

Technical Note: An evaluation of 4 clovers and Italian ryegrass for white-tailed deer

MARK K. JOHNSON AND STEPHEN R. SCHULTZ

Authors are professor and assistant professor, School of Forestry, Wildlife, and Fisheries, LAES, Louisiana State University Agricultural Center, Baton Rouge, La. 70803.

Abstract

We evaluated winter weight gain of captive male white-tailed deer (*Odocoileus virginianus*) that grazed pastures of berseem (*Trifolium alexandrinum* L.), white (*T. repens* L.), crimson (*T. incarnatum* L.), or subterranean (*T. subterraneum* L.) clover their first winter and pastures of berseem, white, or crimson clover or Italian ryegrass (*Lolium multiflorum* Lam.) their second winter. Weight gains the first winter (14.7 ± 0.7 kg) did not differ ($P > 0.10$) among the clovers. Bucks that grazed berseem, white, or crimson clover the second winter gained 3.0 ± 0.5 kg, while bucks that grazed Italian ryegrass gained 0.9 ± 0.9 kg.

Key Words: clover, cool-season forages, *Lilium multiflorum*, *Odocoileus virginianus*, *Trifolium* spp., white-tailed deer

Many clovers and clover mixtures are being promoted by commercial seed companies to enhance rangelands for deer. However, there is little information on potential effects of different clovers on deer growth. The purpose of this study was to compare effects on growth of male white-tailed deer (*Odocoileus virginianus*) among 4 cool-season clovers.

Materials and Methods

We studied captive deer at the Louisiana Agricultural Research Station's Ben Hur Farm, East Baton Rouge Parish, La. Levels of soil phosphorus (P), potassium (K), and calcium (Ca) were high. Soil pH was 6.3. These soils do not require liming or fertilization for good clover production (Peevey 1972).

In late August 1986, 4 deer paddocks (about 0.4 ha each) were roto-tilled. *Rhizobium* spp. inoculated berseem (*Trifolium alexandrinum* L.), white (*T. repens* L.), crimson (*T. incarnatum* L.), or subterranean (*T. subterraneum* L.) clover seed was broadcast in each paddock on 2 September 1986. Seeding rates were 15, 8, 15, and 15 kg/ha, respectively. Seed was lightly covered by tooth-harrowing after broadcasting.

Thirty-three male white-tailed deer fawns were weighed to the nearest pound and randomly assigned to the paddocks on 11 November 1986; 8 fawns to each of the berseem, white, and crimson clover paddocks and 9 to the white clover paddock. Bucks were provided water and feed (9.0% crude protein, 1.7% crude fat, 1.1% Ca, 0.2% P, and 25.0% crude fiber) simulating the quality of deer diets on upland pine-hardwood habitats during winter in Louisiana (Causey 1964, Thill and Martin 1980) ad libitum throughout the study. On 10 March 1987, fawns were tranquilized and reweighed to the nearest pound. Bucks grazed pastures of native

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grasses and were maintained on water and feed from 10 March–12 October 1987.

Paddocks were replanted to the same clovers during September 1987. However, little subterranean clover was available because Italian ryegrass (*Lolium multiflorum* Lam.) volunteered heavily in that paddock and dominated forage production. Therefore, the paddock intended as a subterranean clover treatment effectively became an Italian ryegrass treatment. Bucks were tranquilized, weighed, and randomly redistributed to the paddocks on 12 October 1987—8 bucks to each of the berseem clover, crimson clover, and ryegrass paddocks and 7 to the white clover paddock. Bucks were maintained as during the first trial and reweighed on 11 April 1988.

Sward conditions were monitored each winter to ensure there was an abundance of each forage at all times such that consumption was not limited. Pearson's correlation coefficient (r) was used to describe the association between initial study weight and weight gain during the first winter. Analysis of covariance was used to evaluate differences in deer weight gains among forages each winter. Initial study weight was the covariable. All data presented are means \pm standard errors.

