FIELD EVALUATION OF ADVANCED BREEDING LINES FOR ORGANIC COTTON PRODUCTION
Dylan Q. Wann
Texas AgriLife Research and Texas Tech University
Lubbock, TX
Jane Dever
Mark D. Arnold
Heather D. Flippin
Texas AgriLife Research
Lubbock, TX

Abstract
Over 90% of cotton produced in the U.S. is grown with genetically-modified (GM) seed. However, use of GM seed for certified organic production is forbidden by organic certification guidelines. Additionally, nearly 95% of U.S. organic cotton is grown on the Texas High Plains (THP). FiberMax® FM 958 is the predominant variety grown by organic producers on the THP, with few other varieties comprising any significant production. There is a need for greater diversity and availability of high-performing, non-GM cotton cultivars for organic growers. Additionally, thrips (Thysanoptera: Thripidae) are a major early-season pest to seedling cotton on the THP. Therefore, developing non-GM cultivars with high tolerance or resistance to thrips injury is also paramount for providing viable options to organic growers on the THP. Two field trials were conducted in Lubbock, TX and Meadow, TX (under organic production) in 2011 to evaluate thrips resistance potential and agronomic performance of 8 advanced cotton breeding lines and a commercial check cultivar (FM 958). The trials were planted in a randomized complete block design with 4 replications. Thrips injury was assessed for each genotype in Meadow by measuring leaf surface area weekly 4 times, ending the 5th week after emergence. There were no differences in mean leaf surface area among genotypes at the Meadow location, likely due to minimal thrips pressure as a result of severe drought conditions during the growing season. Lint yields ranged from 543-931 kg ha⁻¹ at Lubbock and 966-1124 kg ha⁻¹ at Meadow, but there were no differences among genotypes. Two breeding lines (07-7-1407CT and 07-14-510FS) exhibited equal or greater lint turnout, picked and pulled lint, and crop maturity values as FM 958 at both locations. Along with comparable yield data, these results suggest that 07-7-1407CT and 07-14-510FS could be viable cultivar options for organic production or as parent lines to use in a breeding program for future cultivar development.