

## MYCOLOGICAL STUDIES.

*Wastage in Citrus Fruits.*—A report on various aspects of citrus wastage during transport and storage is given in the Fruit Cold Storage section of this report.

## PHYSIOLOGICAL STUDIES.

*Mottle-leaf.*—The Plant Diseases Division continued work on this disorder, and again found that spray applications of manganese gave an immediate response in the control of this disease; soil treatments, however, have not yet had any beneficial effect.

At the request of the Plant Diseases Division, manganese determinations were made by the Cawthron Institute on several samples of healthy and mottled citrus leaves from the Auckland district and the following results were obtained:—

Leaf material.	Healthy.	Slightly mottled.	Badly mottled.
Manganese, p.p.m. on dry matter	20.2 and 24.0	10.2 and 15.4	4.7 and 6.2

Mottling was associated with a low manganese content of the leaves. It must be noted, however, that magnesium likewise tended to be low in badly mottled leaves.

## MISCELLANEOUS INVESTIGATIONS.

## UNFERMENTED APPLE-JUICE.

Further observations and experiment confirm the points noted in last annual report on the suitability of New Zealand apple varieties for juice manufacture, on the juice yield obtainable, and on the characteristics of the juices of the principal varieties.

A repeat test on the Cox's Orange variety confirms that with fruit in good condition a very good product results, retaining much of the distinctive flavour and character of the variety.

With a view to reducing production costs, a test was made in which the final sterilization of the juice at time of filling was carried out by a flash-pasteurization instead of a cold, germ-proof filtration. The bottles were pre-heated in clean, warm water, and no difficulty was experienced from thermal breakages. The test was entirely successful with the Sturmer variety, but with the Cox's Orange the juice became hazy within a short time of pasteurization. It would appear that, although the initial pasteurization temperature had been maintained approximately 3° C. above the final pasteurization temperature, the difference was not sufficiently great to prevent further precipitation of colloidal material after the second heating.

## PUBLICATIONS.

The following papers on fruit problems and research have been published during the year by officers of the Department or of co-operating organizations. The abbreviation *N.Z. Jour. Sci. & Tech.* denotes the *New Zealand Journal of Science and Technology*, "*N.Z. Jour. Agri.*" the *New Zealand Journal of Agriculture*, and "*O.N.Z.*" the *Orchardist of New Zealand*.

## GENERAL.

TILLER, L. W., and COOPER, E. R. (1939): X-ray Detection of Mouldy-core in the Delicious Apple. *N.Z. Jour. Sci. & Tech.*, 21, 168A-169A.

## PLANT DISEASES DIVISION.

ATKINSON, J. D. (1939): Fruitgrowing: In Land Utilization Report of the Heretaunga Plains. *Department of Scientific and Industrial Research Bulletin* 70, 70-102.

——— Black-spot Control on Pears. *O.N.Z.*, 12, 204-205.

——— The Russet Susceptible Period of Apples. *O.N.Z.*, 12, 284-285.

——— Experiments with Bordeaux-oil Sprays. *O.N.Z.*, 12, 287.

COTTIER, W. (1939): Citrus Pests—VII. Scale Insects. Unshelded Scales: The Cottony-cushion Scale and the White-wax Scale. *N.Z. Jour. Agri.*, 58, 421-422.

——— Citrus Pests—VIII. The Leaf-roller Caterpillar and other Insects. *N.Z. Jour. Agri.*, 59, 47-48.

CUNNINGHAM, G. H. (1939): The Plant Diseases Division: Summary of Work in Progress as at June, 1939. *Plant Diseases Division Bulletin* 33, 56 pp.

——— Certification of Therapeutants: Fifth List. Supplement to *O.N.Z.*, September, 1939, 4 pp.

——— Technique of the Certification of Sprays. Lecture delivered before the Dominion Fruit-growers' Annual Conference in Wellington, September, 1939. *O.N.Z.*, 12, 257-258.

——— (1940): Certification of Therapeutants: Sixth List. Supplement to *O.N.Z.*, February, 1940, 4 pp.

TAYLOR, G. G. (1939): Application of Orchard Sprays. *Plant Diseases Division Bulletin* 23, 46 pp.

——— Huapai Experimental Orchard. *O.N.Z.*, 12, 200-201.

WOODHEAD, C. E. (1939): Pruning in Relation to "Mouldy-core" of the Delicious Apple. *N.Z. Jour. Sci. & Tech.*, 20, 402A-403A.

WOODHEAD, C. E., and MOUNT, H. M. (1939): Apple Rootstock Investigations—I. *O.N.Z.*, 12, 279-281.