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7. Title

Genetic Improvement Approaches to Sustained, Profitable Cotton Production in the United States

12. Investigator Name(s) (Last Name and Initials)

Myers, G.

20. Termination Date 09/30/2012	40. Period Covered (mo/da/year): 01/01/2011 TO 12/31/2011

Outputs:

The best performing lines were advanced for additional multilocation testing to verify yield performance, yield stability and high fiber quality. Segregating early generation nursery material was evaluated for fiber quality and/or specific phenotypic traits and selections made for advancement to later stages or initiation of seed increase as a prelude to yield testing. Promising elite germplasm as sent to cooperators for testing in coordinated, multistate trials. Research results were presented via three presentations at two conferences and in three abstracts.

Outcomes/Impacts:

The development of cotton germplasm lines with high yield potential/stability and premium fiber characteristics is essential to the success of cotton producers in Louisiana in particular and the U.S. in general. Drawing upon available commercial cotton varieties and publically available germplasm, over 57 new cross combinations were made. There were two Elite Yield Trials with a combined 33 new entries plus 3 checks. In other internal yield trials, there were 36 new entries (+3 checks) in the Advanced Yield Trials and 68 (+3 checks) in the Preliminary Yield Trials. An additional root-knot nematode nursery was planted at the Red River Research Station (Bossier City, LA). A total of 139 F4:5 progeny row plots were planted at the Northeast Research Station (St. Joseph, LA). There are 13 different F2 populations, 56 different F3 and 38 different F4 populations in nurseries. Three entries were submitted to the Regional Breeder Testing Network and one to the Regional High Quality test. Yield trials were severely impacted by drought and high temperature at two locations and not harvested. Strip trials of lines (LA17, LA06307025, and LA07307025) were performed in Alabama, Georgia, North Carolina and Texas. LA17, LA35RS and LA06307025 and LA0730711 were indicated in variety trials for Louisiana, North Carolina and Texas. In the RBTN test, two of the three LSU AgCenter lines had respectable lint yields ranking 8th and 10th of 32 total entries. Seed quality issues in the RBTN necessitated replants but still did not overcome the thin stands. Two entries, LA06307025 and LA07307106, lint yield did surprisingly well in Jackson, TN coming in 1st and 3rd, respectively, and ranked 4th and 7th, respectively, in Florence, SC. The best performing LSU line, LA06307025, came in 11 of 32 entries in Alexandria, LA and 10 of 32 in College Station, TX. The lone LSU entry in the Regional High Quality Test, LA35RS, was in the top half at St. Joseph. In Louisiana Official Variety Trials, LA06307025 was in the top 25 percent (and not significantly different from the top yielding entry) in both St. Joseph dryland and irrigated tests and did equally well in the irrigated Winnsboro test. Replicated yield trials in a forward breeding project involved two transgenic traits: Bollgard II and/or RoundUp Flex. Continued collaboration exists with North Carolina scientists investigating the molecular basis of heterosis in cotton.

Publications:

Myers, G.O. , F. Bourland, C.W. Smith, P.W. Chee, S. Hague, E.F. Hequet, and D. Jones. 2011. Advances in high quality conventional cottons. In: Proc. Beltwide Cotton Conf., Atlanta, GA. 4-7 Jan. 2011. Natl. Cotton Counc. Am., Memphis, TN.

Myers, G.O. 2011. The use of genetic diversity, near and far, on cotton improvement. In: Proc. Beltwide Cotton Conf., Atlanta, GA. 4-7 Jan. 2011. Natl. Cotton Counc. Am., Memphis, TN.

Myers, G.O. 2011. Raising the bar for cotton fiber quality to meet international and industry requirements. 14th Annual National Conservation Systems Cotton and Rice Conference. (Abstract) Feb. 1-2, 2011. Baton Rouge, LA.

Participants:

Gerald Myers (PI), Patrick Colyer, Ivan Dickson, LSU AgCenter; Freddie Bourland, David Weaver, University of Arkansas; Todd Campbell, Auburn University; Peng Chee, University of Georgia; Michael Gore, Lori Hinze, Richard Percy, Mauricio Ulloa, USDA-ARS; Don Jones, Vasu Kuraparthy, Ted Wallace, Cotton Incorporated; C. Wayne Smith, Texas Agrilife Research; Peggy Thaxton, Mississippi State University.

Target Audiences:

Cotton producers from Louisiana and across the nation, cotton geneticists and plant breeders (public and private); graduate students, classroom and laboratory instruction.

Project Modifications:

Nothing significant to report during this reporting period.

Approved (Signature)	Title	Date