

**RECOVERY OF LABELED FERTILIZER  
NITROGEN IN AN IRRIGATED COTTON  
PRODUCTION SYSTEM**

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**Abstract**

Attaining the highest level of efficiency associated with the application of fertilizer N in an irrigated cotton (*Gossypium spp.*) 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 (*G. hirsutum* L., var. DP 20) at the University of Arizona Marana Agricultural Center on a Pima clay loam (Typic Torrifluent). Three treatment regimes consisted of varied times of application (pinhead square, early bloom, and peak bloom) of <sup>15</sup>N labeled fertilizer as (<sup>15</sup>NH<sub>4</sub>)<sub>2</sub>SO<sub>4</sub> with 5 atom % <sup>15</sup>N at a rate of 56 kg N/ha/application. All treatments received a total of 168 kg N/ha from the three dates of application, with the <sup>15</sup>N labeled applications occurring at only one date of application. At maturity, entire plants were collected and analyzed for fertilizer N uptake. Soil samples were collected at the end of the season from the center of the microplot areas to a depth of 1.8 m by 30 cm increments. In general, plant uptake and recovery of fertilizer N increased with later dates of application, coinciding with higher periods of N demand. However, plant uptake and recovery estimates of fertilizer N and lint yields were not significantly different as a function of time of application. Most of the fertilizer N that was recovered in the soil was found in the top 30 cm. Over 95% of the fertilizer N in the soil was recovered in the top 60 cm. Total fertilizer N recoveries (plant + soil) averaged 86.43% among the three treatments, with no significant differences among treatments. Of the total fertilizer N that was recovered, approximately 40% was taken up in the plant and approximately 60% was recovered in the soil. 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.