Cotton Nitrogen Management for a High-Residue Conservation Tillage System. (S06-reiter173537-Poster)

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Abstract:

Over 70% of the cotton (Gossypium hirsutum L.) in the Tennessee Valley of northern Alabama, USA is currently raised using conservation tillage techniques. High-residue small grain cover crops are becoming a common tool in these systems, but N immobilization may occur causing previous N recommendations to be obsolete. A replicated 3-year field study was initiated in 1999 on a Decatur silt loam (clayey, kaolinitic, thermic Rhodic Paleudult) to test a factorial arrangement of N source (ammonium nitrate (AN) and urea-ammonium nitrate 32% (UAN)), N rates (0, 45, 90, 135, and 179 kg N ha-1), N application timing (all at-planting and 50-50 split between at-planting and first match head square), and N application method (banded or broadcast) for cotton grown in a high-residue rye (Secale cereale L.) conservation system. Preliminary results suggest that 135 kg N ha-1 may be needed to optimize yields (875 kg lint ha-1 in 2000 and 1150 kg lint ha-1 in 2001). Generally, highest yields were obtained when N was applied at-planting (900 kg lint ha-1 in 2000 and 1073 kg lint ha-1 in 2001, averaged over N rates, sources, and application methods). Ammonium nitrate applications resulted in greater yields when broadcast at-planting while UAN applications resulted in greater yields when banded, regardless of application timing. At current prices for AN and UAN, the preliminary data suggest the most efficient and economical practice for cotton grown in high-residue conservation systems would be to apply 135 kg N ha-1 as UAN in a banded application at-planting.

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Presentation Information:

Presentation Date: Wednesday, November 13, 2002
Presentation Time: 9:00-11:00 am
Poster Board Number: 2007

Keywords:
N management, conservation tillage, cover crop, cotton