SEED TREATMENTS: HOW EFFECTIVE ARE THEY FOR SEEDLING DISEASE MANAGEMENT IN LOUISIANA COTTON

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Introduction

Disease management is among the first concerns a producer faces at planting. A uniform, healthy stand is a key ingredient for maximizing profits and yields; however, seedling disease can interfere with this goal. From 2004 to 2007, losses to seedling disease ranged from 1% to 3% in Louisiana. The best defense against seedling disease is to plant when conditions favor seed germination and seedling establishment. However, additional fungicides may be necessary at planting if weather conditions or seed quality is not conducive for seedling establishment.

In the past, in-furrow applied fungicides were the most effective means for managing seedling disease in cotton. These fungicides, while effective, are costly and require additional equipment (hopper-box or sprayer) and time to apply. Seed treatments were available in the past, but not widely accepted. The perception was, in-furrow products were more effective than seed treatments. However, with the recent advances in seed treatment technology, interest in these treatments has increased exponentially over the last several years. Producers now have the option of planting seed coated with a complete fungicide package. This option is attractive to producers because of the added convenience, but questions still remain about the effectiveness of these treatments.

Therefore, in an effort to determine the utility of seed treatment, seed-applied fungicides were evaluated for efficacy against seedling diseases common to Louisiana cotton. Tests were conducted in northeast Louisiana on the Macon Ridge and Northeast Research stations, as well as, off-station locations. Treatments were evaluated for impact on seedling establishment, plant vigor, plant maturity, and yield.

Materials and Methods

Twenty-two small field plot tests designed to evaluate the efficacy of Dynasty™ CST (Syngenta Crop Protection), Delta-Coat AD® (Agriliance), Catapult™ XL (Agriliance), and Trilex® (Bayer Crop Science) seed-applied fungicides were conducted on the Macon Ridge and Northeast Research Stations during 2003 to 2007. Additional tests were conducted on producer farms in northeast Louisiana. Dynasty™ CST, Delta-Coat AD®, and Catapult™ XL were compared from 2003 to 2007. Dynasty™ CST and Trilex® were compared from 2006 to 2007. When possible, tests were planted during the early portion of the recommended planting window (mid-April). To enhance disease pressure in some tests, millet seed colonized with *Rhizoctonia solani* was added in furrow at planting. Experimental plots were four, 45-50 foot rows spaced 40 inches apart. Treatments were replicated three to four times and arranged as a randomized complete block. Standard chemical and cultural practices for cotton production were implemented in accordance with Louisiana Cooperative Extension Service recommendations. Tests conducted in producer fields were arranged as large strips (usually several acres per block). Number of emerged plants was recorded two, four, and/or six weeks after planting. In some tests, plant vigor, plant height and number of nodes above the uppermost first position white flower were recorded as an indication of plant maturity. Plots were machine picked to assess treatment effects on yield.

Results and Discussion

Dynasty™ CST, Delta-Coat AD®, and Catapult™ XL Comparisons:

Number of plants per foot ranged from 2.3 plants to 1.6 plants two weeks after planting (Figure 1). Both seed treatments improved stand over the commercial standard. Similar results were observed four or six weeks after planting. Relative to the commercial standard, number of plants was 0.64 to 0.71 more in the Delta-Coat AD/Catapult XL and Dynasty CST treatments, respectively. Yields were also improved by additional seed treatments (Figure 2).

