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Contributors

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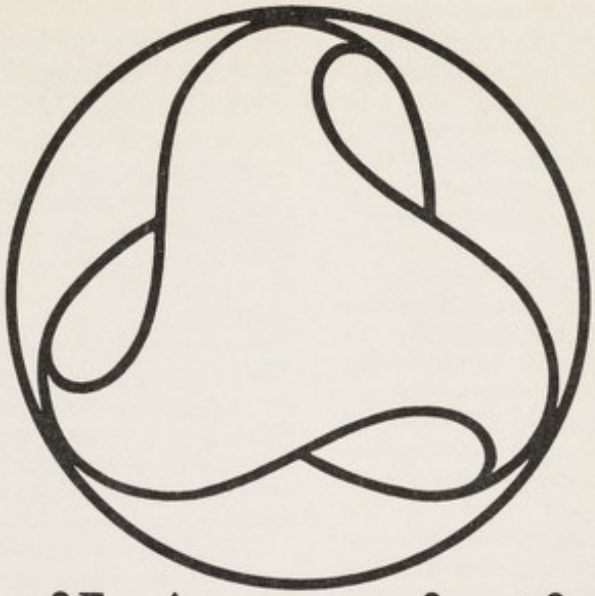

Soil Association

* Registration applied for

Organic Husbandry: Qualifying Standards

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SOIL ASSOCIATION ORGANIC HUSBANDRY : QUALIFYING STANDARDS

To live physically Man must respect the Earth
To live socially Man must respect his Neighbour
To live spiritually Man must respect Himself
H G Finlayson

The aim of organic agriculture is to produce food of such quality and quantity as to promote health of the community and to maintain the soil fertility for future generations.

Soil fertility is a measure of the effectiveness of the living processes whereby inert materials and recycled organic matter are changed into more living forms using energy from the sun. An understanding of basic principles of plant nutrition is needed to find practical methods for promoting fertility in the individual soils of every farm and garden.

Plants are able to use energy directly from sunlight. From the air they obtain oxygen and carbon. The water drawn up through their roots provides hydrogen, the third constituent element of sugar, which is the primary energy source for animals and man. Plants need many other elements to grow, develop and bear fruit. The obtain nitrogen, calcium, phosphorus and potassium and many other minor but no less essential nutrients through the agency of living soil processes.

A complete, balanced and appropriate nutrition for plants, the requirements of which vary continuously (i.e. with temperature, stage of growth, length of day) can only be provided by managing the soil as a whole living system. We believe that produce from crops so nourished in turn helps to provide a complete and balanced nutrition for man and animals.

Organic husbandry may be considered under the following headings:

Humus Husbandry
Soil Aeration
Soil Moisture
Balanced Mineral Availability
Crop Husbandry

The following guidelines must be observed by those wishing to obtain a licence to lable their produce with the Soil Association symbol. The classes of applicable produce are cereals, vegetables and fruit; additional Standards dealing with animal products will be drawn up in due course.

HUMUS HUSBANDRY

Humus is the complex material originating from decomposition of animal and plant residues by micro-organisms. Humus distinguishes a living soil from a dead one. What it does matters more than what it is.

It provides food for bacteria and fungi and a medium in which they can work. Different groups of microbes are vital for transforming organic residues to plant nutrients and fixing nitrogen from the air. We believe that microbes associated with the root are another group of special importance.

It encourages mycorrhizal association – channelling of nutrients into plant roots through fungal threads.

It changes the texture and improves the crumb structure of the soil. See 'Soil Aeration'.

It holds moisture and so conserves water for the plant.

Quality of humus is as relevant as quantity. The carbon/nitrogen ratio is significant. For example a manure with sufficient straw to dung leads to better humus than dung applied on its own.

For Maintaining and Increasing Humus Content of the Soil We Recommend:

Permanent pasture with seeds mixtures incorporating wide variety of grasses, legumes and herbs stocked with a variety of grazing animals.

Rotations including mixed leys stocked with a variety of grazing animals.
Green manuring
Sheet composting.
Mulching
Yard manure from own farm.
Slurry from own farm – spread on pasture or stubble and not on crops for human consumption.
Compost from own plant material and animal manures made without additives or with only the following: herbal activators, seaweed preparations, ground and powdered rock and nitrogenous animal waste.

The following may be used only after the source of supply has been approved in writing by the Standards Committee of the Soil Association:
Composted municipal wastes.
Digested sewage sludge.
Brought-in manures.
Brought-in commercial vegetable waste e.g. apple residues, coffee grounds, wool shoddy, banana stalks.

For Minimising Wastage of Humus We Recommend:

Crop wastes should be recycled and not sold off, burned or otherwise destroyed.
Soil inversion should be kept to a minimum. For example chisel ploughing is preferable to ploughing when soil conditions permit. Ploughing should be as shallow as practicable.
Crop residues and manures should not be buried but used as a mulch or worked into the surface. Breakdown in the absence of air may lead to production of toxins.
Soil should be kept covered by vegetation to protect the humus content from destruction by sunlight and rain.

SOIL AERATION

Soil aeration is necessary to allow respiration of soil organisms. Moreover, substances produced by micro-organisms growing in the absence of air may be detrimental to plant growth.

