Pasture Survey.

Strain Testing and Certification.

The following numbers of lines have been sown and studied for certification and type test :—

Perennial rye-grass	616	Cocksfoot	220	Brown-top	345
White clover	427	Subterranean clover	67	Italian rye-grass	92
Phalaris tuberosa	27	Prairie-grass	21	Red clover	132

1. *Perennial Rye-grass.*—Plant Breeding, Selection, and Improvement: Approximately 10,180 single plants from control pollinations are now under study. Of this number, 3,480 plants have been raised from crosses made in the 1935–36 season. Crossing-work for the 1936–37 season has consisted of inter-family and back-crosses of F_1 plants selected from the progeny of the 1934–35 crossings. Some L_1 plants have been out-crossed. Each plant used in breeding and crossing-work has also been selfed. A total of 81 crosses has been made, and the seed from these has been harvested, threshed, and is now ready for sowing.

Pedigree Strain Selection: The increase area planted in 1934 has been harvested for the third year in succession. Seed from this area has sown down 32 acres, which have been harvested on a contract basis, and the pedigree seed from these areas is now widely distributed throughout New Zealand. Good reports of this line are coming to hand. A new glasshouse selection has been made and another increase area of $\frac{3}{4}$ acre has been planted out from the seed harvested in the glasshouse.

Single Plant Study: A selection of desirable plants has been made and 10,000 single plants which were raised for the purpose of providing suitable material for further work have been planted out.

Tiller-row studies of selected single plants are being continued. The plants selected from South Island uncertified low U.V.-light-testing lines are far below the standard of the plants found in the certified lines and so this material does not offer very satisfactory scope for the building up of a good strain from the South Island.

Low Germination of Perennial Rye-grass: The seed from the experimental areas at Winton and at Palmerston North has been harvested, and the seed is now ready for germination tests. Fungus infection has been heavy this year and it will be interesting to record the degree of infection which has occurred in each of the 300 lines of various origins which have been tested.

2. *Italian Rye-grass.*—Plant Breeding and Selection: From 8,600 single plants derived from inter-family groupings of 4 F_1 or L_1 plants 260 plants have been selected, and the crossings carried out from these have been as follows :—

Intra and inter-family crosses	110
Crossings of selfed plants	22

In addition, 46 original plants provided material for 30 crosses thus making a total of 162 for the season. Plants have been crossed in pairs only, and the selfing of these plants has also been a feature of the work.

Pedigree Strain Production: Fifteen selected plants were put out in the glasshouse, and the seed from these was harvested to provide sufficient material to plant out a $\frac{3}{4}$ acre block. This has been done and the increased area will be harvested in the 1937–38 season and will provide the first lot of pedigree Italian rye-stock seed.

3. *Cocksfoot and Brown-top.*—No work other than certification testing has been done with these species.

4. *Prairie-grass.*—Twenty different lines have been studied as plot rows and single plants. The New Zealand lines appear to be fairly uniform, and tests are now being made in connection with overseas material.

5. *Phalaris tuberosa and Phalaris Species.*—Twenty-seven lines have been under trial as plot rows and single plants. There are distinct strain differences to be noted in this trial. Seven lines were sown in the spring with a view to testing for certification *Phalaris tuberosa* free from *P. minor*.

6. *Timothy.*—Seventeen overseas strains have been compared with locally obtained samples.

7. *White Clover.*—(*a*) Plant Breeding and Selection: The 1934 block of plants has been retained, and the best 125 plants in the block have been put to further breeding tests. When their progeny have been studied final selections will be made from the 1934 block.

The 1935 block of 4,500 single plants is still under regular observation.

The 1936–37 season's crosses have consisted of—

Ten crosses to complete diallel crossings of the seven plants used in the 1936–37 glasshouse selection; and

Five crosses in which the experimental crossings of Type 1 × Type 5 (Kentish) have been carried to a second generation.

The 189 plants in tiller rows have been under constant study.

(*b*) Pedigree Strain Production: No nucleus stock seed has been distributed this year, but from the 58 acres sown down from previous distributions several thousand pounds of dressed seed have been harvested this year and will be distributed by the Department of Agriculture.

Some excellent reports have come to hand regarding the behaviour of the pedigree white clover under farming conditions.

A 1936–37 glasshouse selection has been made by the selection of seven plants, which are themselves exceptionally good plants and as the result of breeding tests are known to give good progeny when inter-crossed. The seed from this selection is being raised in boxes prior to planting out a $\frac{3}{4}$ acre increase block.

(*c*) Single Plant Studies: In order to build up a permanent strain of clover, less aggressive than our Type 1, plants are being selected from a block of 1,600 single plants raised from lines classified as being dominantly Type 2.