EFFECTS OF NITROGEN AND POTASSIUM RATES AND TIMING ON COTTON YIELD AND FIBER QUALITY

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Abstract

The purpose of this research is to help better predict the effect on yield and quality that variable timings and rates of nitrogen (N) and potassium (K) have on cotton. Too much of either nutrient can result in luxury consumption or delayed maturity, while too little could result in plant stress or inadequate yields. Poor application timing may render nutrients unavailable when needed, while spoon-feeding applications may be logistically inconvenient or economically draining. Timing and rate decisions are made on a case-by-case basis and are better made when there is relevant research available.

K treatments include one, one and a half, and two times the recommended rate applied at pre-plant, layby, and 3 weeks after layby while N treatments include a total combination of 20, 80, or 110 pounds/acre at the same timing. Measurements included nodes above white flower at first bloom, second layby, and two weeks after second layby, a petiole sample two weeks after second layby, end of season plant mapping, defoliation rating, yield quality, and fiber quality. There were 10 K treatments, three rates and three timings with a control, and 8 N treatments, two rates at three timings, a control, and a single 20 pounds at pre-plant. K trials took place at the Sandhills Research Station and the Peanut Belt Research Station in 2017 and, in 2018, at the Upper Coastal Plains Research Station along with the stations from the previous year. N trials took place at the Upper Coastal Plain Research Station and the Peanut Belt Research Station in 2017 and, in 2018, at the Sandhills Research Station along with the stations from the previous year.

No significant yield advantage to applying over 80 pounds N/acre. Tissue percent N had a positive correlation with both rates in timings. Tissue percent N didn't correlate with lint yield. Height, total nodes, and nodes to the uppermost harvestable boll increased with N rates. Every treatment had lint quality that avoided a discount.

No significant yield difference for any rate or timing of K. Tissue percent K had a positive correlation with K rates. Tissue percent K didn't correlate with yield. Growth and maturity were not significantly affected by treatments. Every treatment had lint quality that avoided a discount.

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