RESPONSE OF JAPANESE HONEYSUCKLE TO MANAGEMENT IN THE ARKANSAS OZARKS[1]

by
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ABSTRACT

Honeysuckle planted in 1968 consistently yielded more than 2,000kg of leaves and twigs per ha after 1972. Fertilization with N substantially increased total vegetative yields and crude protein content of leaves. Utilization by deer was highest when acorns were scarce and when snow covered the ground. Despite high yields, there was evidence than an effective means of weed control would be necessary to prevent native woody species from eventually suppressing the honeysuckle. Mowing was not sufficient control, and spraying with 2,4,5-T killed honeysuckle as well as native woody species.

INTRODUCTION

Intensive timber management practices such as even-aged regeneration are increasing the need for supplemental food plantings to maintain resident game populations in southern forests (Halls and Stransky 1968). Japanese honeysuckle *(Lonicera japonica)* is a prime candidate for habitat improvement plantings on wildlife food plots. It provides food and cover for many species of birds and mammals, especially during severe winter weather when other vegetation is covered by snow and ice (Handley 1945). The fruit is eaten by several species of birds, including the bobwhite *(Colinus virginianus)*, and both fruit and foliage are eaten by the wild turkey *(Meleagris gallopavo)*. The leaves are evergreen in the South and are a preferred winter food of white-tailed deer *(Odocoileus virginianus)* throughout the Southeast (Harlow and Hooper 1971).

This paper reports the successful establishment and maintenance of Japanese honeysuckle on wildlife forage clearings in the Ozark Mountains of north central Arkansas. We previously reported yield and utilization from the time of planting through the third year of growth and discussed seasonal nutritive quality of leaves and twigs (Segelquist et al. 1971). Recently, we described the results of fertilization trials conducted in 1971 (Segelquist and Rogers 1975). The present paper summarizes pertinent information from the earlier publications, reports annual yield in subsequent years, and discusses control of competing native vegetation. The information might prove useful to wildlife managers wishing to practice intensive habitat improvement for deer and other species.

MATERIAL AND METHODS

In April 1968, Japanese honeysuckle was planted on four small clearings located in upland hardwood and pine-hardwood forest types. Two of the plots contained about 1 ha each, and the other two about .5 ha apiece. All merchantable timber growing on the plots was harvested, and the remaining trees, stumps, slash, and underbrush were piled and burned. Plots were tilled and leveled, and rooted honeysuckle cuttings were planted at about 3 to 3.5m intervals in rows approximately 3m apart. Plants were placed in narrow furrows formed by a subsoiler, and soil was packed around the roots with a dibble.

Agricultural limestone (3,360kg per ha) and ammonium nitrate (33-0-0) at 134kg per ha were applied at the time of planting. Three months later, the plots were topdressed with an additional 56kg per ha of ammonium nitrate; thereafter they were fertilized twice annually — in spring and late summer or in early fall. Spring applications usually averaged about 112kg per ha each of a complete

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fertilizer (12-12-12 or 10-20-10) and a nitrogen fertilizer (ammonium nitrate or urea, 45-0-0). Late summer applications consisted of about 112kg per ha of ammonium nitrate. Fertilization tests were performed on two plots in the summer of 1971, when ammonium nitrate, P_2O_5, and K_2O were applied at various concentrations for a total of 12 treatments (Segelquist and Rogers 1975).

During the first four growing seasons (1968-71), plots were mowed once during the spring or summer with a tractor-drawn rotary mower to reduce competition from native vegetation. Vegetation was cut to about 15cm between rows and to about 35cm within rows, honeysuckle included. No mowing was performed in 1972, but all vegetation was mowed once in 1973 — to 35cm and twice in 1974—to about 15cm in early spring and to 35cm in midsummer.

Two small areas (95 sq m) on one clearing were sprayed with a mixture of 2,4,5-T and water in July 1972 to determine if this herbicide would control woody vegetation without killing honeysuckle.

