

DairySA Project Update

06

SHED WASTE IS A SUSTAINABLE FERTILISER REPLACEMENT

Stored dairy shed effluent and separated solids can successfully be used to substitute fertiliser without causing environmental problems or reductions in crop yield or quality. This encapsulates the results from six years of work carried out by Trevor Clark, Rural Solutions, SA.

In 1999 Trevor Clark established a dairy shed effluent trial at the Slape's 180 cow dairy at Riverton. With funding from DairySA and the Natural Heritage Trust, the work aimed to show that land spreading of dairy shed effluent was a long-term, environmentally sustainable and economic option.

At the Slape's all effluent from the yard and pit of the herringbone dairy enters a trafficable solids trap from where the liquid fraction is pumped to an anaerobic treatment pond and then to a secondary, shallow storage pond. A major concern in this region is that water from saline underground aquifers is often used for washing yards. If applied undiluted this will damage growing plants and in this area irrigation water is not available to dilute effluent.

Therefore, the trial applied liquid or solid effluent to crop stubbles in April, ploughing these in within 48 hours, in order to minimise nitrogen losses to the atmosphere. The amount of waste applied was calculated using a nutrient mass balance. That is where the amount of key nutrients that will be removed by the crop is estimated and the amount of manure applied is designed to equal the removal.

The nutrient content of the well mixed samples of solid and liquid waste were analysed each April and this information was used to calculate the required spreading rate.

This most limiting nutrient determined the area over which the waste was spread. That is, if the area required for the crop to use nutrients completely is: 10 hectares nitrogen, 20 hectares phosphorus and 15 hectares potassium, then the waste is spread over 20 hectares.

"Using the most limiting nutrient can result in some under fertilisation, depending on the crop and anticipated nutrient removal, but minimises the risk of nutrient leaching or run-off.

"In the trial we found using this method resulted in nutrient inputs and removal being well matched. Crop performance was similar to the control treatments where conventional fertiliser was applied to the same wheat, barley or pea crops that were either cut for hay or harvested for grain," said Trevor Clark.

Trevor warns that discrepancies between nutrient inputs and removal can occur if:

- yield is over estimated or as in the case of the trial where a hay cut was taken from a crop planned to go to grain
- waste samples are not representative due to poor mixing or insufficient samples are taken from a range of locations in the pit or stack
- calibration is poor or equipment is unable to apply uniform rates
- actual yields are not measured accurately.

Soils were sampled each year, analysis included macro and micro nutrients and detrimental elements such as boron, sodium and salinity. While there was some variation, annual soil sampling is not considered necessary. For the liquid and solid waste annual analysis is essential as considerable variation between nutrient levels and the concentration of salts were recorded.

For example in 2005 the effluent in the storage pond recorded high levels of potassium and salinity giving a reading of 7700mg/litre of dissolved salts. Liquids with a salt concentration of over 2000mg/litre are at high risk of affecting plant germination and growth, and increasing soil salinity, if used for irrigation. Therefore, the model used to calculate spreading rates classed this effluent as too saline and so only solid waste was spread in the final year of the trial.

The trial showed that the use of dairy shed effluent on these clay loam soils over a clay subsoil did not adversely affect the heavy metal composition of the soil.

The spreading rate model developed from the trial is available to dairy farmers with the Manual for Spreading Nutrient Rich Wastes on Agricultural Land; available on CD from the Roseworthy Information Centre, freecall 1800 356 446.

For more information contact Trevor Clark, 08) 8842-6226, Clark.TrevorJ@saugov.sa.gov.au

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FOCUS ON FORAGE

DairySA's program, Focus on Forage, has been initiated to address feedback from Taking Stock & farmers generally, that forage production and utilisation are still key opportunities for dairy farm profitability.

There are three components of the program:

1. ForageSkill\$
2. South East Forage Innovation Project (SEFI)
3. 3030 Regional Farm Network

DairySA has been working with Dairy Australia, local farmers and agronomic specialists to develop these programs for South Australia. ForageSkill\$ is focusing on farmer skill development while the SEFI & 3030 programs are focusing on taking forage production systems to the next level.

1. The ForageSkill\$ program involves small groups of farmers & coaches participating in on farm learning activities throughout the season. The program aims to help farmers develop their forage skills, leading to increased confidence in implementing these skills on farm, and ultimately to improve farm profitability. Registrations for ForageSkill\$ will open soon – so keep your eye out in June!
Contact Kirstie Murphy on 0408 088 624.

2. South East Forage Innovation is trialling a continuous forage cropping regime on commercial irrigated farms in the South East aiming to produce 40 ton of dry matter per hectare in a year. The main question posed for the local research in the South East is "can the maize crop produce enough in time & in a sustainable manner?" A local steering committee has commenced with farmer, and industry representatives. A position is still available on the committee for a farmer from other irrigation areas of South Australia.
Contact Rick Jordan 0427 447 753.

3. 3030 Regional Farm Network is the South Australian based component of the National 3030 program. The program aims to achieve a 30% improvement in home-grown forage, leading to a 30% increase in return on capital on a dry land dairy farm, hence the name 3030! Greg Mitchell will be working with a cross section of farms across the Hills & Fleurieu on this project.
Contact Greg Mitchell 0417 814 037.

The three programs will be linked through DairySA who have recently contracted Kirstie Murphy as the Focus on Forage Extension Officer. Information from 3030 and the SEFI programs will be directly provided to ForageSkill\$ participants and the wider dairying community will also have the opportunity to learn from all three projects through the media, field days, & other industry events. Contact Kirstie Murphy on 0408 088 624

The Focus on Forage program is a major DairySA initiative over the next three years. Significant dairy farmer levies are being invested over these three key projects to ensure that the primary issue of forage utilisation for South Australian dairy farmers is addressed.

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