

## INCREASE THE CAPACITY OF FARM MANURE (SLURRY) STORES

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### *Description*

On farms where there is currently limited storage capacity, expansion of facilities for collection and storage of slurry and dirty water to allow them to be spread at times when there is a low risk of run-off and when there is an actively growing crop to utilise the nutrients supplied in the manure.

### *Rationale, Mechanism of action*

Collection and storage of slurry and dirty water provides flexibility in terms of when these materials can be applied to fields. There will be fewer occasions when a lack of storage capacity forces farmers to apply manures at times when there is a high risk of polluting ground or surface waters.

If a farm has little or no storage for slurry and dirty water, the farmer will be obliged to spread these materials as they are produced. This will inevitably result in applications at times when there is a risk of nitrate leaching and of N and P from the manure being transported to watercourses in surface run-off or in drainflow. Adequate collection and storage facilities provide greater freedom in choosing when to apply slurry to fields. There will be fewer occasions when lack of capacity forces the farmer to spread manure, particularly slurry, at unsuitable times. Applications can be restricted to periods when nutrients will be used by a growing crop and when there is little risk of surface run-off or rapid transport to field drains.

### *Applicability*

The method is applicable to livestock farms that have limited manure storage facilities. The provision of adequate storage facilities is most important on farms that handle their manure as slurry and those that produce dirty water. In contrast, solid manure can be stored in field heaps, or sometimes in the animal house, prior to land-spreading at a time of year that presents less risk of pollution. The method would be effective on all types of soil.

### *Effectiveness, including certainty*

For nitrate, Cuttle et al. [1] estimated the effectiveness of the option on an arable farm with manure (2,700 t of farmyard manure and pig slurry spread in the autumn over 300 ha). Given a baseline nitrate loss of around 50 kg N/ha for a UK medium rainfall area (600-700mm annual rainfall), they estimated that around 10-20 kg N/ha reduction per year (20-40%) could be expected, if no account is taken of additional manure N in setting fertiliser rates. If account is taken of additional manure then an expected reduction of between 15-30 kg N/ha per year (30-60%) could be possible. Additional manure N is nitrate that has been saved from leaching by moving application times.

Effects in grassland systems are typically 2-5 kg N/ha per year for dairy or 1 kg N/ha in beef systems, averaged over the farm area [1].

For total phosphorus, Cuttle et al. [1] estimated that for farms with slurry, the option could result in a reduction of 25% in the manure component of the baseline P loss [1]. The option is also estimated to result in a 20% reduction in the losses of FIOs.

*Time frame*

Effectiveness will be seen during the autumn (for P and FIOs) and winter (for nitrate) following implementation.

*Environmental side-effects / pollution swapping*

Applying manure at times when there is a lower risk of surface run-off or drainflow following application will reduce the potential for ammonium-N and BOD losses. There are likely to be some increases in ammonia and methane emissions during storage.

*Relevance, potential for targeting, administrative handling, control*

The method will only be effective if implemented in conjunction with other manure management methods, where relevant to the farming system. For example not applying manures to high-risk areas and at high-risk times.

*Costs: investment, labour*

The cost implications will vary depending on farm type. Dairy and pig farms will incur considerable costs, it was assumed that at present farms have 3 months storage, as a result an additional 3 months will be required, this will require long term investment. For slurry the amortised cost is £3.99/tonne slurry pa for 20 years [1]. Typical beef farms are straw-based, so manure will be stored in the field at no extra cost.

References

- [1] Cuttle, S., Macleod, C., Chadwick, D., Scholefield, D., Haygarth, P., Newell-Price, P., Harris, D., Shepherd, M., Chambers, B. & Humphrey, R. (2006) An Inventory of Methods to Control Diffuse Water Pollution from Agriculture (DWPA) USER MANUAL. Defra report, project ES0203, 115 pp. p. 52-53 [http://www.cost869.alterra.nl/UK\\_Manual.pdf](http://www.cost869.alterra.nl/UK_Manual.pdf)