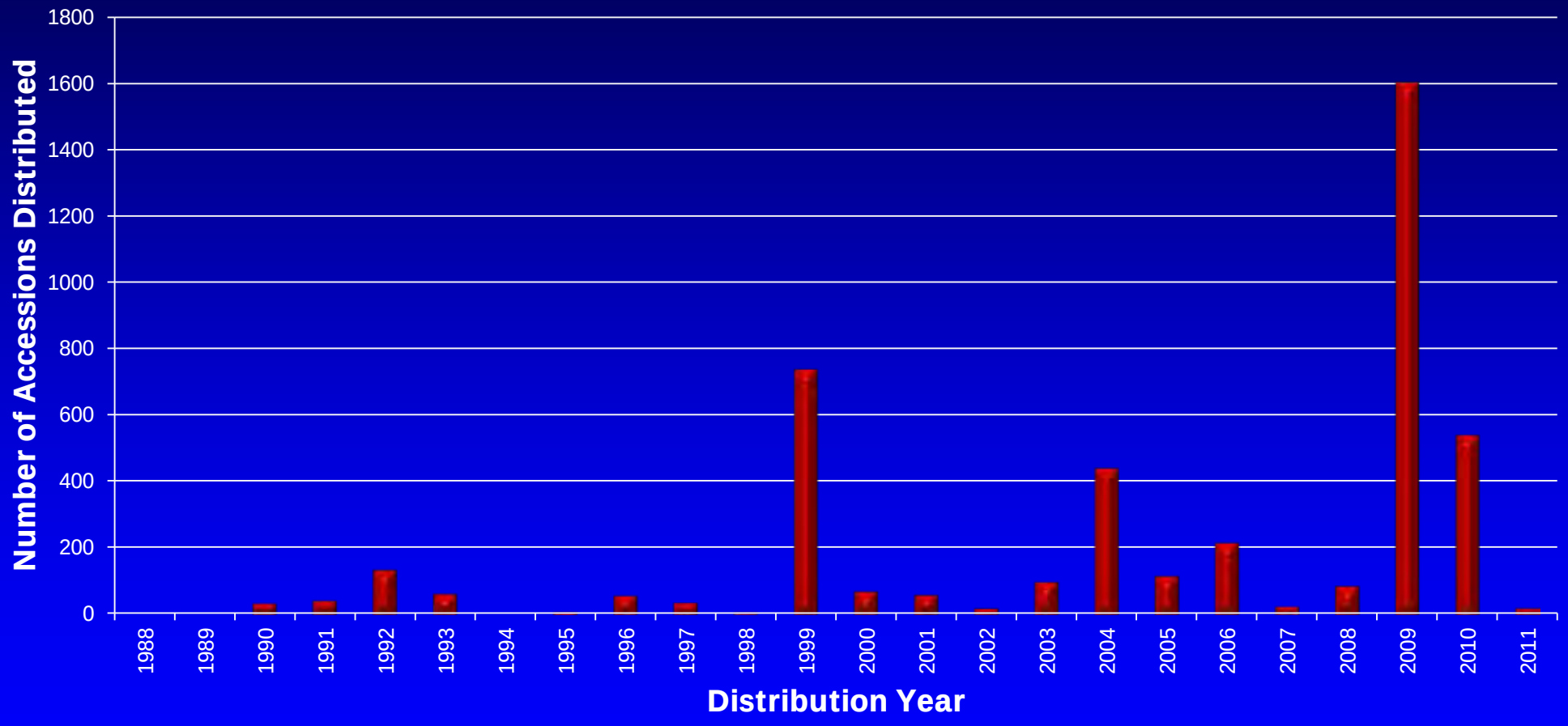
Grass and Pearl Millet – Viability



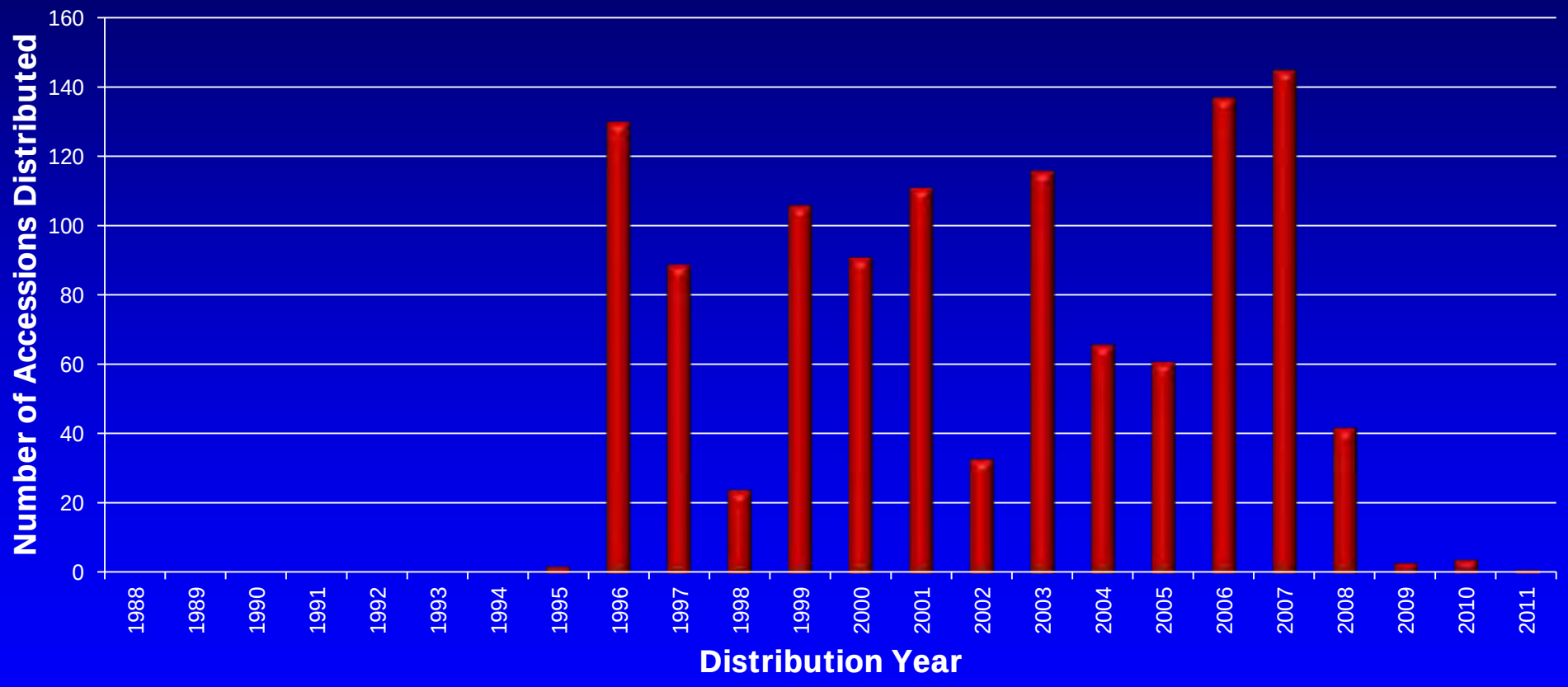
WS Grasses - Utilization



Pearl Millet - Utilization



Bamboo - Utilization



WS Grasses – Top Ten Requested Accessions

ID	Distributions	Taxon	Cultivar
PI 421521	91	Panicum virgatum	KANLOW
PI 422006	88	Panicum virgatum	ALAMO
PI 196257	65	Chrysopogon zizanioides	
PI 271633	62	Chrysopogon zizanioides	1027
PI 469228	62	Panicum virgatum	Cave-in-Rock
PI 476297	62	Panicum virgatum	Caddo
PI 537588	62	Panicum virgatum	DACOTAH
PI 591824	61	Panicum virgatum	SHAWNEE
PI 302300	60	Chrysopogon zizanioides	A 7026
PI 431575	57	Panicum virgatum	KY 1625

