

Get slurry on target for optimum benefit

At current fertiliser prices, the nutrients contained in 1,000 gallons of cattle slurry (at 6% DM) have a value of €35. Over an average winter, 100 dairy cows will produce slurry worth about €4,500

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Before spreading slurry ask yourself a question. Would you apply chemical NPK fertiliser in that location if the slurry wasn't available? If not, then why are you spreading slurry there and not somewhere it may be more badly needed?

As chemical fertiliser allowances continue to be reduced due to environmental regulation it becomes ever more important to optimise your use of slurry. There is now little scope to compensate for poor slurry utilisation by later applying additional chemical fertiliser.

In the future, poor slurry management on farm may result in a reduced capacity to produce grass, leading to a need to cut stocking rate or import additional feed.

Variability in your slurry is a challenge when trying to use it efficiently as a fertiliser on your farm. The nutrient content will be affected by factors such as animal type, diet, housing/storage system, and the ad-

dition of water.

Dry matter content is a useful indicator of the quality of slurry, and can be measured on farm by using a slurry hydrometer and comparing the results with associated tables. An advantage of this system is the ability to quickly carry out tests on farm throughout the spreading season. For even more accurate results, laboratory analysis can be carried out at a relatively low cost.

Utmost care is needed when taking a slurry sample. Often the simplest and safest method is to suck up a load of slurry with the vacuum tanker after agitation and then take the sample from the tanker filling point.

Regardless of the method used, it is essential that the sample is representative. So fully agitate the slurry tank before sampling.

Table 1 outlines the available nutrient content of cattle slurry applied by LESS in spring-time based on dry matter content.

Once you have established the nutrient content



Knowledge grows

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of the slurry is established, you must assess where it will be of most benefit. 60% of the nutrient value of cattle slurry is from its potassium (K) content, while a further 22% is from phosphorus (P).

Therefore, slurry should be targeted at areas of the farm where phosphorus and potassium levels are low or deficient. Consult your soil sample results and nutrient management plans to pinpoint the areas of the farm with low P and K indices.

The level of nutrient offtake from different areas of the farm also needs to be considered as these offtakes must be replaced to maintain the nutrient status. There is a large difference in the nutrient offtake from areas which are grazed or cut for silage.

The production of one tonne of Grass DM requires 4 kg of phosphorus and 30 kg potassium. When consumed by a grazing cow 40% of this phosphorus and 10% of the potassium is retained by the animal. The remaining nutrients are returned to the soil in urine and faeces.

Therefore, the total offtake of nutrients due to the consumption of one tonne of Grass DM by the cow is 1.6 kg Phosphorus and 3 kg Potassium. For a farm utilising 12 tonne of Grass DM per hectare 20 kg P/ha (16

units/acre) and 36 kg K/ha (29 units/acre) will be required to offset what is retained by the grazing cow.

Returning large quantities of slurry to the grazing platform is likely to substantially over supply potassium to that area. In contrast, when grass is harvested as silage, all of the phosphorus (4 kg) and potassium (30 kg) is removed from the field.

Harvesting 12 tonnes of grass per hectare for silage will remove 48 kg P/ha (38 units/acre) and 360 kg K/ha (290 units/acre). For this reason it makes sense to return a large proportion of the slurry produced on farm to areas cut for silage.

An application of 3,000 gallons/acre of good quality cattle slurry will fulfil the P and K requirements for a 1st cut silage crop, requiring only nitrogen and sulphur as chemical fertiliser.

Red clover silage swards are also an excellent area to apply cattle slurry as they have a very low requirement for nitrogen, but substantial P and K requirement similar to grass-only silage swards.

Table 2 outlines the results of a recent on-farm study of slurry nutrient content carried out by William Burchill, UCC, in conjunction with Dairygold and Teagasc.

It is clear that the nutrient content of slurry from uncovered storage facilities is lower due to the volume of additional water collected. On many farms there are a number of different storage systems used. Where this is the case it is sensible to use the slurry from covered storage facilities on silage ground as this slurry has the highest nutrient density.

More dilute slurries and dairy



washings can be applied to the grazing area as there is a much lower nutrient requirement on these areas, particularly for potassium.

Transporting and spreading slurry is costly. Where slurry must be transported substantial distances to out blocks and silage ground it makes sense to use the most nutrient-dense slurries available.

Spring slurry applications result in higher recovery rates of the nitrogen as ammonia losses will be lower in the cooler, damper conditions. The use of LESS equipment such as dribble bars and trailing shoes will also help to maximise N recovery.

