Compost

From 1 April it was going to be illegal for garden centres to sell compost containing peat, but the government has put this back to the end of the year. Although ending the use of peat is extremely good for the environment it poses problems for growers, both commercial and at home. As always with government legislation there is a fudge! Commercial horticulture can still use peat-based composts until 2026, and then until 2030 for raising plug plants and some other specific uses. At the moment this only applies to England, but Wales and Scotland are likely to come in line. So far, the EU have not brought in the same ban, so UK horticulture will be hit by cheap imports.

So why ban peat extraction?
Peat takes millennia to form.
It is a good carbon sink.
It is a fantastic ecosystem supporting many plants and insects found nowhere else.
Using it for compost is madness.

Until the mid1960s most compost was either made commercially from a loam base (such as John Innes), or at home by mixing the compost from the heap with varying amounts of sand, peat and sieved garden soil according to its use. Plants would have been grown at home from seed and cuttings or bought locally from one of 1000's of small nurseries, and then carried home wrapped in newspaper. The mass use of peat-based composts and plastic pots brought down the weight of the plant and enabled a global trade in garden plants. A lorry can now carry 10s of thousands of relatively cheap pots, sourced world-wide, from Holland, to the UK. Peat based composts are able to be kept just damp enough to maintain the plants, without being too wet (water is heavy).
I have yet to find a good peat-free compost for cuttings (but I have found 2 new ones which we will see later) or for long-term growing on in pots and containers. Some contain large amounts of coir which should be put back into the soil where coconuts are harvested to maintain soil quality, plus which it seems to form a crust on the surface which then acts as a barrier or even a wick to water. Others have large amounts of twigs which drain fast, good for pelargoniums and Mediterranean herbs, but poor for water and

feed retention. Last summer Thetford Garden Centre potted several containers with the same summer annuals, using all of the different composts they were selling, which initially showed some interesting results. However, when the hot weather came, they all turned up their toes!

So, before considering some of the commercially available composts let's get a handle on what we are trying to replace … SOIL.

Soil is the loose material that covers most land.