Firstly, practises for the removal of excess water from the topsoil are as follows:–
Watertable adjustment by ditching.
Tile draining, mole draining and subsoiling so that the water is maintained at the level of the watertable.
Avoidance of soil pans and smearing e.g. caused by heavy machinery, a rotavator used always at the same depth and wheel spin.

Breaking up soil pans by subsoiling or deep chisel ploughing in dry conditions.
Encouragement or increased numbers of soil fauna by humus husbandry to assist soil drainage and aeration e.g. worms.

Secondly, soil aeration may be increased by improving soil structure by the following:–
Plant roots on dying, if decayed by the right bacteria, leave passages in the soil.
Most cultivations tend to increase air in topsoil but loss of humus through excessive air is a danger.
The addition of organic matter, particularly when it leads to humus formation. See 'Humus Husbandry'.

SOIL MOISTURE

Soil Moisture is necessary as plants absorb most of their nutrients dissolved in water and required water to prevent wilting. In temperate climates, irrigation on an agricultural scale is not normally an economic proposition but in intensive horticulture it may be.

Retention of water in topsoil depends again on structure. Loss of water by evaporation should be reduced by maintaining a soil cover as constantly as practicable. Subsoiling of dry clay soil produces fissures allowing improved root penetration. This also assists upward capilliary movement of water from deep in the subsoil. Therefore, subsoiling may be a prudent alternative to drainage systems which remove water altogether. Emphasis should be on building up water retention in the soil, a characteristic much enhanced by humus.

BALANCED MINERAL AVAILABILITY

Most soils have enormous reserves of all minerals needed for plant nutrition. The degree of availability of these is a growth determining factor. In a humus rich soil, well aerated and moist, micro-organisms release nutrients suitable for plant use. Since both plant and micro-organisms are inter-dependent and governed by identical climatic conditions, the rate of nutrient provision and the requirement of the plant are precisely matched. Moreover the nutrient provision is continuous and balanced. Such conditions can never be realised by the addition of water-soluble chemicals (e.g. N P K from the bag) which may cause excessive uptake of the limited range of nutrients so supplied. Excessive application of soluble chemicals may also cause 'disappearance' of trace elements. The practise of attempting to supply soluble chemicals direct to plants is therefore excluded from organic husbandry. The excessive use of some organic manures may also give an unbalanced mineral supply with similar detrimental effects. Practices fro 'Humus Husbandry' ensure a return of some of the minerals removed by cropping. The availability of subsoil minerals is assisted by deep rooting plants.

For soils in a low state of fertility, the necessary living systems may be encouraged by the addition of minerals and trace elements in suitable forms. Where soils are deficient in these they should be added. Brought-in organic manures specified for 'Humus Husbandry' add minerals to the holding. These may be supplemented by the following:– Slow acting powdered natural rocks, such as limestone, calcarium lithaneum, chalk, rock phosphate, granite or dolomite, kainit as mined, felspar and basalt. Also applications of up to 10 cwt per acre of low grade basic slag.
Use of animal by-products such as hoof and horn meal, bone meal, dried blood, wool shoddy, feathers, fish wastes, guano etc. if free from soluble chemical additives and contiminents.
Seaweed, in its natural state, liquified, powdered, or as liquid extracts. Seaweeds are particularly valuable as a source of trace elements.

CROP HUSBANDRY

Healty plants grown in ideal conditions have a high degree of resistance to attack by diseases and pests.

Commercial conditions are never ideal and some diseases and pests are always present. Incomplete or unbalanced nutrition of plants reduces their resistance. Repeated mono-cropping causes a build-up of diseases and pests which enjoy the conditions suitable to them.

Bredding genetically resistant varieties gives only temporary protection, until the offending organisms adapt or slightly different organisms build up. Plant breeding research for frequent genetic variation is expensive. The growing of a wide variety of crops in planned rotations together with the provision of complete and balanced plant nutrition should keep diseases and pests to an acceptable level. The idea of elimination of crop disease and pest organisms is unrealistic.

Present economic conditions make it necessary to restrict variety in rotations and so, even with good nutrition, pests and diseases tend to rise above acceptable levels. Crop protection methods must therefore be considered. Biological control by encouraging and even introducing natural predators of the disease organisms and pests can be effective. For example, ladybirds feed on a wide variety of aphids.

Biocides – chemicals which kill pest and disease organisms – are not selective and thus often kill useful predators, reducing natural biological control. The use of sprays which make crops unattractive to pest and disease agents without killing them is therefore preferable. For example, it is suggested that the silica based bio-dynamic sprays repel moisture on foliage making it a less suitable habitat for fungi (e.g. potato blight). Liquified seaweed preparations are not biocides but also help to protect foliage. Garlic extracts appear to have pest repellent effects and their application is currently being investigated by the Soil Association and others.

When disease and pest damage is still above acceptable levels, only those biocides on the Soil Association's current permitted list may be used. The permitted list is under constant revision. New products and others not included on the list may be used only after written approval of the Soil Association Standards Committee or its authorised representative. Applications of permitted biocides should be made when day flying insects (i.e. bees) are not working.

Weed Control

Weeds can be adequately controlled by the use of rotations and timely mechanical means, and in horticulture also by mulching. Some plants have the ability to restrict growth of others.

There is no satisfactory evidence that herbicides exist which do not contaminate the soil as a living environment.

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