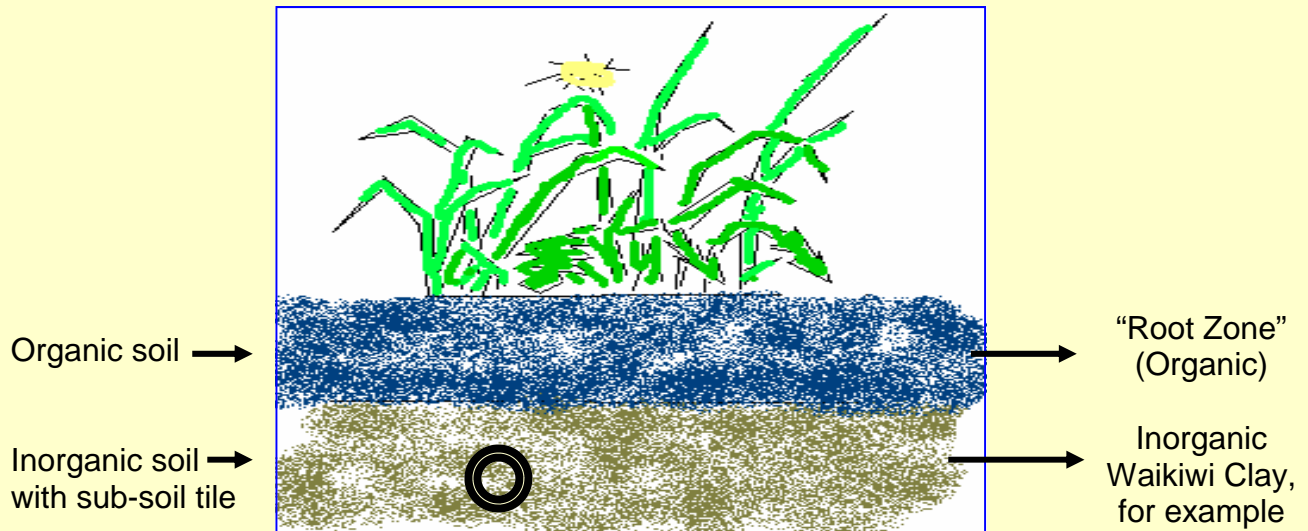


Deferred Irrigation explained:



We just want to keep it in the “root zone”...

Nearly all your farm wealth begins in “the root zone” - a layer of soil which is often no more than just a hand span deep.

It contains a mix of organic and inorganic materials (as well as microbes, insects and worms) overlaid onto much deeper layers of *inorganic* soil.

- If we can keep all the “deposits” from animals or fertiliser spreaders (and so on) in “the root zone”, then these “deposits” don’t escape from your farm or percolate through to underground water.
- If you can keep all the “deposits” in the “root zone” then you are retaining all the nutrients and water for the growth of your own grass.
- If this stuff stays on your property, then there is no fear of contaminating streams or underground water. (Even now, you may be drinking the effluent from your own property or that of your neighbour...)

We can’t do too much about urine and dung patches (except to inhibit their effects) but we can do a lot more with the nutrients and water that make up farm dairy effluent.

So with these points in mind let’s look at a new way of irrigating which has the greatest chance of improving our water quality and giving a production gain, too.

The method is called **”Deferred Irrigation”**. It has a lot going for it. Here’s why:

- It avoids the irrigation of effluent on to wet or *saturated* soil in the winter or early spring and on days when it is raining. (No run-off to drains or rivers)
- It enables irrigation in the warm part of the season when grass can actually use all the water and nutrients. (Irrigating cold soil can cause the nutrients to just pause, - unused - in the soil, until the next shower of rain washes them right through the root zone, out of reach of the plants.)
- You irrigate known amounts of effluent which are always less than the top soil has the ability to absorb. (The water and nutrients are retained in the top soil and don’t run away to drains)
- It avoids drowning soiling micro- and macro-organisms which are essential to pasture health. (They don’t work well in soil that lacks air spaces.)