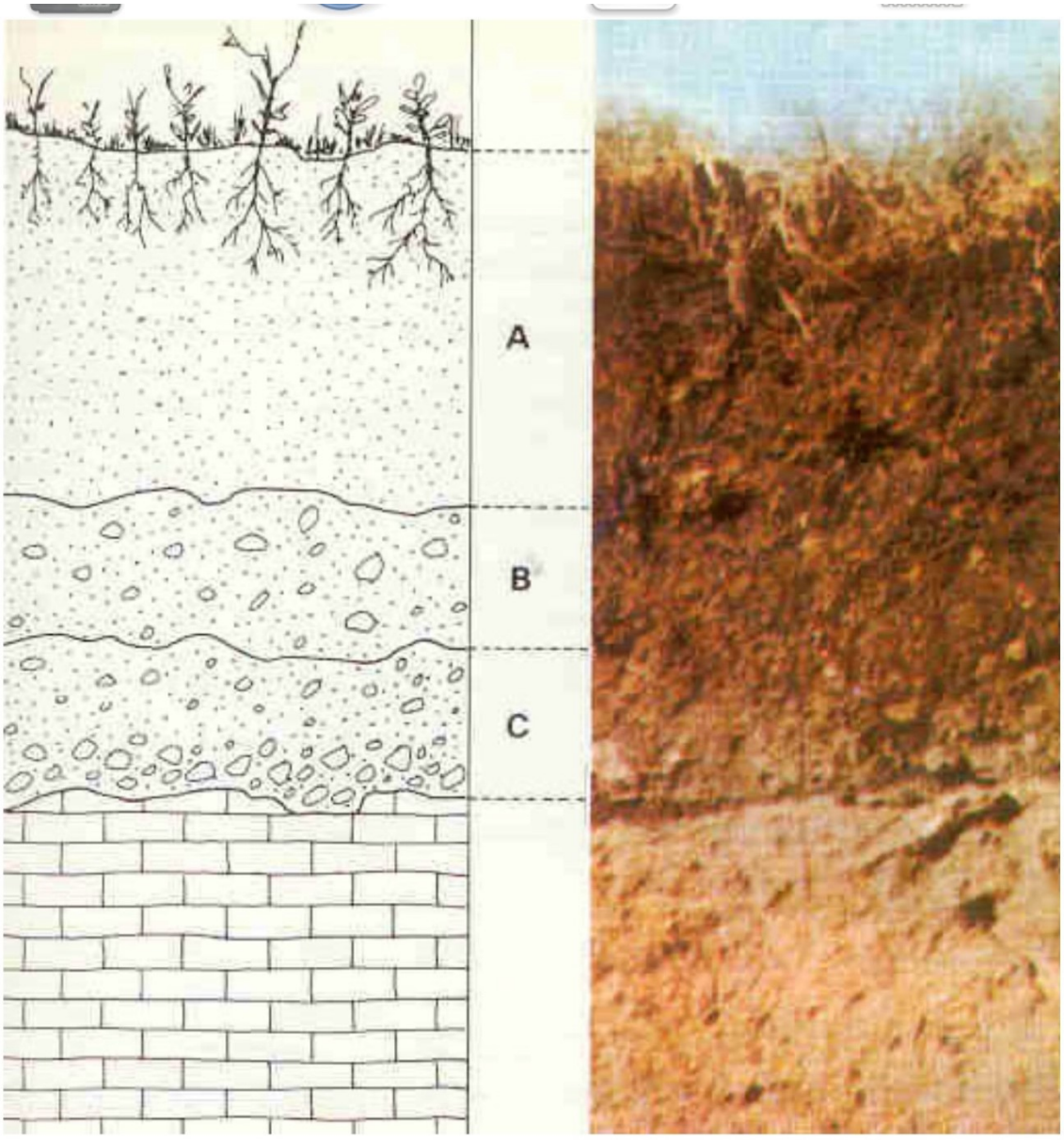
***QUESTION** From a plant's point of view what is soil for?*

It provides …
Structural support for plants and is their source of water and nutrients.
SO, WHAT EXACTLY IS SOIL??
The first thing is that it isn't exactly anything, every one of you will have different soil in their gardens, and different again on your allotments.

Soil is a mixture of mineral (or inorganic) and organic matter that contains gases, water, and microorganisms. It provides a medium in which plants grow, a habitat for animals to live in, a good water store, and as we are now finding out a good sink for greenhouse gases, especially CO2 (a hectare of dried out peat bog releases 13 tonnes of CO2 annually). Many processes take place in soils, including the recycling of nutrients, purification of water and exchange of gases with the atmosphere.
The mineral content of soil is derived from a parent material, normally, but not always, bedrock which has been modified over millions of years through the action of physical, chemical, and biological processes. As bedrock varies massively from place to place so does the soil derived from it.
Water (in its liquid and solid forms) has played a major role in this process of soil formation through mechanical fracturing and/or dissolving the bedrock and by supporting biological activity. Of particular importance is the freeze-thaw process in which water stored in cracks in the rocks freezes and expands causing further

cracks to form. As this freeze- thaw cycle continues the rock is broken down into smaller and smaller pieces.