However, take care to ensure the risk of nutrient runoff are minimised by avoiding applications to very wet soils and before heavy rainfall, and by observing required

Table 1. Available N, P & K values of Cattle at different Dry Matter (DM)% in springtime by LESS application techniques

Dry matter %	N kg/m ³ (units/1,000 gals)	P kg/m ³ (units/1,000 gals)	K kg/m ³ (units/1,000 gals)
2	0.4 (4)	0.21 (2)	1.4 (13)
4	0.7 (6)	0.35 (3)	2.1 (21)
6	1.0 (9)	0.5 (5)	3.5 (32)
7	1.1 (10)	0.6 (6)	4.0 (36)

Note – On index 1 & 2 soils reduce slurry P availability by 50% & reduce K availability by 10%



More dilute slurries and dairy washing can be applied to the grazing area as there is a much lower nutrient requirement on these areas, especially for potassium.

Table 2: Outline of the results of a recent on-farm study of slurry nutrient content carried out by William Burchill, UCC, in conjunction with Dairygold and Teagasc.

		LESS spring	Splash-plate Spring	Phospho- rus	Potas- sium	
	Slurry Dry Matter %	Units N/1000 gals	Units N/1000 gals	Units P/1000 gals	Units K/1000 gals	No. samples taken
Standard Teagasc values	6.3	9	6	5	32	
Teagasc/ Dairygold JP	6.7	11	8	5	27	128
Covered tanks	7.3	12	9	6	29	53
Open towers	6.5	9	7	5	25	9
Open tanks	5.5	8	6	4	23	15
Lagoons	4.3	7	5	3	17	4



Where slurry must be transported substantial distances to out blocks and silage ground it makes sense to use the most nutrient-dense slurries available.

buffer zones.

Nitrogen requirements are relatively low in early spring due to low grass growth rates and this should be considered when applying slurry. Even where phosphorus and potassium requirements are high, applications should be limited to 2,500 gallons per acre early in the season to avoid excessive N application and

consequent risk of leaching.

Two light applications of slurry to an area during the year can effectively supply the same amount of phosphorus and potassium as one heavy application, but will likely result in a higher utilisation of the available nitrogen.

An area often overlooked for maximising the utilisation of nutrients contained in slurry is the availability of sufficient slurry storage capacity.

Adequate storage allows for slurry to be applied at times and to areas where it will be of most benefit.

Where storage capacity is insufficient, farmers are often forced to spread in less than ideal conditions, or to fields which do not really require the nutrients.

While the construction of slurry storage is a substantial financial cost, it is a long term investment.

The financial benefits of better nutrient management and accelerated capital allowances on storage facilities, coupled with the reduced stress of monitoring remaining storage capacity make slurry storage a very sensible investment.

Available Nutrient Content & Guide Value (€) of Organic Fertilisers 2023

Organic Fertiliser Type	N kg/m ³ (units/1,000 gal) ⁵	P kg/m ³ (units/1,000 gal) ^{5, 6}	K kg/m ³ (units/1,000 gal) ⁶	Value €/m ³ Or (€/1,000 gal) ^{3, 4}
Liquid Manures				
Cattle (6% DM)	1.0 (9)	0.5 (5)	3.5 (32)	7.7 (35)
Pig (4% DM) ²	2.1 (19)	0.8 (7)	2.2 (20)	8.5 (39)
Soiled Water	0.48 (4)	0.08 (0.7)	0.6 (5)	1.7 (7.7)
Solid Manures				
	N kg/t ¹ (units/t)	P kg/t (units/t)	K kg/t (units/t)	Value €/ton
Dungstead Manure	1.4 (3)	0.9 (2)	4.2 (8)	10.5
Farmyard Manure	1.35 (3)	1.2 (2)	6.0 (12)	14
Poultry³				
Broiler / deep litter	14 (28)	6.0 (12)	18.0 (36)	64
Layers (30% DM)	6.85 (14)	2.9 (6)	6.0 (12)	27
Layers (55% DM)	11.5 (23)	5.5 (11)	12.0 (24)	50
Turkeys	14 (28)	13.8 (28)	12.0 (24)	82
Spent Mushroom Compost	1.6 (3)	1.5 (3)	8.0 (16)	18

¹ The value of N in Cattle slurry is 9 units/1,000 gallon (Based on total N of 2.4kgN/m³ @ 40% N availability by LESS application). Conversion - kg by 2 = units
Spring application of organic manures is required to maximize N recovery. Manures should be tested to determine manure nutrient content.

² Incorporation of high N manures within 2 to 6hrs after application assume 50% N availability

³ Value of N = €1.38/kg, P = €3.40/kg, K = €1.32/kg for 2023 (Nutrient values based on price / volume of range of fertiliser products).

⁴ Cost of spreading & transport not included. ⁵Reduce P availability to 50% on P index 1 & 2 soils.

⁶ Values under units/1,000gals or per ton have been rounded to closest unit.

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