

## PLANT DISEASES DIVISION, AUCKLAND

## I. Pomology

(a) *Roostocks*.—(i) *Apple*: Sturmer on Sturmer roots has given outstandingly heavy crops in comparison with trees on Northern Spy and East Malling rootstocks. The accumulated crop total (average per tree) for the sixth to ninth years was 357 lb. for the former, compared with 289 lb., 233 lb., and 228 lb. respectively for M XII, Northern Spy, and M I. The trees are growing on a heavy clay loam. In a similar trial on volcanic soil, but including for comparison trees on Northern Spy only, Sturmer on Sturmer roots has shown the same marked superiority in crop. It is probable that the larger trees on M XII, not yet in full bearing, will eventually overtake those on Sturmer roots, but the position of the latter in relation to trees on Northern Spy is likely to remain unaltered.

Cox's Orange Pippin has, up to the ninth year, cropped most heavily on M I and Northern Spy, but the latter are being rapidly overhauled by the more vigorous trees on M XII and M XVI.

Yields of Jonathan on M XII are now higher than on Northern Spy.

In the trial of Dougherty on twelve rootstocks laid down in 1941, the trees have made excellent growth and will be allowed to carry their first crop next year.

Eight-year-old Gravenstein trees on roots of the same variety have borne their first appreciable crop this year, the yield being approximately 30 per cent. less than that of comparable trees on Northern Spy. The former are superior in growth and are as yet free from the "gnarling" disease which has appeared in the trees on Northern Spy stock.

Differences in resistance to excess soil moisture have been shown by three apple rootstocks in a block of young Delicious at the Oratia Experimental Orchard. Following two wet years, losses have ranged from 50 per cent. for trees on Northern Spy to 12 per cent. on each of the stocks M XII and M XVI.

(ii) *Plum*: Investigation of rootstocks for English and Japanese plums has been commenced this year with the propagation of eight different stock types, to provide material for budding with scion varieties later.

(iii) *Citrus*: Results have been prepared for publication dealing with performance of five-year-old Washington Navels on various stocks, including double-worked trees. In this trial, sour orange, alone or in combination with other rootstocks, proved incompatible with the scion. Of rootstocks worked directly with the scion variety, citronelle produced the largest and trifoliate orange the smallest trees, those on Island sweet orange being intermediate in size. Double-working with a more vigorous stock considerably increased tree size on the dwarfing trifoliate-orange root. On the other hand, vigorous stocks were little affected by interposing a dwarf stock between them and the scion. Taking into consideration both growth and flower formation, trifoliate-orange rootstock with an intermediate stem-piece of either Cleopatra mandarin or Island sweet orange appears very promising, at this stage of the trial, as a stock for Washington Navel.

Four-year-old Lisbon lemons on citronelle stock have made slightly better growth than comparable trees on Island sweet orange. Growth on sour-orange stock is much inferior.

(b) *Varieties*.—(i) *Apple*: Laxton's Exquisite, Laxton's Epicure, Ellison's Orange, and Monarch are the most promising of new varieties under test.

(ii) *Peach*: Crop weights in the trial of new varieties have again been recorded.

(iii) *Citrus*: New varieties of citrus and also a number of species of citrus and related genera, which may prove of value for breeding or as rootstocks, have been received from the Bureau of Plant Industry, United States of America.

(iv) *Sub-tropical Fruits*.—(1) *Persimmon*: Many of the eighteen varieties of Japanese persimmon planted in 1940 are now fruiting. Observations have been made on flowering, fruit set, premature drop, fruit type, and tree characters.