Staff.

Mr. Claridge is devoting all his time to potato-certification and Mr. Thomson to selection work. Both officers have rendered valuable and efficient service. The Fields Division officers have carried out their certification duties in a most efficient manner, and a great deal of credit is due to them for the accuracy of the large volume of work they have undertaken.

AGROSTOLOGY.

The year has been noteworthy for the evolution and consolidation of an organization that provides for research from its inception to ultimate extension by the Fields Extension Service of the Division. Roughly speaking, such an organization provides for—

(1) Critical study of the behaviour of the individual species or strains of these as single plants and in broadcast plots in pure sowings and in combinations under a management technique designed to test production, persistency, disease-resistance, establishment, effect of competition, &c.; the evolving by breeding and selection of elite strains and testing of these by an approved technique.

(2) After preliminary trial, and where differences in form and effect are shown to exist either in the commercial lines or in specially selected or bred-up lines, to provide for the testing of those types and practices throughout the country within differing habitat conditions (soil, climate, management.)

(3) Where constancy of behaviour characterizes a type and marks it superior to ordinary strains for a specific or general purpose, to provide for the reproduction and perpetuation of that type under certification scheme.

(4) To provide for co-ordinating and linking-up of all field research work with the Fields Extension Service, so that new ideas and facts automatically are absorbed and immediately become propaganda material.

Each of the above branches requires men specially trained for the service, and the agrostological unit is at the present moment in the happy position of being reasonably well served by an enthusiastic and competent staff.

The appointment of Mr. William Davies, M.Sc., as Plant Geneticist on loan from Aberystwyth enabled the preliminary critical trial work to be well started and efficiently carried out during the past year. The introduction of certification to rye-grass, brown-top, and white clover, with the possible extension in the coming year to include cocksfoot and red clover, working in close co-ordination with the Agrostologist and the Fields Extension Service, completes an organization that bids well to revolutionize the grassland swards of New Zealand and must ultimately have a big influence on the export seed trade of this country.

The research work of this section may be divided into two main branches: (1) Intensive critical research at the central Plant Research Station, (2) field research in co-ordination with the Fields Extension Service of the Division and other specialist officers of the Plant Research Station.

(1) *Work at the Central Research Station.*

This concerns itself largely up to the present with the strain trials in relation to grasses and clovers.

Perennial Rye-grass.—(*a*) Broadcast trials: Approximately 1,000 lines of rye-grass of commercial origin have been studied under broadcast conditions and under a triple system of utilization by mowing—(1) cutting by lawn-mower once a week, (2) cutting with a motor-mower at 6 in. to 10 in. stage, (3) cutting with motor-mower at flowering-stage. Persistency and recovery under these methods of cutting were carefully noted. Steps are now being taken to study further the lines that have shown high persistency and good recovery, and from these will be worked up forthwith elite strains. These, after definite field trials, will be handed over to the Agronomist for reproduction and perpetuation under certification scheme.

(*b*) Single-plant studies: From those broadcast plots showing eye-differences single plants were taken at random, 100 plants from each line. These were planted out at 2 ft. apart each way, and were critically examined from the following points of view: (1) Growth-form, (2) recovery after cutting, (3) persistency, (4) rust-resistance. Six thousand single plants in all were so studied. At the end of the first year's trial the first culling was made, and approximately 80 per cent. of the lot were rejected as not conforming to type. The 20 per cent. selected were nearly all drawn from the Hawke's Bay, Poverty Bay, and Sandon lines. These selected plants have been lifted and replanted, and single plants from the more persistent broadcast plots make the total of single plants now under study approximately 3,000.

(*c*) Nine hundred and eight additional broadcast plots were laid down this autumn. These are being subjected to the same triple-mowing scheme as outlined above.

(*d*) Rye-grass lots from various habitats and sources: Seed of 121 lots has been collected and sown in rows. From any outstanding lots of these single-plant studies will be made prior to working up sufficient seed for broadcast trials. Turfs of 140 lots have been collected and put out in rows for trial.

(*e*) Broadcast plots, sown spring, 1928: One hundred and four lines were sown. These have been regularly cut, and virtually all South Island and imported lines have practically disappeared. Hawke's Bay and Poverty Bay lines are now recovering well, with Sandon lines doing only fair. The rye-grass-strain work of 1929 can almost be regarded as ushering in a new epoch in the rye-grass-seed trade of New Zealand. The elimination of the poor types and perpetuation of the good types will have a far-reaching effect on the swards of the Dominion.

Cocksfoot.—(*a*) Broadcast trials: One hundred and seventeen lots laid down in the spring of 1928 have been regularly mown all the year and responses of the different types noted. Akaroa cocksfoot still maintains superiority over the Danish, both in total growth and persistency under weekly cutting.

(*b*) Row trials: One hundred and fifteen lots from various habitats and sources have been sown in rows. From these will be drawn material for single-plant study.