

About one-half of this seed has been planted, the lack of ground at the College area preventing the planting of the balance.

Growth measurements of leaves have been recorded for sixteen months now in the varieties Ngaro and 156. Detailed analysis of these records is being postponed until the first-measured leaves die in the next six or eight months.

SOIL SURVEY OF PHORMIUM AREAS.

In September a period of ten days was spent with Mr. N. H. Taylor and Dr. J. K. Dixon, of the Soil Survey Division, in soil examinations of phormium areas in several districts.

Although no comprehensive examination of the problem could be made in so short a period, most interesting results were obtained. In general it might be said that the best phormium areas have a high soil fertility and a low-water table. The general relationship of high-water table to unthriftiness in phormium has long been realized by many growers, and more precise information on this aspect is urgently needed.

ENTOMOLOGICAL WORK.

Miss G. E. Wall has continued to carry on her investigation of phormium pests, paying particular attention to the leaf-eaters *Melanchra steropastis* and *Xanthorhoe praelectata*. Work on these species at the College has been limited on account of their very scanty occurrence in our area. This applies especially to *Xanthorhoe*. This may be taken as an indication that in well-tended phormium plantations the conditions are not satisfactory for the multiplication of these insects. Miss Wall's own account of her work is as follows:—

“During the past year the life-history study of *Melanchra steropastis* has been continued and a written account of this, together with a written account of the anatomy of *Opogona omoscopa*, was forwarded to the Department. Following the observation of the grass-eating habit of the larvæ of *M. steropastis*, a series of experiments was carried out in the field to note the effects of cultivation on the prevalence and general activity of the pests. An area containing about twenty-four one-year-old flax was completely freed from grass. These plants were then infested at intervals with a total of 450 first instar larvæ. Throughout the period of observation no larvæ were found on the plants after the day of infestation and there was no subsequent injury to the plants through insect attack.

“As a control experiment three flax-plants growing among grass were chosen. These plants were carefully examined and all stages of *Melanchra* present were removed. At a distance of 3 ft. from the base of each plant an area 2 ft. wide was dug, thus removing a circular band of grass and isolating each plant. These were then infested each with 200 first instar larvæ. During the following weeks the larvæ were observed feeding on the surrounding grass. The first attack on the flax itself was made four weeks after the date of infestation. From that time the larvæ migrated from the grass to the flax and continued to feed upon the latter. These experiments and later observations have proved that grass or some plant other than flax is essential to the earlier stages of *M. steropastis*. Satisfactory control of this pest would most probably be obtained if the grass could be replaced by a cover-crop during the two main breeding-seasons of each year. Experiments are now being carried out to discover which plants, other than grass, provide suitable food for the young larvæ of *M. steropastis*.

“During the summer the scale insect *Leucaspis stricta* became a pest of the flax, especially of variety No. 56. Control was attempted by means of spraying. Black Leaf 40 was used, but proved unsuccessful, and later Red Oil was used, effecting good control. Further work is necessary before it will be possible to say what strength of spray it is most economical to use and also whether one concentrated or two consecutive weaker sprayings gives the higher control.

“Only a very small percentage of the plants growing in the nursery suffered from yellow leaf during the summer. Attempts were made to transmit this disease to healthy plants by injecting into them the sap extracted from diseased plants. Infection was attempted both by rubbing and by the use of a hypodermic syringe, but the results were negative in every case.”

We have again to thank all flaxmillers and others who have helped the work during the past year.

MINERAL CONTENT OF PASTURES.

TENTH ANNUAL REPORT ON MINERAL CONTENT OF PASTURES INVESTIGATION AT THE CAWTHRON INSTITUTE, NELSON.

COBALT INVESTIGATIONS AT THE CAWTHRON INSTITUTE, PERIOD 1937–38.

Sir THEODORE RIGG, Officer in Charge.

INTRODUCTION.

During the past year animal experiments in connection with the use of cobalt salts for the control of stock ailment at Glenhope, Nelson, and Morton Mains, Southland, have been continued. In addition, similar work has been initiated at Westport, where calves grazing pastures established on pakihī land have suffered from a wasting ailment resembling bush sickness.

In the chemical laboratory much time has been spent in studying the cobalt status of typical pastures in the Nelson district and in determining the effect of various cobalt top-dressings on the cobalt content of the pasture.

A start has been made with the collection and examination of pasture samples from different localities in the South Island, where a somewhat low cobalt status of the soil suggested the possibility of pastures being deficient in cobalt.

Considerable time has been spent in investigating the preparation of cobaltized fertilizers and in carrying out in co-operation with fertilizer firms semi-commercial tests for the manufacture of cobaltized superphosphate.