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African Journal of Agricultural Research Vol. 3 (1), pp. 068-073, January 2008
 Available online at <http://www.academicjournals.org/AJAR>
 ISSN 1991-637X © 2008 Academic Journals

Full Length Research Paper

Evaluation of slow-release nitrogen and potassium fertilizers for cotton production

Derrick M. Oosterhuis^{1*} and Donald D. Howard²

¹Department of Crop, Soil and Environmental Sciences, University of Arkansas, 1366 W Altheimer Drive, Fayetteville, AR 72704, U.S.A.

²Plant and Soil Sciences, West Tennessee Experiment Station, 605 Airways Blvd, Jackson, TN 38301, U.S.A.

*Corresponding author. E-mail: oosterhu@uark.edu

Accepted 26 November, 2007

Abstract

Current nitrogen (N) and potassium (K) fertilization involves the use of conventional fertilizer materials with little information on the use of slow release materials. The objectives of this research were to evaluate new programmed slow-release N and K fertilizers for cotton production. Field experiments were conducted in 1997 and 1998 in Tennessee and Arkansas in the USA. The applied nutrient rates were a percentage of the total recommended rates for each state. In 1997, the applied percentages were 100, 80, and 60%; an additional 40% rate was evaluated in 1998. The recommended rate of either N or K was applied as conventional fertilizers controls. These varying rates of programmed-release materials were applied in direct contact with the seed at planting while the conventional fertilizers

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were broadcast before planting. Cotton yields were not reduced when the N rate was reduced to 60% recommended rate and applied as Meister programmed slow-release N. Yields were reduced when N applications were further reduced to 40% the recommended rate in 1998. Similarly, in-furrow applications of the slow-release K at 60% of the recommended rate did not affect yields for both states. Our results indicate that programmed-release, soil-applied fertilizers can potentially provide a one-time fertilizer application at planting with no detrimental effect on seedling germination, growth or yield. Furthermore, nutrient efficiency for applying the slow-release materials was increased by maintaining high yields at reduced fertilizer rates.

Key words: Cotton, nitrogen, potassium, Meister programmed release fertilizer, slow-release fertilizer, lint yield.

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