After 30 months, living honeysuckle plants were counted, and survival was expressed as percentage of the total planted.

Yields per plant were measured in late summer or early fall of 1969, 1970, and 1971 by clipping a portion of 25 randomly located plants per ha on each clearing. From 1972 through 1974, all new growth was clipped on 20 ramdomly located quadrats (0.9 m sq) on the two largest clearings and from 10 each on the two smaller ones. Samples were ovendried and weighed, and the leaves were stripped from twigs and reweighed to determine total vegetation yields and proportions of leaves and twigs.

Each fall, wire cages were placed over several randomly selected plants to exclude browsing deer. Winter forage utilization and retention of leaves were estimated each March by comparing clipped or estimated weights of protected and unprotected plants.

RESULTS AND DISCUSSION

Survival, Yield, and Utilization

Almost all of the plants survived the first 30 months, and survival was apparently not influenced by excessive or deficient rainfall (Segelquist et al. 1971).

Yields increased steadily from the first measurement in 1969 to maturity; by 1972, the food plots were yielding over 2000kg of leaves and twigs per ha:

1969	*1970*	*1971*	*1972*	*1973*	*1974*
−75±12[3]	268±56	840±84	2,443±368	3,173±350	2,861±321

Leaves, the most palatable and nutritious part of the plant, contributed from 41 to 66 percent of the toal growth annually. The proportion of leaves was highest when plantings were young and generally decreased as they became older. As plantings grew older, the early spring growth became heavily shaded by the increasingly dense new growth. This dense shading may have caused the lower leaves to be shed prior to the fall sampling period.

Annual winter leaf retention ranged from 2 to 100 percent. Retention was high in 1969, 1970, and 1974, when there were no ice-storms; in 1971, 1972, and 1973, however, ice-storms caused the leaves to fall prematurely. The storms did not occur until mid-winter — long after all leaves had been shed by native deciduous browse, and some honeysuckle leaves were retained throughout the severest winter.

Since there was little evergreen foliage on the study area, honeysuckle leaves provided almost all of the available green winter browse. Honeysuckle was not readily eaten by deer during spring and summer, but in fall and winter, consumption ranged from 3 to 95 percent annually. Because deer ate little honeysuckle during the growing season, most current annual growth was still available when native forages were least abundant.

The availability of mast, primarily acorns, usually determined the amount of honeysuckle eaten by deer. In 1970, for example, mast yields averaged only 12kg per ha, but deer ate 61 percent of the available honeysuckle (Segelquist et al. 1974). However, in 1971, mast yields averaged 195kg per ha, and deer ate only 3 percent of the honeysuckle. Deer fed most heavily on honeysuckle when snow covered the ground.

[3] ± 95 percent of confidence intervals.

Response to Fertilization

Total yields of honeysuckle (leaves plus stems) and crude protein content of leaves were substantially increased by fertilization with high levels of N (Segelquist and Rogers 1975). The ratio of leaves to twigs was constant at all levels of fertilization. Moderate levels of 12-12-12 and ammonium nitrate in 1969 produced a much higher crude protein content in honeysuckle leaves than in those of unfertilized native winter forages (Segelquist et al. 1971.)

Fruit yields declined as levels of N increased. Fruit production on 3-year old plantings averaged 15kg per ha without N additions and only 4kg per ha when N was applied at 300kg per ha (Segelquist and Rogers 1975).

Although fertilization is not essential for establishing and maintaining honeysuckle on forage clearings, fertilization with N increases forage yields and enhances nutritive quality. Honeysuckle can therefore be maintained without fertilization during noncritical seasons, and fertilizer may then be applied to produce high quality, nutritious fall and winter forage.

