Growing Deer Food Amidst Southern Timber[1]

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Highlight

In addition to growing timber, pine-hardwood forests of the South produce food for white-tailed deer. The food yields, and thus deer populations, are governed by timber stand density, frequency of timber cuttings, size and distribution of harvest cutting units, and application of prescribed burning.

Southern pine-hardwood forests have an enviable potential. They are expected to be the Nation's main source of timber by the year 2000 (USDA Forest Service, 1965). At the same time, they have possibilities of sustaining large herds of healthy deer (Fig. 1).

Deer restocking, improved law enforcement, control of screw-worm (which formerly killed many fawns), and the public's desire for better hunting have increased southern deer herds many-fold during the last 25 years. The population in 1965 was estimated at 2 million, 250,000 of which were legally harvested. Deer numbers will likely continue to increase, and the population limits will largely be determined by amounts of food and cover.

Within certain bounds of climate and soil the production of deer food in the South is largely determined by timber stand conditions. This paper shows how timber stands can be managed to improve the quality and quantity of deer food. The discussion is pertinent to the South's 105 million acres of pine-hardwood forests, most of which are managed for pine.

Principal trees are shortleaf (*Pinus echinata*), loblolly (*P. taeda*), slash (*P. elliottii*), and longleaf pine (*P. palustris*), usually in combination with sweetgum (*Liquidambar styraciflua*) and several species of oak (*Quercus* spp.) and hickory (*Carya* spp.). They are usually grown under even-aged management for pulpwood and sawtimber, and, more recently, for manufacture of plywood. Although timber is likely to continue as the main crop in these forests, deer undoubtedly will enhance the economic and recreational values of the stands.

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Understory plants of many species provide food for deer. Some of the common southern browse species are greenbriers (*Smilax* spp.), hawthorns (*Crataegus* spp.), dogwood (*Cornus florida* L.), hollies (*Ilex* spp.), yellow jessamine (*Gelsemium sempervirens* (L.) Ait. f.), honeysuckle (*Lonicera japonica* Thunb.), and American beautyberry (*Callicarpa americana* L.). Legumes, euphorbs, panic grasses, and mushrooms are also important sources of food.

Timber Stand Density

Forage production is inversely related to timber density. When trees are scattered or absent herbage yields approach 3,000 lb/acre (Duvall and Hilmon, 1965). Browse yields in forest openings may reach 1,400 lb or more (Strode and Chamberlain, 1959). As the timber stands become progressively denser the forage yields decline in a slightly curvilinear pattern; at about 90 ft^2 of tree basal area the total yields are usually less than 500 lb (Halls and Schuster, 1965).

A timber stand supporting 90 ft^2 or more of tree basal area thus is likely to be a poor deer range. On the other hand, stand densities of less than 75 ft^2 of basal area are usually not adequate for growing profitable crops of timber (Reynolds, 1959). A stocking somewhere between these extremes is practical for landowners interested in growing both timber and deer (Fig. 2). Stocking at the lower range of these densities would be favorable to wildlife and in line with present trends toward a relatively wide spacing of timber.

Most understory browse plants produce fruit that deer eat readily. The yields vary widely according to age and species, but, as with forage, they are highest in the open and lowest beneath trees. For example, the fruit yields of 5-year-old browse plants grown in the open were 32 times greater than those of plants grown beneath a pine stand of 70 ft^2 of basal area (Halls and Alcaniz, 1968). Lay (1961) has indicated, however, that production of understory fruits in pine stands may be several hundred pounds per acre with the proper species and age classes of food plants.

Foresters can exert considerable control over tree stocking at the regeneration and harvesting phases of the rotation. During regeneration the initial tree spacing can be controlled by planting at specified intervals or by regulating the rate of seeding. In natural regeneration the spacing can be governed to some extent by cultural practices, such as disking.

A wide spacing at regeneration is an advantage in regard to deer food. The period of maximum forage production is extended several years because the developing young trees are slow to form an overhead canopy. Also, there is more space for growth of understory plants during the sapling

FIG. 1. Healthy deer can be sustained on properly managed pine-hardwood forests in the South.

and pole phases of rotation, when forage yields are usually low.

When trees reach harvestable size the stands can be thinned to provide growing space for deer browse without detracting from their wood-producing potential. A stand being managed for saw logs is likely to be thinned several times; if periodically thinned to about 75 ft^2 of basal area it probably will produce good quantities of forage and fruit to the end of the rotation. If the stand is managed on a short pulpwood rotation, however, it is unlikely to be thinned at all, and the period of good food production thus will be limited to the seedling and young sapling stages.

