

Managing the riparian zone on dairy farms

Findings from the “Sustainable dairy farm systems for profit” project

M5 Project Information Series - Studies on Mutdapilly Research Station and subtropical dairy farms 2001 to 2005

Robert CHATAWAY

edited by **Anne CHAMBERLAIN**

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Overview

THE three main areas of focus to reduce the risk of sediment and nutrients moving from a dairy farm to a waterway are:

1. Management of ‘point’ sources - such as effluent and feed pads – from which nutrients could make their way down to the watercourse.
2. Attention to cultivation, fertiliser and irrigation management – to reduce sources such as soil erosion (moving sediment and soil nutrients), and nutrients dissolved in water.
3. Management at and adjacent to the watercourse - to prevent direct sediment from unstable banks, and direct input of manure and urine from stock in streams; and to improve the capability of the riparian area to act as a trap for nutrients and sediment, preventing their entry to the water course.

Many subtropical dairy farm businesses are choosing to fence off creek banks – for easier stock management, for cleaner water supplies, for mastitis control, and to prevent further bank erosion.

Farmers interested in taking this management step are advised to check first to see if there is funding assistance available – either through regional natural-resource management groups, or under federal or state programs.

Industry background

THE riparian zone – the land immediately adjacent to streams and other water bodies – lies alongside or includes some of the most productive areas of dairy properties.

It is also a very important zone for wildlife, native vegetation and species diversity. These competing roles raise a number of issues with stock grazing in this zone as uncontrolled stock access to stream banks can impact negatively on stream health, biodiversity and water quality through damage to banks, native vegetation and direct pollution of streams.

In 2002, a forum of dairy farmers, representatives of Landcare and catchment management groups and researchers identified two high priorities for dairy farmers in the region - a clear definition of the riparian zone and its function, and how to manage cows in that riparian area.

Farmers are not the only ones with an interest - a wide range of agencies and community groups have an interest in managing the riparian zone for the diverse range of values and services it provides.



PHOTO 1. FENCING of the riparian zone enables greater control over grazing management.

Lessons from the M5 farming systems project

ONE of the environmental objectives of the *Sustainable dairy farm systems for profit* project was to ensure that more intensified dairy farming systems would not have an impact on the wider environment.

While riparian management was not addressed as a central issue in this project, an increased understanding was gained from experiences on the Mutdapilly research farm, and activities undertaken by M5 companion farmers during the course of the project.

Mutdapilly Research Station

In 2002, with funding support from the Bremer Catchment Association, changes were made to the management of the riparian area at Mutdapilly Research Station. This included fencing along the stream's high bank (Photo 1), and the provision of off-stream watering points (Photo 2).

Stock now have only limited and controlled access to the riparian zone. Grazing is still considered a useful strategy for providing some control over the two most invasive weeds of the area – cats claw creeper (*Macfadyena unguis-catii*) and Chinese elm (*Celtis sinensis*).



PHOTO 2. INSTALLATION of off-stream watering enables greater control over grazing management.

M5 companion farm experiences

Discussions with the M5 project companion farms included their current and planned approaches to environmental issues - including managing riparian zones on their farms. Northern NSW companion farms highlighted the pressure they were under to

fence off waterways and to plant more trees – in response to market demands for more environmental accountability.

In southern and central Queensland, two of the project's companion farms provide typical case studies of dairy farmers who are taking action to reduce off-site movement of sediment and nutrients into waterways - and at the same time seeing management benefits for their farm.

PERRY family, Gin Gin, central Queensland

PAT and Rose Perry and their son Phil's 136-ha Gin Gin farm is dissected by Geramanbulian Creek, which their 120-cow dairy herd had previously used as a loafing area.

They have now fenced off the banks of the creek, and blocked stock from randomly using it for watering, loitering and cooling off. There is adequate shade for the herd on the remainder of the property.



PHOTO 3. FENCING off the creek and preventing stock access has cleaned up the stream.



PHOTO 4. NEW water troughs provide creek water for stock, away from the stream.



PHOTO 5. THE FENCED laneway moves stock alongside the creek and banks, rather than allowing them through it.



PHOTO 6. GERAMANBULIAN Creek runs through the middle of the Perry’s dairy farm.

Construction of fencing for just under \$1000/km (materials) has had many positive benefits.

Getting the cows in for milking is now a much easier job – particularly in the hot weather, when cows used to head for the creek to drink, then refuse to move out. Water supplies for stock drinking and for dairy washout are cleaner; and the herd cell count has been reduced.

Pat Perry: “It used to be a nightmare getting the cows in for milking. They’d go down to the creek for a drink on the way home, and you couldn’t get them out.”

Fencing off the creek and making cows stick to a laneway has reduced evening mustering in summer by $\frac{3}{4}$ of an hour.

Two extra water troughs were installed as alternative stock water points.

Electric fencing with treated pine strainer posts was used for its ease of management and to cater for the zig-zag nature of the creek. Pine posts driven 1200 mm into the ground were used wherever the fence changed direction, with steel posts in between.

The fence has held up well through two fast-moving floods. The majority of the fence is 2.6 hi-tensile galvanised electrified wire, with the usual electrified ‘tape and hook’ temporary gate at the crossing section – which ‘let go’ during floods.

