HARVEST AID EFFECTS ON SEED QUALITY ON THE TEXAS HIGH PLAINS

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Abstract

With the increased use of harvest aids on the High Plains, a region that has historically grown its own planting seed, concern has been raised regarding the effect of harvest aid chemicals and timing of application on planting seed quality. Harvest aid usage has recently expanded from less than 30 percent of the acres treated in 1992 with up to 80 percent treated in 1995. Harvest aid chemicals are now a very important management tool for High Plains cotton growers. Both growers and seed producers must be able to capture the maximum potential of their crop and not be at the mercy of the weather. Effects of harvest aid treatment on seed quality are important considerations for those who produce seed for next year's crop. The objective of this research is to evaluate the effects of harvest-aid treatments applied at various stages of boll opening on lint and seed yields, fiber properties, and seed quality parameters.

Two harvest-aid trials were initiated in 1996. 'Paymaster HS26' cultivar was planted at the Lubbock site on May 9, and at the Barwise location on May 24. A Prep+Def tankmix (1 pt Prep/acre + 1 pt Def/acre) was applied at various stages of boll opening (20, 30, 55 and 75 percent open bolls at Lubbock; and 0, 2 and 20 percent open bolls at Barwise) in a randomized complete block design with three replications. An untreated check was included. Treatments were initiated on September 25 at Lubbock and October 4 at Barwise and proceeded on a weekly basis until a freeze was encountered. Treatments were applied using a Lee Company "Spider" sprayer equipped with XR Teejet XR11002VS spray tips calibrated at 10 GPA at 20 psi. Seedcotton was picked from 50 bolls in the lower one-third, middle one-third and upper one-third strata of plants two weeks after a killing freeze, and were ginned to obtain seed and lint samples. Lint yield was determined by hand harvesting 26 row-ft (November 9 and 16 for Lubbock and Barwise, respectively). Lint samples were collected and HVI fiber properties on both composite and strata samples were determined at the Texas Tech International Textile Center. Gin-run seed was collected from each plot for seed quality determinations. Cool germination (7 days at 64°F), and total warm germination (10 days - alternated for 16 hrs at 68°F and 8 hrs at 86°F) percentages were determined, and the cool warm vigor index was calculated (CWVI = 4 day warm germination percent + 7 day cool germination percent of seedlings greater than 1.5 inches). A completely randomized design was used in the laboratory germination chambers.

Analyses of variance on treatments indicated that no significant differences for lint yield and micronaire for the composite harvest were observed. Micronaire at the Barwise location was extremely low due to lateness of the crop and corresponding lack of fiber maturity. Anticipated effects of early-applied harvest-aid treatments included reductions in seed quality as measured by the cool and warm germination tests and the CWVI. However, no statistically significant reductions in seed quality due to any applications of Prep+Def were noted for cool germination percentage, warm germination percentage, or CWVI. Laboratory measurements of the response variables exhibited considerable variability which reduced the ability to detect statistical differences among treatments. The application of Prep+Def at the various stages of boll opening included in this research indicated no statistically significant effects on lint yield, micronaire and seed quality parameters evaluated. Certain responses, however, did suggest that further investigations should be conducted. Field and laboratory studies were continued in 1997 to elucidate the effects of several harvest-aid treatment regimes on the above parameters.

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