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DEER BROWSE GROWTH REDUCED BY PINE OVERSTORY

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ABSTRACT

Twig growth of young browse plants growing in the open was several times greater than that of plants beneath pine trees. The difference was most pronounced when plants were youngest. Most twig growth was within reach of deer (below 5 feet) until plants were 5 or 6 years old, but the proportion decreased with age for tall shrubs and small trees.

Although twigs constitute only a small fraction of the browse consumed by deer (Harlow and Hooper 1972), twig length is a good indication of total browse yields (Schuster 1965). This paper presents data on the length of annual twig growth for young browse plants growing in the open and beneath a canopy of pine trees in east Texas.

METHODS

In 1963 and 1964, 1-year-old seedlings of 14 browse species were planted beneath a recently thinned sawtimber-size stand of shortleaf and loblolly pines

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(Pinus echinata, P. taeda). Basal area of the remaining pines averaged 70 square feet per acre. Vegetation other than pines was cut or killed with chemicals before the browse plants were set out. Nine plants of each species were equally spaced within each of four contiguous ¼-acre blocks. Shrubs and vines were planted 5 feet apart; small trees were 10 feet apart.

The same planting schedule and arrangement were implemented in a nearby abandoned field. Here, the land was disced in preparation for planting. Weeds were kept down by discing until plants were definitely established and thereafter by mowing.

Total twig length was calculated for 12 woods-grown and 12 open-grown plants of each species by counting the twigs on the plant and multiplying that number by the average twig length. For shrubs and small trees, a distinction was made between twigs above and below a height of 5 feet since those above are generally unavailable to deer.

This paper presents data collected from 1967 through 1972. An earlier phase was reported by Halls and Alcaniz (1968).

RESULTS

During the 6-year period, the average total length of current twig growth was 3.7 times greater for browse plants growing in the open than for those growing beneath pines. The ratio in twig growth between open-and woods-grown plants was approximately 10:1 for the vines Alabama supplejack, Carolina jessamine, and saw greenbrier. American beautyberry, brook euonymus, and sassafras had the lowest ratios (approximately 2:1) Table 1).

The differences in twig growth were greatest when plants were youngest. From 1967 trough 1969 the average ratio was 5.96 to 1 in favor of open-grown plants, but from 1970 through 1972 it was only 2.67 to 1. The tendency for twig growth to become more uniform with increasing age was most evident for American beautyberry, brook euonymus, and sassafras. In fact, in 1972 when most of these plants were 10 or 11 years old, twig growth beneath trees was equal to or greater than that in the open.

The proportion of twig growth below 5 feet varied with age for shrubs and small trees. In 1967 when most plants were 5 or 6 years old, 94 percent of the twig growth in the open and 98 percent in the woods were within the 5-foot height zone.

Throughout the study, twigs on brook euonymus and rusty blackhaw were always within the 5-foot zone. A large proportion of twig growth remained below 5 feet for American cyrilla and yaupon plants growing in the open; however, by 1972 twig growth above 5 feet was equal to or greater than twig growth below for plants growing beneath trees. Although American beautyberry plants produced considerably more total twig growth in the open than beneath trees, the twig length below 5 feet was approximately the same at both locations from 1968 through 1972.

After small trees were 5 or 6 years old, an increasing proportion of twig growth occurred above the 5-foot zone. Sassafras grew out of reach quickest. By age 6, only 13 percent of the twig growth for sassafras plants in the open and 37 percent for those beneath trees was below 5 feet. Most blackgum growth remained within the 5 foot zone until plants were 9 years old, but at age 10 the ratio of twigs above and below 5 feet was 5 to 1. The proportion of twigs below 5 feet decreased consistently with age for dogwood plants beneath trees; at age 11 twig length above 5 feet was approximately the same as below. However, at the same age dogwood plants in the open still had a higher proportion of growth below 5 feet.

Table 1 Total length of current twig growth for browse plants growing in the open and beneath pine trees, 1967 through 1972.

Species	Open		Beneath trees	
	Total Length	Proportion below 5 feet	Total Length	Proportion below 5 feet
	Cm.	Pct.	Cm.	Pct.
Shrubs				
American beautyberry (*Callicarpa americana*)	5,510	81	2,908	86
American cyrilla (*Cyrilla racemiflora*)	11,901	80	2,223	29
Brook euonymus (*Euonymus americanus*)	2,505	100	1,667	100
Yaupon (*Ilex vomitoria*)	21,605	88	8,801	74
Rusty blackhaw (*Viburnum rufidulum*)	3,144	100	991	100
Small trees				
Flowering dogwood (*Cornus florida*)	15,295	62	5,496	75
Blackgum (*Nyssa sylvatica*)	17,368	69	3,787	28
Sassafras (*Sassafras albidum*)	10,191	17	5,297	5
Vines				
Alabama supplejack (*Berchemia scandens*)	14,038	100	1,526	100
Carolina jessamine (*Gelsemium sempervirens*)	16,263	100	1,640	100
Honeysuckle (*Lonicera japonica*)	25,347	100	7,375	100
Saw greenbrier (*Smilax bona-nox*)	8,709	100	766	100
Common greenbrier (*Smilax rotundifolia*)	7,336	100	1,487	100
Muscadine grape (*Vitis rotundifolia*)	6,640	100	1,467	100

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