Under the supervision of the Division, an *Oxycanus*-infested area of 12 acres on the Nelson Aerodrome was treated by the Public Works Department, with satisfactory results. The bait in this case was applied with a tractor-drawn Simpson manure-distributor which gave fairly satisfactory results, though it was slow and not capable of fine adjustment to the rate of feed.

A poison-bait distributor of American design has been ordered. This will be available to make application of the bait on larger areas this coming season.

Introduction of Parasites.—Through the aid of the Belleville Parasite Laboratory in Canada, parasites of the codling-moth (a shipment of which is now on its way to the Dominion) and of the wheat-weevil (which it is hoped will be ultimately secured from the Argentine) are being secured or searched for on behalf of the Division.

GRASSLANDS DIVISION, PALMERSTON NORTH.

Director: Mr. E. Bruce Levy.

Plant Breeding and Strain Ecology.

During the past year new increase areas of perennial, short rotation, Italian rye-grass, broad and Montgomery red clovers, and type 1 and type 2 white clover were planted out. Harvesting conditions were extremely adverse and yields in all cases were low. Breeding-work on Italian rye, short rotation, and broad red clover is continuing and crosses and selfings of selected types made. Selected plants of timothy were isolated in the glasshouse for a mass selection. A mass selection of promising types of cocksfoot is also proposed.

Blind-seed Diseases.—Inoculation technique has been improved further and is now very satisfactory. Resistant plants from previous trials were again inoculated and in the main continued to exhibit resistance.

Strain Testing.—Three thousand plots and rows for certification purposes have been established and reports prepared. Field investigations on the value of improved strains have been undertaken in co-operation with the Department of Agriculture.

Substation, Lincoln.—Useful information continues to be derived from this station to confirm observations made on breeding-material at Palmerston North.

Five acres of nucleus stock Italian and 2 acres of short rotation rye-grass were grown and harvested for seed by the Agronomy Division.

Field Ecology.

Sheep-nutrition Area run in conjunction with Massey College.—A feature of the experiment is the excellent performance of the pedigree strains and also the good results obtained from low manuring with the small paddock control and continual rotational grazing. Under this intensive system there seems to be no great advantage to date of applying very high quantities of artificial fertilizer.

Digestibility Trials with Sheep.—Work on this project has been cut down this year to the determination of the digestibilities of last season's experimental silage to this year's experimental silage material, and to lupins under trial for the Agronomy Division.

Sheep-grazing Trial to measure Effect of Dung and Urine on Pasture Growth.—This trail has continued. The high differences recorded last year tended to level out, due to the presence of a good white clover in all plots.

It can be concluded that the value of a good clover well fertilized is great in itself, even though the nitrogen excreted into the soil is much slower to show its effect upon the grass than that which passes through the animal.

The trial has demonstrated and given opportunity for measurement of the well-publicized cycle of pasture growth. The trial has, however, brought out a very important phase of the cycle—*i.e.*, the great value of the animal to the pasture in its young stage.

Ensilage.—Last year's programme of work has been completed and sent forward for publication. Features of the work are (*a*) the very high losses in nutrients that occur in unroofed but weighted stacks and pits, as compared with roofed but weighted stacks and pits; (*b*) the direct relationship of the value of the silage to that of the ensiled material.

Due to all the experimental work to date being carried out on small-scale pits, this year's programme consists of checking the losses on one type of material in pits and stacks varying from the smallest practical size to the large commercial proposition. The following series was laid down: (*a*) 1-ton silos roofed and unroofed; (*b*) 3-ton silos roofed and unroofed; (*c*) 25-ton pits roofed and unroofed; (*d*) 50-ton stacks roofed and unroofed; (*e*) 2-ton pits variable pasture covered.

All treatments were made with the same material and were well consolidated. On the very small silos gases and juices were collected and losses recorded periodically by moving the silos *en bloc* on to a weighbridge. Temperatures were recorded electrically at different depths.

Simple v. *Complex Mixtures.*—The project reported in last year's report has been laid down, and paddocks are now fenced and yards and sheds erected. Some striking differences are already apparent in the results from the different species and strains. To date the best all-round performance has been recorded on the fully utilized simple mixture of rye-grass and white clover, while the low productivity in their early stages of dogstail, cocksfoot, timothy, fog, and Phalaris is well marked.

The complex mixtures of several species have not to date shown a very great advantage over the simple mixture of pedigree strains in so far as spread of and total production of herbage and meat is concerned. It is also again apparent that simplicity or complexity of pasture swards do not depend so much on the seeds mixture as upon the management the pasture receives on the particular soil type.

Facial Eczema.—Due to staff shortage and restriction on travelling, this project has been confined to the growing and collection of grass suitable for the plant chemists of the bureau, and to the dissection of samples submitted for botanical examination. Collaboration has been maintained in the main field experiments of the Animal Research Division of the Department of Agriculture.

Aerodrome-turf Production.

During the year the activities of three members of the staff have been confined almost exclusively to aerodrome-turf work both in an experimental and in an advisory capacity. The production of tough, hard-wearing, fibrous turf is essential for aerodromes, and the research work carried out in the past