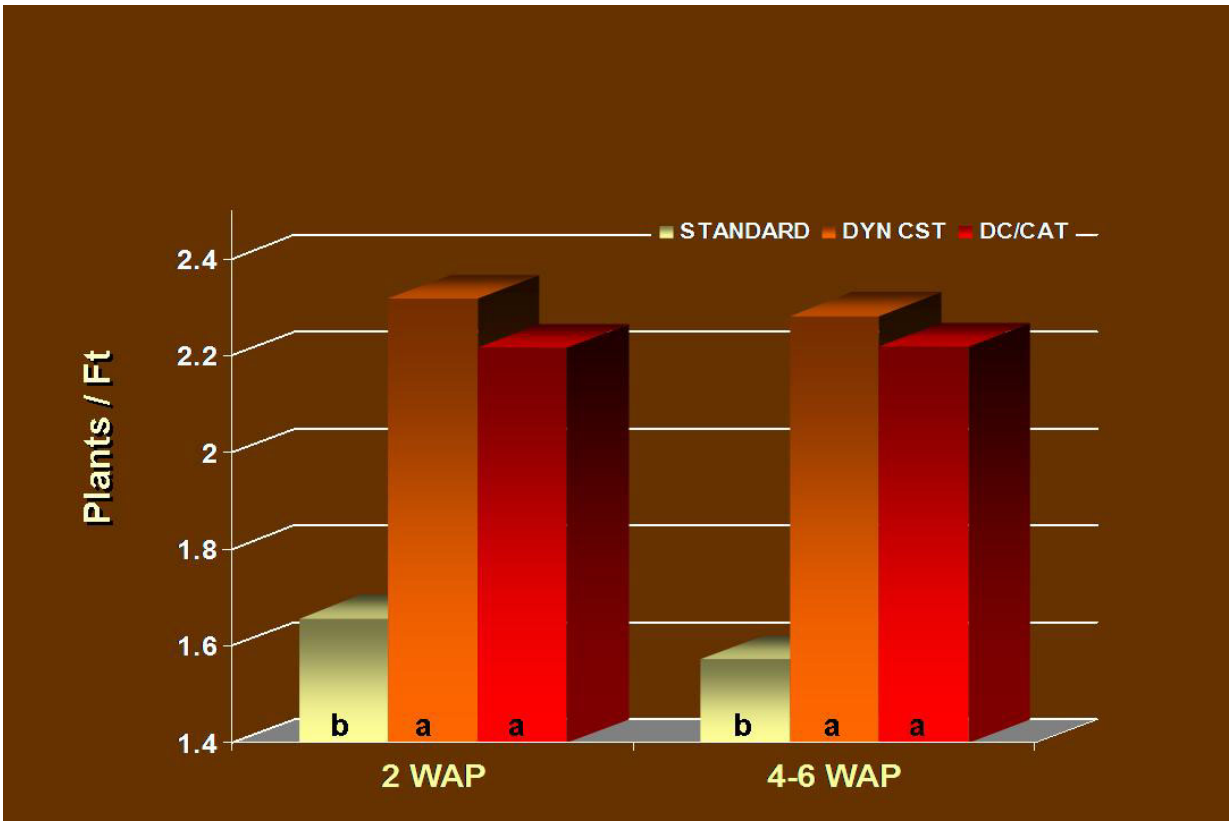

Figure 1. Plant stands per foot for selected fungicide seed treatments.

