

NITROGEN SOURCE INFLUENCE ON COTTON YIELD

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ABSTRACT: A study was conducted in 2004 to evaluate sources of nitrogen effect on cotton yield in a fall land preparation stale seedbed system. The study was conducted on a Leeper silty clay loam soil at the MAFES Northeast Branch Station, Verona, Mississippi. UAN (32% N) solution was applied with a coulter knife applicator and ammonium nitrate was applied surface broadcast with a Gandy air applicator to cotton in the pinhead square stage of growth. Both were applied at 90 lb N/ac. The 2004 growing season was favorable and resulted in above average yields. The study mean seed cotton yield, lint cotton yield and percent lint turnout was 2921 lb/ac, 1186 lb/ac and 40.7%, respectively. Seed cotton yield, lint cotton yield and percent lint turnout showed no response differences to fertilizer nitrogen source.

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KEYWORDS: Cotton, fertilizer N source, yield.

MATERIALS AND METHODS: A study was conducted in 2004 to evaluate nitrogen sources [ammonium nitrate and urea/ammonium nitrate (UAN)] for cotton production at the MAFES Northeast Branch Station, Verona, Mississippi. The study was conducted on a Leeper silty clay loam soil as a randomized complete block design with 4 replications. Plot size was 8 rows (38 inch) for the liquid UAN and 12 rows for the ammonium nitrate by 100 ft in length. The nitrogen fertilizer treatments were applied to cotton in the pinhead square growth stage on 5/25/04. UAN (32% N) solution was applied 6 inches from the row and 2 inches deep with a coulter-knife applicator. Ammonium nitrate was applied surface broadcast with a Gandy air applicator. Both were applied at 90 lb N/ac. Phosphorous and potassium (potash) fertilizer were applied based on soil test recommendations. Potash (0-0-60) and phosphorous (0-46-0) + zinc sulfate (31% zinc) at 200 + 100 + 10 lb/ac as a mixed blend were applied broadcast on 10/24/03. Fall land preparation included paratill followed by bed-roller on 11/4/03. The beds were smoothed with a do-all (row conditioner) and Deltapine DP 444BR cotton was planted on 38 inch rows at 4 seed/ft of row on 5/4/04.

Roundup WEATHERMAX (glyphosate) + Clarity (dicamba) at 1.0 + 0.25 lb ai/ac was applied as a burndown treatment on 03/13/04. A second burndown application of Roundup WEATHERMAX at 0.75 lb ai/ac was applied 4/27/04. Roundup WEATHERMAX at 0.94 lb ai/ac was applied to 4 leaf cotton on 5/25/04. Matador (quazalofop) + Staple (pyrothiobac) at 0.06875 + 1.0 oz ai/ac was applied postemergence on 6/10/04. A post-directed layby broadcast application of Roundup WEATHERMAX + Direx (diuron) at 0.94 lb + 0.75 lb ai/ac was applied on 6/21/04. CoRoN (10-0-10, 0.5%B) at 1 gpa was applied on 7/13/04. To control rank cotton

growth, Pentia (mepiquat pentaborate) at 0.08 lb ai/ac (12 oz/ac) was applied on 7/6/04. Due to rainfall wash-off within 15 minutes of the first application, the application was repeated on 7/9/04 at 0.06 lb ai/ac. A third application of Pentia at 0.10 lb ai/ac (15 oz/ac) was applied on 7/16/04. Cotton was scouted twice weekly and insecticides were applied when insect infestations were at or above threshold. Infestation levels were light during the growing season. Insecticide applications of Bidrin (dicrotophos) at 0.25 lb ai/ac and Centric (thiamethoxam) at 0.05 lb ai/ac were applied for tarnish plant bug (*Lygus lineolaris*) control on 6/15/04 and 8/2/04, respectively.

Cotton was defoliated with Dropp (thidiazuron) + Finish (ethephon + cyclanilide) at 0.04 and 1.0 + 0.1875 lb ai/ac on 9/10/04. The center 2 rows of each plot were harvested with a spindle picker on 9/15/04 and 10/5/04. The plot samples of seed cotton from both harvests were weighed and a grab sample from each plot was taken from the first harvest. The seed cotton grab samples were ginned with an 8-saw micro-gin (no dryer or lint cleaner) to determine lint turnout. All data were subjected to Analysis of Variance and means were separated using Fisher's Protected LSD calculated at the 5% significance level.

RESULTS AND DISCUSSION:

The 2004 growing season was favorable and resulted in above average yields. The study mean seed cotton yield, lint cotton yield and percent lint turnout was 2921 lb/ac, 1186 lb/ac and 40.7%, respectively (Table 1). Seed cotton yield, lint cotton yield and percent lint turnout showed no response differences to fertilizer nitrogen source with a fall prepared stale seedbed system.

Table 1. Seed cotton, lint cotton and percent lint turnout response to nitrogen sources in 2004, Verona, MS.

Fertilizer treatment	Seed cotton lb/ac	Lint cotton lb/ac	% Lint turnout
Ammonium Nitrate 265 lb/ac (90 lb N)	2890	1183	41.0
32% UAN solution 25 gal/ac (90 lb N)	2951	1188	40.3
Mean	2921	1186	40.7
LSD _(.05)	NS	NS	NS
%CV	7	7	1.2

COOPERATORS: None

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