Report from Phil Cooper of the Farm Consultancy Group

With increasing cost of fertiliser products and pressure on milk price, farmers are looking more and more at how their slurry and manure can be used on farm to reduce fertiliser costs. With developments in slurry spreading equipment enabling slurry to be either injected into the soil or placed on the top of the soil without contaminating the crop, livestock farmers are finding that they can reduce their fertiliser usage and save money.

The amount of money saved is dependent on the level of nutrients in the slurry or manure, which varies with the type of animal. Not all the nutrients in the slurry are available to the crop. Availability varies with product type, time of application and application process. Table One gives an indication of available nitrogen in different products applied with different equipment at different times.

Table One: Availability Rates of Nitrogen

Slurry Type	Total N kg/m^3	Availability Surface Spread 35%	Availability Injected 45%	Availability Band Spread 40%
Cattle	2.6	0.91	1.17	1.04
Weeping Wall	2.0	0.7	0.9	0.8
Mechanically Separated	3.0	1.05	1.35	1.2

Source: RB209
Note: Assumes spring application on all soil types in kg/m^3 applied

Based on the data in Table One, an application of 56m^3 per hectare, (5000 gallons/acre) of cattle slurry would equate to a value of £44/hectare of nitrogen, (£18/acre).

Table Two: Availability Rates of Nitrogen

Slurry Type	Total N kg/m^3	Availability Surface Spread 50%	Availability Injected 60%	Availability Band Spread 55%
Pig Slurry	3.6	1.8	2.16	1.98

Source: RB209
Note: Assumes spring application on all soil types in kg/m^3 applied

Based on the data in Table Two, an application of 56m^3 per hectare, (5000 gallons/acre) of pig slurry would equate to a value of £88/hectare of nitrogen, (£36/acre).

The level of nitrogen within slurry can alter significantly whilst in storage due to losses of ammonia to the atmosphere. Wind passing over the top of the slurry store and high temperatures during the summer months lead to atmospheric loss of ammonia. Research concluded that 13% of the total ammoniacal nitrogen is lost during storage due to wind and increases in temperature, (McGinn, Coates, Flesch and Crenna 2008).

Losses also occur when stirring the lagoon prior to spreading and when jetting to break up crusts that form on the top of lagoons and tanks. Allowing a natural crust to form can reduce losses during storage, but a natural crust can be costly in terms of time and energy to break up.

So what is the answer? Using a cover that floats on the surface of the lagoon will help reduce ammonia losses. This works in two ways. Firstly it creates a physical barrier that prevents wind and sunlight coming into direct contact with the slurry. Secondly it creates an aerobic layer of bacteria within the cover that oxidise odours as they pass through the cover reducing the smell released from lagoons and tanks

We have been looking at a new product which has been designed to cover slurry storage lagoons and tanks and digestate stores. BioCrust™ is an expanded clay product that can be spread over any shape lagoon, at a thickness of 75mm, and will reduce ammonia losses and prevent a natural crust forming. The product floats on the surface and the layer rises and falls with the depth of the slurry, maintaining a permanent cover when stirring and emptying. BioCrust™ protects the slurry from wind and direct sun, which cause ammonia losses, and creates an aerobic barrier to reduce odour release. Research has shown that this type of covering will reduce odour release by 90% and ammonia losses by 65 to 95%, (MAFF 2000; Nicolai, et al, 2004).

Biocrust™ is inoculated with bacteria which reduce ammonia losses further by converting it into nitrates. Recent farm trials on a dairy farm showed no loss of Ammonium Nitrate from a tank covered with BioCrust™ over a three month period.

A reduction in losses to the environment of ammonia not only helps the business to comply with NVZ and IPPC regulations and cross compliance, it will also increase the value of the slurry spread.

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