

(b) Turnip-mosaic: The list of susceptible hosts has been extended to include white mustard, wild turnip, hedge-mustard, narrow-leaved cress, shepherd's purse, and *Sisymbrium altissimum*. Several other cruciferous weeds are at present under test.

(c) Club-root and Dry-rot: Work on these diseases has been confined to field tests, partly on a local experimental area and partly in Southland, in co-operation with the Fields Division of the Department of Agriculture, to ascertain the relative powers of resistance of some seventy varieties and strains of swedes. The results confirm previous work in showing the outstanding qualities of the variety Wilhelmsburger in resistance to club-root disease as measured by weight of crop on infected land. No evidence was obtained pointing to varietal resistance to dry-rot disease.

(d) Brown-heart: Numerous field trials of the boron treatment for this disease showed the efficacy of the method in controlling the condition but that severe germination injury may take place if wrongly applied. The information gained has been very useful in planning the coming year's experiments on methods of application in practice.

Potato-diseases.—Masked Virus: The potato variety Iron Duke has been shown to be susceptible to this disease. It causes the typical severe streak symptoms on leaves and stem and also causes internal discoloration of the tubers.

The disease may be transmitted to tobacco, where it causes very severe symptoms—stunting of plant, mottling, and necrosis of leaves. It may also be transferred to tomatoes, on which it causes a mild mosaic mottling with very slight stunting.

Tomato-diseases.—(a) Spotted-wilt: Dahlias, chrysanthemums, zinnias, asters, Cape gooseberry, *Nicotiana rustica*, delphiniums, anemones, and cinerarias have been added to the list of hosts susceptible to this disease in New Zealand.

(b) Leaf-mould: Three years' experiments on the control of tomato leaf-moulds in the glasshouse (Hutt Valley) carried out in conjunction with Messrs. Dallas and Taylor, of the Horticulture Division of the Department of Agriculture, and Mr. Brien, of this Division, have been completed. The trials have shown that of the materials tested Shirilan AG gave the best results.

(c) Late Blight: Spray trials for the control of late blight have been carried out, but results are not yet to hand.

(d) Stem-disease: A tomato stem-disease widespread this season is being investigated.

Tobacco-diseases.—Mosaic: Experiments have shown that the disease may carry over from one season to the next in the seedling bed. In boxes exposed to the weather the virus remained viable for three months and a half. It has been shown that when mosaic-infected plants are replaced by healthy plants a high percentage of replants become infected—80 per cent. in trials carried out in the field.

Passion-fruit Diseases.—(a) Bacterial Diseases: The causal organism has been isolated and pathogenicity proved.

(b) Brown-spot: Investigations have been carried out, including isolations from Keri Keri specimens, and inoculation tests with the various fungi obtained. A species of *Alternaria* consistently isolated from brown-spot lesions has been found to be pathogenic, producing typical lesions on fruit and leaves.

Cucumber-diseases.—Mosaic: The host range of this disease has been extended to include tobacco, tomatoes (so-called "narrow-leaf"), blue lupins, *Lupinus mutabilis*, *L. Leuteus*, and violas, as well as pumpkins, spinach, marrows, and melons. Field experiments are being carried out to determine the effect of this disease on the yield of tomatoes and also of cucumbers, marrows, &c.

It has been shown that the disease may be transmitted by *Aphis gossypii* and *Myzus persicae*, and also through the seed of vegetable marrows.

Damping-off Diseases of Seedlings.—(a) Tomatoes: Further experiments have been carried out on the control of tomato seedling damping-off, by the use of seed-dust therapeutants. Ceresan, copper carbonate, and Agrosan dusts gave satisfactory results. Results in publication form are at present in the hands of the printer.

(b) Vegetables: Field trials have been carried out on the control of damping-off of cucumbers, spinach, and lettuce by the use of seed dusts.

CERTIFICATION OF THERAPEUTANTS.

Papers have now been prepared for this purpose, and the scheme will be made operative early in December. Owing to the lateness of the season it will be possible to certify this year only those orchard sprays which previous tests of the past three seasons have proved satisfactory.

SOIL BIOLOGY.

Continuous work has been in progress on the biological analysis of soils, more particularly in regard to the fungi. In one series of experiments a distinct apparent correlation was obtained between the relative abundance of certain mould fungi and vigour of grass and clover as affected by different fertilizers. The probable error of the replication in those experiments was too high for reliability and further work has been necessary, directed towards improvement in technique.

INDUSTRIAL MYCOLOGY.

Discoloration of house paint has been traced to two fungi—*Dematium nigrum* and *Cladosporium hebarum*. Laboratory experiments have shown the possibility of preventing the growth of these fungi by the addition of Shirilan paste to the paint. One large firm of paint manufacturers is now testing the method on a practical basis.