

NITROGEN MANAGEMENT OF COTTON FOLLOWING CORN IN THE HIGH PLAINS

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ABSTRACT

Nitrogen (N) management in cotton (*Gossypium hirsutum*) is challenging given physiological dynamics in an indeterminate crop. Cotton performance may be harmed due not only to under fertilization of N, but also excessive fertilization. This is especially pertinent when managing cotton for earliness. Often these challenges occur in the form of delaying the onset of reproductive structures due to the crops indeterminate nature, leading to problems associated with "finishing" the cotton crop in a short-season environment. These factors can be compounded when considering N dynamics following a corn crop where often excessive N application rates are applied as a safety net or in expectation of high yields. This can lead to excessive amounts of residual N for the following cotton crop lending itself to management concerns, especially in a semi-arid environment such as the high plains in which residual N is likely well within the available soil volume for N uptake. This experiment looks to evaluate cotton lint yield response to N applied in the previous growing season in combination with an in-season application of N at the pinhead square stage of cotton development or an omission of in-season N management in the cotton crop. This experiment was placed at the Oklahoma Panhandle Research and Extension Center in Goodwell, OK - located in the central Oklahoma Panhandle. The experiment utilizes a split plot design consisting of eight row corn plots receiving anywhere from 0 to 336 kg N ha⁻¹. These eight row plots were then split into four row cotton plots each receiving 0 or 56 kg N ha⁻¹. Corn yield was not influenced by N rate with an average corn yield of approximately 20 Mg ha⁻¹. Cotton lint yield was influenced by corn N rate when combined with an in-season application in the cotton crop with yields decreasing linearly upon reaching 224 kg N ha⁻¹ total. Cotton lint yield was maximized with 56 kg N ha⁻¹ in-season with 0 N applied in the corn crop. This project indicates that excessive residual N in the previous crop may have a profound impact on cotton lint yield the following season.