TRENDS IN UNITED STATES COTTON YIELD PRODUCTIVITY SINCE 1980

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Abstract

Cotton is produced in over 30 countries and provides a major fiber source for textile manufacturers. In 2012, the direct market value of 17.0 million bales of U.S. cotton equated to US$ 8.1 billion. The objective of this study was to document trends in U.S. upland cotton yield productivity since 1980. A second objective was to document the impact of genetic gain on yield productivity. To meet these objectives, on-farm and replicated variety trial yield datasets were analyzed and interpreted. Analyses suggest that yield productivity and genetic gain have occurred since 1980. Production systems during this time period saw major advances; most notably among these was the successful eradication of the boll weevil. Beginning with the adoption of transgenic cultivars in 1996, productivity increased significantly. The rate of genetic gain for yield from 1981-1995 was significantly lower than the rate of genetic gain from 1996-2011. This indicates the shift to transgenic cotton production systems paralleled substantial yield productivity and genetic gains realized through long-term breeding efforts. Significant genetic gains occurred through efforts to transfer stably inherited transgenes into improved cultivars. Traditional germplasm enhancement programs, new transgenic technology, and molecular/genomic breeding technologies offer exciting opportunities for future productivity increases.