

Magnum Bonum variety failed to make a satisfactory braird. Imperial Green Globe turnips were then sown, but these failed to strike. The other seven plots made a good growth, but after thinning was completed the common cutworm did considerable damage.

Poerua: This area was sown in permanent pasture, and no further experiments will be carried out.

Westport: The Westport grassing-area of 2 acres was sown in two grass mixtures of half an acre each, and one acre in ten individual grasses. The grass mixtures have done excellently, but the individual grass plots suffered from a strong growth of weeds, principally spurrey and redshank. The area at Sergeant's Hill was abandoned, and the fencing-material removed and used for the Westport grassing-area.

Murchison: The fernland grassing-area at Murchison has been well stocked with sheep during the season, and at present is closely fed down. Sheep show a decided liking for the No. 4 plot, in which *Poa pratensis* is the dominating grass.

Drainage of bush-terrace land: Drainage by explosives was tried on this class of land by driving a bar down to depths of from 5 ft. to 8 ft. and then putting in a strong charge of explosive, but results were not effectual. Shafts were sunk to a depth of 9 ft. and 11 ft., and good drainage was obtained in this way.

GENERAL.

The economic investigation of the montane tussock-grassland conducted by Dr. L. Cockayne, F.R.S., as outlined in last year's report, has been continued during the period under review. Many data of a valuable nature have been obtained and the most important features published in the *Journal*.

During the year the matter of an experimental farm for the West Coast District of the South Island was definitely advanced by the purchase of an area of 150 acres near Waimaunga Railway-station, Grey Valley. Measures to develop the area are now being put in hand.

CHEMISTRY SECTION.

REPORT OF THE CHEMIST.

The Director-General.

Wellington, 17th June, 1920.

I FORWARD herewith the annual report of the Chemistry Section for the year ended 31st March, 1920.

B. C. ASTON, F.I.C., F.N.Z.Inst., Chemist.

INTRODUCTORY.

During the year there has been an increase in the amount of work done in the Chemical Laboratory. As a temporary measure since 20th October, 1919, the supervision and administration of the fields instruction work, in collaboration with the Director-General, has been added to the Chemist's personal duties. He has also been responsible for the work of the departmental library during the year under review.

SOILS.

The general work of soil-investigation has been continued as time and staff permitted. Samples of soils from different parts of the Dominion have been collected from time to time, and the investigation of these samples has gone on continuously during the period; 156 soils were collected (for analysis) by the Chemist and staff, and 214 were collected (for lime-requirement tests) by field officers.

In June of last year it was decided, in view of the great value of lime as an improver of New Zealand soils, that steps should be taken to bring home to farmers the necessity for liberally liming their lands in order to obtain the best results. The Fields Instructors and their staff were therefore notified to collect typical samples of soil from their districts, and to select the samples in such a way that the tests would result in the greatest good to the greatest number of farmers. They were instructed to collect few samples of a representative character rather than a large number of samples which might represent only limited areas. The results of this work, so far as it has gone, are being published in the *Journal*.

Early in May, 1919, the Chemist visited the Te Teko district, the Mamaku Experimental Farm, and the Ruakura Farm of Instruction, and in the course of the trip took a number of samples. In February, 1920, he visited Dunedin and collected representative Otago Peninsula soils for analysis and study. The Canterbury lucerne areas were also sampled.

Articles on the soils of Nelson and Marlborough were published in the August and October, 1919, issues of the *Journal*. The results were most instructive, and indicated the need for further research on the soils of these districts. Mr. Rigg, the agricultural chemist to the Cawthron Institute (and late assistant in this laboratory), is now engaged in making a soil survey of Nelson.

An article embodying the first part of the Manawatu soils investigation, and dealing with the dune areas of the west coast of this Island, has been published in the *Journal*. The comparative richness of the dune lands in mineral plant-food is there made public. A report on the encroachment of sand-dunes at Kawhia was made to the Director-General in June, 1919. The importance of adopting a progressive policy in utilizing the dune areas of New Zealand has been pointed out not only in order to make waste lands productive, but also to fix sand-dune areas and prevent their destructive action on adjoining good land—an action which is taking place in many localities in the Dominion.

At the request of Mr. F. W. Fulkert, Assistant Engineer-in-Chief, Public Works Department, the composition of the Canterbury scrub lands has been again investigated. Some previous results of