

A pedigree leafy cocksfoot and a pedigree leafy timothy have been added to the grasses, and both these will find a ready place in short- and long-rotation pastures.

Short-rotation rye-grass is already filling a long-felt want, and glowing reports of its performance in the field are coming to hand. The factor of persistency is still receiving attention, and whereas the first selections were somewhat lacking in persistency under very hard environmental conditions, this deficiency is being remedied in the latest selection now being increased.

Pedigree Broad Red clover, pedigree Montgomery Red clover, and pedigree White clover, are readily finding a place in temporary, short-rotation, long-rotation, and permanent pastures. The trade in pedigree seeds continues to expand, and these must soon have a very great influence on production and are bound to encourage a plough-up and resow policy as soon as normal conditions return to the farm.

Blind-seed Disease.—Breeding for resistance to blind-seed disease in the rye-grass family has been continued, and for this work the new Gore Substation will be of very great value. One thousand single plants containing all rye-grass types and the parental material of all bred plants were put out at Gore, and those which seeded last summer have been separately harvested and threshed. Germination tests are being made, and it is hoped, by handling large numbers of plants in open-air conditions in a climate that is particularly favourable to the development of the disease, that some resistant plants will be isolated to serve as nucleus material for the building-up of a resistant strain. At present blind-seed disease threatens to ruin the rye-grass-seed trade in many parts of New Zealand, and evidence during the past three to four years appears to indicate that the disease is spreading into districts that could normally be relied on to produce high-germinating seed.

Testing of Selected Types.—A feature of the plant-breeding programme is the testing under broadcast pasture-sward condition of promising types that may ultimately form improved strains or become incorporated into the standard pedigree line of seed.

The broadcast sward is also used to check up on the behaviour and production of nucleus lots of seed before these actually go forward to the seed-increase stage. One-tenth-acre areas are sown, and these are regularly grazed by sheep, measurement of production being made simultaneously by frame enclosures. These tests are being conducted at Palmerston North, Lincoln, and Gore, and it is later hoped to establish substations in other climatic zones in New Zealand.

During the year plots of Western Wolthys rye-grass, Italian rye-grass, Short-rotation rye-grass, perennial rye-grass, and mixtures of the two latter have been laid down. Similarly, types of cocksfoot, timothy, and red clovers have been established for comparative measurement work under broadcast and grazed conditions.

This autumn a series of short-rotation pastures were laid down at Palmerston North and at Lincoln, and a spring sowing of these will be made at Gore. In this later series the new Long-rotation rye-grass is included.

The trials of the rye-grass hybrid types that make up the blend for the Long-rotation rye-grass have done very well at Palmerston North and at Lincoln over the last two years. It is anticipated that this strain is destined to play a very useful role throughout both the North and South Islands.

A further development is the testing of bred pedigree seeds for the possible improvement of hill country grasslands. Some 15 acres have been differentially sown to incorporate bred strains as single dominants within the mixture.

STRAIN ECOLOGY

The study of pedigree seeds and their behaviour under many conditions of soil, climate, and grazing management has been renewed in full collaboration with the Department of Agriculture. In this work this Division provides seed in weighed-out plot lots to officers of the Department of Agriculture, who make all arrangements to sow them out and report on progress. Periodical inspections are made by officers of this Division.