



DEPTH OF EFFLUENT V's RATE OF APPLICATION

- The depth of application is the amount of effluent applied per pass in mm
- The application rate is the amount of effluent that is applied per hour

Consent conditions

- Typical Consent conditions for effluent application- this can change for different consents
- Depth of effluent not to exceed 15mm per application
- Maximum Rate of application not to exceed 10mm per hour

How to Work it Out

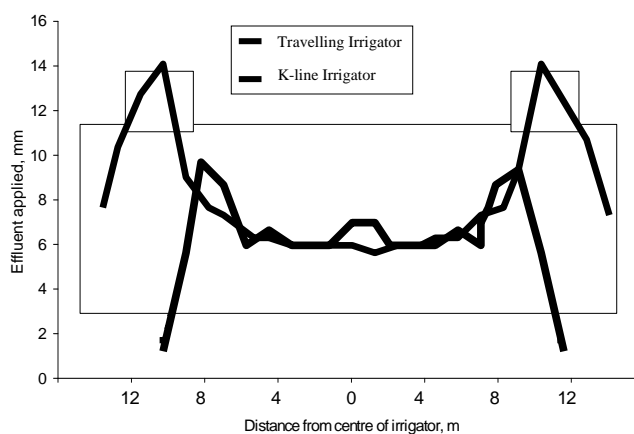


Irrigation Time = 20 minutes

Depth of effluent = 12mm

Application Rate = 12mm x 3 = 36mm / hour

COMPARISON OF SPREAD
TRAVELLING IRRIGATOR vs. LOW APPLICATION SYSTEM



How much are we losing?

Factors that increase likelihood of nutrient loss:

- 1. Irrigation when soils are wet.**
- 2. Applying more nutrient than required.**
- 3. Uneven application.**
- 4. High application rate on unsuitable soils**

- *20 – 30% loss = \$5 000 - \$7 000***

- **Are you disposing of effluent or applying nutrients?****

What is Soil Moisture????

- Soil moisture is expressed as "Water Filled Pores" which is a measure of pore space filled with water
- A completely saturated soil has 100% water filled pores
- Field capacity typically between 70 to 90% of water filled pores

- Soils at "field capacity" cannot physically store any more water
- Excess water moves below the root zone to ground water or into tile drains or run off into surface drains

When not to Irrigate Effluent??

- **No Irrigation**

Soil moisture content is close to, or above field capacity

Low Rate Irrigation

- **Use Low Rate Irrigation**

when soil moisture content is high. Irrigate effluent using low rate application systems

- maximum application depth of 5 mm to ensure the soil is able to absorb the irrigation
- Irrigate for 20 minutes then off for 40 minutes for 4.5 hours

Good Irrigation Conditions

- **Safe For Irrigation**
when the soil moisture content is low.
- minimal environmental effects from effluent irrigation
- application depth does not exceed 15 mm or the application depth specified on your consent.
- continuous irrigation for up to 3 hours
eg. K-line system

Further Benefits

- **Cow acceptance of irrigated pasture.**
- **Ease of management:**
 - **minimal working parts.**
 - **easy to shift.**
 - **no need for irrigation on holidays, calving even week-ends.**
 - **remote switching on and off.**
 - **loss of prime control**

\$\$\$ - Show me the Money?

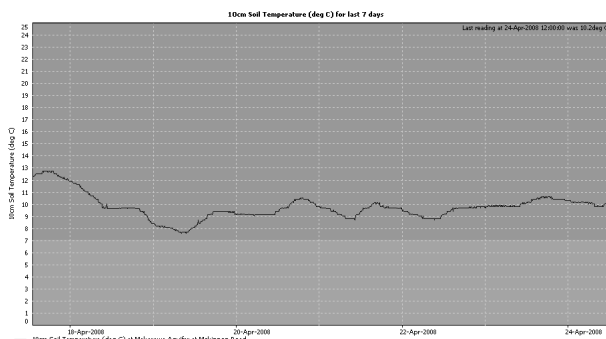
800 Cows - 100 ha effluent area

• Units/ha	\$
• N 73	10,937
• P 8	1,797
• K 65	7,776
• S 16	
• Ca 15	650
• Mg 6	
• Na 2	
• <u>Total</u>	<u>\$ 21, 472</u>

