



Managing Wet Soils: Case Study of Subsurface Drainage (2)

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Murray and Cathy Joiner have installed sub surface drainage to reduce pugging damage during winter.

They have found that by using a range of strategies such as “on off” grazing and sacrifice paddocks that they have been able to save paddocks and not lose as much pasture production in the following spring.

They have found that with sub surface drainage the plant roots are deeper in the soil profile as they are not waterlogged for 3 months of the year and are therefore stronger, harder plants that persist longer during the summer.

Property background

Murray and Cathy have been farming at Scotts Creek for the past 20 years. They share-farmed on the property for the first few years after they were married, and then bought the property from Murray’s parents in 1987. The annual rainfall is 975 mm with a winter dominance, resulting in some waterlogging in most years.

The property is 82 hectares of a heavy clay loam soil. They also have 9 hectares of creek frontage lease. It is commonly referred to as a “disgusting soil” but brilliant for mole draining.

They milk 180 Friesian cows, at a current stocking rate of 2.1 cows per hectare. They start calving in mid July but are moving to late May to capitalise on the incentives for winter milk. The cows are milked in a 15-unit swing over herringbone dairy

Pasture

The farm has a good base of perennial ryegrass and white clover dominant pastures. They have been on a 10-year renovation plan and work around the farm renovating 2 paddocks a year.

Murray and Cathy have been using a 28-day rotation through out the year. The paddocks range in sizes of 1.9 hectares to 3 hectares. To try and minimise damage to their pastures they use “on / off” grazing. When using this strategy they usually leave the cows on the laneway and in the yard. Over the past few years they have used this strategy probably three or four times when it has got too wet to put cattle on paddocks.

To ensure that they have enough pasture in front of the cows during winter, they have invested in a small super spreader and as the cows come out of a paddock they apply 60 kilograms of urea per hectare. They used to put urea out on the paddocks every six weeks but felt they were getting a better pasture response when applying after each grazing.

Supplementary feeding

Murray and Cathy cut silage on the home place each year and by having sub surface drainage they have been able to get onto paddocks earlier and cut much higher quality silage than before the drains went in. They feed 2.2 tonne of grain per cow per year and that is usually whole triticale and 20% lupins after joining. They will also add mineral pellets when required.

Why sub surface drainage?

In 1987 Murray and Cathy were milking 110 cows and wished to increase size of the herd, but were unable to on their own property. They tried to buy extra land but were unable to find any suitable. They then began to investigate other alternatives available to them. They found that the only real drainage option available on their soil type was mole drains.

Construction method

The mole drains were installed first to save time and the best time to do this is in September to October on Murray and Cathy’s property. The collectors were to be put in during January, however the contractor was unable to get there until late March. That required all hands on deck to get it finished in time for the winter. It takes one hour to pull one acre of drains.

The mole drains are 200 meters long and as the property is slightly undulating they usually follow the fall of the hill. The mole drains are 760 millimetres deep and spaced one and a half meters apart. The water drains down the moles to a collector drain. The collectors drain the water to cherry barrels (cheap junction boxes and silt traps) that are sunk into the ground. The cherry barrels are concreted around the top to allow for a grate to be placed over the top.

From these cherry barrels the water is then drained into dams on the property to ensure that the water is used later on in the season.

After the drains had been in for one year, Murray and Cathy then reassessed the effectiveness of the drains. In areas that were still getting too wet, they either re-mole drained, or put more collectors and mole drains in.

Management of drains

Murray and Cathy have found that the mole drains should be reinstalled every 5 years. In a few places the drains have lasted as long as 7 years before they have needed re-doing. As a result of the continuing maintenance required on the drains and the fact that they have continued to put in more drains, Murray and Cathy have invested in a mole plough. This enables them to get moles into the ground when the timing is right and not having to wait on contractors.

It is important to remember that drains will not save a paddock from getting badly pugged if there is an intense rainfall event. Murray and Cathy believe that it is important to keep an eye on the weather at all times during the winter. If a cold front is on its way it is important to ensure that the cows are in a paddock that is well sheltered and that you are able to change, by not being stuck in a fixed rotation.

Keeping this in mind, Murray and Cathy have used sacrifice paddocks during the winter and found this to be very successful. They choose paddocks that are to be renovated in the following spring. They also use “on/off” grazing strategies and have found this to also be very useful. The cows are allowed onto the pasture after the morning milking for approximately four hours and then taken off and kept either on the laneway or the dairy yard. It is important however to make sure that the yard is kept free of stones as cows can become lame if they bruise their hooves. However over the last 3 years, Murray and Cathy estimate they have only had to use such strategies 4 or 5 times.

Murray and Cathy believe that their investment in subsurface drainage was well worth while as it has led to better pasture management, better quality fodder reserves and has allowed them to increase cow numbers and farm production.

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.

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