



Managing Wet Soils: Case Study of Feedpad Use

Updated: February 2008

AG0951

ISSN 1329-8062

Michele Ryan, Warrnambool

Graeme and Margaret Ross of Cudjee in South West Victoria have built a feedpad as a strategy to try and reduce some pugging damage during winter.

It allows for cows to be better fed during winter and also saves pasture from being pugged up by the cows and tractors used to feed out hay and silage.

It has also enabled the time spent feeding cows to be reduced by half.

Property background

Graeme and Margaret Ross have been farming at Cudjee (15 km east of Warrnambool and 230 km west of Melbourne) in southwest Victoria for the past 10 years. The annual rainfall is 800 mm with a winter dominance, resulting in some waterlogging in most years.

The farm is 360 hectares in area, with three distinct land types. There are 200 hectares of heavy black river flats that are very prone to waterlogging and pugging damage in the winter. There are 120 hectares of better-drained clay loam soils and 40 hectares of very steep hills, which are very difficult to manage.

They milk 600 Friesian and Friesian Jersey cross cows, at a current stocking rate of 1.3 cows per hectare. As they have been building up the herd over the past few years the calving spread is rather long, starting in May and continuing through to August. However they intend to tighten the spread over the next few seasons and have the bulk of the herd calved in May to June. The cows are milked in a 40 unit rotary dairy.

Pasture management

The farm has been extensively re-fenced and subdivided over the past few years. There has been an extensive pasture renovation program undertaken to introduce new cultivars of perennial ryegrass and white clover sown into permanent pasture. They also use short-term ryegrasses as a winter fodder crop to try and get early winter feed.

Supplementary feeding

Most of the pit silage has been made from the home farm in recent years. This year Graeme is going to purchase standing silage crops and ensile them at home to try and increase the amount of good quality silage he has available

for his cows. He also will try and buy good quality vetch hay depending on the price and stockpile it for later on in the season. Normally 2 tonnes of crushed grain per cow is fed in the bail.

Why a feedpad?

The reasons that Graeme decided to put a feedpad in were twofold. One was to try and better feed his cows during winter. He found that once it got wet there were very few places to feed his cows hay in the winter without causing major damage to his pastures. Secondly, after doing the Target 10 nutrition program he realised that fibre was lacking in the cow's diets at different times of the year. The feedpad allows him to easily feed this additional fibre when required.

The feedpad is situated close to the dairy for ease of access and so that the effluent can be disposed of using the existing infrastructure. The feeders at the centre of the feedpad are cleaned out every week with a front-end loader and take two to three hours to clean out.

Construction method

Both the dairy and feedpad are on top of a naturally occurring scoria cone and that has enabled the costs to be kept quite low, as no extra fill was required for the base of the pad. By using a large grader they were able to scrape the topsoil from the top of the hill to expose the scoria cone. Once the scoria was exposed it was then possible to grade it to form the base of the pad. The base was compacted by running tractors and the grader across it.

The pad has been fenced with conventional three-strand electric fence on either side. A silage stack is positioned on the right hand side of the pad to allow for easy access. The fence between the pad and the stack has a number of attachments that allows for the fence to be let down and this reduces the time it takes to fill the feed troughs.

There is a natural fall of 1:25 on the pad that allows the effluent to run down to the existing effluent system as shown in Figure 2. The pad is approximately 30 meters wide and this allows the 300 cows to fit comfortably. At each end there is an end assembly to help stop cattle rubbing up against the feed troughs and moving them around, as they are not anchored with concrete.



Figure 1. Cows on feedpad after morning milking

Feeding system

In the middle of the pad “waste not” feeders are linked together to form a feed trough where the hay, silage and any other supplements can be fed. It takes one hour to fill the feed troughs, by using the front-end loader for 600 cows. The feeders are filled in the evening, to save time in the morning. The cows are fed on the feedpad once a day and that is usually straight after the morning milking. On very wet days when he is unable to graze paddocks safely, Graeme leaves the milkers on a sacrifice paddock near the pad, where they can then access the feed in the feedpad ad lib all day. The pad holds 300 cows at a time, once the cows have finished feeding they are then moved on to a paddock.

Graeme has seen the main advantages of the feedpad being able to cut down the amount of time he spends feeding and it also gives him another option to help manage his farm during the winter, and helping cut down the cost of renovating paddocks after each wet winter

At the moment he has no improvements planned for the pad at the moment he is quite happy with the way it is working.

Economic analysis

Method

A discounted cash flow technique was used to assess the economic and financial viability of installing the feedpad on the case study farm. Discounting the value of money to be received or spent in the future is a way of adjusting the future net rewards from the investment back to what they would be worth in the hand today.

This technique is used to generate a measure called the *net present value* of the investment. The net present value (NPV) represents the current value of all the future dollar benefits of the investment subtract the current value of all the future costs of the investment.

