

(viii) *Dicky-rice Weevil on Citrus*: The present method of control by banding is difficult to apply, ineffectual unless properly carried out, and liable to cause tree injury if the material is applied season after season at the same point on the bark. Further, it is unknown whether or not the weevil population is adversely affected by the practice. With a view to providing an alternative control, several experiments have been undertaken using sprays of D.D.T., cryolite plus summer oil, Gammexane, and lead arsenate. Preliminary results showed that D.D.T. at 0.1 per cent. concentration gave 100 per cent. control, cryolite, banding, and Gammexane from 99 per cent. to 98 per cent., and lead arsenate 94 per cent., indicating that a promising alternative method of control lies in spraying with one of these.

(ix) *Bordeaux Sprays for Delicious*: As a result of the work of the past and previous seasons, recommendations have been made for field applications on this variety for control of ripe-spot and black-spot.

(b) *Testing of New Therapeutants*.—(i) *D.D.T. and Gammexane*: Trials on a field scale have been carried out in apple orchards in Auckland, Hawke's Bay, and Nelson. From these the following conclusions may be drawn:—

- (1) Codling-moth control is readily secured with D.D.T. even at dosages as low as 0.05 per cent. Gammexane is less effectual.
- (2) Leaf-hopper is readily destroyed by both, but relative toxicities have not yet been ascertained.
- (3) Woolly-aphis: Evidence indicates that D.D.T. does not combat this pest though it readily destroys the parasite *Aphelinus mali*. Gammexane, on the other hand, appears to give effectual control.
- (4) Red-mite populations have increased where D.D.T. has been used. Gammexane again has proved toxic to the pest and might develop as an efficient agent of control.

(ii) *Dithane and Fermate*: Both have given encouraging results in control of black-spot. At 2 lb. per 100 gallons, Dithane is more effectual than the standard spray treatments of lime sulphur and colloidal sulphur. Although causing less foliage injury, it russets fruits at this dosage, but not to an extent which would affect the grade of fruit.

Fermate at 2 lb. per 100 gallons gave black-spot control comparable with that secured with standard spray-programmes. Though it caused less foliage damage than the standard programme and did not produce russet, residues were conspicuous and difficult to remove.

(c) *Certification of Therapeutants*.—Certification lists have been maintained, and adjustments made to standards of materials where necessary. All samples of certified products taken for check analysis have shown that the initial standards have been maintained.

Attention has been given to methods of preparing D.D.T. as dusts and sprays for horticultural and agricultural use. It has been ascertained that micronized D.D.T. dusts of highly effective field performance can be prepared in New Zealand.

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(a) *Magnesium-deficiency Investigations*.—Observations have been maintained on the experimental areas of Cox's Orange Pippin, Jonathan, and Sturmer apple trees at Braburn and Tasman to determine the present effect of treatments applied in the 1939–40 and 1940–41 seasons. Since then no further magnesium applications have been made, except on certain Jonathan trees. In all cases ground dolomite has shown more lasting effects than either magnesium sulphate or magnesium carbonate. The sulphate is now the least satisfactory, although in the first few years following treatment it was quite effectual. The use of 6 lb. dolomite per tree in each of two successive seasons has