Low rate application systems

- Separated solids need to be applied separately.**
- Only 2 – 4% of the total effluent volume.**
- The liquid portion contains the vast majority of the nutrient.**

Soil Temperature (web Site)



Soil Temperature & Pasture Growth

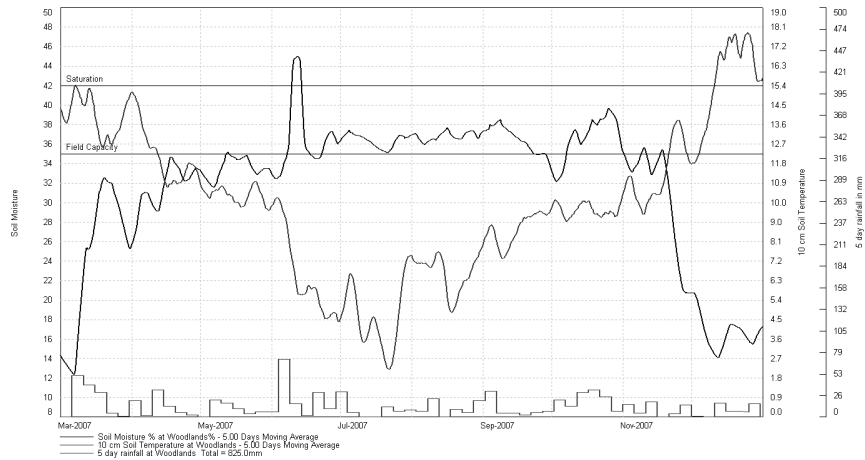
■ Pasture Growth

When the soil temperature is above 5 °C during spring or above 7 °C during autumn, nutrients in the farm dairy effluent are able to be utilised for pasture growth.

■ No Pasture Growth

When the soil temperature is less than 5 °C during spring or less than 7 °C during autumn there is a risk that nutrients in the soil will be lost due to slow growth rates. Effluent applied at this time may sit in the soil and leach into groundwater or run off to surface water with the next rainfall.

Soil Moisture – Temperature & Rainfall



Deferred Irrigation Storage

- Environment Southland's requirement for effluent storage
- 90 days for travelling irrigator
- 60 days for low rate system
- based on 50 litres per cow per day
- solids separation required for low application rate system

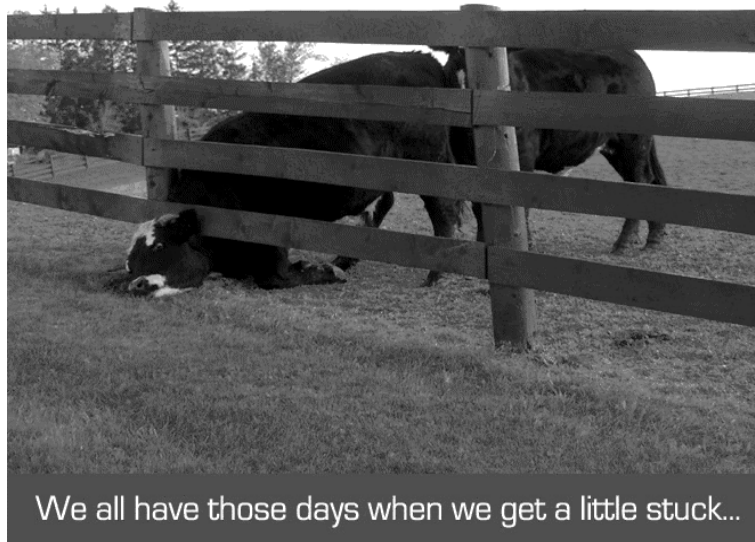
Weeping Wall Solid Separation



Storage Pond & Weeping Walls



60 Day Storage Pond



We all have those days when we get a little stuck...



Trust Us!!!

• Environment
Southland **IS** here to
HELP

Acknowledgements

- Dr. David Houlbrooke – AgResearch
Invermay
- DairyNZ
- Fonterra