

of the Fields Division. Over two hundred purity and germination tests on the bulk deliveries have been made and reported to the above officer, together with such commentary as might be deemed necessary in cases of deliveries below specification.

(c) The application of the examination under screened ultra-violet light of rye-grass seedlings to the official certification scheme was effected as from the start of this season's operations, thus replacing certain of the plot trials on certified lines hitherto carried out for every line by the Agrostologist. Up to the present, circumstances have permitted of the examination of only a portion of the samples representing seed classified as permanent pasture eligible for reclassification as mother seed, the reclassified lines relieving to some extent the active demand for mother seed which is in very short supply. The whole of the samples will be examined as opportunity permits, but it is unlikely that the whole will be completed for some months. Samples received for trial by the Agrostologist are also examined and reported on, the results being used in conjunction with the data obtained from plot trials carried out by that officer.

(d) The quartz lamp is also being used for an additional service to the seed trade and to farmers, and which must be considered unique in its application. Following the examination under ultra-violet light, the percentage reaction is interpreted in a formal certificate on which is set out seven retrogressively inferior classes—i.e., A 1, 2, and 3 of perennial representing "superior," good average, and fair average types, followed by B 1, 2, 3, 4 of false perennial rye-grass. This classification is based on certain fixed percentages of reaction the classification of the particular sample covered by the certificate being entered in the place provided thereon. Thus, provided with a report which indicates the value of the seed in terms of perenniality, the holder of the seed may buy or sell with confidence in the description of the seed. Some of the seed reported on is of course equal to certified seed, but care has been taken to present the information in such a form that no obvious comparison may be made between uncertified and certified lines.

Although the service was commenced only in February of this year, up to the 31st March, 75 samples had been received for classification.

Altogether in that period 480 samples have been examined comprising: Seed-merchants, 67; farmers, 8; Agrostologist, 27; Fields Division, 13; certification, 331; Station check tests, 34.

There are at present awaiting the ultra-violet-light test over one thousand trial and certified seed-samples.

#### RESEARCH.

(a) Diagnosis of type in rye-grass by the examination of ten-day seedlings under screened ultra-violet light:

Early in 1931 advice was received from England that a method of positive identification of Italian rye-grass seed had been demonstrated by Professor Gentner of the Seed-testing Station, Munich, and steps were taken by the Station to obtain the necessary equipment with a view to the observation of the results of the test on the various types of rye-grass present in New Zealand. Approximately ten days later published results of an investigation carried out in Ireland along the lines planned here, on thirty samples of New Zealand seed, were received. The results even on this small range of samples were sufficiently conclusive to warrant the purchase of the necessary equipment, which was obtained, set up, and in operation within a few days. During the following six months over four thousand separate examinations were made on samples which for the most part had previously been classified on plot trial by the Agrostologist. Ample confirmation was obtained of the theory tentatively suggested by the Irish workers—i.e., that the plant type could be closely correlated with the percentage of fluorescent seedlings of any sample of perennial or false perennial rye-grass.

A paper covering the results of this work and discussions relative thereto was published early this year. As previously stated, ultra-violet-light examination has now become an integral part of the Station's routine functions, has replaced the greater part of the certification plot trials, and may ultimately find application to other phases of the certification system.

Some three thousand seedlings, representing positive and negative reacting individuals, were removed from the test pads during examination under the lamp, boxed, and finally planted out for study as mature plants. Some of these have suffered badly through the drought earlier in the year; the whole block, therefore, was not ready for critical examination as early as was anticipated. The majority of the plants have now recovered from cutting and will shortly be ready for observation. The purpose of this study is to obtain some idea as to the type of plant represented by positive and negative seedlings in the various types of rye-grass and to obtain confirmatory data in relation to the genetical aspect of the appearance or non-appearance of the reaction in certain types of plant. Certain of the plants have been selected for selfing purposes next season and if the selfing is successful, further data will be available on this aspect of the study.

(b) Low germination of rye-grass: Earlier reference has been made to the low germination of the certified rye-grass produced in certain districts during the 1930-31 and 1931-32 seasons.

For some years past, this trouble has been experienced in the Sandon district of the Manawatu, and latterly became so pronounced that many of the growers abandoned seed-production altogether. With the advent of seed certification, however, seed-production was revived on areas sown down in Hawke's Bay mother seed, and this season there has been seen the reappearance of low germination of apparently normal and healthy seed. Furthermore, most of the areas in Southland and portion of Otago sown with mother seed have produced seed very low in germination, some lines showing growth percentages as low as 10 per cent.

Obviously the problem has become a matter of concern to the growers of certified seed in the Southern districts and to a lesser degree in some of the other producing districts.

Observations made over a period of years have led to the belief that the trouble was associated with climatic conditions prevailing at about the time of flowering of the parent crop. Laboratory studies on Southern-grown seed have now demonstrated the presence on the non-germinable seeds of a fungus which is considered to be the primary cause of the death of the seed. The work has been carried sufficiently far to indicate that the degree of infection is always directly associated with a high relative humidity at the time of flowering and that the perennial strains are far more susceptible than false perennial types or Italian.

The co-operation of the Mycological Section has been sought, and that section is now carrying out pathogenicity studies.

At the moment it would appear that, unless strains showing a fair degree of resistance to the infection can be isolated, the growing of perennial rye-grass will necessarily have to be restricted to those areas where the possibilities of hot dry conditions at flowering and during seed formation. It should be stated that, given the conditions favourable to its development, the infection has appeared to a varying degree in all parts of New Zealand.

To ascertain the possibilities of strain resistance and seed hot-water treatment, the Agrostologist has provided certain material which is being grown in Southland preparatory to next season's harvest.