A discount rate is used to convert costs and income incurred some time in the future into current dollar terms. This rate represents the opportunity cost of the capital invested (ie. to reflect the annual returns from the next best

investment alternative, such as a fixed term bank account, or the share market).

If the NPV of an investment is greater than zero, then the investment is earning at a higher rate than the next best alternative investment option (as represented by the discount rate).

While the NPV is a measure of the economic *viability* of an investment, it does not indicate how long it will take before the annual benefits associated with the project exceed the annual costs. A measure called the *payback period* indicates the number of years after the initial capital investment before positive annual cash flows are achieved. This latter measure provides an indication of the *feasibility* of the investment in terms of cash flow management.

Key assumptions of the analysis

The key assumptions used in the analysis were:

- If properly maintained the feedpad should last for 30 years.
- A discount rate of 12 per cent (nominal) was used to represent the opportunity cost of capital (ie to reflect the annual after tax returns from alternative investments). Cost inflation was assumed to be 3 per cent and income inflation 1 per cent.
- Negative annual cash flows are covered by an overdraft at 10 per cent interest. Any cumulative cash surplus is invested in the bank at an interest rate of 6 per cent.
- Ten per cent Goods and Services Tax is payable on all additional milk sales and relevant input costs (excluding labour).
- Initial capital cost of the feedpad is written off in the year of expenditure under the outright deduction for expenditure on landcare operations criteria.
- Taxable income over \$6,000 is taxed according to the Australian Taxation Office rates.
- Additional hay and silage (wet) are purchased at \$110 and \$90 per tonne respectively.

- Additional milk produced is valued at an average price of 23.4 cents per litre. However price is varied monthly between 18.6 and 33.5 cents per litre according to seasonal production premiums.

Costs and benefits of feedpad installation

Extra costs

The extra costs associated with installation of the feedpad included the following:

- \$26,000 over two years installation cost
- Increase in hay fed per cow from 0.25 to 1 T
- Increase in silage fed per cow from 1.78 to 1.96 T wet
- Annual feedpad maintenance cost of \$2,000

Extra benefits

The extra benefits associated with installation of the feedpad include:

- 20% increase in milk production over three years to 5,900 litres per cow
- 15% reduction in pasture renovation costs
- 50% reduction in labour for feeding hay/silage from 6 to 3 hours per day

Results of analysis

The analysis revealed that installation of the feedpad on the case study farm was both economically and financially viable.

Table 1: NPV (\$'000) and payback period (years) for various milk prices and hay costs on the case study farm.

		Av. Milk Price c/L				
		21.0	22.2	23.4	24.5	25.7
Hay	\$150	\$176 (3)	\$201 (3)	\$226 (3)	\$251 (3)	\$276 (3)
	\$125	\$223 (3)	\$248 (3)	\$273 (2)	\$298 (2)	\$320 (2)
Price	\$110	\$251 (2)	\$277 (2)	\$298 (2)	\$323 (2)	\$346 (2)
\$/T	\$100	\$270 (2)	\$292 (2)	\$317 (2)	\$340 (2)	\$364 (2)
	\$90	\$289 (2)	\$310 (2)	\$333 (2)	\$358 (2)	\$382 (2)

- The results in Table 1 above indicate that at the estimated hay price of \$110 per tonne and average milk price of 23.4 cents, the farmer in this example could expect to be about \$298,000 better off in current dollar terms by installing and using the feedpad over a thirty year period. The payback period for the investment is only two years.

Table 1 also reveals that even if the long term average milk price is 21 cents per litre and hay is \$150 per tonne, the farmer can still expect a net present value of around \$176,000 with a three year payback period.

At an average long-term milk price of 21 cents per litre, the long-term hay price would have to rise to around \$245

per tonne before the investment would become unprofitable. It is suggested that this is unlikely to occur.

Conclusion

Given the results presented above, it is concluded that on the case study farm, investment in the feedpad proved to be both economically profitable and financially viable in terms payback periods.

Obviously the economic and financial viability of installing a feedpad will vary from farm to farm depending on the type of feedpad and the potential benefits to the farm business.

It is also important to be aware that a feedpad is only one option for reducing the effects of waterlogging on dairy farms. Other options include drainage, sacrifice paddocks or buying more land. Any or all of these alternatives could also be used in conjunction with a feedpad.

In any case, when considering any large investment it is advisable to conduct an investigation into the value of likely future costs and benefits of the investment before making any decisions.



Figure 2 Feed troughs filled with silage

The Water Act

The Water Act (1989) provides guidance for the management of waterways and swamps. Before considering draining a wet area you should contact your local Catchment Management Authority for advice, as a permit may be required.

The previous version of this note was published in February 2006.

The advice provided in this publication is intended as a source of information only. Always read the label before using any of the products mentioned. The State of Victoria and its employees do not guarantee that the publication is without flaw of any kind or is wholly appropriate for your particular purposes and therefore disclaims all liability for any error, loss or other consequence which may arise from you relying on any information in this publication.