

604.01 THE NUTRIENT CONTENT OF SLURRY AND MANURE

The nutrient content of manures and slurry is highly variable - depending on their dry matter, how they are stored and how the animals were fed.

To make sensible and accurate decisions on applying manure and slurry, and on subsequent fertiliser application, it is important to estimate their nutrient content.

Standard values – the values in Table 1 are useful for general planning and are an excellent starting point.

Lab analysis – collecting a sample and sending in for analysis provides a more accurate assessment. It is crucial to collect a truly representative sample of the material (ensure the slurry store is well stirred and multiple samples are collected and bulked together).

On farm testing – equipment is available to give an instant assessment of slurry N – and a slurry hydrometer can be used to assess dry matter and P and K contents.

Table 1 – Standard Content Values

SOLID MANURE							
		Total Nutrients (Kg/tonne)			Available Nutrients (% of total nutrients)		
	Dry matter%	Nitrogen (N)	Phosphate (P ₂ O ₅)	Potash (K ₂ O)	Nitrogen (N)	Phosphate (P ₂ O ₅)	Potash (K ₂ O)
Cattle	25	6.0	3.5	8.0	See Table 2	60	90
Sheep	25	6.0	2.0	3.0		60	90
SLURRIES (Kg/m ³)							
Dairy	2%	1.5	0.6	2.0	See Table 2	50	90
	6%	3.0	1.2	3.5		50	90
	10%	4.0	2.0	5.0		50	90
Beef	2%	1.0	0.6	1.5		50	90
	6%	2.3	1.2	2.7		50	90
	10%	3.5	2.0	3.8		50	90
Dirty water	Less than 1	0.3	trace	0.3		50	100

Dry Matter

The thicker the slurry the more nutrients it contains – so make a good assessment of the material to be spread and ensure the store to be sampled is well mixed.

Rule of thumb definitions include:

thick porridge - Slurry straight from the cow, mixed with urine at around 10%.

thick soup - Slurry mixed with parlour washings and some rainwater; about 6% and at the upper limit for pumping.

thin soup - Slurry in a store receiving rainwater from yards and roofs; as low as 2% and easily pumped.

'dirty water' is water that has been contaminated with manure, urine, effluent, milk or cleaning materials – water from a separator or weeping wall will have a far higher nutrient concentration.

Nutrient Availability

Not all the nutrients in slurry/manure are available to the plant due to losses from leaching, run off or to the atmosphere. These losses depend on manure type, dry matter, application time and soil type. Availability of P and K varies little – but nitrogen availability changes greatly.

Table 2 – Percentage of total nitrogen available to the next crop following surface application

Timing Soil Type		Autumn		Winter		Spring	Summer
		Sandy/ shallow	Medium/ heavy	Sandy/ shallow	Medium/ heavy	All soils	All soils
Fresh FYM	25% DM	5	10	10	15	20	No data
Old FYM	25% DM	5	10	10	10	15	No data
Cattle slurry	2% DM	5	20	25	40	50	35
	6% DM	5	15	20	30	35	20
	10% DM	5	10	10	15	20	10
Dirty Water	<1% DM	0	40	10	60	80	50

Nutrient demand – nutrient applications should only supply what the crop needs and what is required to maintain stable P and K indexes at 2.

Table 3 – Crop demand (kg/ha)

Soil Index	Nitrogen	Phosphate (P) Index			Potash Index (K)		
		1	2	3	1	2	3
Silage 1 st cut	120	65	40	20	110	70	30
Silage 2 nd Cut	100	25	25	0	100	75	40
Grazing	**	40	20	0	30	0	0
Maize	40	85	60	20	205	170	110

* assumes a moderate Soil Nitrogen Supply

** will vary depending on stocking rate and level of production.

Conversions 1kg/ha = 0.8 units per acre 1m³/ha=90gallons/acre

Maximising Nutrient Uptake and Cut Wastage

- 1) Avoid high risk times. Applying in late autumn and early winter often means high rainfall – resulting in nutrient leaching and runoff and soil temperatures are lower, reducing plant uptake. Surface applications in summer are prone to high losses as ammonia gas – especially from high dry matter material.
- 2) Avoid high risk areas (especially during high risk times!). Applications on steep slopes, waterlogged ground and frozen ground should be avoided.
- 3) Avoid heavy applications. Applying more than 35m³/ha (3150 gallons/acre) in one application is likely to 'overload' the system, increasing the chances of losses – as well as damaging the sward and killing worms.
- 4) Apply only what the crop needs, check soil indexes and account for nutrients in slurry.
- 5) Check that spreaders (including contractor's) are calibrated correctly and spread accurately.
- 6) Produce a clear manure management plan – and discuss it with your contractor.

FURTHER INFORMATION:

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Other Factsheets:

IGER GDC Factsheet 603.01 - Why use a slurry injector?