

**NITROGEN NUTRITION UNDER
CONSERVATION TILLAGE**

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Abstract

Information on nitrogen (N) application methods and rates for no-tillage (NT) cotton (*Gossypium hirsutum* L.) production is limited. Research was initiated in 1994 and continued through 1997 on a Loring silt loam at the Milan Experiment Station. Research was also initiated in 1996 and continued in 1997 on a Collins silt loam at the West Tennessee Experiment Station and on a Memphis silt loam at Ames Plantation. Surface residues were different on the three soils. Winter weeds was the cover on the Loring soil while winter wheat was the cover on the Collins soil and corn stover was the cover on the Memphis soil. The experimental design was an RCB with treatments replicated five times. N rates of 0, 30, 60, 90, and 120 lb/acre were broadcast, injected, and split applied. The cultivar D&PL 50 was planted in 1994 through 1996 with D&PL 5409 planted in 1997. Experiments were planted in May. The broadcast and injected N rates were applied immediately after planting. At planting 60 lb N/acre was broadcast with additional side-dressed rates applied a month later. Ammonium nitrate was utilized as the the broadcast N source while UAN was the injected N source.

Yields were affected by a year-by-N rate interaction at each location. A higher N rate was needed in 1997 relative to the other years presumably due to excessive spring rainfall after N application. Broadcasting N rates up to 60 lb/acre was sufficient most years on the three soils. Injecting did not improve N efficiency on any of the three locations regardless of cover. Side-dressing with 30 lb N/acre (total of 90 lb N/acre) increased NT yield at one location for one year. The primary reason to inject is to reduce N immobilization by surface residues. These data indicate that N immobilization by the surface residues (winter weeds, killed wheat, and corn) in this research was insufficient to affect yields.