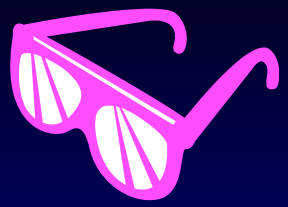
Pearl Millet – Top Ten Requested Accessions

ID		Distributions	Taxon	Cultivar
PI	300088	20	Pennisetum glaucum	Pearl millet
PI	532675	19	Pennisetum sieberianum	Chibra
PI	219820	18	Pennisetum glaucum	Bearded Munga
PI	586660	18	Pennisetum glaucum	ICMV-IS 88102
PI	279664	15	Pennisetum glaucum	Early Millet Ghana 1
PI	462372	14	Pennisetum glaucum	35
PI	535955	14	Pennisetum glaucum	Dogona (Arabic language)
PI	164410	13	Pennisetum glaucum	Bajra
PI	185642	13	Pennisetum glaucum	
PI	296377	13	Pennisetum glaucum	Ames 93
PI	532674	13	Pennisetum glaucum	Chibra
PI	536331	13	Pennisetum glaucum	Kazoui peelga
PI	537065	13	Pennisetum glaucum	Bouchoucheni (Tamacheq language)
PI	572232	13	Pennisetum glaucum	IKMV 8201
PI	587024	13	Pennisetum glaucum	15012

Bamboo– Top Ten Requested Accessions

ID	Distributions	Taxon	Cultivar
PI 647947	53	Phyllostachys nigra	Hale
PI 647942	41	Phyllostachys bambusoides	Castillon
PI 647937	39	Hibanobambusa tranquillans	Shiroshima
PI 647943	38	Phyllostachys bambusoides	Allgold
PI 77259	34	Phyllostachys nigra	Muchisasa
PI 25835	32	Pseudosasa japonica var. tsutsumiana	TARS 16445
PI 73452	31	Phyllostachys dulcis	TARS 16441
PI 546939	30	Phyllostachys aureosulcata	HARBIN
PI 143540	29	Phyllostachys bissetii	TARS 16484
PI 112080	28	Semiarundinaria fastuosa	TARS 16461

Regeneration Plan - Notes



- Presented Plan is *Ideal* Plan – not limited by land, labor, and supplies

- Current land, labor, supplies =
  - 100 accessions per year for WS grasses
  - 2 accessions per year for pearl millet

Regeneration

Target population = 100 plants per accession

Accessions isolated by distance to reduce cross pollination between accessions

Same number of seed heads harvested per plant to reduce genetic drift

WS Grasses – Regeneration Plan

Regeneration Year	Criteria	# of Accessions	Total # of Accessions for Regeneration Year
1	Storage >46 Years	199	
	0-10% Viability	214	
	NSSL Only Accessions (est)	10	423
2	Storage 41-45 Years	230	
	11-20% Viability	79	
	NSSL Only Accessions (est)	10	319
3	Storage 41-45 Years	231	
	21-30% Viability	96	
	NSSL Only Accessions (est)	10	337
4	Storage 36-40 Years	292	
	31-40% Viability	77	
	NSSL Only Accessions (est)	10	379
5	Storage 36-40 Years	291	
	41-50% Viability	60	
	NSSL Only Accessions (est)	10	361
6-10	<50% Viability (est)	1807	362
11-25	Remaining Accessions	4935	329

Pearl Millet – Regeneration Plan

Regeneration Year	Criteria	# of Accessions	Total # of Accessions for Regeneration Year
1	0-20% Viability	80	
	Storage >25 Years	3	83
2	21-40% Viability	97	97
3	41-50% Viability	86	86
4-5	51-60% Viability	151	75-76
6-9	61-70% Viability	196	49
10-13	71-80% Viability	199	
	Storage >15 Years	38	60

