



SILAGE DECISIONS FACTSHEET



PHOSPHATE AND POTASH

Adequate levels of phosphorus (P) and potassium (K) are essential in productive grass swards. In fertilisers, P and K are normally expressed as phosphate (P_2O_5) and potash (K_2O), respectively.

P is primarily associated with energy transfer within plants and root development and K plays an important role in water regulation within plants. P and K needed by crops can be supplied by reserves in the soil, bagged fertilisers and livestock manures.

P and K soil status is best monitored via soil analysis. Soil sampling in grassland should be to a depth of 7.5 cm (3in), every 3-4 years. Multiple cores should be taken, and mixed together to ensure a representative sample. Analysis results should be used alongside crop requirements to generate P and K recommendations.

- P and K indexes of 2 are targeted
- Clover is particularly sensitive to soil P and K levels
- High K indices (above 3) can lead to luxury uptake and mineral lockups
- Sandy soils have few reserves of potash
- Clay soils can supply significant potash

Farm yard manure and livestock slurry contains large amounts of total and available (bagged fertiliser equivalent) phosphate and potash.

Typical Phosphate and Potash content of FYM and Slurry

Manure Type	Dry Matter	Total Nutrients		Available Nutrients	
		P	K	P	K
Solid Manures	%	kg/t		kg/t	
Cattle FYM	25	3.5	8	2.1	7.2
Pig FYM	25	7	5	4.2	4.5
Slurries/Liquids		kg/m ³		kg/m ³	
Dairy Slurry	6	1.2	3.5	0.6	3.15
Beef Slurry	6	1.2	2.7	0.6	2.4

Source: *Managing Livestock Manures booklet 2*

Soil levels of P and K depend on the balance of nutrient taken away via grazing or conservation and those applied via manures or fertiliser. As a consequence, grazed pastures have low requirements for P and K where as silage crops have high requirements, particularly for P.

Grazed Grass - Phosphate and Potash Requirements

	P & K soil indices			
	0	1	2	Above 2
	nutrient required (kg/ha)			
Phosphate (P)	60	40	20	0
Potash (K)	60	30	0	0

Source: *RB209 Fertiliser Recommendations for Agricultural and Horticultural Crops*

Grass Silage – Phosphate and Potash Requirements

	P & K soil indices				
	0	1	2	3	4
	nutrient required (kg/ha)				
First Cut					
Phosphate	90	65	40	20	0
Potash					
autumn	60	30	0	0	
spring	80	80	60 - 80	30	
Second Cut					
Phosphate	25	25	25	20	0
Potash	120	100	60 - 90	40	0
Third Cut					
Phosphate	15	15	15	0	0
Potash	80	80	40 - 80	20	0

Source: RB209 Fertiliser Recommendations for Agricultural and Horticultural Crops

Spring applications of P are generally preferred as is one application per year. P applications may be more targeted if soils have low P indices and, as requirements are higher, they are best matched to crop offtake. No more than 80-90 kg/ha should be applied to first cut to avoid luxury uptake with the balance applied the previous autumn.

Manure or slurry can be used to supply the total P and K requirement of a silage crop. However, be aware that over application and subsequent “luxury uptake” of potash can lead to reduced uptake of magnesium and low blood magnesium levels. The symptoms of this (hypomagnesaemia) can lead to over excitability, muscular spasms, convulsions and death (grass staggers) in livestock.

At soil indices P = 2 and K = 2, there are sufficient amounts of these nutrients in the soil for first cut silage and the recommended applications of phosphate and potash are for maintenance to maintain soil indices at 2.

Further information Fertiliser Recommendations (RB209), published by DEFRA and available free online:

www.defra.gov.uk/farm/environment/land-manage/nutrient/fert/rb209/intro.pdf

PLANET – Electronic Version of RB209 – www.planet4farmers.co.uk

Managing Livestock Manures booklet 2: Making better use of livestock manures on grassland, available free from ADAS (01623 844331) or online at www.defra.gov.uk

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