controlled by potassic manures. Sometimes necrosis in the tissue of the tomato occurs without the appearance of blotchiness of the fruit.

Dr. Bewley considers that the type of blotchy ripening known as cloud at Nelson is frequently associated with lack of fibrous roots and an undue proportion of deep roots. Though the Cheshunt Station has not made detailed investigations of cloud, he agreed with the results of Cawthron Institute investigations which showed that soil moisture was a factor of great importance in the incidence of the disorder.

Greenback and Hard Core

According to workers in England, hard core is not synonymous with greenback. Tomatoes showing greenback may be affected with hard core, but the latter condition may occur apart from greenback. Little is known in England about the factors which produce hard core, but it is considered to be a nutritional disorder. In England emphasis is placed not only on a correct balance of manures but also on uniform conditions of culture. Intense sunlight, drought, and heavy winds all militate against good quality of tomato fruits.

In the opinion of plant breeders, greenback in tomatoes could be eliminated in five years by crossing desirable varieties with Stoner's Exhibition, which does not show greenback characteristics.

An interesting feature of experiments at Cheshunt is the testing of calico and transparent plastic materials with a view to the culture of outside tomatoes under semi-glasshouse conditions. It is claimed that in the English climate there would be great advantages, if costs were not too great, in the production in south-east England of early fruit of higher quality than that obtained from outside.

John Innes Horticultural Station

The John Innes Horticultural Station is very widely known for its valuable work on genetics and plant breeding. Of no less importance to the nurserymen and amateur gardeners of England has been the standardisation of potting soil, investigations of compost, and the testing of many well-established practices in the conduct of nursery work. Though the work of the station covers a wide range of plants, including pip and small fruits, sweet corn, and flowers, considerable attention has been devoted to tomatoes, particularly the breeding of improved bush and dwarf plants and the production of tomatoes resistant to leaf mould.

Standardisation of Potting Soil

A mixture of two parts of good loam—preferably obtained from a pasture field—one part of friable peat, and one part of coarse sand is recommended for all potting and nursery work. The loam should be prepared 6 months in advance by cutting turves 4in. thick and piling them 4ft. high. The peat should not contain a high percentage of loam, but should be easily broken into pieces up to ⅜in. in size. The sand should be a clean river sand of the coarser grades up to ⅛in. in diameter.

The loam must be sterilised by steam treatment in the usual way, and then the requisite fertilisers should be mixed with the sand. The soil, sand, and peat should then be mixed, resulting in a standard potting soil of wide use in all types of nursery work. The amount of fertilisers added to the sand depends on the purpose for which the soil is to be used. For the sowing of seeds smaller quantities of fertilisers are used than for potting plants.

Nursery Technique

A number of experiments in nursery and garden practice has been carried out. The more important findings from these experiments are:—

The pricking out of young seedlings at the earliest possible time is desirable, and results in better growth and earlier fruiting than with seedlings pricked out late.

Better growth and earlier fruiting are obtained from tomato plants by potting them in 3½in. and 5in. pots than with smaller sizes.

Overhead watering of seed boxes and potted plants is superior to dipping the boxes and pots.

If weeds are removed by hand, hoeing of garden crops gives no particular advantage. Weeds in garden crops, particularly carrots and onions, greatly reduce yield. As the hoe is the best tool for removing weeds, hoeing must continue to be an important garden operation.

The composting of tomato plants affected with virus does not destroy the virus. Though infection of tomato plants under outside conditions of culture is unlikely, such compost should not be used for glasshouse work or for potting soil.

Compost suitable for nursery and garden work can be made from wheat straw, using appropriate amounts of ammonium sulphate and water during the process of rotting.

Outdoor Varieties

Though the climate in south-east England is not very favourable for outside tomato culture, considerable success has been achieved at the John Innes Station by choosing varieties suitable for the soil and by timing seed sowing, potting, and transplanting to avoid any check to growth of the plants. Tomatoes are seldom planted out before late May or early June, resulting in a very short season for the plants. At the John Innes Station, Stoner's Exhibition, Harbinger, Market King, and Potentate have all given good results, and yields of 4 to 4.6lb. of ripe tomatoes a plant have been obtained.

Other work handled by the station includes the breeding of mould-resistant varieties of tomatoes and the classification and improvement of both dwarf and bush tomatoes.

Effect of Deficiencies

Fruit studies comprise the major activities of Long Ashton Fruit Station, an important research centre, but tomatoes have been included in nutritional studies of a large number of crops. By sand culture experiments carried out in pots, the effect on the growth of tomatoes of omitting different plant foods is being closely studied.

Clear-cut deficiencies of nitrogen, phosphate, potash, and magnesium have been obtained in these experiments. Potash deficiency is usually the most serious in its effect and quickly results in the death of the plants. Magnesium deficiency causes a pronounced yellowing of the leaves, resulting finally in the death of tomato plants. In the early stages of magnesium deficiency fair growth of the plant is obtained and yellowing is not marked until fruiting begins. Phosphate deficiency results in a purple colour of the leaves and poor growth of the plants. Nitrogen starvation results in a yellowing and in serious cases complete failure of the tomato plants.

In England repeated sprays of 2 per cent. magnesium sulphate are recommended for tomatoes and other garden crops affected with magnesium deficiency.

Growth-promoting Chemicals

In recent years investigators in both the United States of America and Great Britain have tested several chemicals which have peculiar growth-promoting qualities.

Alpha naphthalene acetic acid has been shown to be valuable in preventing pre-harvest drop of certain varieties of apples. At Long Ashton B-naphthoxy acetic acid and dichlorophenoxy acetic acid have been tested to ascertain their value in promoting set of tomatoes. B-naphthoxy acetic acid used at a concentration of 30 parts a million in water has given very good results, producing effective development of tomatoes even when the stamens of the flowers have been removed. Phenoxy-acetic acid, used in smaller concentrations, has likewise resulted in fruit set, but malformation of the tomatoes frequently occurred.