

THE INFLUENCE OF SOWING RATE OF RYEGRASS (*LOLIUM PERENNE*) AND WHITE CLOVER (*TRIFOLIUM REPENS*) TYPES ON THE CLOVER CONTENT IN THE RYEGRASS WHITE CLOVER SWARDS

O.Y.Romero.1., B. N. Butendieck and A.C, Sleman

Agricultural Research Institute. Carillanca Regional Centre. Animal Production Department. P:O:Box 58 D.Temuco, Chile

ABSTRACT

The objective of this study was to determine whether the sowing rate of ryegrass Nui (*Lolium perenne*), Giant and Huía white clover (*Trifolium repens*) influence the clover content in the ryegrass-clover mixed sward. The trial was conducted at the Carillanca Experimental Station. Three sowing rates were studied: 18, 12 and 6 kg/ha for Nui perennial ryegrass and 3, 4.5 and 6 kg/ha for Giant and Huía white clover. The clover content in the sward was increased by reducing the sowing rate of the ryegrass from 18 to 12 and 6 kg/ha or increasing the sowing rate of the clover. Management of the sowing rate of the species components of the mixed sward can be used to manipulate the botanical composition of ryegrass-white clover swards.

KEYWORDS

Ryegrass white clover Swards, Sowing rate, White clover content

INTRODUCTION

The ryegrass-clover mixed sward is the main pasture sown in the south of Chile. The pasture is ryegrass dominant and white clover content in the sward is less than 10%. The research has shown that mixed grass clover swards, containing at least 20% of dry matter as white clover and receiving no fertilizer nitrogen had a beneficial role in grazing systems and receiving no N fertilizer. The most used seed rate for this mixture in the South of Chile is 18 kg/ha for ryegrass and 3 kg/ha. The high density of ryegrass reduced the size of the plant and stolon development. The growth habit and plant stature are important features in plant competition.

The need to adjust the sowing rates of grass- legume mixtures was stressed by Green and Corral (1965). Differences in relative establishment growth rates can influence the composition of swards.

The objective of this work was to assess the effects of the sowing rate of ryegrass Nui (*Lolium perenne*) and Giant and Huía white clover on the composition of the grass clover sward.

METHODS

The research was conducted at the Carillanca Experimental Station, located in Temuco, Chile at 38° 41' S. L., 72° 25' W L at 200 m above sea level. The trial was established during spring on volcanic acid soil.

Three sowing rate were studied 18, 12 and 6 kg/ha for *Lolium perenne* cv Nui and 3.0, 4.5 and 6.0 kg/ha of white clover. The seed of clover was broadcast by hand and ryegrass seed was sown in rows.

Ladino and Huía arranged in a randomized block design with split plots, with three blocks. The main plot treatment was Giant and Huía white clover, the subplot treatment were ryegrass nine combinations of sowing rate. The seed of clover were inoculated and pelletized. The fertilizer applied at sowing was: N 32 kg/N/ha in the form of sodium nitrate, 150 kg of P₂O as superphosphate and muriate of potash 50 kg of K₂O/ha.

Plot size was 3.0 x 2.0m, with harvest area of 1x 2m., the plots were cut each time that height of the pasture reach 18 cm, in spring and 14

cm in autumn and summer leaving a stubble 4-5 cm, using a John Deere mowing machine. Herbage samples were taken at each plot at each harvest for separation into clover, perennial ryegrass and unsown species and for determination of dry matter content.

The height of the clover and the perennial ryegrass were measured in situ, from ground level.

RESULTS AND DISCUSSION

The total herbage drymatter harvested was not affected by the different sowing rates of ryegrass- white clover and clover type (Table 1).

Clover dry matter yield show a significant effect of sowing rate ($P < 0.01$). The clover yield was increased by increasing the sowing rate of clover from 3 to 4.5 or 6 kg/ha. In addition, there was a significant ($P < 0.01$) interaction between the effect of clover type and sowing rate (Table 2) and decreasing the ryegrass from 18 kg/ha to 12 kg.

The clover content in the mixed sward was affected by the sowing rate of the ryegrass. The clover content increased as the ryegrass seed decreased from 18 to 12 Kg/ha. and increasing the sowing rate of the clover. In the combination 18 kg/ha of ryegrass and 3 kg/ha of clover the content in the sward was 20% as average of all experiment. The highest content of clover was obtained at seed rates of 12 and 6 for ryegrass with 6 and 4.5 kg/h for white clover with values of 38,9, 38.9 and 34% respectively (Figure 1).

