Objectives and Perspectives in Cotton Breeding

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Objectives

To Educate and Advocate: Quality

the process & the resources

the interaction – with cotton seed variety developers

To Develop: Cotton & Genetic Resources

improved fiber quality & enhanced utilization

increase value

relevant research projects

To Address: Regional Constraints

combine – traits & breeding resources

incorporate – new knowledge, new genes

utilize – new technology

To Improve: Variety Development Process

breeding utility of high fiber quality cotton

regional adaptation

Variety Testing

small plot

National Cotton Variety Testing Program

Evaluate Varieties:

currently available

candidate varieties

Knowledge of industry needs:

breeding targets, strengths, weaknesses

Source of information:

for farmers and other research projects

complementary to large plot

2024 Variety Testing Summary

Trial type, location, and number of entries for external small-plot replicated testing

	Lubbock		Lamesa		Halfway
	Irr	Dry	Irr	Dry*	Irr
Uniform Variety	35	35	35	35	35
New Variety & Strains	40	-	-	-	-
Late Planted	27	-	-	-	-
Verticillium Wilt	-	-	-	-	35
Nematode, RKN	-	-	37	-	-
Bacterial Blight	24**	-	-	-	-
Regional High Quality	17	-	-	-	-
Regional Breeders	24	-	-	-	-

Results Online

*Supplemental Irrigation
**Ratings only

Plains Cotton Improvement Program

A Partnership with Farmers to Improve Cotton Quality

Renewed focus on fiber quality in adapted germplasm in 1982

Address low quality perception for region
Voluntary, regional, farmer-funded check-off
Administered by Plains Cotton Growers
Long-term funding for fiber quality breeding
Development of germplasm base with excellent fiber properties
Supports variety testing, disease, harvest, spinning research
Overall improved fiber value

Breeding

Development of Improved Cotton Germplasm for the High Plains Production Area of Texas

Fiber Quality
Yield
Plant & Boll Type
Environmental Stress

Verticillium Wilt
Bacterial Blight
Root Knot Nematode
Reniform Nematode
FOV4
FOV1

Breeding Nurseries

Irrigated Progenies

- Yield
- Fiber Quality
- Disease & Nematode
  - various combinations

F2 Populations

Fiber Utilization

Seed Size

3-4 yrs of selection cycles

Strains Testing

Objective to improve breeding utility of, and combine additional regional traits with, high fiber quality and enhanced utilization requires accurate, targeted, multi-location performance testing

Evaluate performance characteristics of breeding lines developed with different objectives, use information internally, and provide to stakeholders

Provide more detailed information in germplasm releases

Germplasm Releases

Objective is to provide genetic resources that augment industry portfolios

Address underserved markets

Ensure regional adaptation for high-throughput commercial breeding strategies

Assist the cotton research community with specialized research projects

Research

Quality – Crop & Fiber

"takes more than just genetics"

Collaborative Approach

Pathology
Entomology
Physiology
Molecular science
Production practices
Processing practices

Let's Talk

Perspectives

Developing varieties that can provide sustainable income for farmers while being produced with historically low water availability and historically high input costs will be a driving factor for breeding & research objectives.

increased focus on low water & dryland
low inputs
production systems

Future Work & Realities

Adaptability

- limited water & harsh environment, it is our reality
  - water use, heat tolerance

Fiber Quality (low input)

- we need to compete – producers & industry
- not just competing with cotton anymore

Early Season Vigor & Grit

- getting a crop started in our area is tough
  - many related traits – seed & seedling characteristics

Disease & Pest Resistance

- existing & potential threats

Thank You

Questions
&
Discussion