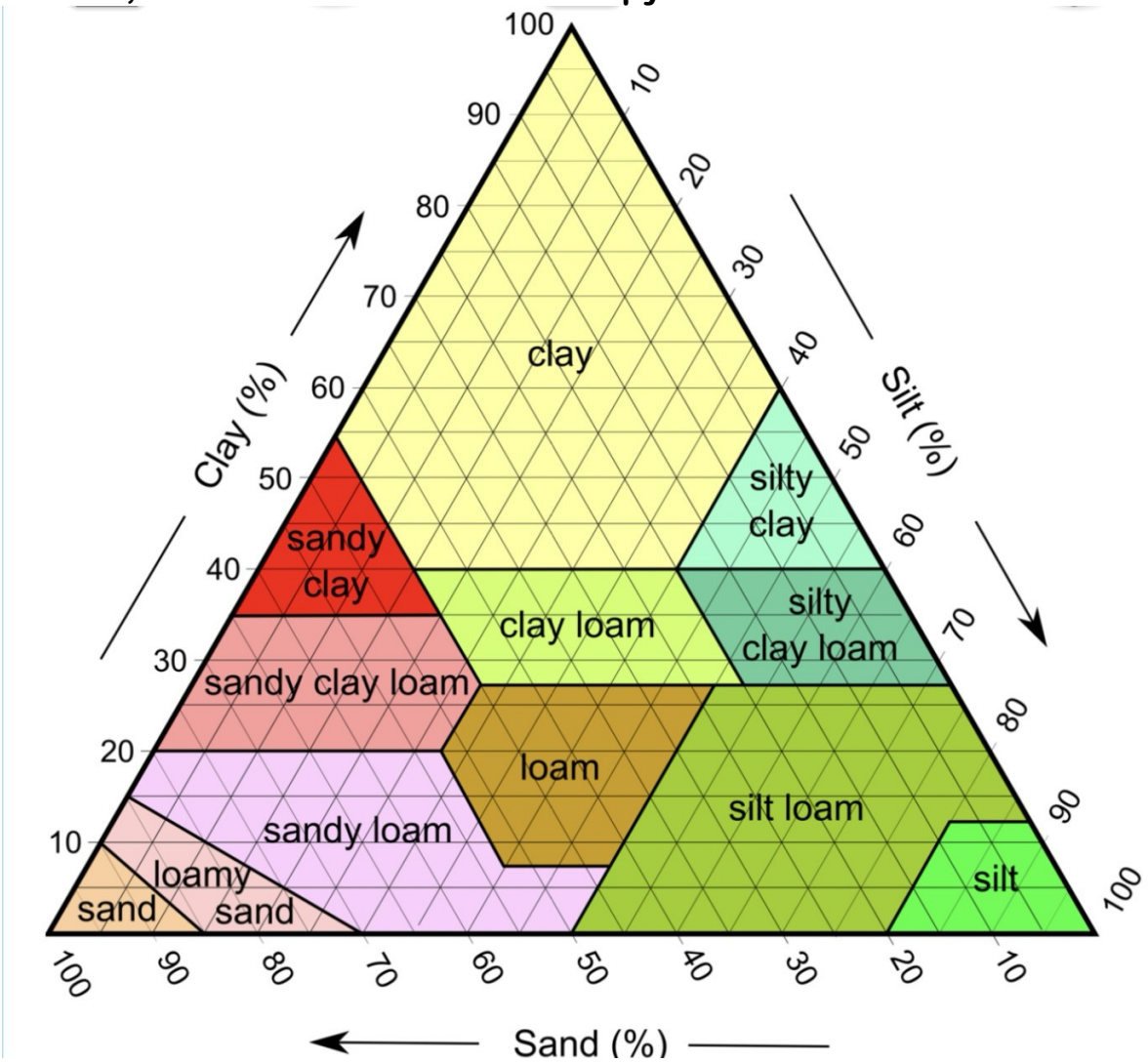
In a soil derived from the underlying material a vertical profile down into the ground would reveal this transition from bedrock through unconsolidated rock containing coarse material and stones to a well weathered soil. These layers within a soil profile are termed horizons. This illustration shows how the soil transitions from parent material at the base to well weathered soil



at the surface.
(not all soil comes from the bedrock, some is transported by water or wind to new locations).
The size of the mineral particles is key to the soils properties and provides the basis for the classification of soils. The largest

particles are sand which ranges in size from 50 to 2000 micrometers (1000 micrometers is a millimetre). Next down is silt which is typically 2 to 50 micrometres and those particles which are less than 2 micrometres are classed as clay. Most of you are familiar with the size of sand particles, but by way of comparison, silt particles are roughly the size of the thickness of a piece of paper, and clay particles are roughly the size of a micro-organism.

