EFFECT OF ADDITIONAL NITROGEN FERTILISER APPLIED TO DRYLAND FORAGE CROPS ON MILK PRODUCTION FROM DARLING DOWNS FARMS

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One third of dairy farmers on the Darling Downs use no N fertiliser on dryland forage crops such as sorghum, millet and oats, and only 6% use more than 50 kg N/ha.year (Anon. 1988), though these forages respond in dry matter yield to high levels of N fertiliser (Mackenzie *et al.* 1982). This project evaluates the effect of additional N fertiliser applied to dryland forage crops on milk production. Results from the first summer are summarised here.

Twelve dryland farms were chosen for the trial, their mean area (± s.e.m.) was 96 (± 22) ha. The farms were arranged in 6 pairs and within pairs farms were similar in the area and types of forage crop grown, the present level of nitrogen fertiliser applied and soil fertility status. Herd size averaged 74 ± 7 cows. A randomly chosen member for each pair was allocated 50 kg N/ha to apply to their grass forage crop in addition to the normal application. The remaining member acted as a control. No additional P or K was applied. Forage yield was measured from a cutting experiment superimposed on part of a grazed paddock. Milk production (M), and the quantity of supplementary feed (hay and grain) given were measured daily and averaged 14.6 L and 6.1 kg/cow respectively. An average of 21 ha grass forage crop and 18.7 ha leguminous forage crop was grown on each farm.

Very dry seasonal conditions were experienced during summer, some of the farms received little more than 50% of their average rainfall for this period. However forage yield increased by 28 kg DM/kg N, which is consistent with previous reports (Mackenzie *et al.* 1982). Milk produced from farm grown forage, after adjustment for supplement, ranged from 6.5 to 10.5 L/cow.day. The low level of production is indicative of the dry conditions experienced on all farms. Milk production per ha of total crop area was analysed using production during the previous summer as a covariate, and increased from 3534 L/ha at the lower level of N to 3719 L/ha at the higher level ($P < 0.05$). The mean increment of N applied was 39 kg/ha, giving a mean response of 4.7 L milk/kg N applied. Regression analysis on adjusted data across all farms showed a linear relationship between (M, L/ha), adjusted to zero concentrate input, and kg of N applied per ha. The equation was:

$$M = 2795 + 14.3\ (\pm 1.8)\ N \quad (P < 0.10)$$

These values are in the range measured for pastures in coastal districts (Cowan *et al.* 1987) and suggest a return in the order of $A1.50 to $4.00 for each extra $ spent on N. The project will continue for a further 18 months.

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