Questions

Appendix 7

DR. NOELLE BARKLEY

REGENERATION PLAN FOR THE ARACHIS GERMPLASM COLLECTION

Regeneration Plan for the *Arachis* Germplasm Collection

Noelle Barkley

Taxonomy

- Cultivated *Arachis hypogaea*
  - 2 subspecies –*fastigiata* and *hypogaea*
  - 6 botanical varieties –*aequatoriana, fastigiata, peruviana, vulgaris, hypogaea*, and *hirsuta*

- Wild *Arachis* species
  - 80 described species
  - USDA collection contains 65 species

Arachis Germplasm Collection

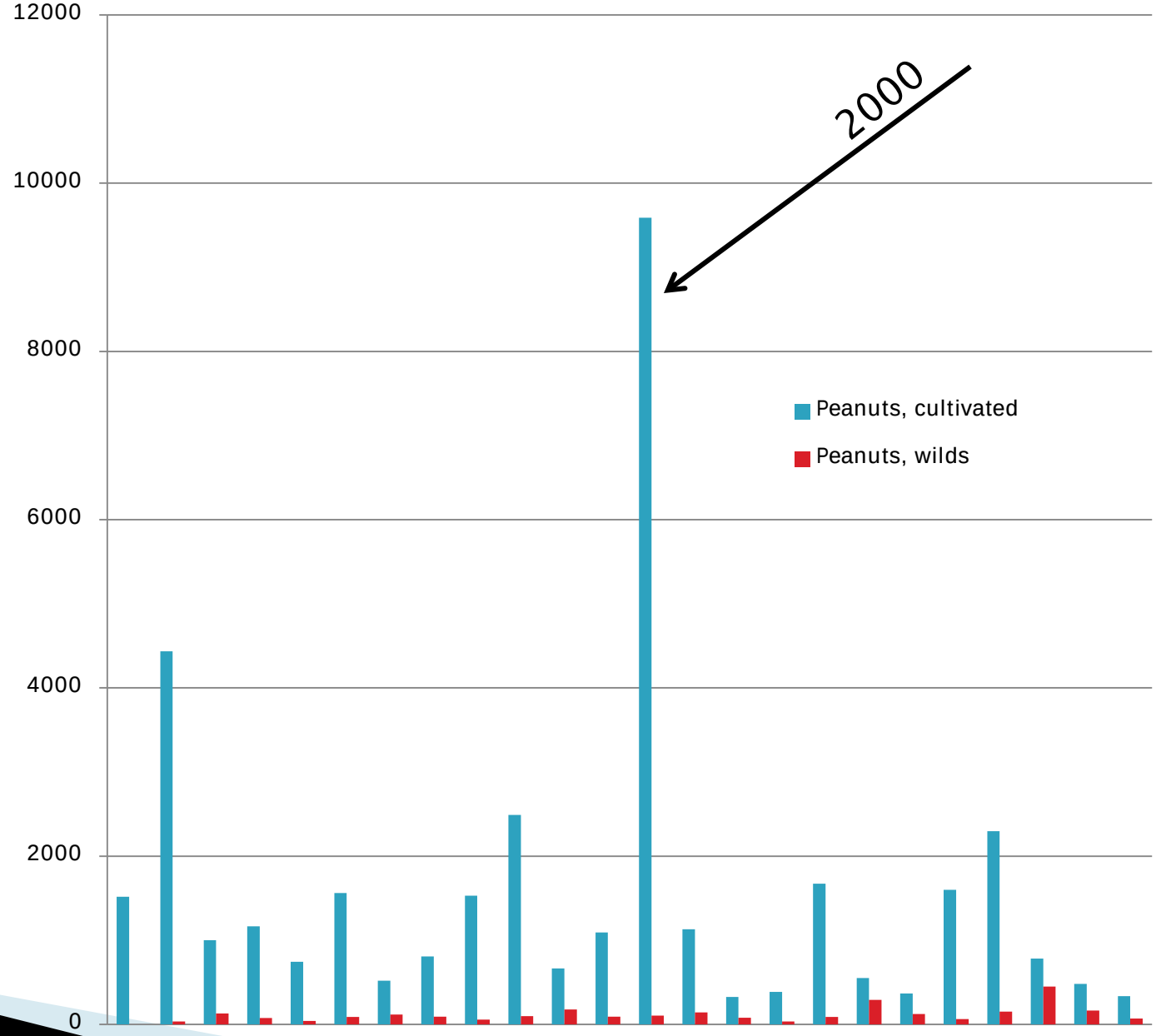
- Totals
  - 9,310 cultivated
  - 607 wild species
- Available
  - 8,075 cultivated (86.73%)
  - 406 wild species (66.88%)
- Back Up at NSSL
  - Cultivated 96.7%
  - Wilds 62.4%
- -18C
  - 6,208 (66.7%) cultivated
  - 43 (7%) wilds