Grazing of the fenced-off area still takes place, but in a controlled manner. Weeds have routinely been sprayed out along the banks for several years.

While the Perry’s fenced off the creek and installed off-stream water troughing with their own funds, farmers considering the same action should check funding opportunities.

ROHAN family, Kerry, southeast Queensland

Benefits of an active approach to managing the riparian zone on the Rohan farm on the Upper Albert River in the Kerry Valley, southwest of Beaudesert include an increased chance of irrigation holes remaining in position; control of woody weeds; retention of gently sloping banks; and being able to maintain good grass cover on the upper banks.

The property has 2 to 3 km of river frontage, with both sides accessible. Upstream and adjoining the farm is a public camping area; downstream are other farming enterprises.



PHOTO 7. A LIGHTLY grazed grass buffer strip between the more intensively farmed land and the wooded riparian zone.



PHOTO 8. A GULLY, well grassed with kikuyu, entering the main stream on the farm.



PHOTO 9. RHODES grass pastures are being planted on lower slopes between open-forest country and the river flats to reduce the risk of soil erosion.



PHOTO 10. SOME of the Rohan milking herd grazing irrigated ryegrass on the Upper Albert River flats, which are surrounded by hilly, forested country.

In its upper reaches through the Rohan farm, the Albert River generally flows for 12 months of the year over a rocky streambed, and is an important source of irrigation and stock water. However the Rohan's don't rely on the river to provide shade for stock.

On their farm, most stream banks have a low gradient and are relatively stable - but there are some steep, unstable banks on the outside of meanders. Water flow into the river from the farm and associated hills is via three major gullies.

The river and its surrounding environment is actively managed by the Rohan family as part of their whole farm. They manage the riparian area as an important buffer zone between their farming activities and the river.

Important aspects are:

- **Controlled grazing.** The river is completely fenced off with a combination of barbed and electrified plain wire. In areas most vulnerable to flooding, fencing is restricted to a single electrified wire and steel posts; where that fence is under pressure – e.g. where dry stock are separated from milking stock - two electrified wires are used. Fencing is typically placed 20 to 30 metres back from the bank.
- The fenced area generally comprises a woody vegetation strip adjacent to the stream, and an unfertilised grassed area next to it - as insurance against erosion in high flooding (see Photo 7). This 'riparian paddock' is grazed by dry and milking stock 10-12 times/yr, for short periods to minimise stock impact. This system appears to be allowing some regeneration of native vegetation.
- **Weed management.** Weeds are managed with herbicides and grazing. The cattle achieve two things - their grazing controls some weeds and they keep the area more open, enabling easier access. Lantana is a particularly problematic weed. Peter Rohan: "When it gets in the path of floodwater it can be quite destructive. It's shallow rooted with no ground cover beneath, making the bank prone to erosion."
- **Management of gullies.** All gullies - including where they enter the main stream - are managed the same as other riparian areas on the farm (see Photo 8). They have found erosion can be overcome by controlling stocking rate (resting the area) and allowing grass to come back.

- Management of cultivation land on lower slopes. Erosion is a problem on lower slopes, which are vulnerable to overland flow of water from the mountains. To minimise erosion, much of this land is being planted back to tropical pastures – mainly Callide Rhodes grass (Photo 9). The future aim is to have all of this land planted with improved tropical grass.

Other studies

Managing riparian zones on Queensland dairy farms

MANAGING this important area of the farm is the focus of a riparian management project being conducted for the northern dairy industry by the Department of Primary Industries and Fisheries, supported by funds from Dairy Australia and the Bremer Catchment Association.

The project has identified the main riparian issues on dairy farms, and obtained farmers' input to add to existing scientific and ecologist views.



PHOTO 11. CAT'S CLAW vine is a significant weed in the riparian areas of southeast Queensland and the Burnett. It is a very difficult weed to control.

Information and resources from the riparian project will be provided to farmers through the Dairying Better n Better for Tomorrow project.



PHOTO 12. ON their Mary River dairy farm north of Gympie, the Burnett's are trying a range of management tactics along 2 kilometres of river frontage. The majority of the riparian area is now fenced, so that they can control stock access into a grassed buffer zone.



PHOTO 13. WILLOW trees were once common on the Upper Condamine and its tributaries. Darling Downs dairy farmers attribute a lot of the problem of bank instability to removal of these trees by river trust authorities, and failure to replace them with other bank-binding vegetation.



PHOTO 14. A REFORESTED riparian area in north Queensland. Rapid canopy closure in this high-rainfall environment minimises the opportunity for weeds to invade the zone.



PHOTO 15. TREES specifically planted for shade on a Beaudesert dairy farm reduce pressure on remnant native vegetation.

Contact

Rob Chataway, Mutdapilly Research Station

Ph (07) 5464 8745

Email: robert.chataway@dpi.qld.gov.au

The *Sustainable Dairy Farm Systems for Profit* project at Mutdapilly Research Station and on associated commercial farms investigated the potential impact of intensification of five subtropical dairy farming systems on business productivity, on the social well being of farming families and on the farm environment.

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