GS4

Managing your soil

A fertile soil is one with both a good structure and a good supply of plant foods. When managing your soil, hold both these objectives in mind. Aim to protect and maintain what you have, as well as looking at ways of improving it.

Cultivation

The first impulse for many gardeners, when faced with an empty plot, is to reach for a spade and dig. This may, or may not, be useful. Digging is a good method of breaking up a hard layer or 'pan', loosening compacted or heavy soil, and exposing soil pests to predators. But digging also speeds up the breakdown of organic matter (an essential and valuable component of a fertile soil), encourages weed seeds to germinate and breaks backs! To protect your soil, dig only where necessary - or consider a no-dig system.

Beds

Walking on soil compacts it. The easiest way to avoid this is to use a bed system, so that all work can be carried out from surrounding paths. Alternatively, use a plank or similar to spread your weight. Never walk on wet and sticky soils.

Digging tips

- Avoid mixing subsoil and topsoil; there is a change in colour where topsoil becomes subsoil.
- Use a small, sharp spade and stop regularly to stretch.
- Never cultivate a soil that is frozen, dried into solid lumps or wet enough to stick to your tools.

If you have a clay soil, the 'window' for digging can be short. Such soils are usually dug in the early autumn, allowing frosty weather to break up the heavy clods over winter so a seed bed can be prepared in the spring. This does little in the long term for soil structure so it is not an alternative to soil improvement with organic matter.

Other soils are best covered with a mulch or green manure over winter and dug, if necessary, in the spring.

Double digging, single digging or no digging?

Double digging, i.e. to two spades depth, is only recommended where soil is very compacted or there is a subsoil pan (impenetrable layer). Dig out a trench to one spade depth (or to the depth of the topsoil if less than this) and take to the other end of the plot. Loosen soil to another spade's depth using a fork pushed into the soil then moved backwards and forwards. Continue filling up the previous trench with soil from the next one. Fill the final trench with the first soil removed.

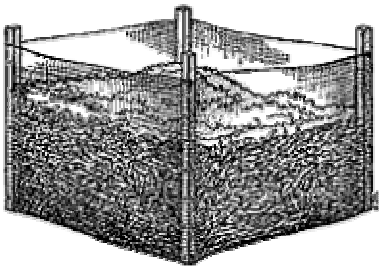
Single digging is useful for incorporating crop residues, green manures and manures; also for removing weeds. To make digging easier, take out an initial trench as above but don't loosen the deeper soil.

No digging - A garden can be run without regular digging as long as compaction or drainage problems are sorted out first. A no-dig, or reduced dig, system is worth trying on both heavy and light soils, especially with fixed beds that are not walked on. Manure and compost is applied to the soil surface at the usual rate.

Soil improvers

Dead plants and leaves, compost and manures are all forms of bulky organic matter. Microscopic soil creatures feed on it, releasing food for growing plants. They mix it up with the mineral components of the soil, improving drainage on heavy soils, helping light soils to hold water and reducing erosion. Aim to maintain or increase levels of organic matter in the soil using a combination of materials.

Compost and strawy animal manures provide plant foods and improve soil structure.



Leafmould bin

Leafmould, on the other hand, contains few plant foods (very slowly available) but can be used ad lib to improve structure and water holding. It can also help to release plant foods in heavy soils, and to hold on to those present in light soils, improving fertility without directly adding nutrients. Leafmould is easy to make collect fallen deciduous leaves in autumn and pile them in an open-sided container for one to two years. You can also use pierced black plastic bin bags.

Choose what is appropriate to the situation and the requirements of your particular soil. See the table for details.

Sources

The best source of bulky organic materials is your own garden, but most gardeners will need to import some too, ideally from another organic grower. However, in most cases the best we can do is to go for the least polluted sources - manures from less intensive systems, leaves from parks and quiet roads for example. Use locally available waste products as far as possible.

Putting it on

All manures should be well rotted or composted before use. Observe the usual hygiene precautions when handling them (wash hands well with soap and running water, keep cuts covered, keep up anti-tetanus protection). Produce should be washed well before consumption.

Bulky organic materials can be either applied as a mulch, or dug in. Those that supply plant foods should be kept to the top 15-20cm (6-8in) of soil, no deeper, as this is where the plants' major feeding roots are at work.

Compost, manures and other materials containing significant levels of plant foods (see table below) should be applied in the spring or summer to growing plants, or where plants are to grow shortly. If you prefer an autumn application, cover the treated soil with black plastic, or grow a winter green manure crop such as grazing rye to avoid nutrients being washed out and wasted.

Mulches tend to insulate the soil so are best applied when the soil is warm and wet (unless you want to keep it cool).

How much?

The table below gives some idea of how much to apply, on average. Obviously some composts will be richer than others and manures that have been out in the rain for months will contain fewer plant foods than those stacked under cover. The main message is *'Don't be too lavish with the nutrient rich materials'*. If you add too much at once, much of the goodness it contains may be washed out before the plants can use it.

Lime and liming

If you need to raise the pH of your soil ground limestone and dolomitic limestone (also contains magnesium) are the organic gardener's choice. Their action is much slower and gentler than gardener□s lime. They are best applied in the autumn, at a rate of around 250g/sq m (8oz/sq yd). If the soil is very acid, another application may be needed the following year but measure pH first. The full effect is felt in the second year.

Liming an acid soil will help to make certain plant foods more available, and to speed up the decay of thatch on a lawn.

Green manures

Green manures are plants that are grown to protect soil structure and fertility. For more information see our Getting Started Guide to Green manures or buy our step by step leaflet Green Manures available from the Organic Gardening Catalogue (price □1.35).

Fertilisers

A regular programme of adding compost, leafmould and other materials as appropriate is often all that is required to keep your garden growing steadily. At Garden Organic Ryton, on a light sandy soil, home-made compost is our main soil improver, backed up by loads of leaves, and small quantities of animal manures brought in locally.

We don't use additional fertilisers, though a range of products of plant and animal origin is available to correct mineral deficiencies and provide quicker supply of additional plant foods if necessary.

Over winter

Where annual flowers and vegetables are grown, soil is often left bare over winter, allowing the rains to destroy the structure and wash out goodness. To protect the soil keep it covered with a growing crop, a green manure or mulch. Use a low nutrient mulch such as leafmould or straw, or even newly fallen autumn leaves.

If you prefer to add compost or manure in the autumn, either sow a green manure crop afterwards, or cover the soil with a sheet of black plastic.

Material	How to apply		When to apply		Average rate of application	Soil structure improver?	Provides plant foods?
	Dig in	Mulch	Growing season	All year round?			
Garden compost (mixed ingredients)	yes	yes	yes	no	2 barrows full per 10 sq m per year	short and long term	short and longer term
Municipal compost (primarily prunings)	yes	yes	yes	yes	2-3 barrows full per 10 sq m per year	long term	mainly longer term
Well rotted strawy animal manures	yes	yes	yes	no	1-2 barrows full* per 5 sq m per year	short term	short and longer term
Straw	no	yes	yes	when soil is wet and warm	8-10cm (3-4in) thick	not applicable	K; longer term
Leafmould	yes	yes	yes	when soil is wet and warm	5-8cm (2-3in) thick	short and long term	very low and long term
Hay	no	yes	yes	when soil is wet and warm	8-10cm (3-4in) thick	not applicable	short and longer term
Shredded bark	fine grades	yes	yes	when soil is wet and warm	5-8cm (2-3in) thick	short and long term	negligible
Organic mushroom compost	yes	yes	yes	no	1 barrow full per 10 sq m per year	short term	short term, very alkaline

* Higher figure if manure has been stored in the open.