

of trials with "pelleted" seed is under examination. Results to date have not been very promising, but improved types of pellet are being developed at the Rukuhia Soil Research Station and these may prove more satisfactory.

Trials on Tussock and Depleted Country.—The improvement of the tussock and depleted country must follow the control of rabbits, of burning, and of grazing. Until this is accomplished the chances of successfully introducing species by seeding are very small. Several trials involving studies of natural tussock regeneration following shutting up from grazing are in progress in the Cass district, where a series of plant-introduction plots has also been established. In the Central Otago depleted country work on species introduction is being continued at the Pisa Experimental Area, and an area has been secured for large-scale plant introduction trials on the hills bordering Hawea Flat. Several species have been successfully established at Pisa. They include *danthonia*, *Poa pratensis*, *Phalaris tuberosa*, tall oatgrass, tall fescue, sheep's burnet, yarrow, the grasses *Brachypodium phaeocoides* and *Agropyron scabrum*, and lucerne.

(3) Annual Crops

Wheat.—The field testing of crosses bred by the Wheat Research Institute continues to be an important link in the improvement of wheat varieties. Testing of the yielding ability and agronomic features of these crosses in co-operative trials on farms has given reliable information concerning the probable commercial merits of new varieties. A comprehensive series of wheat-manuring trials has been completed. These showed that wheat soils in general have sufficient available potash for wheat and that land of high natural fertility and which has been generously dressed with phosphatic fertilizers before the wheat crop did not give responses to phosphate applied with the wheat. Nevertheless, on heavily cropped land or on medium to light wheat land some response to phosphates might be expected. Significant responses to nitrogenous fertilizers top-dressed on the growing crop in the spring were secured in a large number of trials. More evidence is needed, however, of the conditions under which such responses to nitrogen might be expected. The survey of factors affecting the yield of wheat crops in the Christchurch and Ashburton districts, which has been in progress for the past five years, has shown the importance of previous cropping history. Trial results require re-analysis on this basis and future work will be planned to study more carefully the inter-action between rotational history of the trial area and the responses to fertilizers.

Oats.—Work with oat varieties has not progressed very far, as none of the new crosses developed by the Crop Research Division, Department of Scientific and Industrial Research, has given very promising results in field trials. The primary aim is a high-quality milling oat of good yielding ability and showing resistance to lodging. The testing of new varieties from overseas against standard local varieties appears likely to continue as the main type of trial with oats.

Barley.—Some new introductions, particularly the Danish stiff-strawed variety Kenia, have compared more than favourably with local varieties in field experiments for yielding ability, resistance to lodging, and suitability for harvesting with the header harvester. Barley varieties which have been standard types in New Zealand for many years are rapidly losing ground to new introductions, and in Canterbury particularly to Research, an Australian variety. Research has performed well in trials, but the lines available in New Zealand have not been favoured by maltsters due to their mixed nature in respect of times of maturity. The Crop Research Division, Department of Scientific and Industrial Research, has made a number of selections from Research which mature at different times, but each is even in this respect within the selection, and these are being tested in field trials this year.

Linen Flax.—The experimental work with this crop has declined as has the importance of the crop in New Zealand. Some promising rust-resistant varieties of Russian origin are being tested in field trials.