

Fert\$mart Effluent

Using effluent as fertiliser

This fact sheet is part of the Profitable Dairying series - *Good business management reduces greenhouse gas emissions.*

The Australian dairy industry has committed to reducing greenhouse gas emissions intensity (emissions per L milk produced) by 30% by 2020.

Effluent and manure management accounts for around 20% of greenhouse gas emissions from dairy farms.

Fert\$mart is the Australian dairy industry's national nutrient management framework. It has been developed to improve the efficiency and profitability of fertiliser and effluent use on Australian dairy farms.

Making the most of effluent

Effluent is a valuable source of nutrients and reuse of effluent as a fertiliser can be easy if you have an efficient and well managed system.

Return on the investment to capture and re-use effluent is relatively quick given its fertiliser and soil conditioning properties. Look at good systems on other farms or seek design advice if needed. [Click here](#) for effluent system designers.

Re-using effluent provides a range of benefits including:

- A source of essential plant nutrients, boosting crop and pasture yields,
- Replacing some bought in fertiliser, reducing annual fertiliser expenses, and
- Addition of organic matter to the soil, improving soil structure, water and nutrient holding capacity.

[Click here](#) for more information.

Avoiding problems with effluent application

Dairy effluent typically contains relatively large amounts of readily plant available nutrients, particularly nitrogen (N) and potassium (K). The nutrient that requires the largest reuse area is normally potassium and this sets the application rate.

Total potassium per application should be no more than 60 kg K/ha, and no more than 120 kg K/ha per year. This applies for both liquid effluent and sludge. Soil K levels in paddocks that have been repeatedly used for effluent often have very high K levels. Effluent paddocks can be cut for hay or silage to remove excess potassium and prevent overloading.

Avoid applying effluent to paddocks used to calve down the herd as the excess potassium can lead to grass tetany or milk fever with cows going down due to induced magnesium deficiency. Also avoid calf paddocks to minimise risk of Bovine Johne's transfer.

Where possible effluent applications should be synchronised with paddock rotations to allow sufficient time between application and grazing. In summer, 2 weeks is the recommended minimum before grazing. In winter, 3 weeks is the recommended minimum

Effluent can be saline. Effluent can be shandied with irrigation water to reduce the salinity levels. Effluent should not be applied to young seedlings or to irrigate crops during the emergence stage due to the risk of burning. Run effluent in a separate line through your pivot or flush with fresh water at the end of the season to prevent corrosion of irrigation equipment.



Calculating nutrients applied in irrigated effluent:

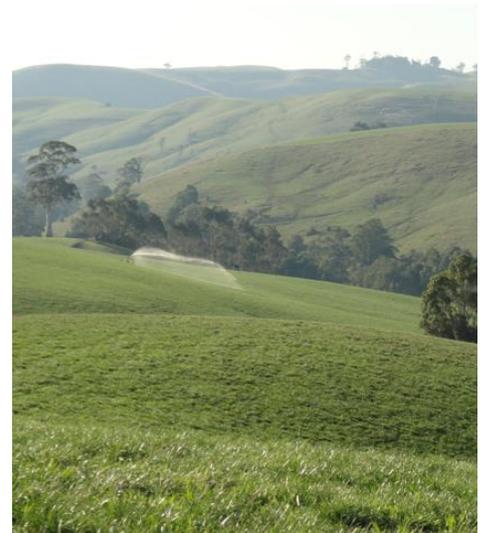
1. Collect an effluent sample for analysis. This must be as applied to the paddock via the irrigator. A good way is to put out buckets while irrigator is going. Measure the amount that irrigator is applying (mm), remembering that 100 mm/ha is equivalent to 1 ML per ha.
2. Keep effluent sample cold and get to lab for analysis asap.
3. Look at the analysis for nutrients in ppm and convert to kg nutrient per ML. For example:
 - ammonium 8.58 ppm = 8.58 kg in 1ML
 - phosphorus 18.71 ppm = 18.71 kg in 1 ML
 - potassium 58.43ppm = 58.43 kg in 1ML
4. Convert kg per ML to total annual application based on total effluent irrigation for the year

For example: Effluent irrigator applies 4 mm/ha each application, with 30 applications per year to same paddock.

