

**RESPONSE OF COTTON VARIETIES
TO STAPLE APPLICATIONS
AND ENVIRONMENTAL CONDITIONS**

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Abstract

Field studies were conducted in 1997 and 1998 at Winnsboro, LA to evaluate cotton sensitivity to Staple under early season normal (no water stress) and water saturated field conditions. The experimental design was a split-split plot with 3 replications. Factors included environments, cotton cultivars, and Staple rates. Environments were a normal field condition (dry) and a water saturated field condition (wet). Twenty to twenty-four hours prior to application of POST treatments, designated plots were irrigated by overhead sprinklers until water was standing in row middles. After water was surface drained, Staple treatments were applied. Cotton cultivars included BXN 47 and 57; DP&L 5409, 5415, 5415RR, 50, and 20; Hartz 1244RR and 1330RR; SureGrow 125 and 501; and Stoneville 474, 495, and LA 887. Staple treatments included 1.0 oz ai/A preemergence (PRE) followed by 1.0 oz ai/A postemergence (POST), 1.0 oz/A POST, 2.0 oz/A POST, and a nontreated check for each cultivar. Cotton was 3 to 5 inches and 2 to 4 nodes at time of POST application. Visual injury estimates and heights were recorded 7, 14, and 28 DAT. Yield and fiber analysis were also measured. Data were subjected to analysis of variance and means were separated using Fisher's Protected LSD ($P \leq 0.05$).

A year by Staple rate by environment interaction was observed for cotton injury 7 days after treatment (DAT). Injury consisted of chlorosis, crinkled leaves, and stunting. In 1997, cotton injury for the dry environment was 10 to 17% and 18 to 25% for the wet environment with greatest injury observed for Staple at 2.0 oz/A POST. Overall injury was less in 1998 than in 1997 but was still greater for the wet environment and 2.0 oz/A of Staple POST. A cultivar by environment interaction was observed for cotton injury 7 DAT. Injury with the dry environment was 13 to 17% for DP&L 50, SG 125, BXN 47, and BXN 57. For the wet environment, injury was 12 to 27% with BXN 57 exhibiting the greatest injury. With the exception of Stoneville 474 and BXN 47, cotton cultivars were injured more by Staple

when exposed to the wet environment. At 14 DAT, a Staple rate by environment interaction was observed for cotton injury and injury ranged from 2 to 5% for the dry environment and 5 to 9% for the wet environment. For both environments, the 2.0 oz/A Staple rate was most injurious. At 28 DAT cotton injury was no more than 1%.

For cotton height 7, 14, and 28 DAT, a year by Staple rate by environment interaction was observed. In most cases the nontreated control height was significantly greater than that of the Staple treatments, but height reduction was only 1 to 3 cm. In 1997, cotton yield was reduced 4 and 6% when Staple was applied 1.0 oz/A POST and 1.0 oz/A PRE followed by 1.0 oz/A POST, respectively. In 1998, only the 2.0 oz rate of Staple reduced yield (4%). Averaged across Staple rates and environments, highest yields were observed for Hartz 1330RR, DP&L 50 and 20, SureGrow 501 and BXN 47 (3070 to 2870 lb seed cotton/A). Yields of 2350 to 2330 lb/A were observed for BXN 57 and Hartz 1244RR. Cotton fiber analysis indicated no adverse effect from Staple application in regard to micronaire or strength. All fourteen cotton cultivars evaluated responded similarly to Staple applications, but the degree of injury was cultivar dependent. Early season injury with Staple can be enhanced under a wet environment and in some cases may reduce yield.