ALTERNATIVE PASTURE SPECIES FOR DEER PRODUCTION IN THE WAIKATO

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SUMMARY

- Red deer showed a high preference for legumes over grasses.
- Red hinds showed a high preference for red clover.
- Fallow deer did not distinguish between grasses, legumes and herbs, but rejected high endophyte ryegrass, cocksfoot, sainfoin, and sulla.
- High endophyte ryegrass was least preferred by all classes of stock.
- The most preferred legumes overall were low oestrogen red clover and *Lotus corniculatus*.

INTRODUCTION

New Zealand farmers switching from cattle and sheep farming to deer have been faced with dramatically different feed supply problems. The deer farmer has found the natural reproductive and hence feed demand cycle, of the deer to be less flexible than that of sheep and cattle, and in particular to be out of synchrony with the seasonal growth rhythm of sheep and cattle pastures. Consequently, a summer growth slump in production from ryegrass-white clover pasture, while irritating to the sheep and cattle farmer, produces major problems for the deer farmer (Adam 1988).

Proposals to resolve the problem include the use of drugs to try to induce earlier fawning, to align the deer's feed demand with feed supply from a traditional ryegrass/white clover pasture. This approach does nothing to resolve the Ryegrass Staggers/Argentine Stem Weevil dilemma associated with traditional pastures. Ryegrass Staggers can be eliminated by sowing either low-endophyte ryegrass or an alternative grass species. Low endophyte ryegrasses are inappropriate because they require greater management inputs to retain persistency where Argentine Stem Weevil damage is severe, and are not highly productive in summer.

Alternative pasture species for deer are the logical option but appear not to have been researched in New Zealand. This, despite the very high summer production levels that have been achieved with species such as "Grasslands Puna" Chicory, and the drought tolerance demonstrated by "Grasslands Wana" and "Grasslands Kara" cocksfoots, "Grasslands Roa" tall fescue, and "Grasslands Matua" prairie grass.

Deer farmers at the 1987 Grasslands conference at Matamata expressed interest in learning which pasture species were best for deer, particularly during the late summer season, and deer nutrition was the top research priority established at the Deer Industry Research Forum of 1988.

Methods

Research plots were established on a commercial deer farm at Wardville, Matamata to determine pasture species preferences by deer. Four replicates of each of 16 grasses, herbs and legumes (Table 1) were sown on the property of Mr and Mrs J. Minkhorst on 22 March 1988, in plots (7 x 7 m) arranged in an 8 by 8 grid, each replicate block of 16 plots occupying one quarter of the grid.

When plots were, on average, 15 cm in height, deer were introduced and their preferences recorded using four automatic winding, infrared remote-triggering cameras, mounted on 3 m high poles. Each camera sighted four treatment lanes, with two cameras on each of two adjacent sides of the grid. Thus the plots grazed by deer for any sampling photo-frame could be identified through cross-referencing. On each sampling day, cameras were triggered by a concealed operator at two minute intervals for each of three 70 minute runs.

Preferences for three different types of deer are reported here.

Results

Lactating Red Hinds. The pasture species tested fell into four clear preference groups (Fig 1, Table 1).

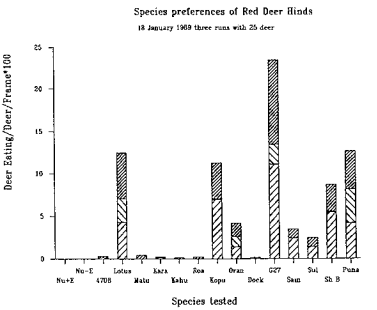

Figure 1: Grazing preferences of lactating red deer hinds in the Waikato during summer.

The low oestrogen red clover was preferred twice as much as any other species, with lotus, chicory, white clover, and sheeps burnet being preferred next. The remaining legumes lucerne, sainfoin, and sulla, were preferred above any of the grasses or dock.

Yearling Red Stags. Three clear preference groups were identified for stags (Figure 2, Table 1). The most preferred species were chicory and lotus, with lucerne, white clover, sheeps burnet, and low oestrogen red clover preferred next. The stags (in autumn) were more inclined to eat grasses and dock than were the hinds (in summer).

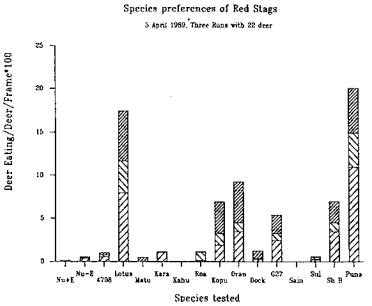

Figure 2: Grazing preferences of red deer stags in the Waikato during autumn.

