

New hybrid hops have been raised from seed and transferred to the Station. A collection of hop varieties and types drawn from all parts of the Nelson district has been established, and lines of two varieties showing considerable resistance to root-rot have been put out for propagation.

New varieties from Wye College and others from Tasmania have been maintained in quarantine in the North Island.

Following a small preliminary aerial survey, the R.N.Z.A.F. photographed a much larger area of hop-gardens in the areas affected by disease. The mosaic maps will be of inestimable value to ground surveys and field experiments, as well as forming a valuable record of the present status of disease in commercial gardens.

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A disease survey in forty-eight gardens distributed throughout the Waimea County has confirmed that the most prevalent disease is black root-rot (*Phytophthora* sp.) and that its intensity varies considerably on different soils. Wai-iti, Wakefield, and parts of the Upper Moutere Valley appear relatively free. During the survey an unidentified rot of the crown of the hop-plant was noted in several gardens, and this is now being studied to determine its nature and control. Symptoms suggestive of virus disease, especially nettlehead, have been found in four gardens in the Wai-iti Valley and in one in Riwaka, but no symptoms of downy-mildew or of verticillium-wilt have been observed.

Soil treatments for possible control of root-rot, using chloropierin and DD, have been extended, and calcium cyanamide has been added to the chemicals under test. The portion of the trial that is in its second season shows hop growth to be best on DD plots, with chloropierin plots intermediate, and untreated plots poorest. With first-year plants the best growth is on DD and calcium cyanamide plots in the majority of cases.

Massive doses of sulphate of potash (2 tons per acre) are being tried in seven gardens on different soils to see if the treatment will increase the resistance of the plants to root-rot.

Ten chemicals have been tested this year for any injuriousness to hop crowns when exposed for pruning in the spring, but no damage has been observed. Bordeaux mixture seems the only specific that has depressed the subsequent growth below that of the untreated plants.

Hop cuttings of five varieties have been tested for susceptibility to *Phytophthora* by planting in infected soil, after hand inoculation. The results are in line with growers' experience that the Fuggle variety is resistant, while Californian and Grape varieties are susceptible.

It has been determined that the *Phytophthora* organism grows well in soils varying from acid to nearly neutral reaction (pH 4.75 to 6.4). Maximum growth is between pH 6.0 and 6.4—the values that might be expected in soils which best suit the growth of hops.

Over one hundred soil samples, taken from at least one garden of every grower in the Nelson district, have been collected for chemical analysis. Determinations so far made indicate a generally low potash status. There is a wide variation in pH, with some gardens clearly needing lime treatment and others so heavily limed that there may be danger of induced mineral-deficiency disorders.