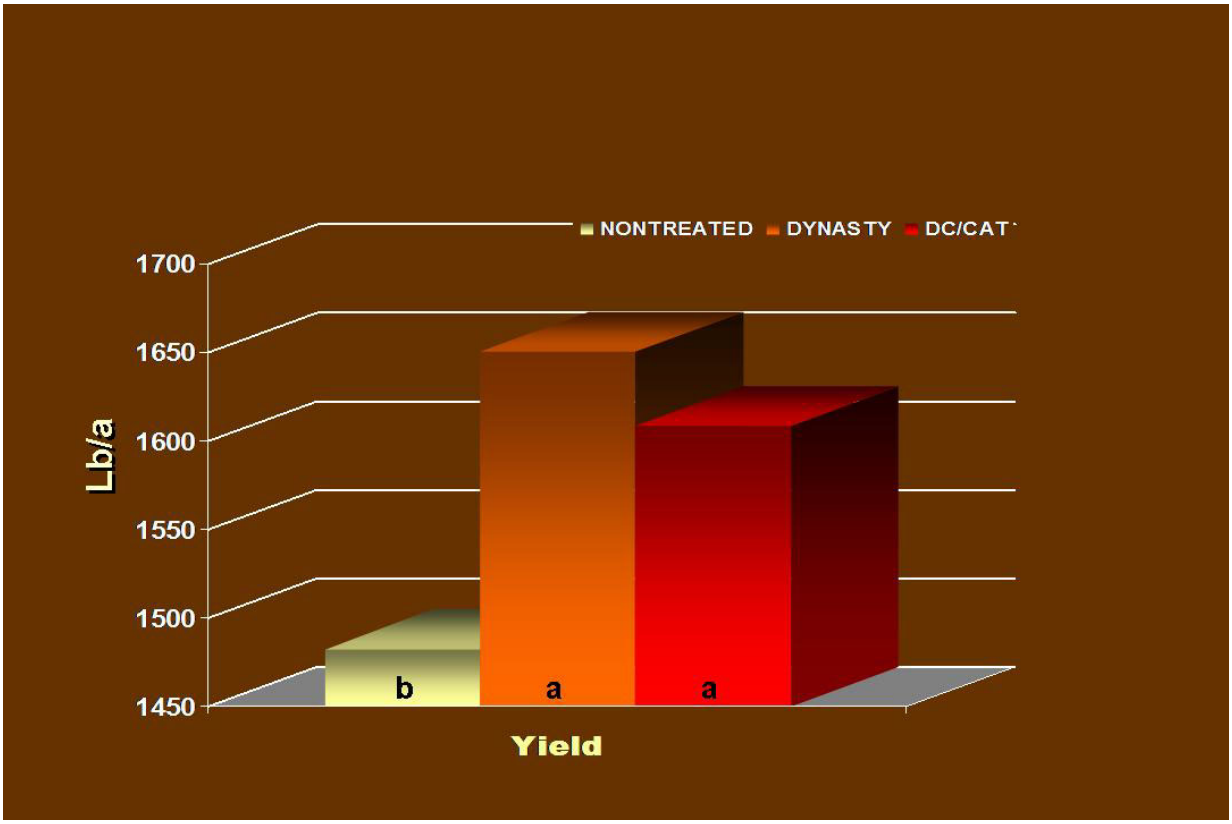

Figure 2. Yield, pounds per acre, for selected fungicide seed treatments.

Dynasty™ CST and Trilex® Comparisons:

Number of plants did not differ among treatments two, four, or six weeks after planting (Figure 3). However, there were trends toward better plant stands in cotton treated with additional fungicides. Yields did not differ among treatments (Figure 4).

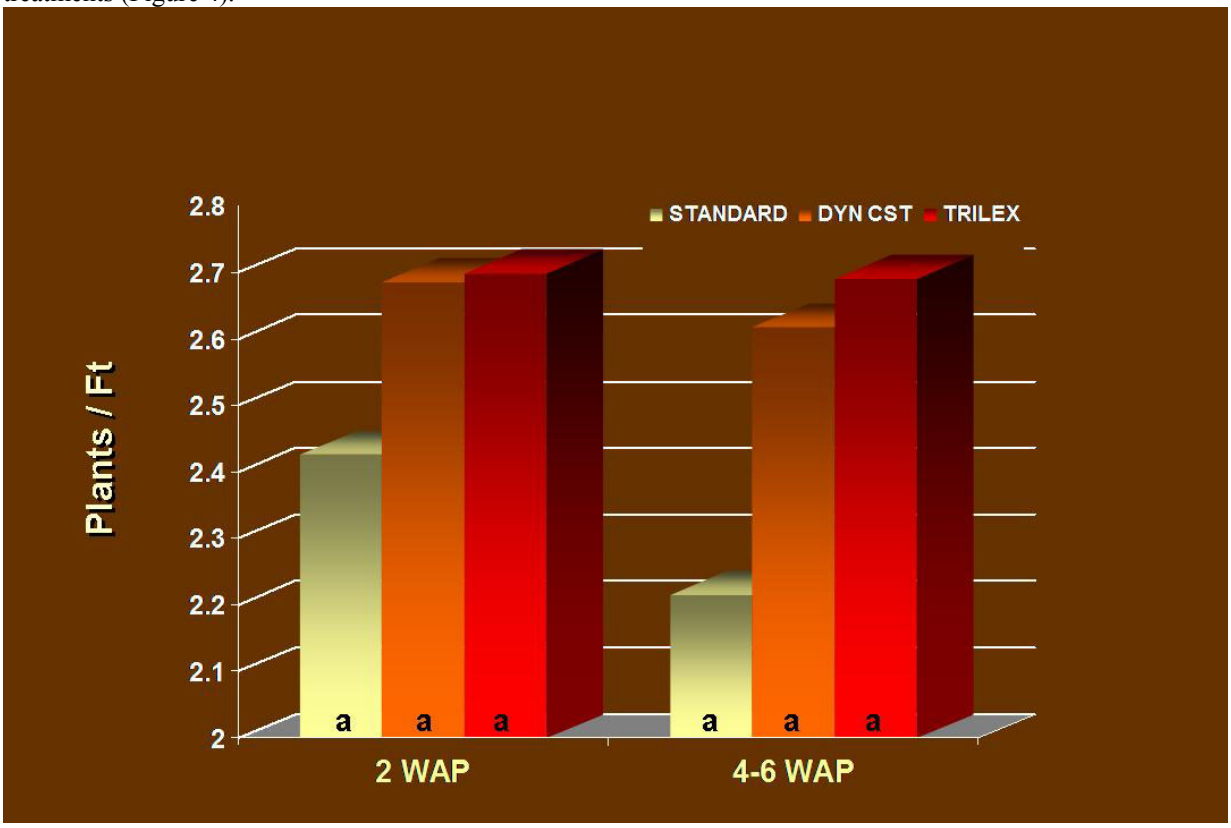

Figure 3. Plant stands per foot for selected fungicide seed treatments.

