

Guidelines for the use of second pond dairy effluent for forage production on farm.

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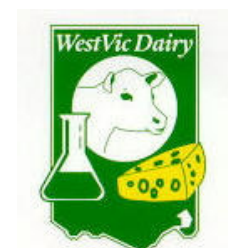
Second pond effluent from dairy waste treatment systems is a valuable source of nutrients and water. Used correctly, dairy effluent can produce some very profitable increases in forage grown on-farm during the drier months of the year. What was often previously regarded as a waste product can now be used for irrigation and as a partial replacement for some bought in chemical fertilisers.

Type of crop

Local research has demonstrated that second pond effluent applications to both pasture and summer forage crops will increase yields and herbage crude protein content. Applying the effluent to paddocks soon after being cut for silage is an excellent way of boosting regrowth and replacing the nutrients removed in the silage. Responses on pasture are sometimes more variable than on forage crops. The brassica forage crops (e.g. turnips, rape, hybrids) have been shown to give good, reliable responses to effluent. With regrowth crops such as rape and Hunter, effluent applications can be split, enabling application before and after the first grazing. Tropical grass crops such as millet and sudax can also be successfully irrigated with effluent.

Timing of application

Applications to pasture should be made in mid to late spring when the pasture is still actively growing. If applied to a drought stressed pasture, responses will be lower. As dairy effluent is often quite saline it should not be used to irrigate a crop up or on young seedlings. Our research indicates that responses to effluent application are due both to the water and nitrogen (N) content of effluent. Therefore, the effluent needs to be applied to crops that are in a responsive growth stage to both water and N. For example, application to turnips is best done at around 6-8 weeks after sowing when the turnip is starting its rapid growth phase. This normally commences with bulb enlargement. With once only grazed crops like turnips, all of the effluent can be applied at this stage. For regrowth crops (e.g. rape), an option is to split the application with half being applied 4-6 weeks before the first grazing and the remainder immediately after this grazing. Improved responses to effluent have been observed when application has been undertaken in conjunction with rainfall (within a week of significant rainfall).



DemoDAIRY

Test your effluent

It is important to know the nutrient concentrations of the effluent you plan to use. When sending samples for analyses the following analyses should be requested – salinity (EC), Phosphorus (P), Potassium (K), total Nitrogen (N), and ideally ammonia-N. The ammonia-N content provides a good indication of the availability of N for immediate plant uptake and use. The higher the proportion of ammonia-N in total N, the greater the likely plant response. Knowing the P and K content will assist in formulating subsequent fertiliser requirements for the paddock.

Deakin University in Warrnambool offer a commercial water testing service. Cost for an effluent sample with the above analyses is in the order of \$200/sample.

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Rates of application

Before deciding on application rate, it is worth knowing how much effluent you have on hand and the area of crop you want to irrigate. For example if your second pond holds 3 megalitres and you want to irrigate 10 ha of crop, then this equals an application of 30 mm over the 10 ha.

Rates of application should ideally be based on the N content of the effluent, as this is the primary driver of plant responses to effluent. Data indicates that for most crops there is a linear response to application, that is, the more effluent applied, the greater the response. However, it is not recommended to exceed application that results in more than 150 kg N/ha being applied. Rates above this may reduce the efficiency of N use, increase the risk of Nitrate poisoning to livestock and may even lead to environmental problems.

Economic analyses of trial data indicated that rates of 30 – 60 mm (45 – 90 kg N/ha) provided the best economic returns to effluent application. The analyses took into account setting up the effluent system, the value of the crop grown (yield and quality) and running costs.

Grazing

It is recommended that there is at least a three-week interval between the last effluent application and the commencement of grazing. This period should ensure that the pasture or crops have sufficient time to utilise N in effluent, reduces any risk of nitrate poisoning and also reduces any risks from pathogens that may be in the effluent. Cows in late pregnancy or soon after calving should not be grazed on forage grown with effluent applications as the very high potassium (K) levels can increase the risk of metabolic problems such as milk fever.

When grazing summer crops grown with effluent applications, all other normal practices should be followed. This includes gradual introduction, correct allocation of feed per animal (e.g. up to 5 kg DM of brassica per animal per day) and balancing the total ration for energy, protein and fibre. Remember not to allow stock under twelve months of age to graze areas treated with effluent if you herd is in a Bovine Johnes Disease Control program.