Core Collection

- Core collection
  - Derived from 7,432 cultivated germplasm accessions
  - Core consists of 831accessions
    - Available 795 (95.6%)
    - List send out to breeders
- Mini core
  - 112 accessions
    - Available 109 (97.3%)
- *A. hypogaea fastigiata var. fastigiata* (valencia)
  - Derived from 630 accessions
    - Core subset of 77 accessions
    - Need to add to GRIN

Distributions 1988–2011

- Totals
  - Cultivated 37,065
  - Mean 1,544
  - Wild 2,795
  - Mean 117



Top Distributed Items

- Cultivated
  - * Florunner (56 x)
  - * New Mexico Valencia A (44 x)
  - * Guanajuato (A. hypogaea var. hirsuta) (42 x)
  - * Pronto (31 x)
  - US 1260 (A. hypogaea var. hirsuta) (29 x)
  - Georgia red (29 x)
  - * Early Bunch (28 x)
  - Spanco (26 x)
  - * Chico (26 x)

* = U.S. Standards

Top Distributed Items

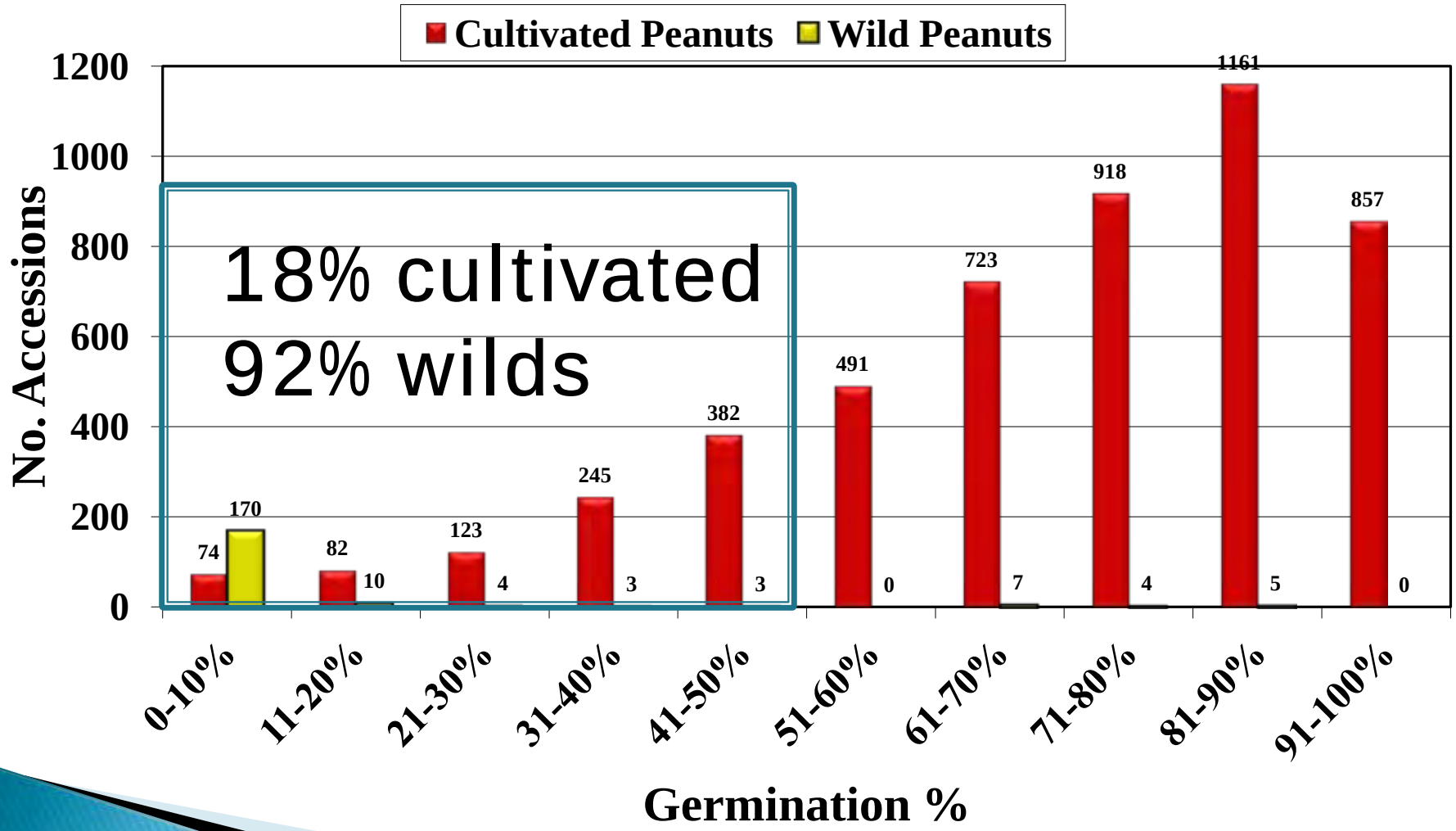
- Wild Species
  - *Arachis ipaënsis* (43 x)
  - *Arachis pintoi* (33 x)
  - *Arachis duranensis* (31 x)
  - *Arachis diogoi* (30 x)
  - *Arachis monticola* (29 x)
  - *Arachis cruziana* (26 x)
  - *Arachis paraguariensis subsp paraguariensis* (24 x)
  - *Arachis glandulifera* (24 x)

