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SUSTAINABLE DAIRY FARMING SYSTEMS FOR THE TROPICS

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Over the past 20 years there has been an average increase of 4% per annum in farm milk production in Queensland. As result of deregulation it has been estimated that the northern Australian dairy industry will need to make productivity gains in the order of 100% over 5 years. There are limited opportunities to reduce the costs of production so most of this gain will need to be achieved through a 2- to 3-fold increase in milk output.

Table 1. Details of the 5 farmlet feed systems and desktop estimates of their performance

Forage system	Off farm feed	% Calving in spring	Stocking rate (cows/ha)	Estimates from desktop study		
				Milk (L/cow/ year)	Labour efficiency (L/unit)	Return on assets (%)
1. Dryland, tropical pasture, grazing (DP)	3.0 t grain, 1 t hay/cow	100	1.95	7 000	629 000	11.1
2. Limited irrigation (130 ML), tropical and temperate pasture, grazing (LP)	3 t grain, 1 t hay/cow	50	2.72	6 560	670 000	6.7
3. Limited irrigation (130 ML), forage crops, grazing and conservation (LC)	3 t grain	33	1.36	7 300	632 918	10.2
4. Full irrigation (720 ML), temperate pastures, grazing with minimal conservation (HP)	3 t grain	33	2.82	7 100	635 000	8.8
5. Full irrigation (1380 ML), silage crops, feedlot, hay & silage/cow (HF)	3t grain	50	4.12	9 650	990 000	9.9

A comprehensive farmlet experiment was established at Mutdapilly in 2001 to investigate the production, water use efficiency, sustainability, economic and social aspects of options to combat the effects of deregulation. The experiment uses systems methodology to evaluate 5 very different tropical dairy farming systems. These range from an extensive system based on rain-grown tropical grass, fertiliser and concentrate through various systems of limited and high irrigation water availability using either pastures or crops to a full feedlot based on concentrate, lucerne and maize silage. All the systems share the same economic goals of a minimum of 10% return on assets and 600,000 L per labour unit. Seasonal calving percentages are matched to forage availability for the 5 farmlets. The experiment will use published models such as DairyMOD (Chapman *et al.* 2000) to compare predicted against actual outputs. This approach allows the many interacting components of a system to be incorporated at optimum levels, and provides scientific interpretation through comparative analysis and modelling.

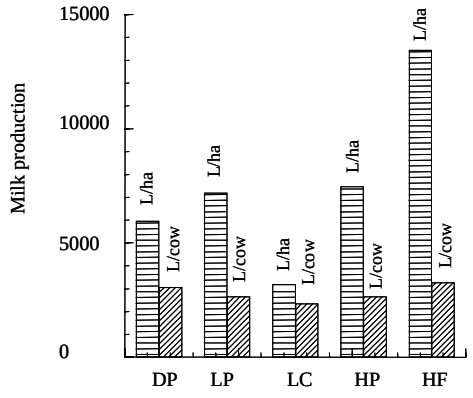

Figure 1. Milk production for the first 5 months

The experiment commenced in September 2001. Desktop study estimates of the performance of the 5 farmlets (Table 1) show that all are expected to achieve the labour criteria but only DP, LC and HF will possibly achieve the expected Return on Assets. Milk production from the farmlets after 5 months is presented in Figure1. The good early performance of DP is related to the high proportion of spring calving cows in the herd. The conservatively low stocking rate from LC resulted in low production/ha.

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