WILDLIFE MANAGEMENT
Publication Series

WARNELL
SCHOOL OF FORESTRY AND NATURAL RESOURCES
THE UNIVERSITY OF GEORGIA

WMS – 08 -- 19 October 2008

Use of Gallagher® 2-Layer Deer-Exclusion Fencing to Temporarily Deter White-Tailed Deer Browsing in Food Plots

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Abstract

Warm-season food plots are an important tool for providing supplemental nutrition to white-tailed deer (*Odocoileus virginianus*). Food plots represent a significant investment in time, materials, and equipment for many land managers. Gallagher® Animal Management Systems markets a 2-layer deer-exclusion fence design for the protection of food plots during establishment. We tested this fence design at two warm-season food plots in Madison County, Georgia. Each food plot contained a mixture of cowpeas (*Vigna unguiculata*) and Lablab Plus, marketed by Tecomate® Wildlife Systems. We enclosed a 4300 ft^2 (400m^2) portion of each food plot with Gallagher®'s 2-layer fence design and randomly established nine 11 ft^2 (1m^2), sample plots within each food plot which included 3 that received no protection, 3 protected by the Gallagher® fencing, and 3 control sample plots enclosed in wire fencing. We measured browse percentage and maximum plant height over a 6-week period. Our data indicated that Gallaher®'s 2-layer fence design could reduce browse damage to warm-season food plots.

Introduction

In many places, particularly the Southeast, food plots have become a widely used technique for supplemental feeding of white-tailed deer (*Odocoileus virginianus*). The Georgia Department of Natural Resources (GADNR) suggests food plots as a way to augment carrying capacity (Georgia Department of Natural Resources 2003). These plantings can represent significant financial investments for some landowners, with costs ranging from $59/ac ($146/ha) to $108/ac ($266/ha), depending on the type of forage planted (Waer et al. 1997).

Deer prefer to forage on legumes prior to flowering; therefore, food plots containing legumes receive heavy forage pressure early in development but before significant growth occurs (Lyon and Scanlon 1987). Gallagher® Animal Management Systems has developed a 2-layer deer-exclusion fence design (Figure 1) intended to prevent deer damage to food plots during early establishment (Anonymous 2007). In this study, we tested the efficacy of this fence design in preventing browse damage by deer on newly established food plots.

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We conducted this study at two food plots established within a powerline right-of-way (ROW) located on private property in Madison County, Georgia. This property is located in the Piedmont of Georgia approximately 5 miles (3 km) southwest of the town of Comer. This area of Georgia falls in GADNR's Deer Management Unit (DMU) 5. Deer densities, for GADNR's DMU-5, averaged 45 deer per square mile (17 deer per km^2) from 1995-2003 (Georgia Department of Natural Resources 2005).

Methods

On 8 July 2007, the property manager established two food plots in the ROW, approximately 4300 ft^2 (400 m^2) in size. Each food plot was planted with a mixture of cowpeas (*Vigna unguiculata*) and Lablab Plus, marketed by Tecomate® Wildlife Systems. About one week later, Gallagher® deer-exclusion fencing was installed around an approximately 1350 ft^2 (125 m^2) portion (31%) of each food plot, (Figure 1). Eighteen 11 ft^2 (1 m^2), sample plots were established at random—nine in each food plot. We grouped the nine sample plots into one of three categories. We established three sample plots each outside the fenced area (hereafter "unprotected"), within the fenced area (hereafter "fenced"), and inside the fenced area and enclosed in galvanized wire fencing 4 ft (1.2 m) in height (hereafter "wire enclosed"; Figure 2). We used an 11 ft^2 (1m^2) hoop to determine plants to include in sampling, and recorded plant heights of cowpeas, ignoring other plant species in the plots.

We sampled each plot 6 times in the late summer of 2007: 26 July, 8 August, 11 August, 16 August, 28 August, and 10 September. We counted the total number of browsed and unbrowsed cowpea plants, and calculated browse percentage. Browsed plants had the stem or leaves bitten or torn, consistent with deer browsing.

Data Analysis.—We performed a repeated measures analysis of variance to test the effect of fencing treatment on sample plots over time for both maximum height and browse percentage measurements. We analyzed variance with respect to measurement date, treatment (sample plot type), and a treatment-measurement date interaction in two separate models using browse percentage and maximum height as dependent variables. P-values <0.05 were considered significant.

Results

Results of repeated measures analysis of variance indicated a difference in browse percentage and plant height existed in relation to measurement date, treatment, and treatment -measurement date. Mean maximum final height measurements, taken on 10 September, indicated that plant growth at wire enclosed sample plots was over 4 inches greater (mean = 16.5 in (42.0 cm); standard deviation (SD) = 3.05 in (7.73 cm)) than plant growth in fenced sample plots (mean = 12.4 in (31.5 cm); SD = 3.4 in (8.9 cm)). Plant growth at fenced sample plots was more than 6.3 inches taller than at unprotected sample plots (mean = 8.9 in (22.7 cm); SD = 2.6 in (6.6 cm)) (Figure 3).