Soils are rarely made up of particles of a uniform size, but instead contain a mixture of particle sizes. The combination of the different percentages of sand, silt and clay is known as the soil texture, and can be seen in the soil pyramid. This classification



method uses the term loam for the various combination of the three components. Those of you living in one of the new houses in the village will have more or less only subsoil , except that much of the airspace will have been squeezed out by the compaction caused by heavy machinery constantly driving over it, and the larger particles will be brick sized and brick shaped, and in fact

will be bricks and other builders detritus on top of which will have been spread a thin layer of the original top soil which was scraped off the site at the beginning of the development and stored in a huge mountain where normal biological processes break down. The only goodness in your soil comes from the base of the turfs if you were lucky enough to have a lawn supplied by the builder. But fear not, in the course of just a few decades you could replicate nature and get a half decent garden soil!

So far, I have only considered the mineral (inorganic) content of the soil. Soil provides a medium for plant growth. Organic matter, i.e., decaying plant and animal material is incorporated into the soil from the surface and can form a very obvious layer or horizon within the soil. Some of this organic matter will be incorporated. deeper into the soil over time through the action of earthworms, roots, animals, water and digging.
As well as organic material soil contains an almost infinite number of living organisms and roots giving rise to a whole ecosystem. Many of the organisms at the bottom of the food chain rely on this organic matter for some of the nutrients they require to survive and grow. In addition, adding extra organic matter can greatly improve water retention. Thus, the organic content of soils is as important as the inorganic content.

Composts

Why do we use commercial compost?

It's convenient:
In general, it is light whereas soil can be heavy.
Soil is varied:
A particular brand of compost is (hopefully) consistent from batch to batch.
It can be used to grow plants that wouldn't grow healthily in our particular soil (eg rhododendrons in ericaceous compost).

Prior to the wholesale use of modern peat-based composts the use of John Innes (JI) composts was recommended. This comprised a soil mix of 7 parts sterilised loam, 3 parts peat, 2 parts sand, to which was added the John Innes fertiliser mix, (or John Innes base), which was 2 parts by weight of hoof and horn

meal, 2 parts by weight super phosphate and 1 part by weight sulphate of potash, and because peat is acidic chalk was added.
JI potting compost sometimes shown as JI zero on the bags contains none of the base.
JI 1 is used for pricking out seedlings and is made up of 2gallons (9 litres) of soil mix to which is added 1 oz (25g) JI base and 1 teaspoon (5g) of ground chalk.
JI 2 doubles the nutrient which suits most established plants including house plants and pot grown vegetables.
JI 3 has 3 times the nutrient and is suitable for well-established plants, trees, shrubs and climbers and for vigorously growing plants such as tomatoes and chrysanths.

JI compost is particularly good for use in light weight pots and for potting valuable plants such as mature olives and bay trees because it is extremely heavy (it comes in 20 litre bags)

Most garden centres, DIY stores and supermarkets now sell a wide range of peat-free composts. They are usually made of a combination of materials, including coir, composted bark, **composted** green waste, grit, and sand. Other alternatives such as wool are being trialled and tested.
Due to their high content of composted materials, peat-free composts are usually richer in beneficial microbes than peat-based ones. This can help protect plants from harmful pathogens. However, over time, the microbes can use up some of the nitrogen in the compost, so extra feeding may be required.
Raising Cuttings and growing seeds in Peat-Free Compost.
According to the RHS raising seedlings and cuttings in peat-free compost is as easy as in traditional peat-based compost. I remain to be convinced.
This is their advice:

Peat-free composts are a good option for seeds and cuttings, BUT if you're used to peat-based composts you may need to make a few adjustments to your plant care routine to achieve the best results: -

1. **Choose the right compost.**

Use specific seeds and cuttings peat-free compost. These are milled to a finer texture, which is especially important for smaller seeds. Multi-purpose composts are better suited to more established plants, as they usually contain more fertiliser that is

slowly released over 3 to six months, which seedlings and cuttings don't need or like.

