

HESLER, L. R., and WHETZEL, H. H.—1917, Apple Scab, *Manual of Fruit-tree Diseases*, New York, pp. 3-13.

KEITT, G. W.—1920, A Preliminary Report on Apple Scab and its Control in Wisconsin, *Phytopathology*, Vol. 10, p. 58.

MASSEY, G.—1910, Apple Scab. *Diseases of Cultivated Plants and Trees*, pp. 204-208, London.

MORSE, W. J., and DARROW, W. H.—1913, Is Apple Scab on Young Shoots a Source of Spring Infection? *Phytopathology*, Vol. 3, pp. 264-269.

NICHOLLS, H. M.—1913, The Black Spot of the Apple and Pear. *Ag. and Stock Dept., Tasmania, 1913, Bull. 48*, pp. 1-15.

PARASITIZING THE WOOLLY APHIS.

PROGRESS OF THE WORK OF BREEDING AND DISTRIBUTION OF *APHELINUS MALI* IN NEW ZEALAND.

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IN a previous article in this *Journal* (July, 1921) I gave an account of the introduction into New Zealand of *Aphelinus mali*, a valuable parasite of the woolly aphis, from North America. In that article I showed how, from three males and two females bred from the parasitized material received from America in January, 1921, a total of 127 adult *Aphelinus* had been bred and placed out in various orchards up to the 3rd May, 1921, when the cold weather stopped all further emergences. The purpose of the present article is to take up the account of the work where the previous article left off, and to show the position at the present time.

With a view to the more intensive breeding of this parasite, the Cawthron Institute insectarium, built in November last, was designed with one room suitable for work with minute parasites. This room was closed in with phosphor-bronze wire-gauze measuring sixty meshes to the inch. The width of the adult male *Aphelinus* being about one-fiftieth of an inch, and the female a little stouter, it was necessary to secure gauze with a mesh as fine as this in order to confine the adults within the insectarium. Four young apple-trees were planted in large tubs and placed in the *Aphelinus* room, ready for the emergence of the parasite in the spring. Mr. A. Philpott, Assistant Entomologist of the Institute, took charge of this work during November and December, while I was away in Australia. He also effectively established colonies of woolly aphis on all four trees in the usual manner, by making cuts of the bark with a knife and placing small clumps of aphis around the fresh cuts.

By the time the first *Aphelinus* emerged from tree No. 5 in the Institute gardens (this being the tree on which they were originally placed early in 1921) the four trees in the insectarium showed a vigorous growth of aphis, due to the sheltered conditions under which they were being grown and the care taken to spread the aphis in every possible way. *Aphelinus mali* began to emerge on tree No. 5 on 10th November, 1921, and continued until the 19th, only six specimens being secured altogether. All these were taken and placed on tree No. 3, one of the special trees inside the insectarium. By