Deer browsed a greater percentage of plants in unprotected sample plots (range 19% - 72%) than in fenced plots and wire-enclosed sample plots had no browsing. Browse percentage values on protected plots averaged less than 7% browsed (Figure 4).

Discussion

The results of this study confirm that Gallagher®'s 2-layer exclusion design is effective at reducing deer browse. Deer browsed a lower percentage of plants at fenced plots than at unprotected plots. The mean browse percentage within the fenced sample plots never reached 7% during the entire study, whereas unprotected plots received browse percentages as high as 72%. This effect is apparent in the height measurements. Cowpea plants within the fenced sample plots had much higher maximum-

height measurements when compared with unprotected sample plots from the second measurement date through the end of the study. In addition, the differences in mean height between cowpeas in the fenced sample plots and those in unprotected sample plots increased throughout the study. As such, both measures of browsing intensity confirm the efficacy of the fences at providing a significant amount of protection to food plots.

However, this is not to say that these fences will work in all situations, and they are not 100% effective. VerCauteren et al. (2006) recommend a woven wire fence greater than or equal to 9.8 ft (3.0 m), when no deer browse is acceptable. In situations of nutritional stress, or when competition for food is high, deer will be motivated to attempt breaching almost any barrier (Conover 2002). Fencing of type we studied might be less effective if competition for resources is high. Deer are physically capable of jumping the 2-layer fence design and may attempt to do so if competition for resources is not controlled.

Late summer can be a nutritionally stressful time for deer in the Southeast, and, if available, deer will shift from desiccated natural forages to agricultural crops (Cook and Gray 2003). Unprotected areas were available in both of our food plots and at nearby food plots, reducing the motivation for deer to breach the fences to consume cowpeas. Management of competition through deer herd density control is the key to making Gallagher® fencing a valuable tool for property managers.

The use of solar-powered electric fences, such as the Gallagher® fences used in this study, provide a useful tool for land managers to protect investments in food plots. Additionally, use of such fences can help managers provide deer with abundant sources of high quality forages though the stressful period of late summer and on into the fall. Gallagher® fencing, in similar situations, can protect food plots during establishment and allow for parts of food plots to be held in reserve. Other research has shown that repellants (e. g., Milorganite®) can deter browsing from young food plots (Stephens et al. 2005).

As the natural forages of spring and early summer become less palatable, unprotected portions of food plots are available to supplement deer diets. Fences (and repellants) allow managers to protect areas within food plots from over browsing. As unprotected portions of food plots are depleted, relocating fences allows managers to provide additional forage. Protecting areas of food plots can also serve as attractants to assist in deer harvest if protected into fall.

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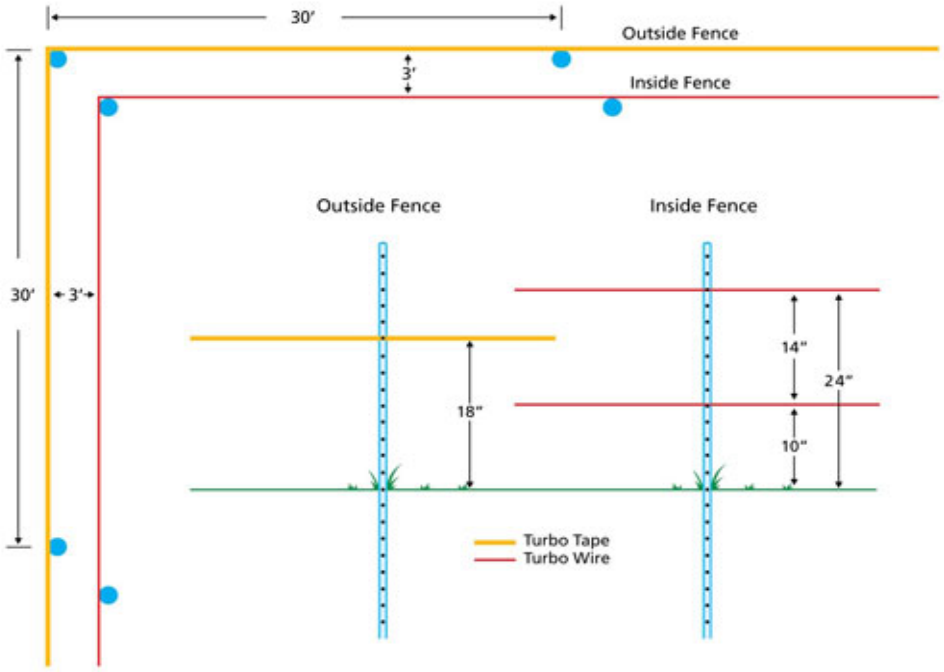

