

years (spring study), and highest in the three-year-old burned area during all three study periods.

On the area burned three-years in succession the *quantity* of forbs was less than in the other burns (spring study). This burned area, however, contained the greatest variety of forbs.

Degree of utilization on forbs, legumes, and woody plants was heaviest in the one and two-year old burns and in the area burned three years in succession. Utilization on grasses and sedges was negligible during all seasons. Utilization on all other plants except grasses and sedges was greatest during the winter.

The most beneficial burning program when soil, wildlife, and pine growth are given equal consideration on the longleaf pine-turkey oak association on the Ocala National Forest is a three-year rotation. Forbs and legumes are maintained at their highest levels of production on this type of burning program.

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GROWTH AND USAGE OF PERMANENT FORAGE BY DEER AND TURKEYS

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INTRODUCTION

In recent years, through trial and error, the development, seeding and maintenance of permanent openings and food plots in the game management areas of Northern Georgia, have evolved, in most cases to permanent pasture. The justification for these openings and food plots was an attempt by the Georgia Game and Fish Commission to increase the numbers of wild turkeys (*Meleagris gallopovo silvestris*) on the game management areas to huntable populations. In the spring of 1954, a program of development was started with the wild turkey in mind, on

several of the game management areas having low populations of turkeys but high populations of deer (*Odocoileus virginianus*). Old house sites and abandoned fields within the management areas were cleared of brush and small trees with a bulldozer prior to seeding. After clearing, the old house sites, fields and ridgetops were either disked or plowed, then harrowed until a suitable seedbed was prepared. At first, wheat, rye and oats were seeded in the fall to provide grazing and grain in season. However, the deer immediately started feeding on the young plants and by early winter the food plots were bare of available foods.

The following spring, soybeans, millet, cow peas and corn were planted in those plots containing two or more acres. Each variety was seeded alone; no two varieties of grain were mixed. Smaller plots were seeded to grasses and clover. By the time the soybeans and cow peas were beginning to bloom, deer had practically eaten the entire planting of these varieties. After the millet had headed and started to produce mature seeds of grain, the deer nipped off and ate the entire crop of this planting. The corn fields were not molested by deer from planting time until the corn had matured in the late fall. Not until winter did the deer start feeding on the mature corn.

Planting of corn in all suitable plots and fields seemed to be the answer, since turkeys fed in those fields practically every day during the winter months on corn the deer knocked down or scattered on the ground. The spring of 1956, every field and food plot of one or more acres of suitable ground was planted to a variety of yellow corn locally known as "Thompson's prolific". Again the corn grew and matured in the fall, with one exception, every management area having even a small population of feral hogs ended up with the corn being destroyed by the hogs.

While the experimenting with grains and corn was being carried out, various grasses were seeded on the smaller food plots that were unsuitable for production of grains. Rye grass (*Poa multiflorum*), Kentucky fescue (*Festuca prantsis* 31), orchard grass (*Dactylis glomerata*), ladino clover (*Trifolium repense*, ladino) and crimson clover (*Trifolium incarnatum*) were used in these seedings. However, each variety of grass and the crimson clover were seeded alone. Ladino clover was seeded in combination with the other grasses. It was noted that for hardiness and year around growth, Kentucky 31 fescue in combination with ladino clover was the most suited for upland growth. Orchard grass and ladino clover was the most suited for lowlands. It was also noted that turkeys and deer were seen feeding in these grass plots the entire year and even in winter some growth of grasses was evident.

The evident production and hardiness of orchard grass, fescue and ladino clover plus the added attraction to deer and turkeys led to the seeding of corn fields to permanent pasture in those management areas having feral hogs. These plots ranged in size from one-half acre to more than five acres with the average size being approximately two acres. It was found that orchard grass seeded at the rate of twenty-five pounds per acre and ladino clover at the rate of eight pounds per acre produced the best results for that combination. Thirty pounds of fescue and ten pounds of ladino produced good stands for this combination. Fertilizer was applied at the rate of five to eight hundred pounds of 6-8-6 analysis per acre, depending on quality of the soil.

