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Water Efficient Farming

New dairy = new opportunities for water savings

Bernie and Bettine Dijs dairy farmers from Binginwarri, are facing the challenges and excitement of planning and building a new dairy. They are mid way through building a 60 unit rotary which includes many innovative features to help improve water, energy and labour efficiencies. These efficiencies will also be enjoyed by sharefarmers Trent and Belinda Crawford.

Milking to date has occurred in a 32 unit herringbone shed, which can take up to three and a half hours per milking at peak, for 500 cows. Bernie plans to expand the herd to 650 cows. It is anticipated that the new shed will halve the milking time, and provide the infrastructure like larger vats for the growing herd. Bernie explains that 'halving the milking time to 2 hours, means that we will be reducing the time in the shed, and also water needed for the **plate cooler** to cool the milk'.

Water use in the plate cooler should be related to the amount of milk and its flow rate. A rotary will have more milk flow so more water will be needed per unit of time than a smaller dairy. However, newer dairies use an industrial plate cooler that has a lower ratio of water to milk than the smaller plate coolers often seen in older dairies.

The new dairy will also have a two staged plate cooler. The first stage uses bore water and the second stage uses a chilled water-glycol mix. Two stage pre cooling allows the milk to be chilled to six degrees by the time it enters the vat. This process helps with chilling, so the vat will only need a smaller compressor.

"We also hope to install new **plant cleaning** equipment that will recycle detergent and also has a cold water rinse. This will help to save on detergent and energy costs for heating the water," Bernie explains.

The dairy has also been designed to maximise cow flow, this includes a **cow underpass** to allow milked cows to go under cows coming up the lane into the dairy. This feature has allowed Bernie to have a yard that holds 200 cows even though he intends to milk 650 cows. Whilst saving costs on concrete and the amount of space that the yards need occupy, this feature also helps to save the amount of water used to hose down the yard. This is because the cows are spending less time on the yard and are therefore manuring less.




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The **new yards** will be washed with two hydrants. Hydrants can help save time and water to clean the yards. This is because water can be targeted to dirty areas of the yard for cleaning. The effluent is gravity fed from the yard into a two pond effluent system. The effluent from the second pond can also be recycled for yard washing.

Capturing shed run-off for plant wash

Bernie's shed is supplied with bore water. "Bore water can be hard on equipment, and can contribute to a ferric build up on the plant", Bernie explains. Consequently, rainwater is needed to clean the vat and plant. A 270,000 litre rainwater tank has been installed to harvest water that falls onto the 672m² shed roof.

So how much water can the roof supply?

If Binginwarri receives 850mm per year then rainfall falling onto the roof for 1 year is equivalent to:

- $672m^2 \times 0.85m^2 = 571.2\ m^3$

To convert to metres cubed to litres multiply by 1000, therefore rainfall harvested is equal to 571,200 litres or 0.5712 Mega Litres per year.

- This roof area can supply ~1560 litres of rainwater/day

The plant rinse requires 900 litres (min) to 1800 litres (max) of water to run. If the plant is rinsed twice daily then 2000 litres of water will be required. Consequently, recycling the water that is used for plant rinsing may need to be considered to make up the shortfall.

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For further information regarding this case study or other Water Efficient Farming case studies, please contact the:
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