EVALUATION OF STARTER MATERIALS AND APPLICATION METHODS FOR NO-TILLAGE COTTON

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Abstract

Starters fertilizers applied either in a 2 x 2 band or as a surface band (S-B) over the top of the planted row have increased no-tillage (NT) cotton yields. The 2 x 2 placement method requires extra equipment and more power during application. The 2 x 2 band and S-B methods require larger nutrient applications relative to applying in-furrow (I-F). Nutrient rates applied I-F needs to be low preventing possible germination damage. Nitrate (NO_3) nitrogen (N) applied I-F have increased cotton yields. Additional information is needed evaluating rates and nutrient combinations for I-F applications. Research was initiated in 1994 at the Milan and West Tennessee Experiment Stations (WTES) evaluating rates of $Ca(NO_3)_2$ applied I-F on NT cotton. Additional treatments evaluated at Milan included $Ca(NO_3)_2$ and 11-37-0 as a surface band (S-B) starter. The Milan research was conducted on a Loring silt loam while the WTES research was conducted on a Collins silt loam. The experimental design was a RCB with treatments replicated five times. Individual plots were 30 feet long and 4 rows wide (40 inch rows). Plots were fertilized with a total of 80-40-60 lb/A of N, P_2O_5, and K_2O, respectively. Fertilizers were either broadcast or applied as a combination of broadcast plus starter. Ammonium nitrate, 0-46-0 and 0-0-60 were broadcast applied. The cultivar 'D&PL 50' was planted April 15 to May 1 at both locations. $Ca(NO_3)_2$ was applied at 2, 4, 8, and 12 lbs/A N I-F plus 10 lb/A N S-B. 11-37-0 was applied I-F at 1.5 gal/A and S-B at 7.5 gal/A. The S-B treatments were not applied at WTES.

Starter's increased two-year average yields at both locations. I-F applying 2, 4, and 8 lbs/A N as $Ca(NO_3)_2$ increased two-year average yields relative to the check. The effects of starters on Milan yields varied each year as indicated by the year-by-starter interaction. In 1994, applying 2 lb/A N as $Ca(NO_3)_2$, applying 3 lb/A N as $Ca(NO_3)_2$ plus S-B 11-37-0, and S-B of 11-37-0 increased yields relative to the check whereas in 1995 all starter treatments increased yield relative to the check. Yield variability in 1994 was high possibly resulting from seedling diseases that reduced plant population. The WTES yields were increased by I-F N rates up to 8 lb/A. The higher N rate tended to reduce yields which was also noted in the two-year Milan data.

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