

is no bud union. On Spy stock symptoms of gnarling first appeared immediately above the bud union, and in the worst case are spreading fairly rapidly up the trunk towards the crotch.

At Appleby the vigorous M XII stock has nearly caught up to Northern Spy in yielding capacity with Jonathan as the scion variety, but with other varieties it is still well behind. As a semi-dwarfing type M I has proved rather similar to Northern Spy, except that its top growth is less and that with Cox's Orange and Delicious as scion varieties it is at present cropping much more heavily.

(c) *Varietal Trials*.—Following the earlier work of classification and trial of strains of Delicious and Cox's Orange, the Plant Diseases Division has made final selections for future propagation by the New Zealand Fruitgrowers' Federation. These comprise one red Delicious, one striped type of the same variety, and one Cox's Orange of normal colour.

In the varietal collection a large number of new varieties is undergoing trial, but has not yet been sufficiently tested to enable any recommendations to be made.

(d) *Plant Protection*. (i) Ripe-spot: Field experiments conducted by the Plant Diseases Division over the past three years have shown that adequate control may be secured by the use of Bordeaux-mixture sprays applied during the critical months of January and February. Injury to fruit is liable to follow the use of Bordeaux. This may be reduced by increasing the quantity of hydrated lime, or by addition of cotton-seed oil. Applications of Bordeaux to fruit after picking have not improved control, and have materially increased spray residues. Fruits sprayed with Bordeaux, when held in cool store, show marked freedom from ripe-spot and soft-rots.

(ii) Black-spot: Bordeaux sprays applied in the late summer have served to control the development of black-spot in cool store.

(iii) Spray Damage: Lead arsenate, which produces a characteristic type of injury on fruits and foliage, is responsible for more damage than is generally recognized. Addition of hydrated lime to arsenate sprays considerably reduces injury. The Division has found that, contrary to the general belief, lime sulphur does not appear to increase the degree of arsenate injury.

STONE-FRUIT

(a) *Apricot*.—Field trials have been undertaken by the Plant Diseases Division to ascertain the possibility of reducing brown-rot losses in apricots by dipping. "Shirlan A.G." gave a high degree of control under the severe conditions of the experiment, whereas sulphur was not only ineffective but caused fruit blemish.

(b) *Plum*.—Work carried out in an infected orchard at Henderson, Auckland, has shown that a substantial control of bacterial-spot is secured by a Bordeaux programme, although spray injury has followed the applications. A study made of this phase has shown that, of some forty varieties, Japanese plums are readily injured by copper sprays, but English varieties suffer no damage. These forty varieties were inoculated with a vigorous strain of the organism, when it was found that the English varieties were immune or very highly resistant, whereas the Japanese varieties were mainly susceptible, a few only being resistant.

(c) *Peach*.—The Plant Diseases Division has tested the susceptibility of the peach to bacterial-spot of plums, and has found that all twelve of the varieties tested have been susceptible to infection.

Full descriptions have been compiled of the fruit of fifty-seven varieties, rather more than half the total number planted in the collection at Owairaka. The remainder are not yet in bearing. Recording of the incidence of brown-rot, both before and after picking, has been continued for the second year in succession.

CITRUS

(a) *Rootstock Trials*.—Washington Navel orange, planted at Oratia by the Plant Diseases Division in 1942 on sweet and sour orange, citronelle, and *Poncirus trifoliata* rootstocks, continues to show marked variation in tree size. The largest trees are those growing on citronelle and sweet-orange roots.

The trial has been duplicated on a smaller scale by a planting on the volcanic soil at Owairaka.

(b) *Entomological Studies*.—As the proprietary "Ostico" is no longer available as a banding-material for the control of dicky-rice weevil, the Plant Diseases Division has manufactured some 2 cwt. for supply to citrus-growers in the Auckland Province.

In field-work carried out by the Division it has been found that soft-wax scale is controlled by a 3 per cent. spray of summer oil.

MISCELLANEOUS

Early in the year a nursery was established at Levin by the New Zealand Fruitgrowers' Federation for the purpose of raising true-to-name trees from selected budwood and on selected stocks. In addition to supplying a nucleus of apple stocks, as previously mentioned, the Plant Diseases Division has advised the federation in the layout and development of the nursery, and has given practical instruction to the nursery staff in approved methods of propagation.

On the recommendation of the Division, bud-selection committees have been formed in the chief fruitgrowing areas, the function of these being to select the best available trees of stone and pip fruits, from which budwood is being secured by the federation nursery, after fruit samples have been approved as true to type by officers of the Division.

As a result of collaboration among the Fruit Research, Dominion Laboratory, and Plant Chemistry Laboratory sections of the Department, a modern apple-dehydration plant is now in commercial operation in the Dominion. The Department was responsible for the design of the plant, and continues to function in a technical advisory capacity to the Internal Marketing Division of the Marketing Department, on whose behalf the factory is being operated.