Figure 1. Diagram showing two-layer deer-exclusion fence design marketed by Gallagher®. Single strand height equals 45.75 cm. Two-strand height equals 61 cm. Layers are separated by 91.5 cm. (downloaded from www.gallagherusa.com)

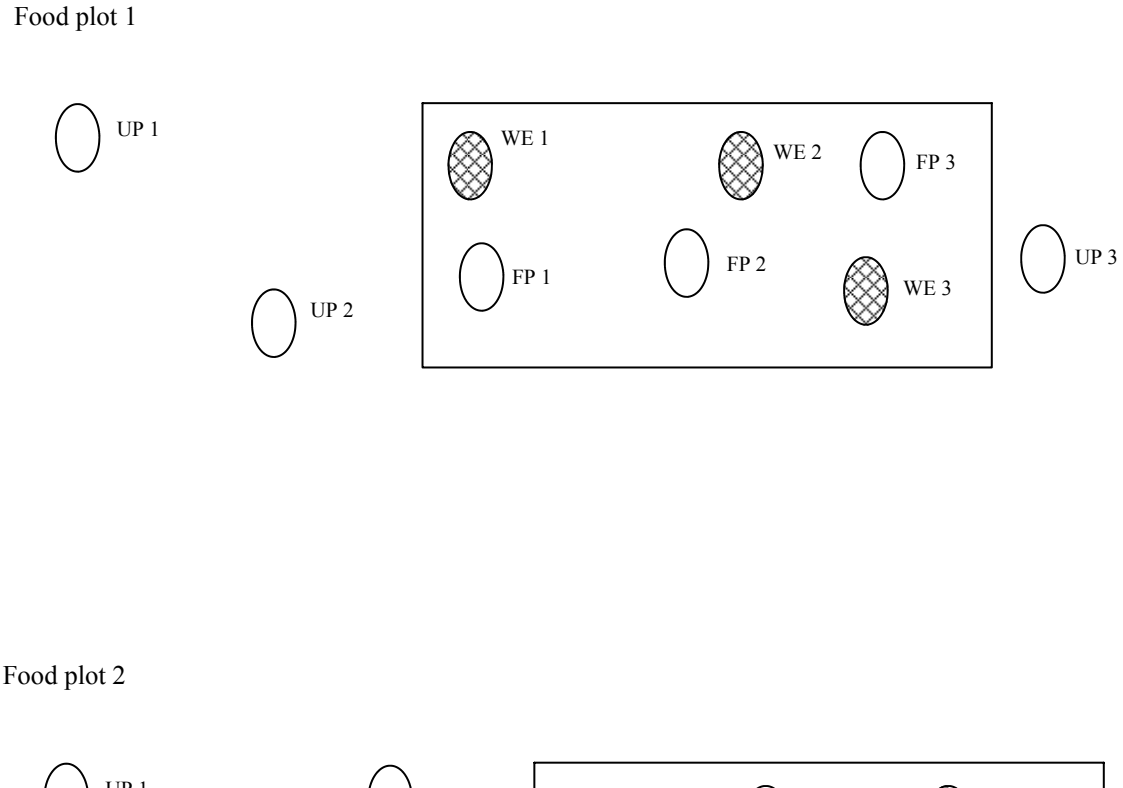

Figure 2. Arrangement of sample plots and fencing at food plots on property in Madison County, Georgia (not to scale).

