

Red Clover—Photoperiodism: This study was commenced with a view to differentiating between early and late flowering red clover from seed, but on the results obtained it would appear that although some indication of strain difference can be gained the method is not entirely practicable. There are indications, however, that all lines of red clover contain varying proportions of two distinct types of plants, and it is considered likely that one of these represents a persistent high-yielding type. If this is shown to be true the method may have a practical application in the estimation of the agronomic value of red clover, both early and late flowering.

Correlation of Artificial and Soil-germination Tests of Perennial Rye-grass: Work completed and the results published. It is shown that the results of artificial tests are invariably higher than those obtained in soil under optimum conditions, and that there is no basis for the frequently stated opinion that soil has some peculiar property responsible for the growth of a larger proportion of seed than is indicated by an artificial test.

Dormancy in Newly-harvested Oats: From the results obtained from various special tests it has been found that maturity can be accelerated by chilling at 3° C. prior to the employment of the usual testing methods. This technique is now being adopted for all tests of newly-harvested oats, and it is therefore possible to advise merchants of the potential growth prior to purchase. This technique is also adopted for certain other seeds.

GENERAL.

Statistical material covering seed import and export, annual and seasonal average purity and germination percentages, has been prepared and distributed.

It is desired to again record appreciation of the co-operation of the Seed Testing Station staff during the year.

CHEMICAL SECTION.

B. W. DOAK, Chemist.

MARTON MOWING TRIALS.

Analyses of herbage samples from these have been continued and a considerable amount of work has been carried out on soil samples from these trials. The study of the movement of phosphate from superphosphate, basic slag, and North African phosphates, each with and without lime applications, has been continued. The results so far are very interesting, but the work needs to be continued for several years to get reliable data.

Investigations into the movements of lime in the soil as affected by rates of application have shown that after two years less than one-fourth of a two-ton per acre dressing remains as calcium carbonate. The remainder has reacted with the soil and is present in an exchangeable form. During this period there has been some movement of this exchangeable lime down below 6 in. in the soil. The effect of two ground limestones, widely separated in chemical reactivity, is being studied, both samples being applied in three grades of fineness.

REVERSION OF SUPERPHOSPHATE BY CARBONATE OF LIME.

As a result of conflicting reports on the ability of a super-lime mixture to eliminate the bad effects of super alone on the germination of turnip-seed, an investigation into the ability of ground limestones to revert the water-soluble phosphate into water-insoluble phosphate, but still leaving the phosphate in a form available to plants, has been carried out. The presence of sufficient moisture is one of the main essentials to efficient reversion. In a dry condition very little reversion takes place in spite of several months in intimate mixture. In this case reversion cannot take place until the mixture is applied to the soil. If the soil is dry and the dry superphosphate-lime mixture is sown with turnip-seed, considerable germination injury may take place. If, however, water is added to the mixture prior to sowing, rapid reversion takes place, and if not too large amounts of water are added the mixture, after reversion, will be in a dry state suitable for drilling. Fineness of grinding of the lime considerably affects the rate of reversion, but differences inherent in the original limestone are responsible for the greatest differences. For example, Waikari and Cheviot ground limestones when used with superphosphate will correct the harmful effect of the superphosphate much more effectively than ground limestone from certain other districts, although the fineness of grinding and the total CaCO_3 may be practically the same.

HYDROCYANIC ACID (HCN) IN WHITE CLOVER.

Determinations of the potential hydrocyanic-acid (HCN) content of approximately 1,200 samples of white clover have been carried out. This work has been done mainly in connection with the certification of white clover. Investigation has shown that while the season to season variation in HCN content may be fairly large, the day to day variation and the variation at different times of the day is not very great. There is a slight tendency towards higher HCN content during the evening, but the results are not very conclusive.