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EFFECTS OF CHRONOLOGICAL DEER DAMAGE ON CORN YIELDS

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To examine the relationship between the timing of deer (Odocoileus virginianus) damage and subsequent yields of field corn, we conducted 2 studies in 2 cornfields in eastern Nebraska during 1989 and 1991.

In the first study, we selected a level, irrigated, 32-ha cornfield with a constant soil type to minimize environmental variability. Twenty-two study sites were randomly located throughout the field. Five variable-sized plots were established in each site, l for each of 5 growth stages in which we simulated her damage. Growth stages included: sixth leaf (15 June), twelfth leaf (3 July), tasseling-silking (19 July), blister-milk (7 August), and mature (10 October). To simulate deer damage, we removed 500 g of vegetative and/or reproductive tissue per plot in a manner that was consistent with previous experience and similar to deer damage that was occurring on the perimeter of the field at the time. We harvested corn from the plots and adjacent paired-control plots at maturity on 10 October 1989. The mean number of plants damaged per plot to attain a 500-g sample ranged from 2.3 (mature) to 62.9 (sixth leaf). The mean yield perdamagedplantranged from 141.9 g (tasseling-Bilking) to 189.8 g (sixth leaf). The mean yield per plant for the undamaged controls was 180.0 g. The mean total change in yield perplot relative to the undamaged controls was: +0.616 kg (sixth leaf), -0.403 kg (twelfth leaf), -0.989 kg (tasselingsilking), -0.192 kg (blister-milk), and -0.415 kg (mature). With dry shelled corn worth $71/kg, we estimate that 10 deer could cause $220 damage in a 14-day period if half their dietary intake consisted of corn during the tasseling-silking stage.

In the second study, we selected a nonirrigated, 24-ha cornfield in the DeSoto National Wildlife Refuge that had a history of deer damage. Deer activity in and near the cornfield was frequent, as determined by radio-telemetry and direct observation. The summer deer density in the refuge was estimated at 11.6 deer/km2. We randomly located 221-m x 50m study sites along the northern edge of the cornfield, which is immediately adjacent to a field access road and 50-ha woodlot. Sample plots were oriented along a north-south axis to facilitate sampling across rows and to minimize variability. We examined every corn plant in the plots weekly from 15 May through 28 September 1991, and recorded the presence or absence of deer damage that had occurred during the previous week and the plant growth stage. Six 1-m x 50-m control plots were established within 3 randomly located 10-m x 50-m areas that were protected with electric deer fences. No deer damage was observed in the control areas. On 28 September we harvested the treatment plots according to plot, row, and growth stage of damage. Deer damage to corn plants peaked during late June (tasseling-silking), with 147 of 673 (220 of all) damage incidents occurring during this 1-week period. Corn yield measurements are not yet available, but it appears that corn plants responded to deer damage in the same way that they responded to simulated deer damage in the previous study.

Cornfields appear to be highly susceptible to deer damage during the tasseling-silking stage because deer use is high, more plants are required W satiate deer, and the plants are physiologically more susceptible to physical damage. Landowners may be able to reduce their costs of controlling deer damage by delaying implementation of certain control measures until the tasseling-silking stage. The short-term uses of frightening devices andrepellentsweresdiscussed. We thanktheUniversity of Nebraska-Lincoln, Nebraska Game and Parks Commission, and U. S. Fish and Wildlife Service for supporting these projects.