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THE EFFECT OF GRAZING SYSTEMS AND NITROGEN FERTILIZER REGIMES ON MILK PRODUCTION FROM IRRIGATED PANGOLA-COUCH PASTURES

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Experiments in North Queensland have demonstrated the milk production potential of irrigated nitrogen fertilized grass pastures (Chopping et al. 1976). High stocking rates were used to exploit the high dry matter production of tropical pastures and achieve milk yield per unit area. Such stocking rates accentuate the winter feed shortage due to the seasonal growth of tropical pasture species. Rotational grazing is often recommended, especially in periods of low feed availability to reduce trampling, equalize feed intake and improve production. In cutting trials at Ayr, irrigated pastures have responded to very high levels of nitrogen fertilizer suggesting that winter applications of nitrogen may increase winter feed production.

Twepty-four Friesian cows 1 to 5 months in lactation were stratified on calving date and allocated to a 2 x 3 factorial experiment on 17 May 1976. Three groups were continuously grazed at 7.5 cows/ha. The other three groups were rotationally grazed at'7.5 cows/ha in a six paddock rotation of one week in, five weeks out. Nitrogen fertilizer regimes were 672 kg/ha/annum evenly distributed; 672 kg/ha/annum with double winter and reduced spring/summer applications; and 896 kg/ha/annum (double winter and normal spring/summer applications).

Rotational grazing increased winter presentation yields of dry matter, but reduced milk production (Table 1). Reduction in milk yield was greatest when excess feed was available (periods 1 and 3) and minimal in winter when feed was limiting (period 2). Grazing system did not affect milk composition or liveweight. Nitrogen fertilizer regime had no significant effect on milk yield or composition and there was no significant interaction between grazing system and fertilizer regime.

TABLE 1: Effect of grazing and fertilizer management on milk production (kg/head/day) from irrigated tropical pastures.

Period	Grazing management			Fertilizer regime			
	Cont-inuous	Rotat-ional	L.S.D. 5%	672kg even	672kg strategic	896kg strategic	L.S.D. 5%
17.5.76–21.6.76	9.1	8.2	0.7*	8.6	8.8	8.5	0.9
28.6.76–20.9.76	7.4	7.3	1.0	7.2	7.9	7.0	1.2
20.9.76–End†	6.7	4.5	2.6	4.4	6.0	6.4	3.2
Total period	7.9	7.1	0.9	7.3	7.8	7.2	1.1

*$P < 0.05$. †End = End of lactation.

When pasture on offer is not limiting, pasture rationing (rotational grazing) will reduce milk yields by reducing selection. When pasture on offer is low, rotational grazing has not improved milk yield. Despite increased grass growth at high levels of nitrogen, indicated in cutting trials, we did not obtain a response in milk yield. If nitrogen applications are already high, strategic winter nitrogen seems of doubtful value for improving winter production.

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