

**EVALUATING RATES OF PROGRAMMED  
RELEASE NITROGEN FERTILIZER  
FOR COTTON PRODUCTION  
IN TENNESSEE AND ARKANSAS  
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**Abstract**

Nitrogen management has been a major research objective in cotton (*Gossypium hirsutum* L.) production for many years. N management will continue to be important from an environmental aspect. Meister Programmed Release Nitrogen (MPRN) fertilizers are potentially more efficient and environmentally safe than conventional fertilizers, however research is needed evaluating rates for cotton production. Research was established in 1996 and continued through 1998 to evaluate both safety and efficiency of MPRN as an N source for cotton. Field research was established in 1996 and continued during 1997 on a Hebert silt loam in Rowher, AR. Research was established in 1996 and continued in TN on a Collins silt loam. In 1998, research was expanded to include a Loring silt loam, and a Memphis silt loam soils. The applied N rates were 100, 80, 60, and 40% of each state's recommended rate for cotton. These rates were 110, 88, and 66 lb N/acre in AR and were 80, 64, and 48 lb N/acre in TN. Ammonium nitrate (AN) was applied at the recommended rate for both states. In 1996, five treatments were established to evaluate MPRN safeness. The MPRN rates were applied in-furrow (I-F) at planting plus AN was broadcast after planting. In 1997, treatments were expanded to seven that included broadcasting AN and MPRN at 60% the N rate and an I-F applying MPRN at 40% of the N rate. In 1998, MPRN was injected after planting at 80, 64, 48, and 32 lb N/acre plus MPRN was broadcast at 48 lb N and AN was broadcast 48 lb N. Sure Grow 125 was the cultivar planted in AR both years with D&PL 50 planted in 1996 and D&PL 5409 planted in 1997 and 1998 in TN. The experiment design was a RCB with 5 to 6 treatment replications. Yields varied with location. The 1996 and 1997 AR data indicates that I-F applying 88 lb N/acre as MPRN produced higher yields than I-F applying 44 lb N/acre as MPRN or broadcasting AN at 110 lb N/acre. Broadcasting AN or I-F applying MPRN at 66 lb N/acre resulted in comparable yields. The TN data indicates that I-F applying the MPRN at 64 lb N/acre resulted in higher yields than I-F MPRN at 32 lb N/acre. In 1998 a drier year relative to 1996 and 1997, MPRN yields were generally lower and less consistent relative to AN which differ from the previous years. Apparently the dry weather conditions at bloom restricted

N release from the MPRN reducing yield response. Moisture is necessary if the encapsulated urea is to be dissolved and released for plant utilization.