

Gorse.—*Apion ulicis* was liberated in the field early in 1931, and during the present year further extensive liberations have been made in Otago and at Nelson. Examination of the area in Otago, where the weevil was first liberated, showed that infestation of the gorse-pods had taken place.

Ragwort.—During the past season a total of 957,300 *Tyria* eggs were distributed throughout the Dominion. No further consignments of this insect will be imported, since there are now sufficient supplies available in the Dominion. The insect is well established at several points, where it is having a decided influence upon the ragwort. By itself, however, it is unable to cope with the weed, and to overcome this difficulty a seed-infesting fly has been imported, and is now being studied and reared.

Piripiri.—The pre-pupae of *Antholcus varinervis* imported from Chile during 1930 developed to pupae, and gave an excellent supply of adults. The latter readily oviposited in the foliage of New Zealand *Acaena* (piripiri), and from these eggs a good supply of larvae was secured and reared to the prepupal stage. Early in 1932 a large consignment of pre-pupae was received from Chile and arrived in excellent condition. With the adults from this consignment and from the material reared last season, the researches will be continued this winter. There is every indication that *Antholcus* will prove an important check upon piripiri.

FLAX RESEARCH.

Progress during the period under review has consisted mainly of the normal development of the selection and hybridization scheme originally undertaken.

The "fans" planted for rootstock selection are in many cases now old enough for their fibre qualities to be judged, and it is evident that several strains of very high quality have been secured. The selection of strains resistant to yellow-leaf disease requires a longer period, since it is unsafe to base conclusions on the immunity of only three or four plants. Several otherwise good strains have already been shown as most susceptible to the disease. The number of varieties collected as "fans" has not increased greatly during the year, on account of the reduction in travelling.

Hybrids.—The first hybrid plants are now four years old. They are mostly the result of crosses between S.S. (resistant) and 13 K (less resistant). Most of these are now large bushes about 9 ft. or 10 ft. high, and some already have been culled out on account of susceptibility to disease. The more promising of these bushes have been broken into "fans" and set out in order to increase stocks and to test them further for disease resistance. Other hybrids, mainly between S.S. and Ngaro, to the number of about twenty thousand are being grown for selection of the best types.

Pedigree Seedlings.—The seedlings grown pod by pod for a study of inheritance and to develop pure lines have grown excellently. It is already apparent that while the seedlings, in general, breed true to the parent in habit of growth, yet there is great variation in leaf and fibre characters. Genetical study of pedigree seedlings and of hybrid seedlings has provided a great deal of interesting material concerning the inheritance of certain characters. It is not proposed to publish the results until they have been tested by further hybridization during next summer.

Several thousand two-year-old and three-year-old pedigree seedlings are being destroyed, since lack of money prevents their being set out in a plantation.

Yellow-leaf.—Since Mr. Meadows's appointment terminated, at the beginning of the year, no laboratory work on the cause of the disease has been possible. A considerable amount of observation has been carried out concerning the onset and progress of the disease. This has been facilitated by the considerable and not-unexpected spread of the disease in our main area. Selection and hybridization to secure resistant strains is still the main line of attack on this disease.

Manurial Trials.—These trials were set out largely in order to test the effect of fertilizers on yellow-leaf disease. In the main trial area careful examination shows that so far none of the dressings has any effect on the disease. The plots treated with blood-and-bone are showing the best growth on the College farm. On account of the curtailment of travelling, it has not been possible to keep under observation the manurial trials in other districts.

Growth of Leaves.—In August, 1931, there was taken in hand the careful measurement and recording of growth in leaves. This was carried out on some fifty plants of vegetatively propagated Ngaro, and provided some interesting results. The work required about two days in each week, and when economy made it necessary to dispense with our laboratory assistant in December the work could not be carried on. Growth in length of approximately 2 in. a day was recorded at times. Comparisons of leaf-growth between healthy and yellow-leaf-affected bushes gave especially significant results.

Fibre-testing.—Preliminary work has been carried out in an attempt to find the most accurate and rapid method for testing fibres without previously passing them through a stripper. It has been found that fibre hand-dressed from leaves in the Maori fashion does not give a true criterion of the strength of the total fibre of the leaf. The search for an accurate testing method is being continued.

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