Fallow Deer. Fallow deer preference groupings were less distinct than those for red deer (Fig 3, Table 1).

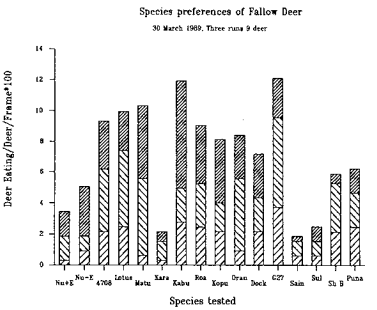

Figure 3: Grazing preferences of fallow deer in the Waikato during autumn.

Low oestrogen red clover and timothy appeared to be preferred slightly above praire grass, lotus, tetraploid ryegrass, tall fescue, lucerne, white clover, dock, chicory, sheeps burnet and low endophyte ryegrass. Least preferred species were high endophyte ryegrass, sulla, cocksfoot and sainfoin.

Table 1: Pasture species preferences by deer in the Waikato.

	Order of preference			
	Hinds	Stags	Fallow	Overall
High Endophyte "Grasslands Nui "Ryegrass (*Lolium perenne* L.)	15=	14	13	16
Low Endophyte "Grasslands Nui "Ryegrass (*Lolium perenne* L.)	15=	12	12	15
"Grasslands G4708" Ryegrass (*Lolium x hybridum* Hausskn.)	10	10	5	7=
"Grasslands Kara" Cocksfoot (*Dactylis glomerata* L.)	12	8	15	13
"Grasslands Matua" Prairie Grass (*Bromus willdenowii* Kunth.)	9	13	3	7=
"Grasslands Kahu" Timothy (*Phleum pratense* L.)	13=	15=	2	11
"Grasslands Roa" Tall Fescue (*Festuca arundinacea* Schreb)	11	9	6	9
"Grasslands G27" low oestrogen red clover (*Trifolium pratense* L.)	1	6	1	1=
"Grasslands G32" Lotus (*Lotus corniculatus* L.)	2	2	4	1=
"Grasslands Oranga" Lucerne (*Medicago sativa* L.)	6	3	7	4=
"Grasslands Kopu" White clover (*Trifolium repens* L.)	4	4	8	4=
"Grasslands Sainfoin" (*Onobrychis viciifolia* Scop.)	7	15=	16	14
Aokau Sulla (*Hedysarum coronarium*)	8	11	14	12
"Grasslands Chicory" (*Chochorium intybus*)	3	1	10	3
Sheeps burnet (*Sanguisorba minor*)	5	5	11	6
Common Dock (*Rumex obtusifolius* L.)	13=	7	9	10

Discussion

The novel photographic technique introduced a reliable method of obtaining permanent records of deer preferences to pure swards of a range of pasture species. The method was precise in that the three successive runs within each class of

stock produced the matching rankings (Figures 1-3), and the general preferences for species by hinds and stags were similar. This technique overcomes the common problems associated with determining species preferences comparing before and after grazing yields (Archer 1971, 1973).

These results immediately explain some common farmer observations such as grass dominance, and the lack of weeds in deer pastures. Some species such as red clover have been observed to disappear quickly from new sown pastures when grazed by deer.

Our results suggest these pastures become ryegrass dominant because deer find ryegrass the least palatable of the species on offer (Table 1), and deer, when given a choice, actively select against ryegrass.

A major feature of the above results was the contrast in preference between fallow and red deer. Fallow did not show the distinct red deer preference for legumes and herbs over grasses, and in particular did not show the red deer's high preference for chicory. Fallow deer showed a marked preference for timothy and prairie grass which was not observed for red deer.

The greater acceptance of the tetraploid ryegrass G4708 (recently released as "Grasslands Greenstone)", compared with "Grasslands Nui" ryegrass (Table 1, Fig. 3) accords with the success of the tetraploid italian ryegrass "Grasslands Moata" with red deer stags at Massey University (Ataja, *et al.*,1989).

The research reported here is continuing to examine deer preferences for pasture species over all seasons, as seasonal influences will affect both the availability and the quality of the species under test. Ryegrasses for example, may be more acceptable to deer in winter when the quality of ryegrass is higher.

These observations during summer and autumn have identified a number of species preferred by deer that could be used as alternatives to perennial ryegrass. The high preference for red clover by red lactating hinds suggests intake and hence production might be improved through the use of special purpose red clover pastures, which are highly productive during summer when lactating deer feed demands are high.

The strong pasture species preferences discovered for red deer in particular, imply that pasture mixtures of highly preferred species with less acceptable species will be difficult to maintain.

Acknowledgements

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