Factsheet

Soil management on organic farms; An introduction to principles and standards.

Contents

Good soil management is the key to plant and livestock nutrition in organic farming. This factsheet provides advice on soil management in relation to both long-term land management and day to day decision making. It gives users an understanding of soil and how farming operations can affect soil properties, and provides practical information on maintaining and improving soil health and fertility.

This guide is mainly aimed at organic farmers, farmers in conversion and farmers interested in organic techniques, but will also be of value to advisors and policy makers.

Principles

Organic farming systems seek to achieve sustainability by emulating natural biological cycles. In natural ecosystems, the processes of death and decay are balanced. This is best observed in a forest soil. Forest systems share a number of characteristics (as outlined by Albert Howard in his 1940 book An Agricultural Testament):

- They are mixed, with a diversity of animals and vegetation
- Large reserves of fertility are maintained
- The soil is protected from the elements to prevent erosion
- Animals and plants are responsible for protecting themselves against disease
- Water is stored effectively.

Altering a natural ecosystem to one that produces food makes it harder to achieve these characteristics. However, a combination of good agricultural practices can be used to emulate natural systems and cycles very effectively. Soil biology is the foundation for sustainable farming from which good soil structure and soil fertility is derived.

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Organic standards

Organic standards identify protection of the soil as a fundamental principle of any organic system. This principle is underpinned, through a number of recommendations and requirements, within the Soil Association Standards for Organic Farming & Production.

Management plan

A soil management plan is required as part of your application to enter land for conversion to organic management. This must demonstrate that adequate consideration has been given to how soil fertility and structure will be protected and enhanced over the course of a crop rotation. This requires close consideration of key practices, such as rotation design, fertilisation strategy, composting, cultivations and livestock management.

Routine soil testing is also recommended, to assess the existing status of the soil and to help plan management practices; for example, by carrying out tests each year at the same time and place, or at the same point in the rotation.

Rotation design

Rotations should be developed to balance the nutritional and structural demands on the soil, while providing an adequate break between crops to avoid specific pests and diseases.

Rotations should provide diversity both above and below ground. Where possible, crops with different root structures should be grown to help protect and improve soil structure. While the rotation will vary depending on the type of enterprise and market outlets, it is important that all farms balance exploitative cropping with fertility building.

Furthermore, every effort should be made to prevent the soil from laying bare for any prolonged period, particularly over winter. Cover crops could be used to prevent this, where necessary. Permission to use permitted fertilisers is only likely to be given if preventive cultural practices have been adopted as a first line of defence. A nutrient budget is a good tool to help make sure that there are adequate nutrients to cope with the rotation that has been developed.

Manures and plant wastes

Composting all manure and aerating slurry is recommended. Composting results in a stabilised product free of pests, pathogens and weed seeds that is an excellent material for building soil organic matter and supporting soil microbial communities. Well composted manure also has increased disease suppression properties.

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Table 1: Required treatment of manures to be applied to organic land

Source of manure	Treatment
Straw and farmyard manure (FYM) from acceptable non-organic sources	Stacked for six months OR properly composted for three months
Manures from non-organic straw based pig units and extensive non-organic poultry units	Stacked for 12 months OR properly composted for three months
Slurry from acceptable non-organic sources	Aerated

There are further recommendations for manures being applied to land growing horticultural crops. These are designed to minimise the risk of pathogen transfer from manures to 'ready to eat crops'. It should be noted that some assurance schemes may require longer timing between application and harvest, or may even prohibit the use of manures on land used for vegetable production.

Table 2: Recommended treatments and timings between application and harvest.

	Non-Organic origin		Organic origin	
Material	Treatment	Harvest interval	Treatment	Harvest interval
Slurry	Aerated	One year	Aerated	One year
Fresh manure		Prohibited		Six months
Stacked manure	Six months cattle) or 12 months (pig/poultry)	Three months	Three months	Three months
Composted Manure	Three months cattle) or six months (pig/poultry)	Three months	Two months	Two months

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Timing and volume of application

Measures to prevent environmental contamination include:

- The total amount of manure applied must not exceed 170 kg of nitrogen per hectare per year on average across the holding or linked holdings.
- In addition, the Soil Association standards prohibit the application of more than 250 kg nitrogen per hectare per year on any one area of land. This equates to approximately 28 tonnes and 40 tonnes of cattle manure per hectare per year, respectively. 1
- Where land is in a Nitrate Vulnerable Zone, local limitations may also apply
- Don't spread slurry on frozen ground
- Don't spread manure less than 50 metres from waterways or 100 metres from bore holes
- If possible store and compost manures indoors, under breathable sheeting, or on hard standing to prevent (or intercept) leaching.
- Try to apply manures and slurry on fertility building crops, grassland and cropped land in spring and summer when plant physiological demand and nutrient uptake is highest

Composts from non-agricultural origin

Composts from green waste composting sites, which shred and compost plant waste from parks and gardens, are classified as 'municipal waste'. These are acceptable under organic standards and are compatible with basic principles of recycling organic matter. Suppliers must be PAS100 certified and may need to provide a heavy metal analysis of the end product, as well as being able to declare that no genetically modified ingredients have been used.

Supplementary fertilisers

Some other materials are permitted for use within the organic standards, such as rock potash and rock phosphate. These should be regarded as supplements to sound system design.

[1] These limits are based on the DEFRA Code of Good Agricultural Practice for the Protection of Water.