A point of particular interest in the present experiment is the fact that the clover content in the ryegrass mixed sward can be controlled by adjusting the ryegrass seed rate and increasing the clover seed rate in the sward without affecting the total herbage production.

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Figure 1

The effect of sowing rate of ryegrass and white clover on clover content (%)

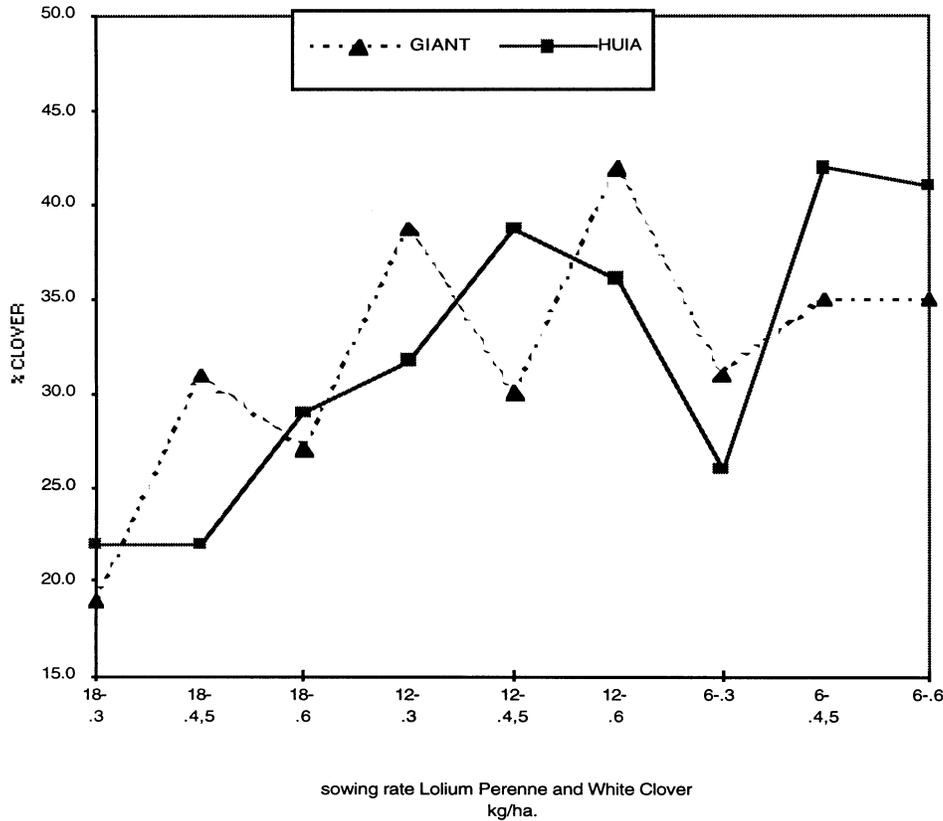


Table 1

The effects of sowing rate of ryegrass-white clover on the total herbage dry matter ton/ha.

White clover		Perennial ryegrass		
		18	12	6
Huia	3	5,31	5,94	6,02
	4,5	5,75	6,07	5,70
	6,0	5,93	5,98	6,85
Giant	3,0	5,32	5,19	5,85
	4,5	6,56	5,44	5,62
	6,0	5,73	5,51	6,34

N.S. Not significant to Tukey's test $P \geq 0.05$.

Table 2

White clover content as proportion of total mass ton/ha

Trifolium repens	Lolium perenne kg/ha								
	18			12			6		
kg/ha	3.0	4.5	6.0	3.0	4.5	6.0	3.0	4.5	6.0
HUIA	1.27	1.34	1.84	1.96	2.55	2.31	1.71	2.53	2.94
GIANT	1.09	2.10	1.65	1.52	1.73	2.52	1.91	2.13	2.43
*	1.18 c	1.73 bc	1.75 bc	1.75 bc	2.14 bc	2.14 ab	1.85 bc	2.33 ab	2.69 a

* Values on the same line with different superscripts are different, $P < 0.05$. (Tukey's test).