Sludge Moisture Reduction Pilot Plant (PIP.034)

Dewatering DAF sludge to make it suitable for composting

Project Aims

- Determine whether a Rotary Drum Vacuum Filter (RDVF) will remove enough moisture from DAF sludge to enable processors to compost the material.
- Develop a process that has the potential to reduce the nutrients returning from abattoir waste to pastures.
- Produced a feasibility study for the RDVF process.

Description of project

A common problem facing abattoirs is the effective and efficient

Major Outcomes

- DAF sludges effectively dewatered
- BOD loading effectively removed from pastures
- Economic viability shown to occur only under limited conditions

management of effluent. Dissolved Air Flotation (DAF) units are commonly used as primary treatment to separate solids from within the effluent. The sludge that forms on the surface of the DAF unit is often hard to handle due to the high moisture and fat content.

The Rotary Drum Vacuum Filter (RDVF) was seen as a potential solution to the difficulties associated with DAF sludge. This project sought to assess whether the technology could reduce the moisture level to 65% - where it was considered that the material could be handled and transported in bins or trucks, rather than in tankers. In addition, the organic content (measured as BOD) would be trapped in the solid portion making it easier to remove from site and the material would be in a state suitable for composting. A trial was conducted using a leased RDVF over an eight-month period and the output assessed on the basis of moisture and BOD reduction. The RDVF was fitted to existing infrastructure to prevent interference to on-going operations.

The RDVF trial allowed the prototype unit to be assessed under production conditions and information to be obtained on the capabilities and efficiencies of the unit. The results of the trial demonstrated that the RDVF is effective in moisture reduction. Although the objective of reducing sludge moisture to 65% was not achieved, the moisture was low enough to allow transport via bins, as opposed to tankers. Trial data showed that a reduction from average moisture of approximately 93.5% to an average of 75% was achieved. Prior to the trial the DAF sludge could not be composted and transport was only possible through the use of a tanker. During the trial, bins were successfully used for transporting caked material to composting sites and allowed material to be composted that, previously, was spread over unirrigated pasture. The results from the BOD tests indicated that the unit significantly reduced the levels of organic waste that would otherwise have been irrigated directly onto pastures. Reductions in BOD potentially provide efficiencies for processors concerned about the maintenance of soil nutrient levels.

Estimated costs to implement the RDVF on a full-time basis was estimated from the trials to be \$136,800 for two complete 8m² units with sufficient capacity to handle all DAF sludge from Fletcher International's WA abattoir. The capital cost was determined to be prohibitive under the existing circumstances.

In the period since the conclusion of the RDVF trial and the unit's removal from the treatment system, the DAF sludge has been spread over the pastures adjacent to the plant. The location of the plant is such that there is sufficient area available to rotate this activity around designated paddocks.

The return-on-income may be more favourable, however, where a processor did not have sufficient land available to dispose of sludge in this way and was required to use an external treatment option for a fee.

Evaluation

A common problem facing abattoirs is the effective and efficient management.

Key points to note from this project are:

- · The RDVF successfully dewatered DAF sludge to allow handling and composting
- The trials proved that organic material (as measured as BOD) could be removed from soil spreading and irrigation
- RDVF is not an economic option unless off-site treatment costs warrant investment in this technology.

Summary

Fletcher International WA has shown that RDVF technology can solve the problems of materials handling of DAF sludges by effectively dewatering them. The resultant solids can be composted and used as a means of reducing the organic load that occurs from wastewater and sludge irrigated directly on to pasture. While the technology is effective, its implementation would only be viable when there are economic or environmental restraints on land spreading of sludges.

Any abattoir facing these constraints should consider this technology as an option. While the capital cost for infrastructure is significant it may be lower than other treatment options.

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