- You only irrigate in the warmer, dryer conditions, so you don't shift irrigators in the busy season, when it's cold and slushy. (Saves you an unpleasant task in awful conditions.)
- If pumps, pipelines or irrigators fail, then a big holding pond allows you plenty of time to get things repaired. (This is a great stress reliever.)

So, **Deferred Irrigation** is the process where you retain effluent (in a pond) during the cold and wet periods until the soil is warmer and *has a moisture deficit* and then you apply it during the dryer and warmer days, in amounts that keep it in the topsoil.

That's all there is to it!

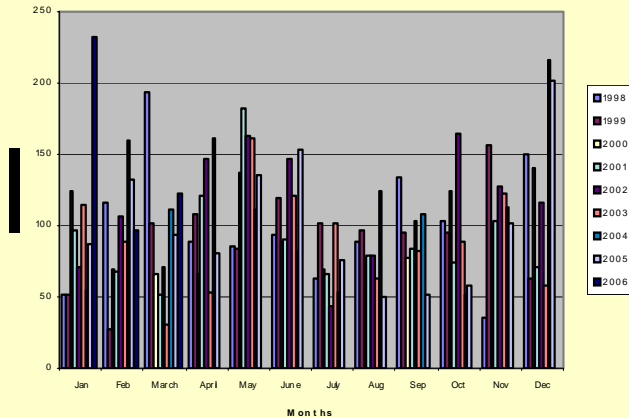
It aims to use *all* the water and nutrient for grass growth so that there is none left over to run away or percolate to drains and aquifers.

Irrigation is now carried out from, say, October - November onwards. You irrigate when there is a soil moisture deficit (that is the soil can absorb moisture) and you apply the effluent so that you don't saturate the soil. (You leave a moisture deficit in the soil after irrigation to absorb subsequent rain.)

If there is a dry spell and a deficit in soil moisture, then the irrigator might run for 1, 2 or three days almost continuously, because you will want to lower the pond level *and* because this is the time when the grass needs the nutrient.

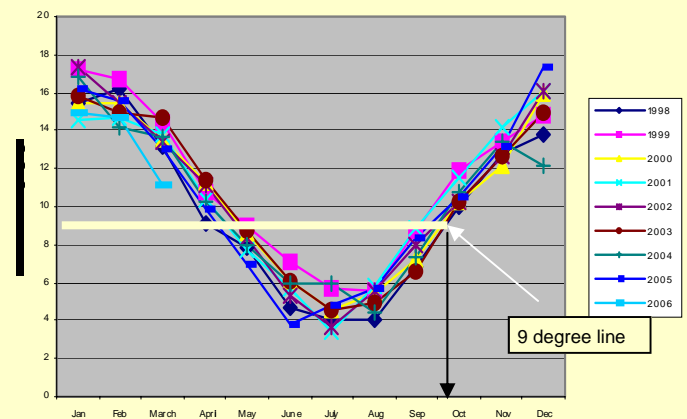
The final point to remember is to get the pond empty by the end of the season so that it is ready for more effluent when lactation begins again after calving.

Monthly Rainfall Stats Till Present



Rainfall at Woodlands

10cm Monthly Aver aged Soil Temps



Soil temperature at Woodlands

Why is two to three months of storage necessary?

Using the Environment Southland web site figures (above) as an example, rainfall is fairly even over the year, but a good growing soil temperature of around 9° C doesn't occur until October, so effluent won't be utilised very well until this period. In this case, then, *temperature* dictates the best time to apply effluent. Higher temperature = more growth and better utilisation of nutrients. If calving begins in July, store until October/November.

We believe that the plain good sense of the "Deferred Irrigation" method means that it has the greatest chance of improving dairy farmers attempts to improve water quality, while at the same time it keeps all the effluent nutrients and micro-organisms on their own properties so as to reduce the need for chemical fertiliser. *Two gains from one method!*

We just want to keep it in the "root zone" ...