# **IrriGate**

#### Sustainable Irrigation Services - North East, Mid and Upper Goulburn Broken Dryland

Welcome to IrriGate Issue 7.

It is getting close, or may have already past, time to consider the first irrigation to avoid production losses. Dig up some dirt and make an assessment, and remember there is still grant money available for soil moisture monitoring tools. I would also like to thank Wendy Paglia for her help over many years and welcome Suzanne Briggs to the team. Dennis Watson - Editor



## Counting the cost of poor distribution uniformity

The distribution uniformity of a spray irrigation is a measure of how efficiently water is applied across the paddock. This is measured as a percentage the higher the better. A low distribution uniformity can mean crop growth is reduced, or more irrigation water needs to be applied to compensate. As well as using more water this also increases pumping costs.

An average water demand for most fodder crops and pastures in the North East and Goulburn Broken Dryland CMA regions is around 6 ML/ha. Compensating for a poor distribution uniformity of 70% and applying more water to make it equivalent to a 90% system means applying an extra 1.9 ML/ha. The extra cost of this water and pumping is likely to be around \$60 to \$150 per hectare depending on the irrigation system and the power source. For high yielding viticulture the average demand is around 4ML/ha, which means applying an extra 1.3 ML/ha to compensate for a distribution uniformity of only 70%; costing around \$60 to \$95/ ha. The difference between four typical irrigation system used across the regions is shown in Table 1.

		extra water cost (\$/ha)	extra fuel cost (\$/ha)	Total (\$/ha)
Centre Pivot	electricity	38	24	62
	diesel	38	42	80
Bike shift	electricity	38	46	84
	diesel	38	74	112
travelling gun	electricity	38	70	108
	diesel	38	114	152
Drip irrigation	electricity	26	35	61
	diesel	26	68	94

#### Table 1: Cost of applying extra water to make up for a poor distribution uniformity

Assumptions:

- Diesel at \$1.2/litre
- Electricity at \$0.17 /Kwatt.hr
- Water at \$20/ML (temporary water value)
- 70% pump efficiency
- Operating at typically average pump pressures.

DPI currently can measure your irrigation systems distribution uniformity free of charge. If you are interest in more information contact Dennis Watson on (02) 6030 4567 or 0429 304 567



### Seeking interest in Tracking irrigation again this season

Over the last irrigation season some irrigators took part in a program where they recorded their irrigation and rainfall. This information was examined each month to check whether irrigation application rates where keeping up with crop demands or if too much water was applied. An example from last year is sown in Figure 1. The horizontal blue dotted line represents a full soil water profile, while the horizontal red dotted line represents plant stress levels. The black line represents the theoretical plant use or soil moisture level, responding to rainfall, irrigation and evaporation. When this line drops past the red line the crop is theoretically suffering from moisture stress.





In this case there where a couple of times where an irrigation may have been warranted prior to December but subsequent rainfalls occurred before any major crop stress would have occurred. The crop started to enter a stressed stage late December to early January and a serries of irrigations of 11mm occurred but these where only enough to keep up with evaporation and not enough to lift the crop out of the stressed stage. The crop was then saved by some reasonable rainfall events early February. A similar scenario occurred towards the end of January. The crop was also again placed under stress for the March April period, however this may have been a deliberate method to avoid waterlogging overwinter. All up from March to February the crop could have been under moisture stress for over 70 days. Soil moisture probes were installed under the crop which validated these results.

If anyone is interested in participating in this program over the coming irrigation season please contact Dennis Watson on (02) 6030 4567 or 0429 304 567

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