

## GROWING PLANTS IN POTS AND BOXES . . .

it is for this reason that gardeners always used to keep sterilised soil for about six weeks before they used it. It is now known, however, that the addition of a little superphosphate will at once counteract the effect of this "free" nitrogen, and also seems to make the seedlings more resistant to disease and cold.

**If soil is sterilised before it is mixed with the leaf mould, lime, and other ingredients, and if superphosphate is added, the compost can be used at once for seed sowing, pricking out, and potting without showing any of the ill effects of soil sterilisation, and will be of great advantage to the plants.**

The longer period of heating and higher temperatures which were recommended in the early days of soil sterilising have been found to be unnecessary and even undesirable. Wherever cases of failure have been investigated it has nearly always been proved that the soil had been over-heated or sterilised too long. One of the reasons why baking soil is less satisfactory than steaming is that the humus in the soil may be ruined if heated to temperatures much above that of boiling water (212 degrees F.).

Soil can be considered sterilised when **all of it** has been heated to a temperature of at least 180 degrees F. for about ten minutes, after which the sooner it is cooled down to normal temperatures the better.

### Soil Sterilising in Laundry Copper

The home gardener can sterilise his soil in several ways, but the principle in each case should be to expose the soil to the heat in relatively-thin layers so that it heats through quickly and does not have to be over-heated on the outside to bring the inside temperature up to the desired point. Moreover, a suitable thermometer should always be used for at least the first few times until the method has been well tried out, to make sure that all the soil is, in fact, heated to the necessary temperatures for the stated time.

The easiest and most satisfactory way of sterilising soil at home is in the laundry copper. Pour 2 gallons of water into the copper, and make an open framework of wire or wooden laths to wedge in the copper about 3in. above the water level. (The space is left to reduce wetting of the soil by splashes of boiling water.)

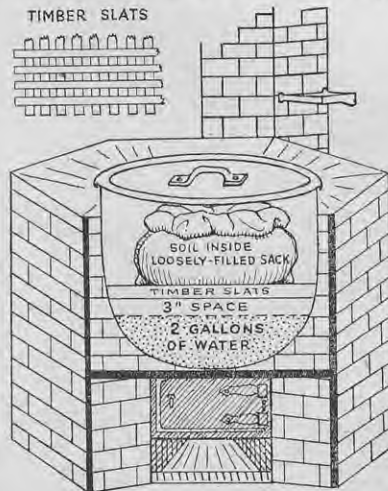
Wet or even moist soil cannot be sterilised efficiently by low-pressure steam. The soil should therefore be dug when dry, and protected from the weather, or allowed to dry out in a shed before it is sterilised. It should then be sieved through a 3in. riddle to ensure that there are no lumps, and put into a coarse, open-weave sack or,

better still, a tin tray such as a dust-bin lid, in the bottom of which numerous small holes have been punched.

If a sack is used, it should be only partly filled and dumped out on the framework in the copper in such a way that it almost covers the whole surface, but it should not touch the sides of the copper, as this may lead to the sack charring and bursting. Put the copper lid on and keep the water boiling vigorously.

### Storing Sterilised Soil

After the temperature in the middle of the soil has been maintained at at least 180 degrees F. for ten minutes it can be considered sterilised, and can be removed from the copper to cool. Unless the soil is to be used at once,



Method of sterilising soil in laundry copper.

it should be stored in a clean box or bin and not left lying in a heap exposed to the air, as this is likely to lead to its recontamination by disease spores.

If the copper is to be used for sterilising further batches of soil, do not forget to add more water to replace that lost by evaporation, and prevent the copper boiling dry.

Although these methods of sterilising soil are quite satisfactory for home gardeners, the commercial grower needs a method which is more suitable for treating large quantities of soil, preferably one using high-pressure steam. Various types of equipment are in use, including one or two ingenious and labour-saving methods devised by New Zealand nurserymen. Details of soil sterilisation on a commercial scale can be supplied by the Horticulture Division.

## Use of Leaf Mould or Peat

Peat is a material formed from partly-rotted vegetation which collects under certain conditions in wet places in layers which may be many feet thick.

Some peats are heavy, slimy, very acid, and quite unsuitable for horticultural use, but others are fibrous, non-dusty, uniform in quality, sterile, free from weed seeds, not very acid, and ideal for use in composts, as they serve to prevent them from drying out and ensure adequate aeration.

Carefully-chosen peats are bought in tremendous quantities by nurserymen and gardeners overseas, but these grades of peat do not seem to be available to gardeners in New Zealand, although no doubt there are natural deposits of suitable peat in this country which, if properly marketed, would probably meet a ready demand.

As suitable grades of horticultural peat are not available to most gardeners, some other form of organic matter must be found. Leaf mould seems to offer the best substitute, although it is so variable in quality that it will not give such uniform results as a suitable peat.

A well-made manurial compost is another possible alternative, although it is even more variable than leaf mould, and should be used only after a small-scale trial has shown its suitability, as it may be far too rich.

**Whether leaf mould or manurial compost is used, the material should be sterilised before use in the same way as described for the loam. It is essential that it should be sterilised separately and not after being mixed with the loam, or very poor plant growth may result for some reason which is still not completely understood. Peat is already sterile in the horticultural sense and does not normally require sterilising.**

Leaf mould collected from under deciduous trees seems to give better results than leaves collected from the same trees and rotted in heaps. Trials have not so far shown that leaf mould from chestnut, plane, or even walnut trees is detrimental to use; but there is no evidence of the value or otherwise of leaf mould from native New Zealand species.

### Sand Must be Added to Compost

Under the artificial conditions which exist in a pot or box it is necessary to add sand to the compost to make sure that the soil does not become caked on top or waterlogged in the middle, and also to facilitate the passage of water through rather than round the outside of the ball of soil.

To achieve these objects, fine sand is useless. The best sand to use consists of angular pieces grading up to 3/16 in. in diameter with a high propor-