given as good a control as one dressing of 12 lb. per tree. Two 12 lb. applications have given slightly better results than one. The present (1946) season is the seventh since treatments were first applied, and it is apparent that some have almost reached the end of their effective life. This may be considered satisfactory when account is taken of the severity with which some of the trees were initially affected.

Fruit and leaf samples have been taken, but analytical data for the 1945–46 season are not yet available.

(*b*) *Chlorosis in Leaves of Delicious Apple.*—A chlorosis of the tip leaves of new growth of Delicious trees has been noted in various parts of the Nelson District for some seasons past. Last season there was a severe outbreak, but very little has been seen to date this season. Analysis of leaf samples taken several seasons ago has not afforded any definite explanation of the phenomenon.

(*c*) *Copper-spray Residues.*—A number of apple samples from the Appleby Research Orchard was analysed for copper at the request of the Plant Diseases Division. The analyses suggest that the skin of Sturmer holds copper much more tenaciously than that of Dunn's, and that there is slight penetration of copper into the flesh of both varieties.

(*d*) *Vitamin C in Apples.*—Further work has been done on the vitamin C content of cool-stored apples. Samples of seven varieties, taken from several orchards on more than one type of soil, were cool stored within a few hours of picking, with control samples taken for immediate determination of vitamin C content of whole fruit, skin, and flesh, and of acidity of expressed juice. In general the vitamin content of the flesh decreased more rapidly during storage than that of the skin. Sturmer again showed the highest value (29 mg. per 100 g. whole fresh fruit) and maintained its potency very well in storage, falling only to 27 mg. per 100 g. after six months. With Cox's Orange Pippin, Jonathan, Granny Smith, Delicious, Statesman, and Red Statesman there was both a more rapid and a greater percentage loss. The acidity, irrespective of its original level, fell to two-thirds to one-half of the initial value during commercial storage.

(*e*) *Die-back of Apple-trees.*—The fungi associated with die-back in apple-trees have been studied in the Annesbrook Orchard, Wakatu, and in six orchards at Tasman and Mahana. The trouble is generally found in mature trees over thirty years of age, and in most cases is associated with poor root development or with severance of roots during cultivation. It is most serious on the thin Moutere Hills soils, but isolated cases have been noted in orchards with moderately deep soil of satisfactory fertility.

Many fungi can be isolated from trees killed by die-back, but six are of common occurrence—viz., *Valsa leucostoma*, *Diplodia* sp., and *Physalospora obtusa* on the upper branches, and *Polystictus versicolor* (heart-rot), *Stereum purpureum* (silver-leaf), and *Physalospora* sp. (black-rot) on main limbs and trunk. The latter group is thought to be of greater significance than the former. The evidence suggests that soil factors and mechanical injury to trees are the primary agents, and that *Stereum* and *Polystictus* then make rapid headway, finally causing death of the trees.

(*f*) *Control of Black-spot.*—Dead leaves under Glou Morceau pear and Dougherty apple trees were given an Elgetol spray in early spring just prior to spore discharge. Test and control trees subsequently received the usual fungicidal sprays. Observations made in mid-October and early November showed that control trees were infected earlier and rather more severely than trees with the Elgetol ground-spray.

(*g*) *Insect Pests.*—A field survey of the codling-moth parasites that were imported from Canada and bred at the Cawthron Institute has indicated that they are not yet sufficiently established to effect any control of the pest.

Observations on woolly aphis show that in certain cases the parasite, *Aphelinus mali*, fails temporarily to give effective control. Aphis has now extended its host range to another plant.

Possibly owing to the very dry summer, maturing apples in parts of the Moutere Hills were damaged to a small extent by the ovipositing of cicadas.