

## DO NOT SPREAD SLURRY OR POULTRY MANURE TO FIELDS AT HIGH-RISK TIMES - UK 35

first DRAFT

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### *Description*

- Do not apply slurry or poultry manure to fields at times when there is a high risk of surface run-off; e.g. in winter when soils are saturated or frozen hard or when heavy rain is expected in the next few days.
- Do not apply slurry or poultry manure to fields at times when there is a high risk of rapid percolation to field drains; e.g. in winter and spring when soils are wet or in summer when soils are dry and cracked over drains.
- Do not apply slurry or poultry manure to fields late in the growing season (i.e. autumn/early winter) or when there is no crop to utilise the added N.

### *Rationale, mechanism of action*

Slurry and poultry manure have high contents of readily-available N. Avoiding applications of these materials at times when surface run-off or rapid preferential flow to drains is likely to occur reduces the risk of these flows transporting pollutants to watercourses. Avoiding applications in autumn or early winter helps to avoid a build-up of soil nitrate that may be leached over winter.

The method reduces the likelihood of recently applied slurry running off the soil surface and transporting N, P and faecal indicator organisms (FIOs) directly into streams and rivers or indirectly in preferential flow *via* soil cracks into field drains. It lessens the risk of similar losses from poultry manure if heavy rain were to fall after the application.

If slurry or poultry manure is spread late in the growing season, it adds mineral-N to the soil at a time when there is little N uptake by the crop and instead, adds to the nitrate available for leaching over the winter. Therefore, applications in autumn and early winter should be avoided [2]. Applications later in winter present less of a risk, as low temperatures slow the rate of conversion of ammonium to nitrate and there is less opportunity for the nitrate to be leached below the rooting zone by the time growth commences [3]. Nitrate is leached out of the root zone most rapidly on sandy soils and on shallow soils with restricted rooting depth [2].

### *Applicability*

The method is limited to those farms producing animal slurry or importing slurry (including liquid sewage sludge) and those using poultry manure. High-risk times will be most frequent in high rainfall areas and on sloping sites with impermeable soils, on shallow or sandy soils and on artificially drained soils where there are preferential loss pathways.

### *Effectiveness*

For nitrate, Cuttle et al. [1] estimated the effectiveness of the option on an arable farm with manure (2,700 t of 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 a reduction of around 25-30 kg N/ha per year (20-40%) could be expected on the area to which the option is applied. For grassland, they

estimated reductions of 2 kg N/ha per year (model dairy farm) or 1 kg N/ha per year (model beef farm) across the whole area of the farms [1].

For phosphorus, Cuttle et al. [1] estimated that the option could potentially result in a 25% reduction in the manure component of P baseline losses on sandy loam soils. On drained clay soils, moving slurry applications from autumn/winter to spring could potentially increase P losses [1].

#### *Time frame*

[The reductions in losses will be seen during the autumn and winter following implementation.

#### *Environmental side-effects / pollution swapping*

Moving slurry applications from autumn/winter to spring on drained clay soils will increase the chances of elevated P and ammonium concentrations in drain flow. There are also likely to be greater ammonia emissions from spring slurry applications to arable land and following summer applications to grassland.

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

For slurry, this method will only be applicable to those farms that have sufficient storage capacity to allow a choice of when to apply slurry. Over 15% of the farms in a recent survey had little or no storage. Even where storage is adequate for normal conditions, exceptional weather or poor planning can create a situation where stores are full during a high-risk period so that land spreading is the only option. It would generally be acceptable to apply slurry to grass later in the season than for other crops, as long as the sward continued to take up N.

#### *Costs: investment, labour*

Cuttle et al. [1] estimated a £2/ha nominal management cost of delaying spreading in 2006. Where it becomes impossible to spread on spring crops, it can be replaced by bagged fertiliser and nutrient status can be taken into account at the next opportunity to spread [4]. If there was a need for increased slurry storage in the dairy and pig systems, there would be additional costs, as a result of having to increase manure storage capacity.

#### 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. 43-44 [http://www.cost869.alterra.nl/UK\\_Manual.pdf](http://www.cost869.alterra.nl/UK_Manual.pdf)
- [2] Chambers, B.J., Lord, E.I., Nicholson, F.A. and Smith, K.A. (1999). Predicting nitrogen availability and losses following application of organic manure to arable land. *Soil Use Manage.* 15, 137-143.
- [3] Chambers, B.J., Smith K.A. & Pain, B.F. (2000). Strategies to encourage better use of nitrogen in animal manures. *Soil Use Manage.* 16, 157-161.
- [4] MAFF (2000). Fertiliser Recommendations for Agricultural and Horticultural Crops. Reference Book 209. The Stationery Office, UK.