$4 \text{ mm} \times 30 = 120 \text{ mm/ha/year} = 1.2 \text{ ML/ha per year.}$

Effluent analysis shows potassium (K) at 58.43 ppm = 58.43 kg in 1 ML, which is 70.11 kg in 1.2 ML.

Therefore effluent paddock is receiving 70.11 kg K/ha per year.



Pond sludge management

- Pond sludge is a nutrient rich product which has a rapid financial return (3-6 months) on the investment of de-sludging and applying back to the farm.
- Dairy sludge is typically 6-8% dry matter as spread, requires specialist handling equipment.
- Applied sludge acts as a long-acting, slow-release fertiliser as the majority of the nutrients are in organic forms that need to be mineralised to convert them to plant available forms.
- Sludge can be applied directly to established pasture or to cultivated ground and incorporated into soil prior to crop sowing
- The time between application and grazing may be up to 6 – 8 weeks due to the solids content and palatability.



[Click here](#) for further information on sludge management

Animal health considerations when using dairy effluent or sludge as fertiliser

Bacteria that cause diseases can be found in manure, urine and milk. These include Johne's disease; Salmonellosis; Leptospirosis; Mastitis and Enzootic bovine leucosis. Worm eggs, coccidial eggs, clostridium organisms and tetanus spores are also passed in manure.

In most cases, the period of time before application to pasture and the dilution effect of the washdown water tend to reduce the risk to stock grazing paddocks that have been treated with waste water. To further reduce the risk to animal health, the following precautions should be taken:

- Do not allow young stock (less than 12 months old) to graze or have access to treated areas.

- Do not allow drains from treated areas to flow into areas where young stock are kept. This will help to reduce the risk of infection with Johne's disease.
- During summer, do not graze areas to which effluent has been applied for at least 2 weeks. If you can safely apply effluent in the winter, do not graze treated areas for at least 3 weeks.
- Do graze areas just prior to effluent application to allow increased sunlight penetration to kill organisms and to extend the period before the area is ready to be regrazed.
- Do spread effluent during the warmer, drier months to reduce survival chances of disease organisms.
- High K levels can cause grass tetany (blood magnesium (Mg) levels fall below a critical level). It is important to regularly soil test areas that are being loaded with effluent. Grass tetany information is on Dairy Australia website. [Click here for more information](#)
- Contact your veterinarian if you have concerns about any specific animal health problems associated with applying dairy effluent wastes to pastures or crops.

Use Dairy Effluent Safely

- Ensure your pond is safe for yourself and contractors working on your farm.
- Ponds must be fenced from people and stock.
- Ponds must have signage stating:
 - Dangerous areas
 - Location of flotation devices at the pond in case someone falls in
 - Procedures for "What if" something goes wrong: e.g. person fell in, tractor fell in.

Safe pumping from ponds

Typically, contractors will come with a tractor and slurry tanker and they will request the farmer to set up a second tractor on the edge of the pond with a PTO driven stirrer.

- Ensure there is safe and easy access to the pond for all large machinery
- Ensure all earthworks around the pond are stable under heavy loads.
- All tractors have PTOs guarded, and are in good condition

Keep in mind:

- It may be difficult to identify the pond surface area if ponds are heavily overgrown.
- Floating debris may cause blockages or be flung into the stirrer
- External batter slopes on ponds may be steep when accessing machinery
- People driving tractors in the vicinity of effluent ponds need to be very experienced and do so with extreme care.
- There needs to be a clear line of sight between all people working around an effluent pond
- Wear Personal Protective Equipment (PPE) and be highly visible

Contractor management - you need to:

- Check contractor registration includes current public liability insurances and "professional indemnity" insurance.
- Undertake contractor induction for your farm (map, with routes to be used and hazards in the area / en-route).
- Ensure contractor's tractor / equipment are safe to operate e.g. PTO guards are in place.
- Check equipment is in good operating order (may need to sight their maintenance records)
- Sight their safe operating procedures for performing this task.

Further resources:

[Dairy Australia Best Practice Effluent Management - videos and fact sheets](#)
[Effluent and Manure Database \(technical resource\)](#)
[FertSmart effluent information](#)

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