Improving nutrient management on Circular Head dairy farms

What we found

There has been a significant reduction in soil phosphorus and sulphur over the past six years on dairy farms in the Togari and Brittons swamp areas (Table 1). There are still many paddocks with extremely high values of plant available soil phosphorus (Olsen P > 80), and soil potassium has increased.

The decrease in soil phosphorus will have saved farmers money in reduced fertilizer application as well as reducing the risk of nutrient loss to waterways. These economic and environmental gains have been due to a combination of effective RD & E by TIAR, Dairy Tas, Dairy Australia and Cradle Coast NRM, plus we were helped by a cyclical downturn in milk prices that focused the farmers' attention on input costs. The RD & E has been locally focused with effort put into relevant, farm specific information for each individual farmer.

Table 1. Soil nutrient levels on nine farms in the Montagu Catchment

	Median		Mean		
Nutrient	**2005**	**2011**	**2005**	**2011**	
Phosphorus Olsen (mg/kg)	48.6	34.7	50.5	36.7	**
Phosphorus Colwell (mg/kg)	119	110	127	123	*
Potassium Colwell (mg/kg)	188	200	218	242	*
Sulphate Sulphur (mg/kg)	24.0	13.0	26.2	16.5	**
pH water	5.9	6.0	6.0	6.0	

* $P < 0.05$; ** $P < 0.0001$ in Students t test (paired) of significant difference between mean results from 2005 and 2011

Individual farm results for the nine farms re-sampled in 2011 show that seven farms had a significant reduction in plant available soil phosphorus (Figure 1) but only two had optimum mean values (20 – 30 Olsen P). Comprehensive on-farm soil testing has identified nutrient 'hot spots' which need to be addressed by improved nutrient distribution around each farm.

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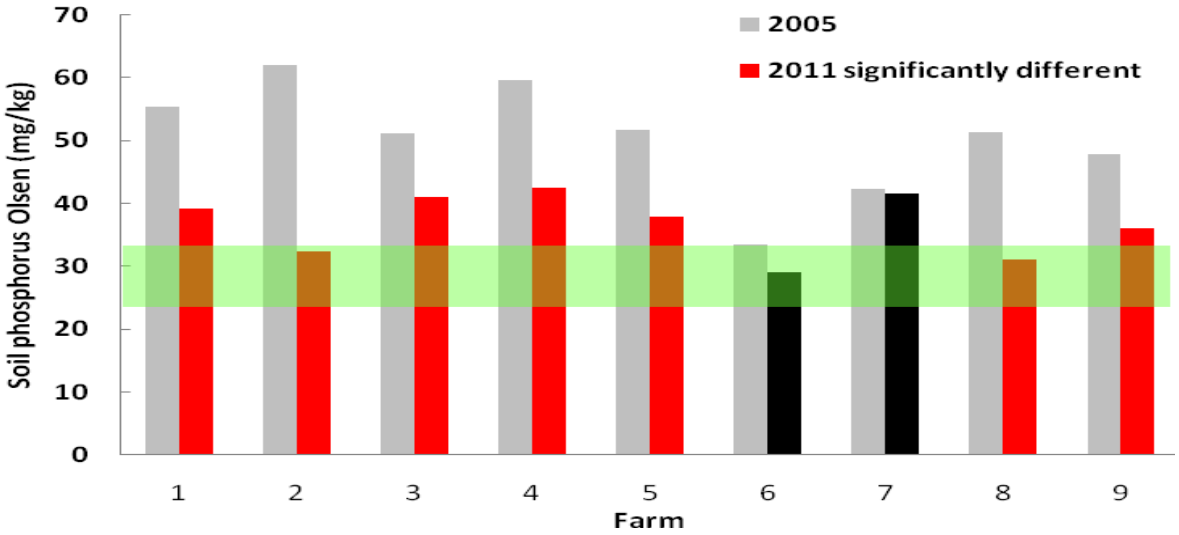

Figure 1. Mean plant availavable soil phosphorus on the nine sampled farms.

Implications for farmers and the dairy industry

It is expected that the use of comprehensive soil testing and whole farm nutrient budgets that allow farmers to maintain or reach critical soil nutrient status for maximum pasture production will raise the profile of nutrient budgeting and nutrient management in the Montagu catchment. Improved management practices will save farmers money on fertiliser inputs, better target fertiliser application to paddocks where it is needed, and reduce the risk of loss of nutrients to waterways. One-on-one discussions have been undertaken with farmers and results will be presented in workshops with advisors. The involvement of industry partners is necessary as nutrient management is not purely a 'research' or an 'extension' issue, but a complex combination of social, community and industry issues which require a strong 'team' approach in order to achieve change over the longer term.

It is expected that some farmers save money by reducing fertiliser inputs, while others will redistribute applied fertilisers to raise nutrient levels in deficient areas and reduce levels in 'hot spots'. Due to the complex factors affecting nutrient loss in catchments, it is unrealistic to predict that this project will have an impact on water quality in the short term, however, it is anticipated that improved nutrient management practices may result in improvements over the longer term.

How we did it

The project originally sampled 29 of 30 farms (1400 paddocks) in the Togari and Britton's Swamp region in 2005. The project was undertaken free of charge to the farmers with funding from the Natural Heritage Trust. In 2011 nine of the original farms (540 paddocks) were re-sampled and new nutrient budgets undertaken with funding from the farmers, Dairy Australia and Cradle Coast NRM.

- 30 soil samples from every paddock were collected on the selected farms to a depth of 7.5cm and analysed for pH (water), Colwell P, Olsen P, Colwell potassium, KCL sulphur.
- This information was mapped using ARC GIS with colour coded areas on maps indicating paddocks as deficient, adequate or in excess of critical soil nutrient levels to promote maximum pasture growth.
- Whole farm nutrient budgets were undertaken using the Target 10 Nutrimatch® program with information from farmers regarding milk production and nutrient imports in the form of fertiliser and fodder brought onto the farm.
- Results were discussed with farmers to develop a fertiliser plan to address excessive or deficient nutrient levels around their farm.

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