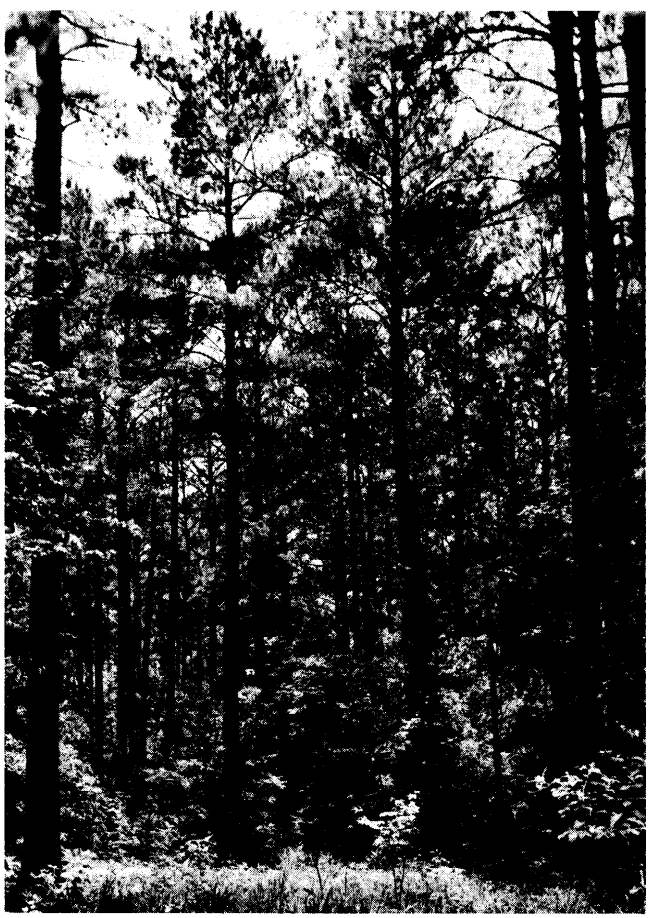

FIG. 2. Browse production is high in this stand because an overstory basal area of less than 90 square feet per acre has been maintained.

The frequency of intermediate cuttings, which is usually determined by growth rate and volume of trees, is important in making the forest appealing to deer. In addition to opening up the stand, timber cutting causes many changes in the vegetation (Ripley, 1963). There is an immediate increase in herbaceous vegetation, some of which is palatable to deer. Established browse plants spread and put out new, succulent sprouts that are more palatable and nutritious than the ordinary growth of leaves and twigs. Some vines and shrubs that normally are out of reach for deer are forced to ground levels. These effects last only a few years after a thinning, however. Thus, to be of optimum value to deer, timber cuttings should be made at 4- or 5-year intervals (Blair, 1968). A shorter term would likely be economically unacceptable to the timber producer.

Size and Distribution of Harvest Cutting Units

The trend in timber management is to harvest the final crop by clear-cutting. Managers of large forests usually prefer to cut in large units, of perhaps 500 acres. In contrast, the wildlife biologist is usually happiest when cutting units are small, 30 to 40 acres.

Cutting units of approximately 50 to 100 acres are a practical compromise. They furnish enough timber products and can accommodate modern machinery. On the other hand, they are small enough to provide adequate forest edge and numerous openings. If these cutting units are strategically located over the entire forest properly, the deer have a diversity of food and cover within their home range.

Prescribed Burning

Prescribed burning is extremely useful in both timber and deer management.

Foresters burn to reduce the logging slash and weed cover, to facilitate the planting or seeding of trees, and to ease the movement of men and machinery. They also use fire to lessen wildfire hazard, to control brown spot of longleaf pine, and to restrict growth of unwanted vegetation. Because the southern pines are fairly tolerant of fire, carefully controlled burning can be done from an early stand age through the entire rotation.

Prescribed fires have an immediate and beneficial effect on the yield and quality of herbage

(Halls et al., 1964). In pine forests that are frequently burned, herbaceous plants usually form the dominant understory. Such plants are suppressed by the trees when fire is excluded.

Fire kills the tops of most browse plants, causing them to resprout near the ground. This new growth is of higher quality and more available to deer than browse from unburned areas (Lay, 1957). Winter burns at intervals of 3 to 5 years help keep the browse low and seldom kill plants or injure game. When given a choice, deer graze the forage in burned woods much more heavily than that in unburned stands (Lay, 1967).

The burns must be carefully scheduled. Summer fires often eliminate many understory species that deer prefer (Klawitter, 1966). Too frequent winter burns may severely weaken browse plants and restrict their growth so that they seldom produce much fruit. Fire should be excluded for several years during the rotation so that some of the large shrubs and midstory hardwoods can reach fruit-bearing size (Lay, 1967). By that time they generally are able to withstand fires.

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