

MANAGING MANURES ON ORGANIC FARMS

Livestock manures are a valuable source of nutrients in many organic rotations. Making best use of these nutrients contributes towards economic sustainability, and minimises pollution of the wider environment.

Nitrogen Availability

- Analysis of manure for the total nutrient content does not necessarily indicate the amounts of nutrients that may be available during the subsequent growing season.
- In organic systems, a better understanding of manure N availability will help develop an environmentally sound and sustainable system.
- Total N content reflects 2 N pools within the manure, the readily available (primarily ammonium N) and the slowly available (organic N) relying on breakdown and recycling by soil biological activity.
- Readily available nitrogen allows a rapid crop response, whereas the organically bound N is a “slow release” form.
- The availability to the growing crop will also be affected by losses via ammonia volatilisation and nitrate leaching.
- Good manure management can increase the potential for N supply from applied manures.

Phosphate and Potash

- Short term availability of P and K from animal manures is greater than from rock sources, as a result over a rotation all of the P and K should become available from the manures.

- On soils with a high reserve of P, the phosphorus from manures should not exceed that removed by crops to reduce the risk of P loss to the environment.

Sulphur and Magnesium

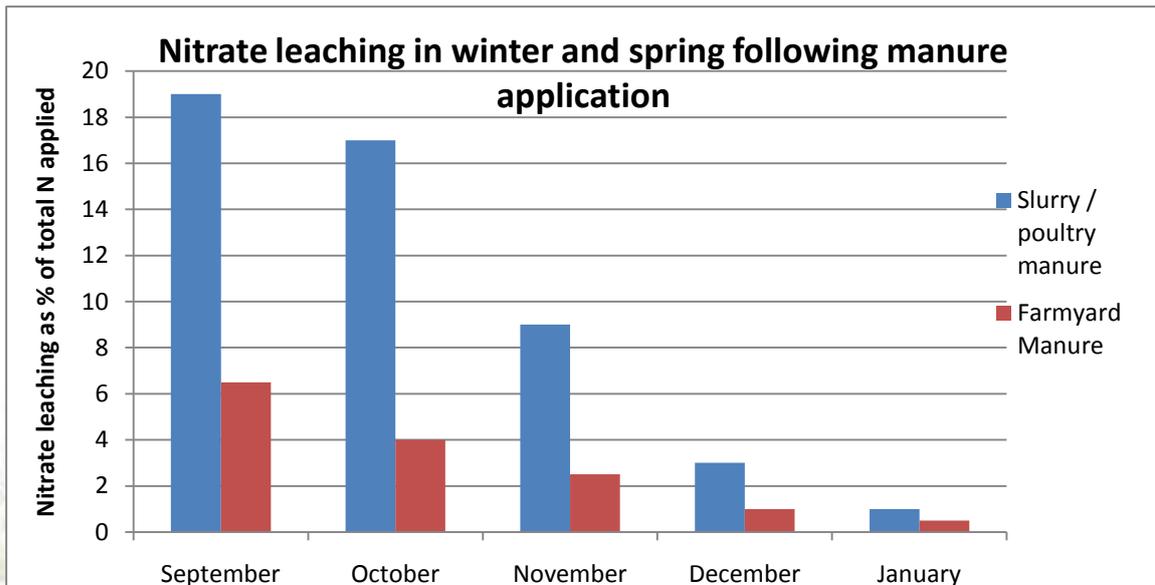
- Manure also provides a useful source of S and Mg which may be deficient in some soils.
- 50% S availability is possible during the grazing season with the remaining organically bound S becoming slowly available as the manure is mineralised.
- Mg inputs from manures will provide maintenance of soil reserves.

Using manures on organic grassland

- Cutting grass for hay or silage can remove large amounts of P and K
- Replace them by applying solid manures in autumn / winter or slurries in spring.
- Most of the nutrients from grass consumed by grazing are excreted back onto the soil so the net removal is small.
- Large applications of N will reduce the clover content of grass / clover soils

Using manures on organic arable crops

- Arable crops will benefit from manure applications



- Solid manures can be applied before cultivating the soil, either in autumn before winter cereals or in the spring before spring cereals or potatoes / sugar beet.
- Rapid incorporation after application decreases losses of N as ammonia.
- Slurry and poultry manure applications will ensure best use of the N if they are made in spring before spring crops.
- Reduces odour and ammonia emissions during land spreading
- Concentrates plant nutrients enabling application rates to be lower and the risk of crop smothering to be reduced.

The degree of composting will impact on nutrient and water losses during storage and the composition of the end product.

The potential benefits of composting maybe lost and harmful environmental impacts caused by poor practice.

Solid manure composting

Composting is actively encouraged on organic farms because it:

- Reduces substrate mass
- Improves friability and handling characteristics
- Destroys weed seeds and potentially harmful pathogens by generating high temperatures during the process
- Provides photo sanitary effects on incorporation into the soil.
- Incorporates inorganic N into the organic fraction this protecting from immediate loss after application.

Nutrient Planning

Planning at the farm level

- Estimate the nutrients in manures produced on farm (and in any imported manures) or permitted fertilisers.
- Use standard figures, animal types and numbers to calculate nutrient production on the farm. Where possible use actual estimates based on analysis of manures and store size.

- Calculate imported nutrients from manure nutrient content and weight / volume imported.
- Use the data to plan where the manures would best be used in the rotation in terms of their nutrient supply.
- Divide total manure N (in kg) by 170 to check that your organic unit is large enough to accept the manure.

Planning at the field level

- Know the weight or volume of the manure to be applied
- Know the nutrients applied to a field by using standard values for nutrient content or analysing the manure and multiplying it by the weight to be applied.
- Ensure the correct N rate is applied, depending on certification body requirements or NVZ status.
- Decide on the best application time depending on the type of manure and the crop to be grown.
- Wherever practical, try to minimise losses of ammonia

and nitrate this conserving nitrogen for use by the crop.

Balancing soil fertility with crop requirements

- Organic systems aim to ensure that soil fertility is maintained without damage to the wider environment. The farm nutrient balance tool is important in order to check this.
- There are several ways to calculate this, but in general all calculate nutrient inputs and outputs.
- Balances are useful to test if a farming system is viable, a large negative value would suggest short term sustainability. A small positive value in the balance of N, P, and K is probably ideal.

Visit www.swarmhub.co.uk for more information on these issues.

Adapted from “Making better use of livestock manures on arable land” developed by ADAS, IGER, and Silsoe Research Institute; funded by Defra. Updated 2007.