Results and Discussion

First Winter

Two bucks (1 each from the berseem and crimson paddocks) died from unknown causes. Weight gains averaged 14.7 ± 0.7 kg and were negatively associated with initial study weights ($r = -0.641$, $P < 0.001$). However, there were no differences ($P > 0.10$) in weight gains attributable to the clover treatments (Table 1). Fawns

Table 1. Body weights and weight gains (kg) of captive male white-tailed deer that grazed different cool-season forages their first (11 Nov. 1986–10 Mar. 1987) and second (12 Oct. 1987–11 Apr. 1988) winters; Ben Hur Biological Research Area, East Baton Rouge Parish, La.

Forage	N	Initial weight		Final weight		Weight gain ¹	
		\bar{x}	SE	\bar{x}	SE	\bar{x}	SE
----- (kg) -----							
First winter							
Berseem clover	7	27.4	2.4	40.1	1.9	12.7	1.1 A
White clover	9	26.1	1.0	39.9	0.7	13.7	0.8 A
Crimson clover	7	22.7	2.0	40.2	2.1	17.7	0.8 A
Sub. clover ²	8	24.6	1.9	39.8	1.3	14.9	1.8 A
Second winter							
Berseem clover	8	59.1	3.0	61.1	2.6	2.0	1.0 A
White clover	7	56.0	1.7	59.7	2.3	3.8	2.0 A
Crimson clover	8	54.6	2.5	57.8	2.6	3.2	1.3 A
Italian ryegrass	8	57.6	2.3	58.5	1.8	0.9	0.9 B

¹Weight gains each winter followed by different letters are significantly different ($P < 0.05$).

²Subterranean clover.

that grazed subterranean clover during this 129-day trial gained an average of 117.8 g/day, consistent with previous studies (Johnson et al. 1985, 1987).

Second Winter

Weight gains of bucks in the berseem, crimson, and white clover paddocks (3.0 ± 0.5 kg) were similar ($P > 0.10$) and greater ($P < 0.05$) than gain of bucks in the ryegrass paddocks (0.9 ± 0.9 kg) (Table 1). These results were similar to those of previous studies comparing deer weight gains on clover versus ryegrass (Johnson et al. 1985, 1987).

Conclusions

Our results suggest that many cool-season clovers may produce high winter gains in young male deer, but do not support contentions that 1 type or variety will produce greater body growth than others. Differences in preference by deer among clover species and the practical advantages or disadvantages of utilizing different clovers to enhance deer range should be addressed before recom-

mending any clover species or mixture for management application. However, the most effective clovers for supplementing deer nutrition may be those best adapted to soil and climatic conditions in different regions.

Literature Cited

- Causey, M.K. 1964. Nutritional analysis and seasonal variation of some herbaceous deer browse plants in the pine-hardwood areas of Winn and Union Parishes, Louisiana. M.S. Thesis, Louisiana State Univ., Baton Rouge.
- Johnson, M.K., S.P. Lynch, and J.A. Zeno. 1985. Effects of supplemental ryegrass versus subterranean clover on fawn weight. Proc. Annu. Conf. Southeast. Assoc. Fish and Wildl. Agencies 39:362-364.
- Johnson, M.K., B.W. DeLany, S.P. Lynch, J.A. Zeno, S.R. Schultz, T.W. Keegan, and B.D. Nelson. 1987. Effects of cool-season agronomic forages on white-tailed deer. Wildl. Soc. Bull. 15:330-339.
- Peevey, W.J. 1972. Soil test results and their use in making fertilizer and lime recommendations. Louisiana Agr. Exp. Sta. Bull. 600.
- Thill, R.E., and A. Martin, Jr. 1980. Seasonal quality of diets selected by tame deer on Louisiana pine-hardwood sites: preliminary findings. p. 19-20. In: The Third Annu. Meeting of the Southeast Deer Study Group. Nacogdoches, Tex.