PROXIMITY EFFECTS OF A CALCIUM NITRATE STARTER FERTILIZER SOLUTION ON COTTON

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Abstract

Current nitrogen fertilizer placement techniques minimize early season contact with cotton roots. Nitrogen fertilizer is primarily banded at a spacing and depth which requires cotton roots to proliferate this zone for uptake to occur. Being a primarily tap-rooted crop and slow in establishing, adventitious root growth during establishment is not as prolific as other crops. This research was conducted to determine the effects of placing a low salt calcium nitrate fertilizer solution in close proximity to the planted seed. Calcium nitrate was either applied in-furrow at rates of 3, 6, and 9 gal/acre, or banded at 1 in. to the side of the planted seed at a depth of approximately 1 in. at rates of 6 and 9 gal/acre. A no starter control was included and the experimental design was a randomized complete block with four replications. The soil at this site is a Leeper silty clay loam (Fine, montmorillonitic, nonacid, thermic Vertic Haplaquept) having a pH of 8.1 and testing medium in P and low in K. All plots received a total N rate of 120 lb/acre with 60 lb/acre applied at planting using banded 32% urea-ammonium nitrate (UAN) solution and the balance was applied at early square using broadcast ammonium nitrate. Varieties used were DES 119 in 1995 and Suregrow 125 in 1996. In, 1996, dry conditions persisted after planting and a linear reduction in stand occurred with increasing rate of fertilizer applied in-furrow. After significant rainfall, stands improved for all in-furrow treatments, but a linear decrease from 19 to 15 plants/3 ft. of row for the check to highest in-furrow rate was still evident. Lint yield decreased linearly for in-furrow treatments both years and is likely related to delaying stand establishment. Banding increased yield both years with maximum yield occurring at a rate of 6 gal/acre. The two-year average yield increase for the 6 gal/acre banded treatment was 58 lb lint/acre. Cotton can benefit from fertilizer N placed in close proximity to the germinating seed, but fertilizer should not be placed in direct contact with the seed.

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