

EFFECTS OF CHAPERONE® ON COTTON YIELD IN THE COASTAL BEND OF TEXAS

C.J. Fernandez

TAMU Agricultural Research & Ext. Center

Corpus Christi, TX

C. Correa

The Texas Agricultural Experiment Station

The Texas A&M University System

Abstract

This study evaluated the effects of different application rates of the plant growth enhancer Chaperone® on yield and fiber quality of cotton grown under dryland conditions. Chaperone®, also called Atonik® or ARYSTA-Exp-NP321 in previous publications, has the following active ingredients: sodium-p-nitrophenolate (0.3%), sodium-o-nitrophenolate (0.2%), and sodium-5-nitroguaiacolate (0.1%). The study was conducted at the Texas A&M University Agricultural Research and Extension Center farm in Corpus Christi in 2003. Cotton (cv. FiberMax 989BR) was planted on 4 April 2003 to a population of 40,000 plants per acre in 38"-row spacing. Experimental plots were four rows wide and 100 ft long. Experimental design was RCB with four replications. Treatments included an untreated check (UTC) and four foliar application rates: 2.5, 5.0, 10, and 20 oz./ac. Treatments were applied at early bloom on June 4 with a 4-row Lee Spider sprayer when plants were 22.5 in. high and had 16 main-stem nodes and 8 nodes above white flower. Soil water content at planting was excellent. Rainfall was deficient from planting to treatment application (0.2 in.), plentiful from treatment application to first open boll (7.5 in.), and deficient from first open boll to defoliation (0.1 in.). Defoliant was applied on August 5 and 13, and plots were hand-harvested (1/1000 acre) on August 25. Results from this study show that Chaperone® applied at 5.0 oz./ac increased lint yield 132 lbs./ac over the untreated control yield of 1528 lbs./ac (a 8.6% increase at $P=0.0856$). Lint yield increase resulted from a significant increase in individual boll weight; 5.375 g of seed-cotton per boll vs. 5.152 g for the UTC ($P=0.0683$). In turn, the increase in individual boll weight resulted from a significant increase in the number of seeds per boll; 26.3 vs. 24.7 for the UTC ($P=0.0364$). There were no significant differences in average weight of individual seeds. No significant differences in lint turnout were found, although the 5.0 oz rate showed a marginal small decrease of 0.4% ($P=0.1503$); lint turnout of the UTC was 41%. The number of opened bolls per plant was significantly higher in the 5.0 oz rate than the UTC; counts were 10.2/plant vs. 8.9/plant, respectively, but this difference can be attributed to a difference in plant population; population of UTC was 37,000/ac, while that of 5.0 oz treatment was 34,000/ac ($P=0.0795$). There were no statistical differences in number of bolls per acre ($\text{avg}=336,050\pm22$). Chaperone treatments had no significant effects on micronaire, fiber length, and length uniformity, but increased fiber strength 1.3 grams per tex over the UTC; 33.625 vs 32.325 grams per tex, $P=0.1162$). These results are consistent with those found in 2001 and 2002 with cotton grown under irrigated condition, and indicate that the use of Chaperone may become an important tool to increase yields and net returns of cotton crops.