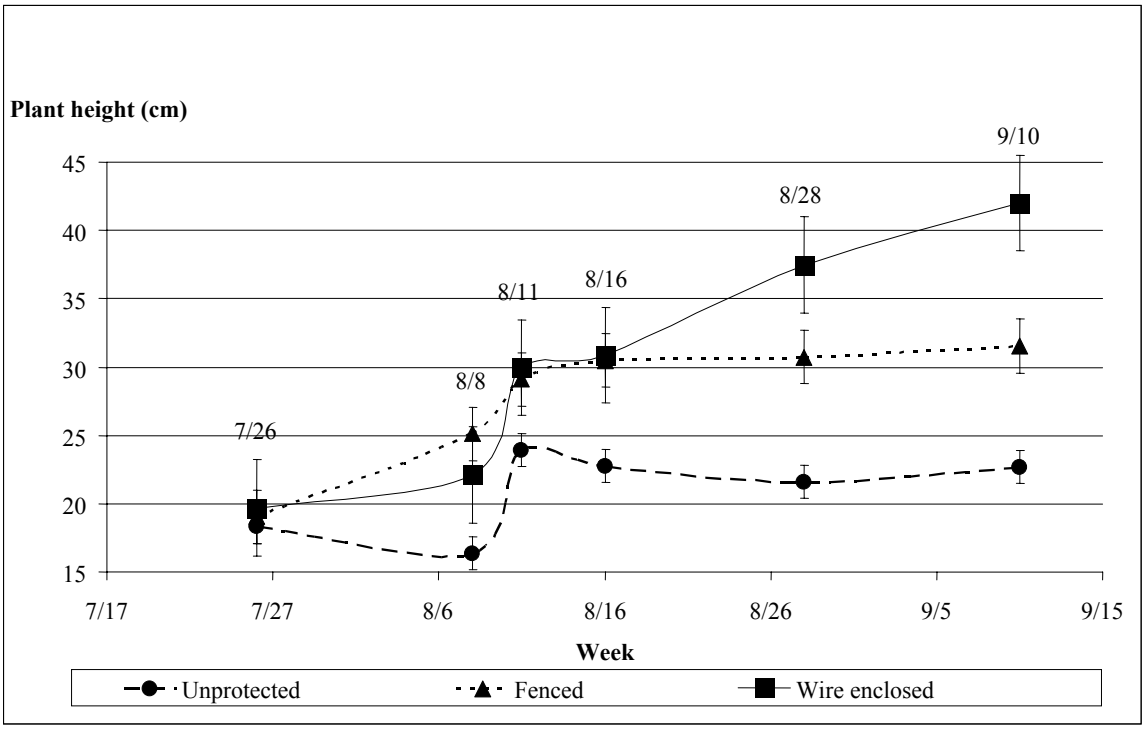

Figure 3. Mean maximum height of cowpeas measured in unprotected, fenced, and wire enclosed plots at food plots 1 and 2 between 26 July and 10 September 2007, Madison County, Georgia. Error bars represent the standard error for each sample plot type.

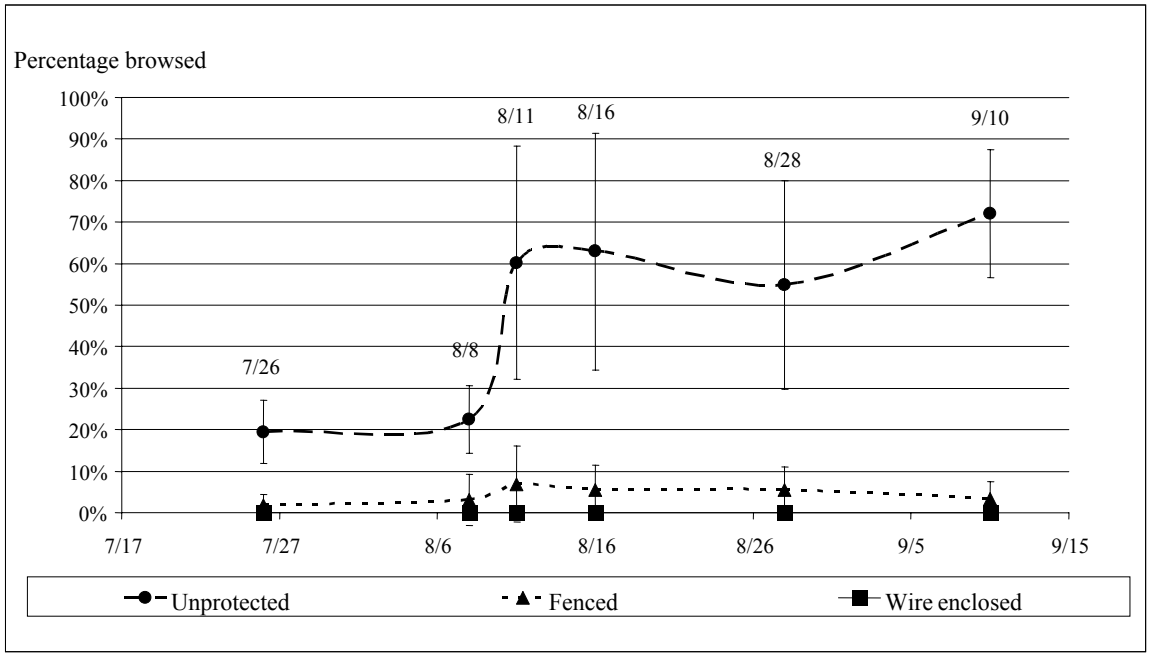

Figure 4. Percentage of cowpeas browsed in unprotected, fenced, and wire enclosed sample plots at food plots 1 and 2 between 26 July and 10 September 2007, Madison County, Georgia. Error bars represent the standard error each sample plot type.

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