UPTAKE AND RECOVERY OF N-15 LABELED FERTILIZER AS A FUNCTION OF TIME OF APPLICATION

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Abstract

Attaining the highest level of efficiency associated with the application of fertilizer N in an irrigated cotton (Gossypium hirsutum L.) production system is important agronomically, economically, and environmentally. The objective of this project was to evaluate the affect of time of application on the uptake and recovery of fertilizer N in a furrow irrigated cotton. Field experiments were conducted using Upland cotton at the University of Arizona Maricopa and Marana Agricultural Centers on a Casa Grande sandy loam soil (Typic Natrargid) and a Pima clay loam (Typic Torrifluvent). Three treatment regimes consisted of varied application timings (preplant, early bloom, and peak bloom) of ^{15}N labeled fertilizer as $(^{15}NH_4)_2SO_4$ with 5 atom % ^{15}N at a rate of 56 kg N/ha/application. At maturity, entire plants were collected and analyzed for fertilizer N uptake. In general, uptake and recovery of fertilizer N increased with later dates of application, coinciding with higher periods of N demand. However, uptake and recovery estimates of fertilizer N and lint yields were not significantly different as a function of time of application. Therefore, applications of fertilizer N between pinhead square and peak bloom stages of growth are capable of achieving equal levels of efficiency in an irrigated cotton production system.

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