Viability Information

- Germinations
  - Cultivated 5,056 = 54.3%
  - Wilds 206 = 25.3% complete

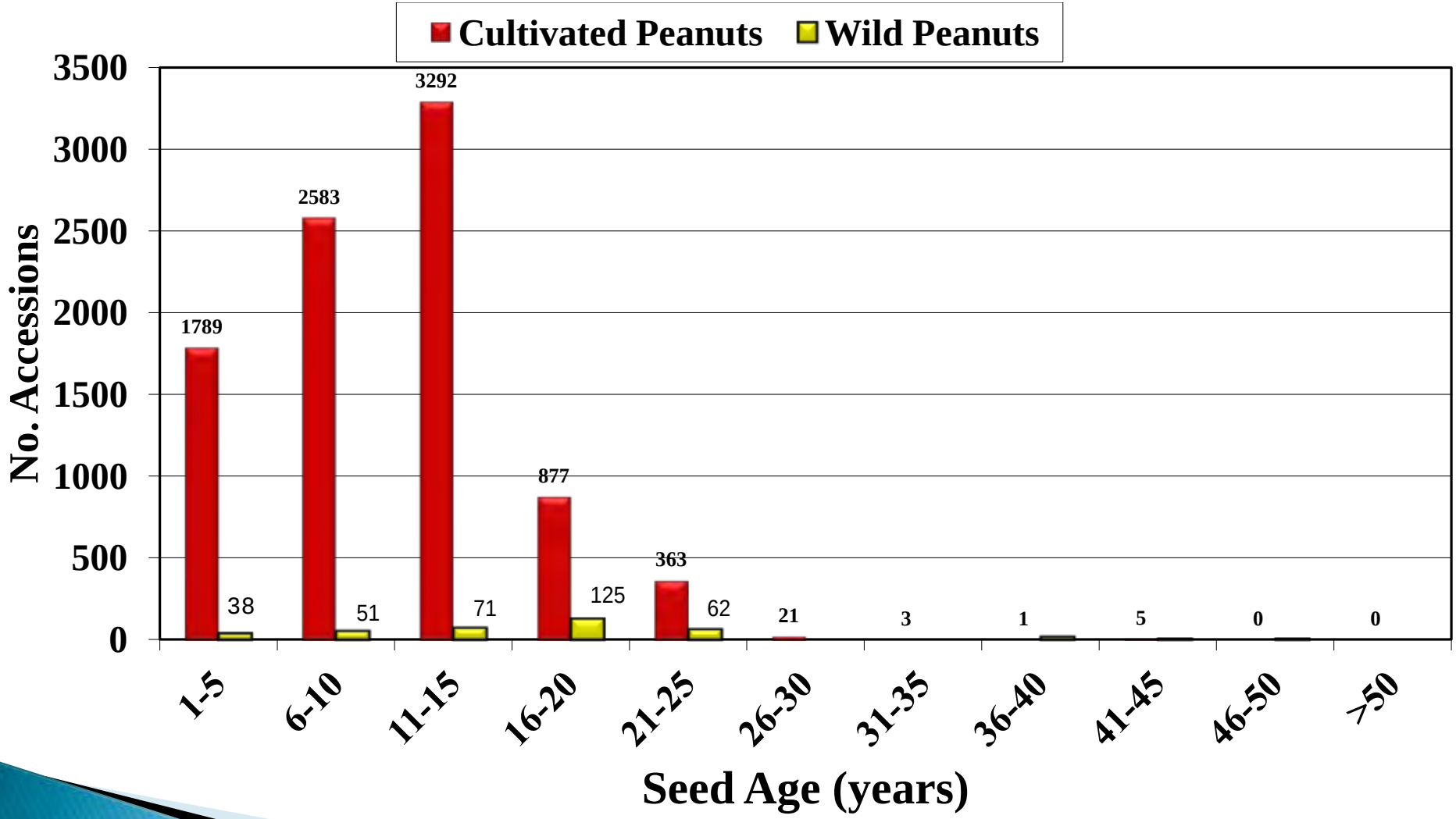
- Unknown viability
  - Cultivated 4,254 = 45.7%
  - Wilds 401 = 74.7%

Peanuts – Viability



18% cultivated
92% wilds

Peanuts – Seed Age



2011 Regenerations

- Cultivated
  - 210 in SE
  - 85 Tifton, GA
  - 75 Spanish Stillwater, OK
  - 125 West Texas
  - 100 East Texas
  - 125 N.C.
  - ~ 50 low seed accessions in GH
- Wilds
  - 270 accessions (38 species) GH
  - 75 in N.C.

U.S. Standards in Tifton

Descriptors:

Growth habit
Main stem
Flowers on main stem
Leaf color
Stem pigmentation
Pod traits
Seed traits

Quarantine 2011

- 92 accessions
  - 10-12 seeds planted for most accessions
  - Test for PStV and PeMoV via ELISA

- Origin
  - ICRISAT mini core
  - Uganda
  - Bolivia
  - Ghana

Digital Images

Future Regenerations

- Storage
  - 10-15 years to avoid loss
    - 660-1000 accessions regenerated / year
    - Help from peanut breeders, grant to support germplasm regeneration
  - Walters et al.
    - P50 780 accessions = 25 years in -18C
    - 372 cultivated accessions / year
    - Wilds = no data

Regeneration Priorities

- Accessions that have < 50% germ
- Low seed counts
- Old accessions > 10-15 years
- Frequently requested items
  - U.S. peanut standards
  - Core and mini core
  - Cultivated wild progenitors

Thank You