

Cotton Genetic Diversity

Jack C. McCarty

USDA-ARS

Mississippi State, MS

Cotton Improvement Programs

Genetic Variability Required:

Sources

- Modern or Obsolete Cultivars
- Primitive or Exotic Accessions
- Species

U.S. Cotton Germplasm Collection

<u>Germplasm</u>	<u># Accessions</u>
Upland (<i>G. hirsutum</i>)	3132
Primitive races (<i>G. hirsutum</i>)	2120
<i>G. barbadense</i>	1585
Asiatic- <i>G. arboreum</i>	1730
Asiatic- <i>G. herbaceum</i>	194
Wild species (40+)	581

U.S. Cotton Germplasm Collection

Diversity Exist

- Morphological traits
- Fiber traits
- Stress tolerance
- Disease tolerance
- Insect/nematode tolerance
- Seed traits (size, oil, protein)

Example of diversity



Naked seed

Example of diversity



Fiber-less

Example of diversity



Kidney seed Accession GB226

Example of diversity



Kidney seed

Example of diversity



Close fruiting (stove pipe)

Example of diversity



Large nectary

Example of diversity



Green, White, and Brown Lint

Example of diversity



Long Stigma, normal



Open Bud

normal

Example of diversity



Orange pollen



Petal spot

Example of diversity

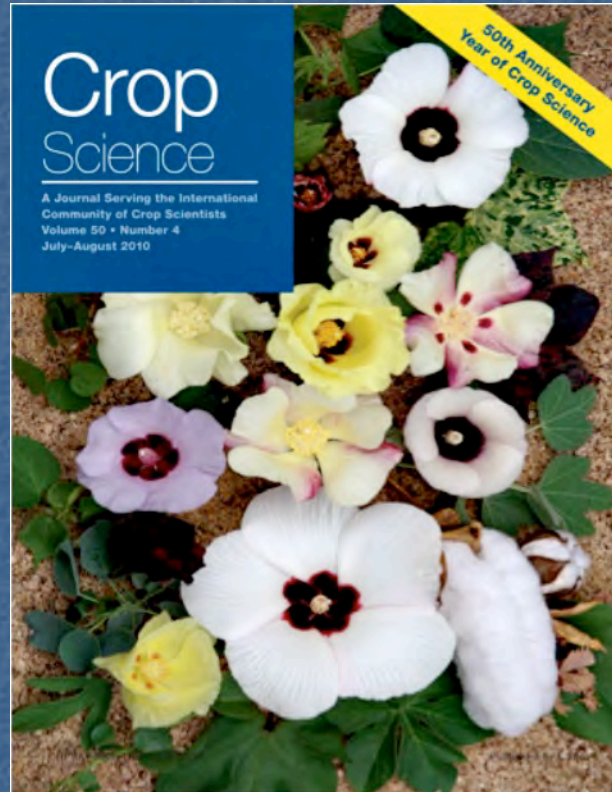


