

(c) Deterioration of Export Seed during Shipment: Results of the moisture determinations made at Cambridge on the dried and specially packed lots of Chewings fescue are to hand, but until the germination test results arrive it is impossible to draw definite conclusions as to the efficacy of drying prior to shipment. It would appear, however, that if the moisture content of the seed is to be kept down some form of sealed packing is essential. Further work on an extended scale based on the results of these trial lots is to be carried out this year.

Representations have been made by several Southern exporting houses during the last few months for further assistance in the matter of deterioration of fescue during shipment, and it now appears very likely that at least one firm will install drying equipment. The co-operation of this Station has been asked for, and it is our intention to carry out as much of the necessary laboratory-work as circumstances will permit. Fescue-seed production is of very considerable value to Southland and worth £80,000 to £100,000 per annum as an export commodity, and in view of the fact that serious attempts are being made to produce this seed in the United States of America, where most of the New Zealand seed is sold, every effort should be made to safeguard the local industry.

(d) White clover—possible correlation between the presence of a cyanogenetic glucoside in seedlings and plant type: Work has been commenced with a view to establishing a laboratory method of distinguishing between white clover seed samples representing superior and inferior plant-types. For the purposes of certification all white clovers are placed under plot trial, and, while this method is perfectly satisfactory from the point of view of classification, a considerable time has to elapse before observations can be made. Tests have been carried out using the picric acid method of detecting the presence of a cyanogenetic glucoside in eight-day seedlings. Approximately fifty samples previously classified on plot trial by the Agrostologist have been tested, with the result that all New Zealand Type 1 samples were definitely positive; of six Type 2, four were positive and two faintly positive; of the mixed Nos. 2 and 3 some were positive and some negative; of the Nos. 3, 4, and 6, all were negative; of two Kentish samples (No. 5), one was positive and the other faintly so. Within the No. 1 group there was a colour range indicating differences in the degree of the reaction, and it would appear possible that these chemical differences might be related to agronomic differences. The work is considered sufficiently promising to warrant its continuation and later association with special field trials.

(e) Various laboratory studies pertaining to purity- and germination-testing technique, have been carried out.

GENERAL.

The usual statistical matter has been compiled and issued to the seed trade and interested parties generally. An unusual amount of advisory correspondence, local and overseas, has been dealt with.

The transfer of this Station to more commodious accommodation was effected early this year and the convenience and ease of operations in the new premises has resulted in the handling of an increased volume of work and in an increased degree of efficiency.

CHEMICAL SECTION.

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MARTON MOWING TRIALS.

Analysis of herbage samples from these trials is being continued. The results of the work on experiment No. 16/2/74, which is a study of the effect of infrequent heavy applications against frequent light applications of super on the yield and chemical composition of the herbage, have been written up, and are at present in course of publication. The results show that, on this soil, the herbage from treatments receiving the more frequent light applications is superior in chemical composition to that from the infrequent applications, and the chemical composition shows less variation.

The analyses so far made on herbage of the effect of super and of slag applications in winter, spring, summer, and autumn show that the chemical composition of the herbage from the super plots is superior to that of the herbage from the slag plots—that from the super plots being higher in lime, phosphoric acid, and protein than the produce from the slag plots. This trial is at present in its fourth year. It has been contended that, because of the slower effect of slag than of super on the pasture, the herbage from slagged areas would be richer in essential elements than that from super areas. The results of this trial show that, for this soil at least, this contention is erroneous.

SOIL WORK.

During the year soil studies have been in progress on samples taken from where the effect of large infrequent applications of super is being compared with the effect of small frequent applications. Four sets of samples have been taken from this area, but the chemical work on these has not yet been completed.

The results so far indicate that the technique of sampling allows very accurate samples to be taken. There are strong indications that rapid leaching of added phosphate takes place on the Marton soil. These losses of phosphate appear to be reduced if the applications are small and frequent as opposed to large infrequent applications. It is very desirable that this work be continued with a view to finding out how these losses can be reduced to a minimum. These results, while agreeing in general with results obtained by Robinson in North Wales, are opposed to the well-known Rothamstead and other results. It is generally believed that phosphates are leached out of the soil very slowly, but the results obtained here indicate that in the case of an application of 8 cwt. of super over two years ago, about three-fourths have been removed from the surface 6 in. of soil. This is confirmed by the yield results. Since the falling-off of the yield is due to the lowered amount of available phosphoric acid in the soil, there are three alternatives: (1) Phosphoric acid must be removed in large amounts by stock. This cannot account for very much of the added phosphoric acid. (2) There must be an accumulation in an unavailable form of nearly all the added phosphate in the surface layers. Analysis of the soil-samples show that this is not the case. (3) Phosphoric acid must be leached out of the surface layers. This is supported by the results so far to hand.

pH determinations were made on soil-samples with a view to finding if increased soil-acidity was the cause of considerable yield depression following successive applications of sulphate of ammonia to the pasture. It was found that there was no important difference in the pH of the soils from the control and from the sulphate of ammonia plots. Where lime has been applied with the sulphate of ammonia (2 cwt. carbonate of lime to 1 cwt. sulphate of ammonia), the pH of the top 2 in. was slightly higher (less acid) than that of the other plots, though even on this treatment the yield of herbage was depressed. This shows that the depression in yield was not caused by increased acidity.

Determinations were also made in connection with the pH of brown-top soils.