

Description

Do not apply slurry or solid manure to field areas where there is a high risk of direct flow to watercourses. For example, directly adjacent to a watercourse, borehole or road culvert, to shallow soils over fissured rock or cracked soils over field drains, to areas with a dense network of open (surface) drains, or to wet depressions (flushes) draining to a nearby watercourse. High risk areas also include fields with high P index soils (P Index 4 and above) and manure should not be applied to these areas at any time.

Rationale, mechanism of action

These are areas where there is a particularly high risk of rapid transport of solutes or suspended material to watercourses and inputs of potential pollutants to these areas should be avoided wherever possible. Losses of P on eroded soil particles and by leaching are greatest on high P index soils. Applying manures to these areas will further increase the excessive P content of the soil and increase the amounts lost.

This method applies to areas where there is a high degree of hydrological connectivity between the field and watercourse. Avoiding applications to such areas reduces the risk of slurry contributing to overland flow or draining directly into field drains and transporting pollutants to watercourses. There is a similar risk of losses of soluble and suspended material from solid manures but these will generally only occur where heavy rain follows the application. The method is most effective against losses of P and FIOs, where the primary mechanisms of transport are by preferential flow and in surface run-off. The risks associated with high P index soils are less dependent on the degree of hydrological connectivity. Instead, withholding manure from these areas allows the high P content to decline, reducing the quantities lost as adsorbed P on eroding soil particles and by leaching from P saturated soils.

Applicability

The method is applicable to all farms applying manures and where these ground conditions occur. These will mainly be livestock farms. Wet depressions are most likely to occur in undulating landscapes over fissured rocks, which produce frequent spring lines. Some upland farms have significant areas of semi-improved grassland with a high density of open drains or gullies within the fields.

Effectiveness, including certainty

For nitrate: Cuttle et al. [1] estimated that baseline losses on the model farms with manure would be reduced by 0-1 kg N/ha per year, averaged over the farm area [1]. The effects would be greater in the affected areas, but it was assumed that these were a relatively small proportion of the farm.

For phosphorus: Cuttle et al. [1] estimated that adoption of this option could potentially result in a 40% reduction in the manure component of P baseline losses, over the area to which the method is applied [1].

Time frame

The greatest impact will be seen during the wet autumn/winter months, when hydraulic conductivity is greatest. However, there will be a reduction in losses all year

round, as a result of some of the high-risk areas being hydraulically connected during the summer months. For phosphorus, there will be additional savings in the longer term as the method will gradually reduce soil P contents, which will reduce losses of P attached to soil particles and by leaching..

Environmental side-effects / pollution swapping

The method will also reduce water pollution risks from ammonium-N and elevated levels of BOD. It is unlikely to increase any form of pollution.

Relevance, potential for targeting, administrative handling, control

Although most hydrologically well-connected areas are likely to be easily identified, some old, but still functioning, drainage networks may not be known to the farmer. Wet areas affected by spring lines are difficult to work and may already be excluded from the agricultural area. On some farms, particularly intensive dairy farms, with a history of high P use and of spreading manures on the same fields, a large proportion of the farm may be classified as having high P index soils and be excluded from receiving further applications. In these circumstances, it may be necessary to export surplus manure to other farms.

Costs: investment, labour

This is possibly a zero cost method if ground is available elsewhere on the farm, incurring only a £2/ha management charge in 2006 [1]. If there was a need for increased slurry storage in the dairy and pig systems, there would be additional costs, associated with increasing slurry storage.

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