

ORGANIC MANURE USE ON GRASSLAND

Slurries and solid manures are valuable fertilisers but may also be potential sources of pollution. With increasing economic and environmental pressures on farm businesses, it makes sense to exploit the fertiliser value of manures while taking action to prevent pollution. With opportunities to apply slurries to grassland on several occasions during the growing season, this could provide up to 20% of the N; 100% of the P; and 80% of the K fertiliser required by grassland used for hay or silage production.

When should I apply organic manures?

- To make the best use of N in organic manures, they should be applied as close as possible to the time when the crop is actively growing, and N demand is greatest – generally during late winter / early spring period.
- N value of manures will usually be considerably reduced if applied in the autumn or early winter because more N will be lost, mostly by leaching. This is particularly true for manures with a high readily available N content (slurries or poultry manures).
- Applications in March are best for efficient use of slurry and poultry manure in late winter and early spring on well drained grassland and before spring sown forage crops.
- FYM can be applied at any time, subject to soil conditions and crop growth.
- The slight risk of scorch / smothering the sward or adverse affect on silage quality following manure applications in late March can be minimised by controlling the application rate.

Why control application rates?

Smothering / scorch and poor silage quality

- Slurry DM loading is critical for surface applications. If more than 4t/ha of slurry DM are applied some reduction in grass DM yield can be expected.
- Application rates should not exceed 65m³/ha for typical cattle slurry with 5-6% DM content.

Surface run off

- Slurry applications should not generally exceed 50m³/ha to minimise the risk of nutrient losses via surface runoff.
- Runoff risk is closely linked with slurry DM loading and with high rainfall.

Crop nutrient requirements

- Target application rates should always relate to the nutrient requirement of the next crop while avoiding significant excesses of nutrients particularly of N or K.

Growing grass for silage production

- Forage crops provide an opportunity to apply manures prior to drilling in late spring, but they must not be regarded as a convenient “dumping

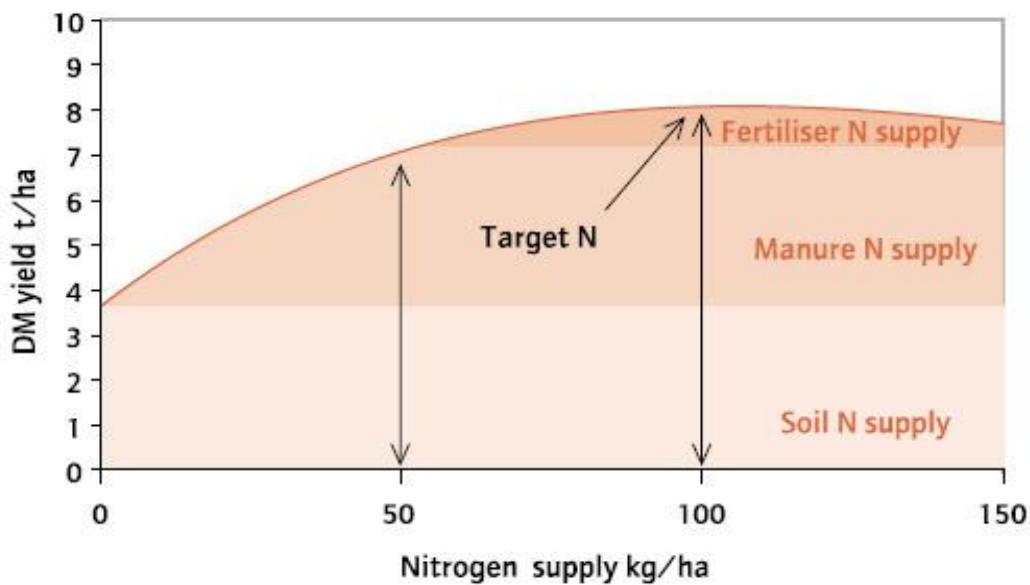
- ground” for large amounts of slurry and FYM.
- Maize can apparently tolerate heavy applications of manures without adverse effects on the crop, nutrient losses via surface runoff and leaching are likely to occur.
- For forages – manures should be applied with the aim of balancing nutrient supply and demand, should be incorporated into the soil as soon as possible after spreading preferably within 6 hours for slurries and 24 hours for solid manures to minimise ammonia losses.
- Nutrient imbalance in herbage – large or repeated manure applications can result in the build up of K in the soil, which can reduce Mg uptake by the herbage increasing the risk of grass staggers. Slurry applications to grazing land in late winter / early spring are best avoided. If soil or herbage analysis indicates potash is required for grazed swards this is best applied either as fertiliser or slurry during mid season.

Growing grass for grazing

- Using manures on grazing land can lead to significant problems. Avoid doing this where possible.
- Diseases – main risk from spreading fresh unstored slurry. Risks are reduced by storage, using low application rates and leaving the pasture for as long as possible before grazing.
- Aerobic composting of solid manures by turning manure heaps or forced aeration will significantly reduce the risk of disease transmission.
- Store slurries and FYM for at least 1 month before spreading.
- Pasture should not be grazed for 1 month (preferably 8 weeks) or until all visible signs or slurry solids have gone to minimise disease transfer.
- Reduced herbage intake may affect yield and composition of milk.

Planning the use of manures and fertilisers

- N is the first consideration in the fertiliser plan.
- Phosphate and potash are easier to manage, particularly when soil P and K status is at index 2/3 as these nutrients are used for maintenance of soil reserves.
- When fertiliser and manure nutrients are used together they are largely additive in terms of crop responses and their effect on soil nutrient status.
- A typical response curve for first cut silage DM yield shows that a significant proportion of the yield is obtained from soil N reserves.
- Grass continues to respond to extra N up to the optimum of about 100kg/ha N.
- Variation in the manure N supply will have little effect on the resulting yield at the target level of 100kg/ha crop available N.



Graph: Supplying first cut silage N requirement from fertiliser and manure

- Where the response curve is almost level, N will have little effect on yield.
- To minimise the impact of variable manure N supply you should aim to supply no more than 50-60% of the crop N requirements from manures. This is better than using only mineral fertiliser because it will give significant financial savings and impose no risk of incurring any yield deficit.
- Only maintenance applications are needed for phosphate at soil P index 2 and for potash at soil K index 2. Grass yield response to applied P and K will generally occur only at indices 0 and 1.



British
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Nutrient Wise Demos Project

In conjunction with the SWARM Hub, the British Grassland Society is running the Nutrient Wise Demos project. The project aims to fill gaps in knowledge in an easy to understand and visible way to give more profit to farmers and reduce nutrient waste. The project will be setting up demonstration sites across the south west on farm and holding events to show farmers the benefits of good slurry management and application.

Visit www.swarmhub.co.uk for more information, or to find out more about these issues.

Adapted from "Making better use of livestock manures on grassland" booklet, developed by ADAS, IGER, and Silsoe Research Institute, and funded by DEFRA. Updated 2007.

