

Grass silage has a large nutrient demand and adequate N, P & K is essential for maximising grass yield and producing sufficient winter feed.

Soil pH - Maintain soil pH at 6.3 to 6.5 for optimum grass production. Leave a minimum of 3 months between lime applications and closing for grass silage. Maintaining an optimum soil pH through regular lime application will help to maximise the availability of N, P and K in the soil.

Nitrogen (N) is the key driver of yield but too much or too little N will have a large impact on grass dry matter production and final silage quality. Grass swards with high levels of perennial rye grass will use N more efficiently than older swards. Recently reseeded swards (0-3 years) will have 25% higher N demand, especially when reseeded after a tillage rotation. A crop of grass silage (5t/ha of DM) will require 125 kg N/ha (100 units/acre). A crop of grass silage will take up on average 2.5kg/ha/day of N (2units/day), therefore apply N at least 50 days before cutting to ensure full N utilisation.

Phosphorus (P) and **Potassium (K)** are essential to maximise grass yields therefore adequate supply of these nutrients in the soil is critical. Assess the most recent (3 to 5 years) soil test reports to determine the P and K requirements (in organic manure and fertiliser) for silage fields. A crop of grass silage will remove approximately 4kg P and 25kg K /tonne of grass DM. Organic manures are an effective source of N, P & K and can provide a large proportion of crop P and K requirements at relatively low cost. Table 1 shows the available N, P & K content for a range of organic manures.

Table 1:-Available N, P K values for a range of organic manures (units/1,000 gallons)			
Manure type	N	P	K
Cattle slurry (7% DM)	6	5	30
Dilute Cattle Slurry (3.5% DM)	5	3	15
Pig slurry	19	7	20
units/tonne			
FYM	3	2.4	12
SMC	3	3	16
<i>Cattle slurry 8% DM, Pig Slurry 4% DM</i>			

Cattle slurry is the most common manure applied to silage fields and can vary in nutrient content depending on its dry matter (DM) content. Diluting cattle slurry with water is beneficial for ease of agitation and can help to improve the N availability in the slurry, however it will also dilute the P and K content of the slurry (i.e. a larger quantity of diluted slurry will be needed to supply the same levels of P and K as undiluted slurry). Table 1 shows the N, P & K values for a normal and dilute cattle slurries at different DM %. It is important to take account of slurry DM content to reduce the risk of under fertilising silage crops. The slurry hydrometer is a tool that can be used to assess the DM% of slurry helping you to predict the nutrient content more accurately.

For example 3,000 gallons of good quality cattle slurry (7% DM) will supply sufficient P and K levels to grow a crop of grass silage. Table 2 shows the recommended rates of N, P & K at different soil P & K indexes (1 to 4) required for 5t/ha grass dry matter (10 tonnes fresh grass / acre).

Table 2:- 1st Cut Grass Silage N, P & K Requirements (5t/ha DM) & Suggested Fertiliser Programmes					
Soil Index	N kg/ha (units/ac)	P kg/ha (units/ac)	K kg/ha (units/ac)	Fertiliser Options³	
				No Slurry	Cattle Slurry 3,000gal/ac
1¹	125 (100)	40 (32)	175 (140)	3.5 bags/ac 0-7-30 4 bags/ac CAN	3.5 bags/ac 24-2.5-10
2¹	125 (100)	30 (24)	155 (120)	3 bags/ac 0-7-30 4 bags/ac CAN	3 bags/ac 27-2.5-5.0
3	125 (100)	20 (16)	125 (100)	5 bags/ac 15-3-20 1 bags/ac CAN	3 bags/ac CAN
4²	125 (100)	0	0	4 bags/ac CAN	4 bags/ac CAN
<p>¹Index 1 & 2 soils apply P & K balance advice to build soil P & K levels to after grass for example as 24-2.5-10 / 0-7-30</p> <p>²Index 4 soils omit P for 2/3 yrs. & retest, Index 4 K omit for 1yr and revert to index 3 advice thereafter until next soil test.</p> <p>³Urea can replace CAN as main N source. Light rain(up to 10 mm) before or after application will reduce N losses from urea</p>					

Timing of N, P & K application

Apply crop N, P & K requirements when closing silage fields in late March / early apply April. Where cattle slurry is applied, delay the top-up fertiliser applications for 1 week. In wetter soil conditions fertiliser N can be split 50:50 for example 50% in late March / early April and the remainder 2 weeks later to reduce the risk of N losses.

Building Soil P & K in silage fields

Apply additional P and K (soil build-up rates) to index 1 and 2 soils after 1st cut silage to or in late summer. For example 16% P or 50% K or 0-7-30 are very suitable fertilisers for building soil P and K's levels to the target index 3 level over a number of years

Don't Forget Sulphur (S)

Sulphur deficiency is most lightly on light sandy / free draining soils with low soil organic matter. Grass silage crops have a requirement of 20kg S/ha per cut. The application of S to soils where it is required will improve grass DM yields and quality as it helps to maintain an optimum N:S ratio and N to be used more efficiency. Apply S with main N split as N +S (e.g. CAN +S / Urea +S)

N, P & K requirements for 2nd or subsequent cuts of Grass silage

Table 3:- 2nd & Subsequent Cuts Grass Silage N, P & K Requirements			
Soil Index	N kg/ha (units/ac)	P kg/ha (units/ac)*	K kg/ha (units/ac)
1	100 (80)	30 (24)	70 (56)
2	100 (80)	20 (16)	50 (40)
3	100 (80)	10 (8)	35 (28)
4	100 (80)	0	0
<p>*Where P and K build has been already applied to the previous crop of grass silage therefore apply P and K offtake based on yields for 2nd cut silage crops as shown for Index 3 advice.</p>			