

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

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Abstract

Starter fertilizers have increased no-tillage (NT) cotton (*Gossypium hirsutum* L.) yields. There are several methods of starter application each differing in equipment required and rate of fertilizer applied. Applying starters in-furrow (I-F) at planting has certain advantages over the other application methods. A primary advantage with the I-F application method is the need to apply low fertilizer rates when compared with other application methods. Nutrient rates applied I-F need to be low to prevent germination damage and to avoid slowing the planting process through frequent refilling of the fertilizer hoppers. Additional information is needed evaluating rates and nutrient combinations for I-F applications. Research was initiated in 1994 and continued through 1997 on a Loring silt loam soil at Milan evaluating $\text{Ca}(\text{NO}_3)_2$ and 11-37-0 applied either I-F or surface banded over the planted row (S-B) as starter application methods for NT cotton. The experimental design was an RCB with treatments replicated five times. Individual plots were 30 feet long and 4 rows wide. A total of 80-40-60 lb/acre of N, P_2O_5 , and K_2O , respectively, were either broadcast or applied as a combination of broadcast plus starter. The cultivar D&PL 50 was planted 1994 through 1996 with D&PL 5409 planted in 1997. The experiment was planted by mid-May. Treatments applied at planting included: $\text{Ca}(\text{NO}_3)_2$ applied at 2, 4, 8, and 12 lb N/acre I-F; $\text{Ca}(\text{NO}_3)_2$ applied at 10 lb N/acre as a surface band over the planted row (S-B); 11-37-0 applied at 1.5 gal/acre I-F; and 11-37-0 applied at 7.5 gal/acre as a S-B.

Over the four years, starters increased NT cotton yields on the Loring silt loam an average of 140 lb/acre. Yield differences were not observed when 2, 4 or 8 lb N/acre was I-F applied at time of planting using $\text{Ca}(\text{NO}_3)_2$. However, applying 12 lb N/ I-F reduced four-year yields relative to applying lower N rates. I-F applying 1.5 gal of 11-37-0 produced yields comparable with the 2, 4, and 8 lb N/acre as $\text{Ca}(\text{NO}_3)_2$ yields. Surface banding either 11-37-0 or $\text{Ca}(\text{NO}_3)_2$ resulted in comparable yields with the I-F treatments and increased yield relative to the check for the four years.