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HARVEST TIMING EFFECTS ON YIELD AND QUALITY OF STRIPPER COTTON IN THE TEXAS HIGH PLAINS

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Abstract

The objectives of this project were to document the effects of harvest timing (with and without harvest-aid crop termination) on field-weathering losses, cotton fiber and seed quality, and yield in the Texas High Plains. A field near Lubbock planted to a stormproof variety (Paymaster 2326RR) was used, and treatment structure included harvest-aid (CottonQuik and Ginstar followed by Cyclone) and freeze termination and varied harvest dates (ranging from October 4 through January 8 in 2001-02). Field plot layout was a split-plot design with harvest dates as main plots and with field cleaning vs. no field cleaning as subplots. Three replications of treatments were used in a randomized complete block design. This allowed the determination of main effects (factors) of weathering (harvest date) and field cleaning (no field cleaner vs. field cleaner) and the possible interactions. Main plot size was 8 40-inch rows, with 4-row subplots. Plot lengths were variable due to circular LEPA center-pivot rows (0.4 to 0.7 acres/sub plot). Completed analyses of 2000-01 crop year lint and seed samples resulted in important documentation of cotton weathering losses in the Texas High Plains. USDA Classing Office analyses indicated that significant reductions in lint quality were observed after 3.1 inches of rainfall were encountered in October. Color grades were degraded over time, with 11 dominating until significant rainfall events occurred. After that time, color grades 42 and 52 were predominant. Field cleaning had minimal practical effect on color grades. Staple length was reduced due to field exposure, and ranged from a high of 33 in early harvests to 32 in later harvests. Fiber uniformity was reduced from 81% in early harvests to 80% after long-term field exposure. Field cleaning had no effect on staple length, HVI length, and uniformity. Micronaire values were unaffected by harvest date, and field cleaning resulted in somewhat higher micronaire. HVI strength was also significantly reduced by field exposure by about one g/tex over the harvest period. Field cleaning had no effect on fiber strength. Leaf grades in early harvests averaged about 2, and subsequently were reduced in quality to 3 and 4 in later harvests. Only a minor effect from field cleaning was noted for leaf and trash. Bark incidence was not observed before October weather events and increased to between 50% and nearly 100% after rainfall events. Field cleaning had a minor effect on bark and reduced the incidence by 7%. USDA loan value for the lint was about $0.44/lb with the early harvests and ultimately reached a low of $0.38 in January. This is equivalent to about $28.80/bale in terms of loan value losses. Detailed AFIS and other fiber quality analyses showed that late harvesting dates resulted in shorter cotton with higher short fiber content. This effect was carried into yarn characteristics, as later harvest dates resulted in lower yarn quality. Later harvest dates resulted in a significant four-fold increase in dust content. In 2001-02, harvests were conducted on 10-20 day intervals ranging from early October through January, 2002. Field cleaning increased turnout by about 6% when averaged across harvest dates. Harvests conducted in October and on November 6 were higher in yield (about 100 lb/acre in 1000 lb/acre cotton) than later harvests (after significant rainfall events totaling 3.6 inches). Results show that when harvest is delayed past an early optimum and when as little as 3 inches of precipitation occurs during a later harvest period, significant reductions in lint yield and quality are encountered.