

Black Currant Big-bud Mite (Phytoptus ribis).—One of the most destructive pests of currants and gooseberries in England, this disease has recently been isolated from currants at Greytown.

Ring-spot of Carnations (Heterosporium echinulatum).—Isolated from carnations grown in a few private gardens in Auckland City. A highly destructive disease if left unchecked.

All these diseases have been introduced with plants or seeds from overseas.

Brassica Diseases.

Diamond-back Moth (Plutella maculipennis).—Work of the previous season has been continued, tests in control being made with nicotine sulphate, lead-arsenate, and calcium-arsenate sprays, and mixtures of rotenone-bearing dusts.

When applied at intervals of fourteen days, nicotine sulphate, even at the high concentration of 1-200, gave inadequate control. Both arsenates at a dosage of 4 lb. per 100 gallons of water, with a wetting agent, proved inferior to nicotine sulphate.

Weekly applications of nicotine sulphate 1-200 gave good control, but at lower concentrations proved unsatisfactory. Both arsenates at a dosage of 3 lb. in 100 gallons of water proved to be practically worthless.

Rotenone-bearing dusts were employed with rotenone contents of 0.25 per cent. and 0.5 per cent. All were applied at a dosage per acre of 25 lb. and 50 lb. Six applications at ten-day intervals of 0.75 per cent. and 1.0 per cent. rotenone dusts were required to give adequate control.

Diseases of Grasses.

Blind-seed Disease of Rye-grass (Helolium sp.).—The fungus which causes the disease does not perennate within the vegetative tissues of the plant, and slime-conidia, after drying, lose their power of germination within one month.

Infection of the new seed crop must therefore be entirely from ascospores produced by blind seeds shed or sown in the previous autumn.

The disease has been found on tall fescue (*Festuca arundinacea*) and meadow fescue (*F. elatior*). Attempts to procure apothecia in pure culture have not been successful.

Endophyte of Perennial Rye-grass.—Microspores have been secured in pure culture which morphologically resemble those of the blind seed fungus and *Endoconidium temulentum*, isolated from darnel in France by Delacroix and Prilleux. No other spore stages have been produced in culture, so the identity of the fungus is still obscure.

Endophyte of Tall Fescue and Meadow Fescue.—Both have been found to be permeated with a seed-borne endophyte very similar in appearance to the fungus of perennial rye-grass. A survey made with the co-operation of the Fields Division of the Department of Agriculture has shown that plants of tall fescue in all parts of the Dominion—save one or two localities in Otago and Southland—are invariably infected, but no outward sign of the fungus has been detected. The organism has been cultured from seeds and stems and has shown a conidial stage identical with that of *Epichloe typhina*, though the conspicuous fructifications of the latter have not been observed in New Zealand.

Ergot (Claviceps purpurea).—Experiments on production of ergot from rye on a commercial scale have been undertaken with promising results. It was found that strains which infect tall fescue, rye-grass, and ten other common grasses did not attack rye. A strain isolated from commercial ergot of Hungarian origin—probably from rye—was found to give heavy infection when a suspension of conidia was sprayed on rye blossoms.

Using this strain on small field plots one spray yielded 115 lb. per acre, two sprays 140 lb., and three sprays 176 lb. of air-dried ergot.

Unfortunately, a sample analysed by the Dominion Analyst proved to be entirely lacking in alkaloids, and hence valueless. Until it is ascertained whether this unexpected result has been caused by locality, season, strain of the fungus, or variety of rye it would be unwise to encourage commercial ergot-production. Experiments to this end will be undertaken.

Potato Diseases.

Virus of Dakota Potatoes.—Inarching tests made in the glasshouse with healthy Up-to-Date and President potatoes yielded a combination of a mild mosaic and a necrotic virus. The former appeared in Dakota plants, while the other varieties showed necrotic markings on stem and leaf, plants eventually dying. Tubers from artificially-infected plants showed necrotic areas both on the exterior and in the flesh. Symptoms do not correspond with any recorded solanum virus.

Legume Diseases.

Bacterial-wilt (Bacillus medicaginis).—Twenty-nine varieties of dwarf and runner beans (including resistant varieties from Germany, Holland, England, America, and Australia) were sown for studies of resistance to this disease. Although some lines of Canadian Wonder were heavily infected, wilt did not develop in any variety. Owing to this negative result the experiment will be repeated.

Pea-mosaic.—Several crosses of the pea varieties Greenfeast × Yorkshire Hero × William Massey, forwarded by the Agronomy Division, were tested for resistance to pea-mosaic in the glasshouse. Seeds from apparently resistant plants were then selected and grown in the field, and from these in turn were made selections of Greenfeast type showing apparent immunity.

Lucerne Nodule Organism.—Cultures sufficient to inoculate 149,460 lb. of lucerne-seed were distributed to 1,620 farmers. This shows an increase of 2,240 lb. over that of the same period for last season.