# IMPACT OF SIMULATED DEER FEEDING ON COTTON AT VARIOUS GROWTH STAGES

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## Abstract

In recent years, many growers have noticed an increasing incidence of deer feeding in young cotton. There are many theories as to why deer have begun to feed on cotton in recent years, where they didn't in years prior. The loss of aldicarb applied in-furrow for thrips and nematode control, and major reductions in peanut acreage in the early to mid 2000's and the resulting absence of preferred food sources are the most common theories for this phenomenon. The number of deer feeding complaints has risen sharply in the last five years, however these cases are relatively isolated to fields that have noticeably high numbers of deer, and fields in close proximity to preferred bedding habitat. Deer appear to feed on young cotton (less than five to eight true leaves) and primarily on the terminal bud, causing a loss in apical dominance resulting in the majority of the harvestable bolls to appear on multiple vegetative branches. Preliminary observations suggest that deer feeding can cause severe stand loss, delayed maturity and yield reductions. Therefore, simulated deer feeding experiments were conducted in N.C. cotton. The objectives of this research were to investigate the effects of simulated deer feeding on cotton growth and yield and to quantify yield losses due to deer feeding. We hypothesized that simulated deer feeding will delay maturity and that impacts on yield will vary depending on seasonal weather and heat unit accumulation.

Replicated trials were during 2016 and 2017 at Rocky Mount, Plymouth, Lewiston, and Sandhills research stations. Treatments included a Non-Treated Control, simulated deer feeding at the 2-3 leaf stage, and simulated deer feeding at the 4-5 leaf stage. Deer feeding treatments were conducted using a standard weed eater operated at idle speed. The weed eater was used to completely remove only the terminal bud and any true leaves, leaving only the cotyledonary petioles (when implemented at the 2-leaf stage), or the complete cotyledons and petioles for one or two true leaves (when implemented at the 4-5 leaf stage). Damage to the main stalk was purposefully minimized to avoid bruising or potential diseases in order to properly simulate deer feeding. All treatments were managed equally with regard to all agronomic inputs. Plant growth regulators and harvest aids were applied at a time suitable for all treatments to reach maturity, as was harvest timing.

Simulated deer feeding resulted in a loss of apical dominance in all treatments, consistently across environments. Simulated deer feeding resulted in significant seed cotton yield reductions in three out of five environments across 2016 and 2017. Reductions in seed cotton yield appeared to be the result of fewer bolls per plant, delayed maturity as most harvestable bolls appeared on vegetative branches, and lack of suitable time for post-injury recovery to occur. Simulated deer feeding at the 4-5 leaf stage resulted in greater losses of seed cotton yield compared to feeding that occurred at the 2-3 leaf stage in four out of five environments. Reductions of seed cotton yields appeared to be greater when feeding occurred at the 4-5 leaf stage due to lack of suitable time for adequate recovery and development of vegetative bolls needed to compensate for losses, more so than that of the 2-3 leaf stage.

In summary, deer feeding can consistently result in yield losses, delayed maturity, and complicated management of affected areas. This experiment did not investigate the effects of deer feeding when seedlings are killed and stand loss results, and this experiment also quantified yield losses when the entire area was affected. Therefore, yield loss assessments in growers' fields should be calculated on affected areas alone. Seed cotton yield losses ranged from six to 30 percent of the affected area when feeding occurred at the 2-3 leaf stage. Averaged across environments, yield losses were 21 percent in the affected area when deer feeding occurred at the 2-3 leaf stage. Seed cotton yield losses ranged from 17 to 36 percent of the affected area when feeding occurred at the 4-5 leaf stage. Averaged across environments, yield losses were 27 percent in the affected area when deer feeding occurred at the 4-5 leaf stage. Although yield losses were generally less when feeding occurred at the 2-3 leaf stage, this stage appeared to be more sensitive to seedling death if feeding occurred below the cotyledons. Although yield losses were generally greater when feeding occurred at the 4-5 leaf stage, this stage appeared to be more resilient to seedling death as seedling were

more robust and feeding occurred consistently above the cotyledons. Ideas for future research include: investigating the effects of simulated deer feeding in both early and late maturing varieties, investigating the effects of simulated deer feeding in both early and late planting dates, investigating differential management practices for cotton with injury resulting from deer feeding.

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