Frego bract



Normal bract

Example of diversity



Status of the global cotton germplasm resources
2010 Crop Science 50:1161-1179

Example of diversity



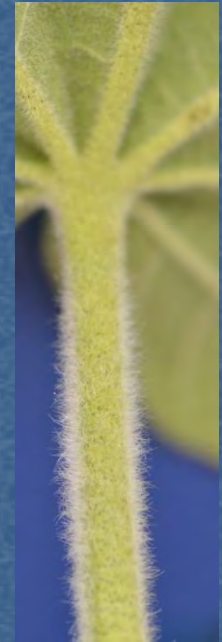
Leaf hairs

Example of diversity



Red vein

Example of diversity



Hairy leaf, stem and leaf petiole

Example of diversity



Glandless and glanded leaf

Example of diversity



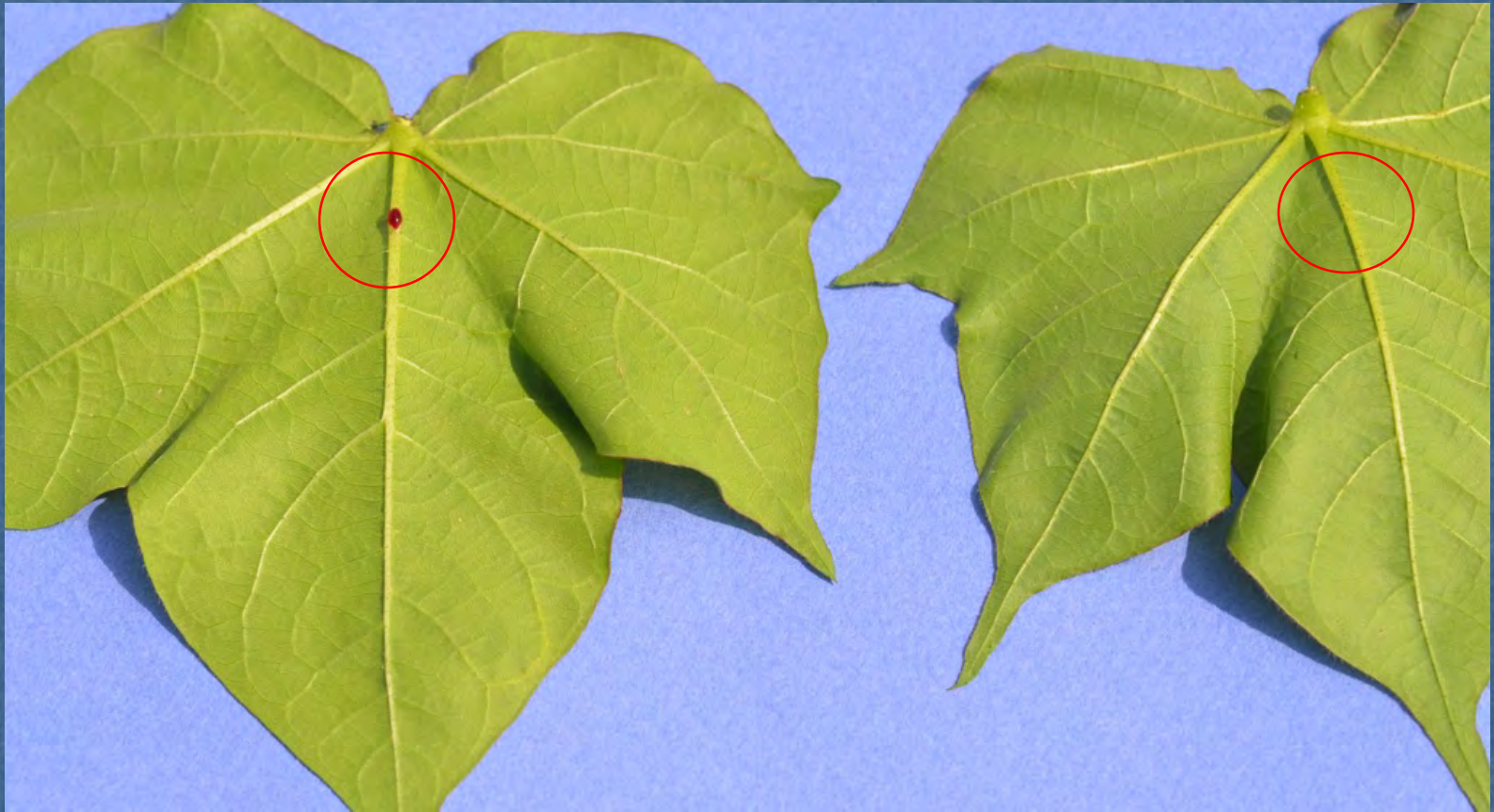
Glandless and glanded square and seed

Example of diversity



Leaf nectary and nectariless leaf

Example of diversity



Leaf nectary and nectariless leaf

Example of diversity



Okra leaf shape

Example of diversity



Super okra leaf shape

Example of diversity



Red leaf color

Example of diversity



Mutant leaf shape

Example of diversity



Leaf color and shape



Boll size and shape

Example of diversity



Pima 3-79 (orange pollen long stigma) and TM-1

Example of diversity



Wild primitive accessions in tropical winter nursery

Example of diversity



Photoperiodic Primitive Accessions In Mississippi Field

Example of diversity



Photoperiodic plant – Day-neutral selected plant

Goal



Thank You