2. **Water with care.**

One of the Key adjustments is with watering. Fine peat free composts, especially those containing composted bark, often hold water for longer, so may need watering less often.

They also tend to be dry on the surface, making it easy to overwater. So, use your fingers to check the moisture levels under the surface where possible or lift the container to see how heavy it is. Also, water using a small watering can or mist sprayer, so that it is easier to control the amount you apply.

Before sowing seeds make sure that the compost is moist but not soggy. Saturated compost is colder, which can slow down germination and may cause seedlings and cuttings to rot.

3. **Apply liquid feed.**

Seed and cuttings compost contains very few nutrients, so start feeding once your seedlings have produced their first true leaves. You can use liquid seaweed feed or similar, or homemade options such as diluted comfrey feed or liquid from a wormery. Don't feed every time you water but apply enough to keep the plants looking healthy- this might be once a week but increase if needed.

4. **Transplant to larger containers.**

Once the seedlings are large enough to handle and cuttings are well rooted, move them to a larger container to keep them healthy and growing strongly. If roots are just showing through the bottom of the pot or cell, that's another good indication that they are ready to move. Use peat-free multipurpose compost, which contains more nutrients.

Problems with new peat free composts

Watch the bag size. Different brands range between 40 and 50 litres for a large pack
Seed and cuttings compost range from 20 to 28 litres.

Cost they are a couple of pounds more for than their equivalent peat-based compost.

The organic matter is often only partially composted, so continues to break down which results in the compost losing its structure and gets easily waterlogged

They almost all dry out fast in hot dry or windy weather.

Read the description eg "with added John Innes might mean a poor compost with no loam or sand, with just John Innes base added". It may be in a 28litre bag which appears good value compared to the normal JI at 20 litres, but if it is only the fertiliser that is different you should be comparing with the equivalent 40 or 50 litre bag.

Conclusion

Like it or not, Peat-free compost is here to stay. The manufactures will keep tweaking the blends, so we will have to trial various brands and blends until we find composts that work for us.

Results of home trials.

Composts used:

General Purpose	bag Size(litres)	price (2023)	price per litre
New Horizon all plant	50	£8.99	18p
New Hoizon all vegetable	50	£7.99	16p
Westland Growsure with JI	50	£7.99	16p
Miracle Grow peat free with JI	40	£6.99	17.5p
Rocket Gro with JI	40	£7.99	20p
Lidl Peat Free	20	£1.49	7.5p

The results of a not very scientific experiment have changed since last month. I potted up various cuttings and strawberry runners in the various composts available in September at thetford garden centre. The rooted cuttings were kept in an unheated greenhouse with the windows open for ventilation throughout the winter. The strawberry runners were planted in litre pots and stood on tables outside. For cuttings of bottlebrush, ceanothus, germander, lavender, sage, rosemary Rocket Gro multipurpose compost with John Innis! Westland multipurpose compost with added John Innes and Westland New Horizon all plant compost fared well, but they dry out faster than the old peat based composts. Interestingly the New Horizon was ok (just) for thymes, whereas most of plants in other composts didn't make it through the winter.

For the strawberries the results were more interesting. As a control I planted some up in garden soil
All of them looked very tired in March. The most promising were the garden soil and the rocket Gro.
Come the middle of April when I am writing this, they all look ok, but not so large as I would have expected in a good peat based compost. The pots of Rocket grow were root bound so need potting on or planting out.

In addition, I have used Westland John Innes seed and cuttings compost for seed sowing with excellent results BUT they dry out much faster than you would expect even with the tiny bit of sun we have had. The ordinary Westland seed compost with John Innes was much coarser with several small clumps which is less suitable for seeds. I will try some cuttings this month and report back later.