Since most all of the mountain soils have a slightly acid content, agricultural limestone was applied at the rate of one ton per acre to all fields seeded to grasses and clover. Seeding took place during the early spring or early fall months. Usually during the month of June all permanent grass fields were mowed with a tractor-drawn rotary power mower commonly called a "brush hog". This mower clipped the grass and clover to within three inches of the ground with the grass and duff being left to rot where it fell. During the month of September all permanent grass fields were side-dressed with three to four hundred pounds of 6-8-6 fertilizer per acre to stimulate growth for fall and winter months.

Method of Obtaining Data

A permanent grass plot of orchard grass and ladino clover typical of the average food plot and located near the center of the Chattahoochee Management Area was selected for the study. This plot was seeded to grass and clover in the spring of 1958 in the same manner and amounts

of seed and fertilizer as others in the area were seeded. This particular plot is approximately two acres in size. To form a base for the study plots it was decided to use a sight line as near the center of the field as possible and to drive a wooden stake into the ground each twenty-five feet along the sight line. Beginning at the north edge of the field and going south along the sight line the stakes were numbered 1, 2, 3, etc., as they were driven into the ground.

Ten wire exclosures were constructed of ten-gauge welded steel wire fence forty inches in height with one inch square mesh. Each exclosure was constructed of a single piece of fence sixty inches in length. This was joined together making a cylinder enclosing a space of two square feet. These exclosures were placed in the grass field by the selection of random numbers. Numbers of not more than two digits were written on a small piece of paper and placed in a small covered box. As each exclosure was to be placed in the field, a number was drawn from the box. The first digit denoted the stake number, the second digit denoted feet from the stake; odd numbers were right side, even numbers were left side, going south along the sighted line. When the spot was located for the wire exclosure, the exclosure was held in place by two wooden stakes driven into the ground opposite each other. The exclosure was then held in place with pieces of wire twisted around the wooden stakes. The exclosures were placed over the study plots on January 15, 1960. On April 21, 1960, each exclosure was removed and the grass and clover inside was clipped within one-fourth inch of the ground. The clippings from each exclosure were placed in a large paper bag. On this same day, April 21, 1960, ten plots were located by drawing numbers from the box, locating the designated stake, then the distance from the stake for the plot location. As each plot was located in the area that had been grazed by the deer and turkeys, a wire sixty inches in length formed into a circle was used to denote the area to be clipped. Ten plots were located in this manner and the areas clipped and the clippings placed in a paper bag.

The samples taken from the exclosures and the samples taken from the grazed area were spread on a wooden floor in a storage room and allowed to air dry twenty-four hours before weighing. Prior to the taking of the samples the weather had been fair and warm for several days, no surface moisture could be detected on the grass and clover at the time of clipping.

Results of The Study

Those samples taken from the twenty square feet of exclosures weighed twenty-one ounces for an average of 1.05 ounces per square foot. Those samples taken from the grazed area weighed fifteen ounces for the twenty square feet for an average of .75 ounce per square foot. Using these samples as a basis for the amount of food available, plus growth during the period, there were 2,858.6 pounds of food available per acre during the ninety-seven day study period. The samples taken from the grazed area indicated that there were 2,041.9 pounds of food available per acre at the end of the study period. The difference in the total of the two samples indicated that 816.7 pounds of food per acre were utilized by the deer and turkeys during the study period.

Discussion

It was apparent to the casual observers that the grass and clover inside the exclosures looked larger and greener prior to the clipping operation. It was also noted that the grass and clover from the exclosures contained more new grass and clover than the samples taken from the grazed area. It is the author's opinion that it was mostly the new growth of grass and clover that the deer and turkeys utilized during the study period rather than an indiscriminate grazing of all year growth.

The large amount of food available in the grazed area at the end of the study period indicates that it was mostly the new growth that was being utilized as it became available to the deer and turkeys.