



SILAGE DECISIONS FACTSHEET



NITROGEN

Nitrogen (N) is important for leaf growth, yield and protein levels in grass. In this respect, it has a larger impact on silage production than any other nutrient. But excess nitrogen applications can lead to depressions in dry matter content and high levels of herbage nitrate, posing a risk of poisoning stock and to poor silage fermentation.

N fertilisers

Ammonium nitrate, containing 33.5 – 34.5% N, is the commonest form of N fertiliser product. Because they can be hazardous, there are regulations concerning the storage and transport of ammonium nitrate fertilisers. Others include ammonium sulphate (21%, 60% S₀₃), calcium ammonium nitrate (26 –28% N) and urea (46% N). Special measures are needed when using urea to prevent losses of N as ammonia to the atmosphere, but it is often used in spring due to its small yield advantage. You can calculate the amount of any fertiliser product needed for the recommended rate of N for a crop from:

Amount of fertiliser Product required (kg/ha)	=	$\frac{\text{Recommended rate of N (kg/ha)}}{\% \text{ N concentration in product}}$	X 100
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N fertiliser recommendations

As a guide, the maximum usage of N for grass silage is 2.5 kg/day of active growth. So with 50 days between fertiliser application and cutting the maximum is 50 X 2.5 = 125kg/ha N. An extra 5–10 days without N should be added to the cutting date to allow for poor growth days or excessive uptake of N.

More accurate N recommendations needed to achieve the optimum economic yield of grass silage can be obtained from Fertiliser Recommendations (RB209) (see below). These recommendations depend upon the Soil Nitrogen Supply (SNS) status.

Soil Nitrogen Supply (SNS) Status

SNS = Soil mineral nitrogen + estimate of total N in the crop + estimate of N released into the soil through mineralisation of organic N.

It is difficult and expensive to measure this by sampling and analysis there is a much simpler field assessment method. This gives a high, moderate or low SNS based on previous management as outlined below:

- **HIGH.** Long term high input grassland with previous N input of over 250kg/ha N not on sandy soils.
- **MODERATE.** First year ley after 2 or more years arable (potatoes, rape, peas or beans) or long term, moderate input grassland with previous N input of 100 – 250 kg/ha N.
- **LOW.** First year ley after 2 or more years arable (cereals, sugar beet, linseed) or any crop on sandy soil. Or long term low input grassland with previous N input up to 100 kg/ha N.

Based on soil SNS, N fertiliser recommendations for first cut grass silage are given below.

N fertiliser recommendations for first cut grass silage.

	Soil Nitrogen Supply (SNS) Status		
	Low	Moderate	High
	kg/ha N		
68-70D silage	150	120	120
64-67D silage	110	100	100

It is recommended that 40kg/ha is applied in February – early March and the rest in late March - early April but at least 6 weeks before cutting. February is also a good time to apply slurry to make best use of its N content.

Nitrogen supplied by manure and slurry

When applying manure or slurry it is important to take the available N into account within the total crop requirement. (See the Applying Manure factsheet)

Dangers of excessive nitrogen application

Excessive nitrogen will increase nitrate and reduce sugar levels in the crop and may negatively impact on silage fermentation and subsequently intake. Fermentation is badly affected at nitrate levels above 0.25%. Below 0.1% is ideal. Ammonia Nitrogen as a % of Total Nitrogen and pH are used as indicators of silage fermentation and intake. Silage with high ammonia levels (10-15%) will reduce silage intakes by 5%. Ammonia levels above 20% will reduce silage intakes by 10% or more.

Further information: Fertiliser Recommendations (RB209) - Published by DEFRA - available free online at:

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

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

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