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# EVALUATION OF COOL SEASON FORAGE COMBINATIONS FOR WHITE-TAILED DEER

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## SUMMARY

Winter forage plantings to supplement wildlife food sources can be evaluated based upon a number of criteria. These include pounds of forage produced per acre, crude protein content during the utilization period, cost of production, response to extremes of weather and grazing pressure. All cereal grain combinations tested proved satisfactory. Differences were seen in total production (poundage), crude protein content, animal preference, cost of production and response to weather conditions, but none were significant to warrant favoring one variety over another. Recommendations for winter planting (based upon a one year study) would lend themselves to a combination of cereal grains (approximately 50% oats and 50% wheat or rye) plus an overseeding of ryegrass and arrowleaf clover. A forage strategy of oats for early grazing and concentration of deer for hunting, wheat, ryegrass and rye for maximum production and cold weather tolerance and arrowleaf clover for a 8 to 9 month grazing program that also returns up to 80 pounds of nitrogen to the soil per acre per year should prove successful in East Texas.

## INTRODUCTION

East Texas landowners and hunting clubs members are placing an ever increasing value on wildlife as evidenced by their efforts to enhance the quality of this resource. The white-tailed deer is considered by many to be the most valuable of these wildlife resources. One accepted method of enhancement of this "renewable resource" is the planting of high quality food plots to increase the level of nutrition available and reduce stress association with winter weather. The large investment of capital and labor involved in developing food plots requires careful evaluation of various plants to compare their productivity and food values. The purpose of this demonstration was to evaluate combination plantings of oats/arrowleaf clover, wheat/arrowleaf clover, elbon rye/arrowleaf clover and ryegrass/arrowleaf clover with regards to weight of dry matter produced, utilization and quality of forage (percent crude protein).

## PROCEDURES

A demonstration site was selected at the Pine Island Hunting Club in Angelina County. The site is on an island of several thousand acres of prime deer habitat containing a well managed deer population.

Soil samples were taken in August 1988. In September 1988 (under extremely dry conditions), the site was plowed, disked and fertilized according to recommendations. Test plots were planted with cereal grains or ryegrass on September 20, 1988. Planting rates were 100 pounds of grain per acre or 40 pounds of ryegrass per acre. Plots were 25 feet by 30 feet in size with 3 repetitions of the 4 treatments. On October 20, 1988, plots were overseeded with inoculated arrowleaf clover at a rate of 10 pounds per acre. A grazing enclosure was placed on each plot to monitor each 30 days regrowth. Plots were visually evaluated and sampled every 30 days. Samples were taken from each plot enclosure, air dried and weighed. Results were converted to yields (pounds per acre) and samples were then forwarded to Texas A&M for protein analysis. Special notations were made of deer numbers, utilization and plant conditions throughout the demonstration. Plots were top dressed with 33-0-0 at the rate of 100 pounds per acre on December 20, 1988.

## RESULTS

Analysis of this demonstration based strictly upon forage production would favor wheat/clover with total production of 8,390 lbs/acre. These yields were followed by rye/clover with 7,801 pounds/acre, oats/clover with 6,244 pounds/acre and ryegrass/clover with 6,155 pounds (Figure 1). However, there are other parameters such as preference by deer and nutritional value that must also be considered. All plant species were readily consumed by deer and other wildlife and all contained an average protein value in excess of the 18% required by deer for satisfactory growth and antler development (Figure 2).

Deer showed a preference for wheat, oats and rye over ryegrass. Utilization was heavy until spring green-up in March, then resumed in May and June in response to arrowleaf clover availability. By day 210 (April), oats, wheat and rye had matured in the enclosures while ryegrass did not mature until day 240 (May). Arrowleaf clover matured in late June.

Cost of planting and establishment is also a concern to hunters, landowners and deer managers, especially in this time of extreme seed price fluctuation. Cost of establishment per acre excluding seed was \$66.10. Cost of seed for the 4 combinations was \$40.60 oat/clover; \$24.60 for wheat/clover; \$26.50 rye/clover; and

\$25.30 for ryegrass/clover. Per acre costs for arrowleaf clover in combination with oats, wheat, rye and ryegrass were \$106.70, \$90.70, \$92.60 and \$91.40, respectively. Cost of forage produced in this demonstration was \$0.01-\$0.02/lb (dry weight) for all combinations.

Another consideration when selecting supplemental winter forages is their susceptibility to winter kills. Estimates of winter kill in this demonstration were up to 60% on oats, 25% on wheat and ryegrass, and none on rye. No damage was observed on arrowleaf clover. Oats are typically affected by winter kill in Angelina County one winter in three; one winter in five, stands are lost completely due to extreme cold. This alone may warrant the use of a combination of cereal grains.

When all data are taken into consideration, we found no definite answer to the question of which combination out performed other combinations. There is a need for cold tolerance, high percent protein, maximum production and least cost when selecting forage for establishment. These criteria point to a recommendation of combinations of grains and clover: (1) Oats for early fall production to draw and hold deer during hunting season, (2) wheat for maximum production, (3) rye for cold hardiness, and (4) ryegrass for landowners in no-till situations. Arrowleaf clover extends the grazing period by providing supplemental forage 45 to 60 days past cereal grain and ryegrass maturation. Plans have been made to follow up this demonstration with another study comparing varying combinations of ryegrass, cereal grains and arrowleaf clover.

## CONCLUSIONS

Cool season forage combinations utilizing arrowleaf clover and oats, wheat, rye and ryegrass extend the period of forage availability as compared to monoculture plantings. Furthermore, production, utilization and quality of these forage combinations were considered to be at or above levels suitable for white-tailed deer.

Additional demonstrations are needed to evaluate combinations of small grains and ryegrass and their interaction with arrowleaf clover. Furthermore, future trials designed to evaluate combinations of small grains/ryegrass planted adjacent to stands of arrowleaf clover should be compared with the results of this demonstration to determine if differences in management requirements, utilization and production costs exist.