Control of Native Vegetation

Honeysuckle had little competition from native vegetation the first year of the study because the soil had been thoroughly disturbed and all woody rootstock removed. Growth patterns of native vegetation between rows of honeysuckle were typical of old field succession, but the early stages were shorter, probably because of frequent mowing and fertilization. From 1968 to 1971, most of the competition consisted of annual forbs and grasses. By the fall of 1970, broomsedge bluestem *(Andropogon virginicus)* — a perennial — was the dominant competing species. Despite continued mowing, woody species began to appear by 1972, the most common being sassafras *(Sassafras albidum)*, black locust *(Robinia pseudo-acacia)*, shortleaf pine *(Pinus echinata)*, smooth sumac *(Rhus galabra)*, and blackberry *(Rubus spp.)*. Japanese honeysuckle did not subsequently smother tree and shrub reproduction as was previously reported in the southeast (Brender 1960); in our study, native woody species easily outgrew honeysuckle. In 1973, mowing temporarily suppressed most of the woody invaders, but smooth sumac and black locust resprouted vigorously. Since sumac spreads by root suckers as well as sprouts, it formed a multi-stemmed colony with a very dense canopy from 2 to 3m high on a small portion of one clearing. Wherever this dense colony grew, it greatly depressed the growth of honeysuckle. However, sumac grew in a limited area, and honeysuckle production still increased to 3,173kg per ha, the highest yield in the study.

Although honeysuckle growth rates and yields remained very good, there was evidence that without effective weed control, trees and shrubs would eventually restrict production. Lay (1968) reported that competing vegetation may cause plantings to fail in E. Texas, but Jackson (1973) stated that Japanese honeysuckle can compete favorably with other species on old-field sites in the Northeast, even if woody vegetation is not controlled. Soil type, fertility, and moisture availability may explain the differences found among geographical regions.

We found that mowing alone was not sufficient control and that the herbicide treatment killed honeysuckle as well as competing woody vegetation, although honeysuckle was resistant to spraying with 2, 4, 5-T in some sections of the Southeast (Brender 1960). The two small test plots sprayed in 1972 were converted to grasses, which still dominated in 1974.

Competing vegetation might be economically controlled or eliminated by applying an herbicide to individual seedlings and sprouts as soon as they appear, as was demonstrated by using picloram pellets to maintain grassy clearings in Wisconsin (McCaffery et al. 1974).

CONCLUSION

Supplemental forage plantings probably have the greatest potential for use in forests that contain inadequate food supplies for year round maintenance of deer. Japanese honeysuckle plantings should not be the only solution for providing winter forages in areas where food shortages severely limit deer populations. However, because of its relative ease of establishment, its response to fertilization, and its desirability as a source of food and cover for deer and other species, Japanese honeysuckle deserves serious consideration for wildlife habitat improvement in intensively managed southern forests.

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DISPERSAL AND ADJUSTMENT TO HABITAT OF RESTOCKED WILD TURKEYS IN GEORGIA[1]

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ABSTRACT

Range parameters of 16 wild turkeys (*Meleagris gallopavo*) restocked in a Georgia Piedmont habitat were evaluated following early spring releases. Turkeys were tracked by radio telemetry. On 152 occasions, they were radio-located every two hours all day; other radio and visual locations were determined randomly for a total of 1,850. Turkeys were released in what was considered to be the best habitat; their activities remained oriented around that area throughout the study. Ranges increased throughout the study and turkeys had adjusted to their environment within five weeks after release. Maximum distances traveled from the release point averaged 2.82km (1.76 mi) and varied from 1.17km to 4.62km (0.73 to 2.89 mi) with gobblers generally moving farther than hens. Ranges varied from 90.4 ha to 952.4 ha (226 to 2381 acres) with an average of 376 ha (940 acres). There was a continuous shifting of social groupings during the study.

INTRODUCTION

Many state game agencies have successfully transplanted wild turkeys in recent years. Although successful restocking efforts have been reported (Powell 1965, Speake et al. 1969, 1975, and others), immediate post-liberation behavior of turkeys released into a new environment has not been intensively studied. This paper includes information on 16 wild turkeys restocked in a Georgia Piedmont habitat where no native turkey population was thought to be present at the time of release.

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