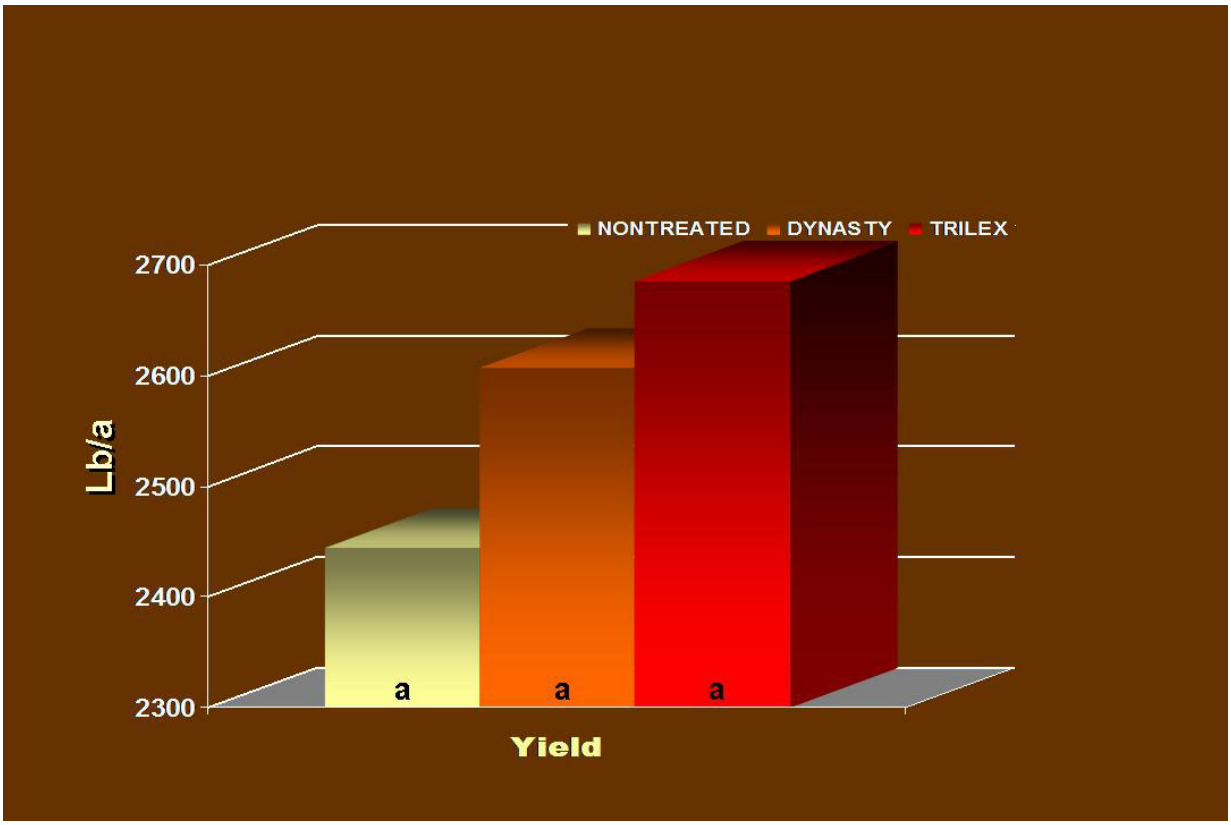

Figure 4. Yield, pounds per acre, for selected fungicide seed treatments.

The National Cotton Council has supported research addressing the efficacy of seed treatments (Rothrock and Winters 2005a, 2005b, Winters and Rothrock 2006, 2007). The efficacy of the seed treatments relative to the commercial standards evaluated in these studies has varied across locations and years. Results from these and other studies have revealed the potential benefits of seed treatments (Caceres et al. 2006, Holloway 2007, Riggs 2006, Wheeler and Schuster 2005). While additional seed treatment fungicides provide added protection relative to the commercial standard, they are not always needed. This is evident by the variable response in numerous tests. More research will be necessary to define when these products are likely to provide an economical return.

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