

During the 1935-36 season the effects shown were, in general, very similar to those recorded for the previous year, except that in most instances the advantage of potash inclusion in the treatment is not apparent to the eye. This, however, cannot be interpreted as due to ineffectiveness of the potash treatments, as several disturbing factors have been contributory. All trees were invigorated by the heavy pruning and thinning-out of limbs, while during pruning limbs showing die-back were removed in preference to healthy wood on trees showing this disorder. The abnormally heavy and well-distributed rainfall throughout the growing period has also probably enabled the trees to utilize to the full any plant-food reserves in the soil. As a result, plots treated with nitrogen alone appear to be little if at all inferior in vigour and condition to those receiving phosphate, or potash and phosphate, in addition. At the same time, however, the contrast between trees receiving nitrogen and those receiving no nitrogen is more marked than ever.

The uniform system of pruning adopted in the past over all the treatments led to considerable congestion of leaders, subsidiary wood and yearling growths on all trees receiving nitrogen actually reducing their useful cropping-capacity. In order to permit the retention of fruiting-wood, improve the colouring of the fruit, and facilitate spraying and other operations, a pruning system modified to suit the requirements of individual trees has been adopted and a photographic record kept of the type of pruning adopted on trees of varying vigour in the several varieties.

In the iron, manganese, and hydrated-lime test on Jonathans, every tree that has received manganese is showing to a greater or lesser extent an apparent toxic effect, manifested as a severe bark-canker on one or more branches, and affecting wood of all ages right up to the current season's growth. The treatment is being discontinued, and the result will be followed up to ascertain, if possible, the cause of the trouble.

Cold-storage Trials of Fruit from Manurial Plots.

(a) In fruit from Jonathan Block E, 2 lb. and 4 lb. ammonium-sulphate treatments have again given progressive increases in breakdown compared with no application, contrasting with the result in the 1934 (heavy-crop) season when breakdown was almost completely absent from all three lines.

(b) In Dunn's similar rates of application of nitrogen have not increased breakdown susceptibility this season. As far as breakdown is concerned there has apparently been a fairly complete recovery from the initial disturbance by the nitrogen treatments.

(c) There was, however, an appreciable incidence of deep scald in long storage this season, and it showed an increase proportional to the amount of nitrogen applied. Fortunately this trouble is extremely rare in Dunn's, and, in contrast to its incidence in Jonathan, does not appear till late in the storage season, so is not of significance in commercial practice.

(d) Nitrogen treatment increased the susceptibility of the Jonathan to deep scald under low-temperature storage conditions, and heavy potash treatment gave rise to a most striking increase in scald incidence. At the moment it is not suggested that these are direct effects, as it is quite possible that they are due to disturbances of maturity. This point is being further investigated.

(e) In Delicious, manurial treatments again do not appear to have had any bearing on storage quality.

(f) In the case of Sturmer, it appears that nitrogen by itself has again shown a tendency to increase breakdown susceptibility on long storage.

(g) No significant differences in storage characteristics can be recorded for the heavy potash experiment of Cox's Block 1, nor in the case of the main block of Cox's.

(h) A comparison of the storage qualities of the three commercial grades of Cox's has given very significant evidence on the association of breakdown and water-core in this variety.

Pruning-experiments.

Under the auspices of the Horticulture Division a series of pruning-experiments have been laid down on Cox's Orange, Sturmer, and Dunn's varieties, comprising heavy, medium, and light pruning. Tree-measurements and crop-weights are being recorded.

Nursery Stock.

The fruit-trees in the nursery have been lifted and ninety-six trees selected from the M. 1, M. 12, M. 15, and Northern Spy stocks for testing purposes, the varieties selected being Cox's, Jonathan, Delicious, and Granny Smith. These have been planted out on a new area at the orchard, giving six replications of each variety on each individual stock, trees of the Delicious variety being used to fill in the surrounding spaces. In all, about 125 trees have been added to the total of the orchard.

Grafting-experiments.

Five Statesman trees have been grafted over to the Cox's variety, four on the refurnishing-system with a multiplicity of scions and one on the orthodox method low down as a check tree.

Six Sturmer trees have been reworked to Hawke's Bay Red Delicious and Richared Delicious strain from U.S.A. These, when producing fruit, should be of interest to compare with the general strain of Delicious in the orchard.

To test the efficacy of in-arching in imparting additional vigour to Sturmer trees, East Malling stocks M. 1 and M. 12 have been in-arched on six trees using respectively 2, 3, and 4 scions to the tree. In the course of four or five years these should indicate whether or not the method is likely to be of benefit under local conditions.