

QUALITY GRASSLAND FOR DAIRY PRODUCTION IN NORTH-WEST SPAIN

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ABSTRACT

An experiment with two groups of 15 Friesian cows grazing independent areas, with no N and 240 kg N ha⁻¹, was run during two years to see the levels of milk production based on a grass/white clover pasture, maintaining high levels of herbage quality.

N application decrease clover content from 55% to 42%. The total DM response to N was low. Herbage utilization was maintained similar in both treatments. Moderate levels of milk production can be reached, more than 4000 litres cow⁻¹ and 9000 litres ha⁻¹, with low use of concentrates, only 400 kg cow⁻¹.

Crude protein levels were high during all grazing season, 16-20% and ADF content was low, 22-30%. Management for a leafy pasture, mainly in the second half of the spring, is the key for a high degree of utilization of herbage, allowing also a better clover performance.

KEYWORDS

Crude protein, acid detergent fibre, herbage utilization, nitrogen fertiliser, stocking rate

INTRODUCTION

Most milk of spanish quota is produced in the humid North-West, Galicia, 30%, with small farms and low quota per farm, using pastures and crops and high levels of concentrates.

In Scotland and Netherlands, if the stocking rate is not very high, 1.9 livestock units ha⁻¹, grass-clover swards can reach the same level of milk production with similar concentrate use than the N fertilizer grass sward (Bax & Schils, 1993).

In our latitude white clover in pastures have high potential in systems under grazing (González, 1991). An experiment was set to show how mixed swards can provide the entire lactation requirements of spring calving cows and to establish the level of milk production that can be supported at a low level of concentrate use for Galicia conditions. Treatments without N and with a high N application were compared, the difference in milk yield between treatments was low, and considering the need for increasing the stocking rate when N was used makes very questionable the economy of N application (González, 1995).

In the same experiment, high levels of clover were found in both treatments and management for quality was carefully maintained all the grazing season. In this paper chemical parameters of quality from this experiment are described.

METHODS

Treatments: Group A: Grass/clover sward with low or no N. Group B: Grass/clover sward with 240 kg ha⁻¹ of N.

A grazing trial was established in autumn 1992 on 12 ha, 7 ha for grazing and 5 ha for silage, in a perennial ryegrass (cv. Brigantia) and white clover (cv. Grassland Huia) sward.

The grazing area was divided into two independent areas and grazed rotationally by two groups of 15 Friesian cows during two years. Mean calving date was early February. Concentrate feeding was sup-

pressed 15 days after turn-out to grazing.

Priority to management for quality was considered. Pasture was carefully monitored to maintain the same height of pasture, 15-20 cm, in both treatments at entrance, and 6 cm at exit from each paddock, cutting for silage was made if paddocks accumulated excessive yield.

Five grazing rotations were made up to the end of August, summer was unusually wet in both years. All cows were housed during September, and fed with silage. In autumn, from October to December, both groups of cows made two more rotations, including the areas cut for silage.

Herbage samples before and after grazing were taken in alternate paddocks. Pre samples were analyzed for botanical composition, crude protein and acid detergent fibre (ADF).

RESULTS AND DISCUSSION

Pasture and milk production under grazing. The use of N on the grazing paddocks, with high clover content, reduced clover from 55 to 43% producing a low total DM response to N, only 4 kg DM per Kg N applied, as mean of two years results (Table 1).

Considering only the effect of N on clover and on the total DM yield, there is no great advantage in using N on cloverly pastures. But complementary studies on this project on the strategic use of N, as in N for silage on grass paddocks, where responses are higher, and in N for early grass, despite not a great response to N, the opportunity for early grazing means a saving on concentrates feeding (González, 1995).

The results confirm the potential of the grass-clover swards without N, with an important DM production of net pasture, for covering the quota in the not intensive farms in Galicia, using low rates of concentrates, only 400 kg cow⁻¹.

Special care should be taken with animal management to match all the pasture produced at the right moment of grazing, trying to get a similar herbage on offer, around 20 kg per cow, and a similar level of intake, 12-13 kg per cow, for both treatments. Management was different in each treatment without and with N and the real differences between them should be found in the number of grazing days, that allows more silage taken from the N system.

Moderate stocking rate seems to be important for relying upon white clover as the main source of nitrogen on dairy farms. In Brittany(France) a perennial ryegrass sward receiving 350 kg ha⁻¹ N grazed at 3- to 5-week intervals was compared with a ryegrass-white clover sward receiving 30 kg ha⁻¹ N and grazed with rotations 10 days longer. Clover content in summer was 45 percent. Milk production and composition, as well as liveweight gains, were similar in the two systems, studied for four years. (Pflimlin, et al. 1989)

Quality parameters of chemical composition: The herbage content in crude protein, acid detergent fibre in each grazing rotation are described in table 2 with the amount of clover.

Crude protein levels were high even in the second half of spring and in summer as a result of management and high levels of clover were found, up to 65% at the end of spring, and 25% in the first rotation. In other trials in the same location levels of crude protein drop to 10% in summer (González et al, 1993).

Conclusions: N application on grass-clover swards seems to be less determinant than a careful management to avoid grazing a stemmy pasture. To maintain good milk yield based on grazing pasture it is very important to do a management for a leafy pasture mainly in the second half of the spring avoiding flowering stems. A good calculation of the grazing pressure and flexibility in the cattle movement from paddocks, grazing up to 5-6 cm, makes better utilization of herbage and a better clover persistence in the sward.

This management allows high levels of crude protein, 16-20%, and low levels of ADF, 22-30%, enough to maintain good milk yield using grass clover swards with no concentrates.

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Table 1
Pasture production under grazing

	No N	240 kg/ha
DM (t/ha)	11.9	12.7
Clover (t/ha)	6.6	5.5
(%)	55	43
Grazing pressure (cow/ha)	3.25	3.50
Stocking rate (cow/ha)	2.15	2.21
Milk yield (l/cow)	4120	4220
(l/ha)	8860	9320

Table 2
Crude protein and ADF content of the mixed sward.

Grazing rotations	Spring					Autumn	
	1	2	3	4	5	1	2
Crude protein (%)							
A) No N	17.2	21.3	17.3	16.4	15.5	16.8	19.1
B) 240 N	17.6	20.3	16.7	19.3	17.4	19.1	21.5
ADF (%)							
A) No N	22.1	21.8	23.2	25.1	29.2	30.0	25.2
B) 240 N	21.9	24.1	26.8	27.6	32.1	28.3	23.5
Clover (t/ha)							
A) No N	0.30	1.00	1.20	1.50	1.10	1.00	0.50
B) 240 N	0.25	0.80	1.10	1.35	1.00	0.60	0.40