

rectify. The fact that the greater part of a drainage system is invisible makes it relatively difficult to estimate whether the system is acting as efficiently as it naturally should. From all this it follows that care, thought, and thoroughness should characterize drainage-work throughout.

It does not follow that because land is poorly drained it should not receive dressings of fertilizer. Indeed, in certain circumstances top-dressing of poorly drained land is definitely advisable. This arises from the fact that high fertility is requisite for success with such species as meadow foxtail, *Poa trivialis*, and timothy, species valuable for conditions so wet that rye-grass and cocksfoot would not tolerate them. At times top-dressing by raising the fertility to meet the needs of these species will prove distinctly profitable. Apart from such special cases, top-dressing of poorly drained land is frequently profitable, although it would probably be more profitable with better drainage.

At times it may not be practicable to provide thorough under-drainage. When this is so it is well to remember that surface drainage, which can sometimes be arranged relatively easily, is much superior to no drainage.

Some Aspects of the Liming Position.

In New Zealand liming grassland has produced very varying results. In some instances field results make liming appear an absolute necessity, while in other cases, which are probably more frequent, carefully obtained field evidence does not support the contention that liming is a desirable or a profitable proposition. Such widely differing results are only to be expected when one takes into consideration not only the greatly differing types of soil, but also the differing pastures and climates with which our farming deals.

Further, the position is complicated by the fact that it does not follow there is no influence of lime because there is no visible influence. It is held by many, including recognized authorities, that the benefits of lime are not easily detected directly. For instance, Professor Stapledon, Director of the Empire grassland research, says: "It is only occasionally and in very bad cases that liming actually adds to the bulk or weight of grass per acre, but it very frequently has a considerable influence on quality." This being so, it is unsafe to condemn liming because of absence of visible evidence of its influence.

Since it is not easy to judge directly whether liming is profitable or not the farming community would welcome some ready reliable means of finding out when liming would be justified. Various attempts have been made to meet the widely felt want in this connection. These attempts usually involve the use of what are termed "lime-requirement" or "soil-acidity" tests. There is in the minds of some the impression that certain of these tests will quickly disclose the amount of lime that may be applied to a soil with profit. This is not so. Probably the best statement on this point is that of Sir John Russell, the present Director of the Imperial Soil Bureau. He says: "Before any indication can be given of the amount of lime required for cultivation, it is necessary to make field trials." This statement completely disposes of the alleged claims of quick and easy tests.

Another important point is that circumstances are conceivable in which the use of lime would be beneficial and profitable but yet not desirable. This position would arise when the possible expenditure on a farm is strictly limited. In such circumstances the question may arise whether it is better to spend money on lime or on phosphates. The answer to be given would depend not on whether lime proves profitable, but on whether it proves more profitable than phosphates. A general indication of what form the answer would take in such a case may be gained from the fact that over this country as a whole the weakest link in the soil supply of