

Drainage planning

Water on, water off...grows more grass

This fact sheet is part of the Profitable Dairying series - *Good business management reduces greenhouse gas emissions.*

The Australian dairy industry has committed to reducing greenhouse gas emissions intensity (emissions per L milk produced) by 30% by 2020.

Well drained pastures are more productive with higher quality feed. High quality feed results in less methane emissions per L milk.

Maintaining aerobic conditions in soils means less nitrous oxide and methane production.

Why drainage is so important?

Good drainage is vital to productive pastures. Poorly drained pastures are not aerated. Soil microorganisms and plant roots need oxygen for respiration. If soils are waterlogged, plant roots and soil biota are effectively drowning.

Poorly drained soils have slower growth rates in spring because they are slower to warm and seasonal growth is delayed.

There are many practical implications for poor drainage:

- Pugged soil and pasture damage
- Slow grass growth
- Late start to seasonal growth
- Slow stock movement
- Bogged machinery
- Low pasture utilisation rates
- Increased risk of mastitis and high cell counts
- Boggy laneways
- Stressed farmers!

Poor soil drainage may be limiting plant growth to the extent that no responses are gained from increased fertiliser use.

What do you want to achieve with drainage?

The aim of drainage is to:

- Prevent surface ponding
- Create an unsaturated zone in the surface 40 cm of soil that increases aeration allowing for improved plant growth.

Achieving this takes thorough planning and investigation of soils and topography on your farm.



"Planning drainage for your whole farm is essential because water draining off one part of your farm can flood lower lying areas, or cause serious problems for your neighbours. Drainage can dominate your farm layout."

Bill Cotching, soil scientist.

Do you need drainage?

Surface ponding, wet area indicator plants like rushes and bogged machinery are all indicators that drainage planning could be considered. Sometimes drainage is not a practical or affordable option so other options like off-farm agistment or feedpads should be considered.



How to plan drainage

Whole farm drainage is very expensive, but it can significantly improve production capability of your farm and should be accounted for in land valuations. Professional expertise should be sought for planning and installation. Talk to other farmers in the district about their experiences with different service providers and contractors. There are many different types of drainage options to suit different farms and soil types - see Profitable Dairying fact sheet *Drainage Options for Dairy Farms*.

Regardless of which drainage structures are used across the farm, there are some “golden rules” when it comes to drainage planning.

- Design your drainage in the wet, install in the dry.
- Check the outfall. Check the levels to ensure water will flow off your farm otherwise drainage can create flooding.
- Arterial drains (major open drains) must be the first part of any drainage system. These ensure that the water can get away. A minimum grade of 30 cm in 100m will ensure water will flow.
- Isolate and Elevate
 - Isolate lower lying areas from up-slope water
 - Elevate topsoil by lowering the water table
 - Use a Google image as a starting point for identifying different areas
- Plan your whole farm drainage in the following order, using a staged approach
 1. Location of outfall
 2. Location of main arterial drains
 3. Location of paddock drains, trench or surface
 4. Location of underground drains



Always think about “downstream of your drain” - is it a neighbor taking drinking water from the river, an oyster farmer or a fragile ecological community? Dairy farmers have an important role in protecting water quality in their catchments. The water leaving your farm should be the water you would be happy to have flowing onto your farm.

Further resources:

[Fert\\$mart waterlogging and drainage](#)

[Reducing drainage costs and impacts](#)

[Agriculture Victoria Planning farm drainage](#)

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