

EFFLUENT IRRIGATION SYSTEMS

STANDARD 5 IN THE CODE OF PRACTICE FOR DAIRY FARM EFFLUENT MANAGEMENT WA: REUSING EFFLUENT

Following the storage period, liquid effluent needs to be applied to pasture or crops where this nutrient rich resource can be utilised and offsite impacts are minimised.

There are many ways to apply liquid effluent from storage systems and each will have advantages and disadvantages dependent on different situations and farm characteristics. Tankers and umbilical applicators are also available for this task, but this article will focus on permanent systems which are summarised below;

Surface Irrigation – Effluent can be either shandied with irrigation water in the head ditch, injected into piped systems or have risers at the head of each irrigation bay. Low maintenance and management costs and can utilise existing infrastructure. Limited to the irrigation area.

Centre Pivot – Effluent can be injected into the main line or underslung in a separate line. High quality effluent and a filter is required for mainline application. Limited to the irrigation area.

Travelling Irrigator – A pump-driven irrigator which is connected to the pond by a series of hydrants. Can be applied to irrigated and dryland paddocks.

Hard Hose Irrigation – A pump-driven irrigator with more capacity and wider wetting front (depending on model) than a travelling irrigator. The hose is reeled in rather than dragged across the paddock like the travelling irrigator.

Pod Irrigation Systems – A series of stationary pods which can be moved between paddocks and are fed by a series of hydrants from a pump at the effluent pond.

All application systems are best suited to areas of low fertility or where there is nutrient export from paddocks cut for hay and silage. Grazed irrigation paddocks tend to have high nutrient levels so are less responsive to the nutrients applied from effluent.

Table 1 shows the relative performance of the various effluent irrigation systems. Individual farm soil fertility and management will influence ratings.

Table 1 Ratings for fixed effluent application systems (assume capital costs for surface and centre pivot irrigation are already sunk/installed costs)

Effluent application system	Capital cost	Management (labour)	Output capacity	Controlled application
Surface irrigation	★★★★★	★★★★★	★★★★★	★
Centre pivot	★★★★	★★★★	★★★★★	★★★★★
Travelling irrigator	★★★	★★	★★	★★★★
Hard hose irrigator	★★	★★★	★★★	★★★★
Pod irrigation systems	★★★	★	★★	★★



Department of Water and Environmental Regulation
Department of Primary Industries and Regional Development



This project is a part of Healthy Estuaries WA – a State Government Royalties for Regions program that aims to improve the health of our South West estuaries.

CASE STUDY: NOAKES FAMILY, FOREST GROVE, WA

Herd Size: 570–600 cows

Farm Size: 300ha

Shed type: 50-stand rotary

System details

The milking platform and pit are hose-washed with fresh water and the main holding yard is hydrant-washed twice daily. Previously the effluent was caught in a trafficable solids trap and sump before being applied directly to paddocks using a traveling irrigator. A two-pond treatment storage system was installed in 2021. Effluent is now applied from the liquid storage pond via a hard hose irrigator to 57 hectares using some of the existing hydrant network and 700 metres of lay-flat pipe. The irrigator can achieve 220m runs that take up to six hours. In the future it is hoped the system will be automated to run at night on off-peak power with automatic shut-off.



Centre pivot irrigator.

What's working well?

The hard hose irrigator is easy to set-up as the pipe winds itself in so it can be moved easily with a tractor. The irrigator is high capacity so it can empty the storage with fewer irrigation events. Once set up the irrigator can move large volumes of effluent which complements the existing irrigation system to grow more grass. It is recommended that farmers install more underground mainline at time of installation rather than having to roll out lay-flat.

"It's easy to manage, it gives us flexibility and it grows a lot of grass."

BRAD NOAKES



Hard hose irrigator.



Pod irrigators have lower output capacity and require more management, but may suit small dairy farms.



This irrigation technology meets Standard 5 in the **Code of Practice for Dairy Farm Effluent WA: Reusing Effluent**.

Further information

Hard-hose irrigation is ranked as a viable management practice in WA. This feasibility ranking is based on best available knowledge and considers ease of management, cost, availability, maintenance, integration and likelihood of success (Price & Tait 2019).

Visit westerndairy.com.au to view a list of all viable management practices and technologies in WA.

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