Increasing clover proportion alters perennial pasture production in West Gippsland

G.N. O'Brien

Department of Agriculture and Rural Affairs, Ellinbank Dairy Research Institute, Warragul, Victoria.

Research and on-farm experience have shown that in most pastures, production is restricted by lack of soil nitrogen. Increasing the proportion of clover may alleviate the soil nitrogen deficiency through increased atmospheric nitrogen fixation. The effect of clover proportion on seasonal and annual pasture production was investigated and reported herein.

Methods

Twenty plots ranging in clover proportion from 15 to 95% in autumn 1984 were cut when growth reached approximately 2.2 tonne DM/ha to leave a residual 1.4 tonne DM/ha. Growth was measured continuously for 3 years. Botanical composition was determined on a dry matter basis. Data was analysed using multiple regression. Clover % operated as a continuous variable which was initially determined by herbicide rate and then varied with season, competition from other species, etc.

Results and Discussion

The following table shows a summary of the relationship between the proportion of clover and growth rate as predicted by regression.

		Average Growth Rate kg DM ha ⁻¹ day ⁻¹			
		20% clover		80% clover	RSI
Autumn	*	12.1	9.2	6.1	2.5
Winter	*	11.9	11.8	11.4	2.5
Spring	*	40.2	42.5	41.8	4.4
Summer	+	22.5	28.6	30.8	3.2
Annual	Average '84	20.3	28.0	27.0	2.5
	Average '85	22.4	21.8	20.6	2.0
	Average '86	22.8	19.7	17.6	2.4
*	average 3 ye	ars	+	average 2 years	s

Increasing the clover proportion in perennial, high rainfall pasture resulted in a decrease in autumn growth and an increase in summer growth. On average winter and spring growth was relatively unaffected. However, the spring growth of high clover pasture was much greater than low clover in Year 1, similar in Year 2 and much less in Year 3. Good growth of clover in summer was associated with 30% above average rainfall over the 3 summers. This may have enabled more clover growth than in a drier summer but would probably reduce the annual growth rates only slightly. As growth rates in spring were much greater than in other seasons, the annual growth rate was largely influenced by the effect of clover proportion on spring growth. There were substantial increases (30%) in annual production in Year 1 due to increasing the clover proportion from 20 to 50%. This did not occur in subsequent years and may have been due to management and/or the increased presence of broad leafed weeds in high clover plots. As annual yields are not dramatically altered as clover proportion increases there is justification for pursuing the use of "high" clover pastures, because clover has a higher feed value than grass.