

Tillers of three selected plants were planted out for seed and the seed from these is now undergoing broadcast plot trial at Palmerston North. A small area for increase growing of each line has also been sown. This seed has been treated with Neill's hot-water treatment.

A small crop of seed—approximately three bushels of dressed seed—was harvested from a line of British indigenous seed supplied by Aberystwyth. One-half of this has been returned to Aberystwyth for further trial at that Station in comparison with the original mother seed supplied. The strain has not done well in New Zealand, and at any period was behind the certified New Zealand rye-grass strain in yield and was more susceptible to rust. This strain, however, was markedly superior to any other line of rye-grass from overseas, but it is definitely not up to the standard of the New Zealand certified strain.

COCKSFOOT.

Certification Trials.—One hundred and ninety lines of cocksfoot have been sown in connection with certification. The general uniformity of type within New Zealand lines is very marked, there being very few lines showing any marked superiority over the majority. A few lines contain traces of the Danish type of plant. No lines entered for certification have been rejected on account of being of the wrong type.

Broadcast Trials.—Danish cocksfoot is still markedly inferior to the New Zealand strain. Under field conditions the New Zealand type is more persistent and more productive than the Danish type. Four lines of cocksfoot, ranging from an extreme pasture type to a hay type, have been received from Aberystwyth. The extreme pasture type is making a good sward, but is low in production. The "dual-purpose" type, which is very similar to our New Zealand strain, appears to be the most suitable for New Zealand conditions. This "dual-purpose" type has been grown out at Flock House for seed, where it is doing very well under row and intercultivation conditions.

Single Plant Study.—More or less outstanding New Zealand lines, together with five selected lines from Aberystwyth, have been sown out in boxes for the purpose of putting out later as single plants for comparative study.

Elite-seed Production.—Two acres planted at Flock House, Bulls, from a pedigree line ex Aberystwyth were harvested and yielded a total crop of 325 lb. of machine-dressed seed. The crop was very uneven in ripening, and this, together with the comparative shy-seeding leafy nature of the strain, largely contributed to the low per-acre yield. One third of the crop, as per arrangement with the Director, Welsh Plant Breeding Station, will be shipped back to Aberystwyth. Broadcast field trials of this once-grown Aberystwyth line are being arranged for to better compare the type with New Zealand certified strain.

BROWN-TOP.

Certification.—Two hundred and fifty-one lines were sown in plots, the majority being in connection with certification. This year's certification trials have again demonstrated the purity of New Zealand brown-top, there being very few lines containing as much as a trace of red-top.

General.—Twenty-five lines of various *Agrostis* spp. have been received from abroad. These are being tested in plots for their lawn-forming properties. The dryland type of brown-top promises to be a useful lawn-grass in that it is more winter green than the true brown-top, and that it is making a close fine turf under mowing. The single-plant work indicates great possibilities of improvement by selection in New Zealand brown-top for the making of fine lawns.

YORKSHIRE FOG.

Single-plant Study.—Seasonal notes have been taken on these. Wide differences from plant to plant are still noticeable, but there are no marked differences from line to line. A fair percentage of the few-tillered, short-lived type is now beginning to die out.

TIMOTHY.

The trials of these on the light-soil type at the Station area continue to give unsatisfactory growth from timothy. No line or strain is outstanding.

WHITE CLOVER.

Certification Trials.—A total of 457 lines of white clover have been submitted for test, the majority of which are for certification purposes.

Single Plants.—Periodical notes have been taken on the original blocks of four thousand single plants which were put out in November, 1929. This year has seen the complete dying-out of most of the inferior types of plants. All the plants that now remain, and are yet of any economic importance, belong either to type 1 or else to type 2 group. Throughout the whole year the type 1 plants have shown marked superiority over all of the other types. A note taken at the end of the winter showed that there had been a relatively high percentage of deaths amongst the Kentish type of plants. Practically no type 1 plants had died, and the number of type 2 plants which had died was only half that of the Kentish. As a group the type 1 plants are outstanding both for persistency and for relatively high leaf-production at each period of the year.

During the year a new block of 2,640 single plants has been planted out. This is made up of fifty plants from each of forty-four lines (nineteen type 1 lines, nine type 2 lines, and sixteen lines for single-plant type test). The first-mentioned twenty-eight lines are to provide a greater number of good plants from which selection and breeding work can be carried out. These twenty-eight lines were chosen as being those which had performed the best in the broadcast trials sown in November, 1929.

Notes taken on these most recent plants tend to show that the amount of flowering in the seedling year is an indication of type, and it helps one to forecast the future performance as well as the persistency of individual plants. The plant that, at this stage, consists of nothing but flowering stems and is flowering profusely, after flowering is over, makes very little more leaf-growth and will probably die before the seedling year is complete, whereas the leafy persistent plant flowers very little in its first year.

Elite-strain Production.—A seed crop has been taken from the first selection planted out at Flock House during spring, 1930. Three separate selections have been made this year. One consisted of planting out blocks of 150 tillers from each of fourteen plants selected by eye from 4,400 single plants previously put out for this purpose. Two-thirds of each of these blocks has been sown with rye-grass and is being periodically mown, but the remaining third has been allowed to go to seed. The second of these selections consisted of 130 tillers of each of five different lots which were dug out of the five best plots in our broadcast trials. These tillers were planted out between spaced rye-grass plants and allowed to go to seed.

A third selection has been built up by planting out 100 tillers from each of the ten best type 1 plants in the single-plant trials which have now been in progress for two years and a half. A good seed crop has been harvested from each of these three selections and is available for plot and field trial next spring. A hand clover-huller has been constructed for the hulling of these selections.