

**NITROGEN NUTRITION UNDER CONSERVATION
TILLAGE**

D.D. Howard
Plant and Soil Sciences Department
Univeristy of Tennessee

Abstract

Nitrogen (N) research on cotton (*Gossypium hirsutum* L.) production has traditionally been conducted utilizing conventional-tillage systems. Information is needed evaluating N fertilization for no-till (NT) production. The effect of broadcast, injected, or side-dressed N was evaluated on NT cotton yields. Field research was conducted for four years on a Loring silt loam (fine-silty, mixed, thermic, Typic Fragiudalfs) having natural winter weeds as a cover. A two year study was conducted on a Memphis silt loam (fine-silty, mixed, thermic, Typic Hapludalfs) having corn (*Zea mays* L.) stover as a cover and on a Lexington silt loam (fine-silty, mixed, thermic, Typic Paleudalfs) having winter wheat (*Triticum aestivum* L.) as a cover. Nitrogen rates of 0, 30, 60, 90, and 120 lb N/acre were either broadcasted as ammonium nitrate (AN) or injected as urea-ammonium nitrate (UAN) at planting. Additional treatments included broadcasting 60 lb N/acre as AN at planting followed by surface banding AN at either 30 or 60 lb N/acre six weeks after planting. Broadcasting 60 to 90 lb N/acre maximized yields on the three soils. Relative to broadcast, injecting N reduced crop earliness certain years and lowered yields three of the seven site-years while side-dressed N improved yields one of the seven site-years. Nitrogen applications greater than 90 lb N/acre were not warranted for NT cotton production. Immobilization of N by surface residues was insufficient to restrict NT yields.