A Question of Fertilisers

By W. N. S. Bissett

The season will soon arrive when most outdoor maintenance activities on the golf course will be in full swing. The bills for fertiliser will be coming in and almost invariably will show some increase on the previous year. This usually gives rise to queries by Committee men on the necessity for the various materials, and ways to keep expenditure to a minimum are examined.

Why Fertiliser?

Of all the factors influencing growth, the nutrient status of the soil is one which can be partially affected by the greenkeeper. However, the extent to which fertilisers improve grass growth is not only dependent on the quantity and quality applied but also on the effects of the other inter-related factors, e.g. light, temperature, moisture and air. Lime is not a fertiliser but is sometimes required to correct over-acidity which restricts growth and fertiliser availability.

To obtain the optimum grass growth, providing that all other factors are favourable, a wide range of mineral elements are required. Most soils, however, naturally contain sufficient minor elements to grow satisfactorily and in general only the major nutrients require replacing, i.e. Nitrogen (N), Phosphate (P) and Potash (K).

Different soils have different levels of natural resources which the bacteria, etc. convert to available plant foods.

For plants to take up the N, P and K, these nutrients have to be in a soluble state and, therefore, are liable to leaching by rainwater and loss into the drains. This point is illustrated by a number of reports of stimulated weed growth blocking rivers as a result of leached fertilisers from agricultural land. The naturally produced elements are, of course, subject to the same losses as applied fertilisers. Artificial watering can also increase the losses by this method.

Once the plants absorb the nutrients they are used to build up plant tissue and it can be seen from this that on golf greens and tees where the grass clippings are removed the nutrients are also removed. A further loss is now created.

Fertilisers are, therefore, required to maintain the balance of nutrient levels so that optimum grass growth is obtained. On a golf green higher levels of fertiliser treatment are required because (a) wear is more intensive and quicker recovery is necessary, (b) clippings are usually removed and (c) artificial watering increases leaching.

On a golf tee, fertiliser treatment should only be slightly less intensive than on a green as quick recovery from wear damage is necessary to maintain satisfactory playing conditions. Circumstances on a fairway are different as clippings are invariably returned, thus creating a cycle of nutrients. However, occasional fertilising may be necessary to make up losses due to other causes.

What Fertiliser?

Once it has been decided that fertiliser is necessary the type of fertiliser to use is the next consideration. Different materials have been shown in experiments to have different effects on turf. The three major nutrient N, P and K, are required annually by the grass plant. The form in which these elements are applied is important. Experiments have shown that alkaline N fertilisers such as nitrate of soda should be avoided as they lead to a turf which is wormy and weedy. Organic N fertilisers have a similar effect if used alone but have advantages which merit their inclusion in mixtures—they are slower acting and assist drought resistance.

The acidic N fertilisers should, therefore, be used and the most convenient is sulphate of ammonia with dried blood or hoof and horn forming the organic content.

To apply P. superphosphate is prominent as the most suitable, with bone meal providing the organic content. Basic slag provides phosphate but also contains lime and will lead to weed and worm invasion if used regularly.

To apply potash, sulphate of potash is the most suitable material.

What Form of Fertiliser?

To apply fertiliser to the fine turf on greens a powdered formulation is to be preferred as there is no risk of the localised scorch which is often obtained with granular materials. On tees either a powder or granular may be used according to preference. The ease with which granular fertilisers are handled makes these materials most suitable for application to the much larger fairway areas.

Liquid fertilisers are often suggested but they have decided limitations. The kind of fertiliser which can be used is restricted by solubility difficulties and there are problems in application. Because of the quantity of liquid involved there is a risk of scorch when applied by a sprayer and because even distribution is required, application by a sprinkler is not recommended.

How is Fertiliser Applied?

The methods which are used to apply fertilisers are varied involving hand or machine application. The person or persons whose job it is to apply the material should obviously be competent. Damage by uneven fertiliser distribution is not only harmful to the sward itself where excess can cause scorching but also to the general appearance where areas may be missed. When dealing with powdered materials it is, of course, essential to bulk the actual fertiliser with a suitable dry carrier, e.g. screened sandy compost to obtain an even spread. This applied whether the fertilisers are applied by hand or machine.

If a machine is employed it is important to ensure that calibration is carried out prior to each treatment so that no more (or less) than the required amount of fertiliser is applied. It is argued, and justifiably so, that a skilled man spreading fertiliser by hand is still one of the best methods of applying fertiliser.

When Fertiliser?

In the spring it is important to select the correct time of application and this can be done accurately using local knowledge of weather, etc. Often a "false spring" occurs early in the year only to be followed by a sudden cold spell. To obtain full benefit from fertilisers in the spring the grass should be starting to grow (seen as greening up of rough or hedgerows, etc.) and the fertilisers will then boost the natural growth.

Further fertilisers are generally required during the season and should be applied when growth from the previous dressings is beginning to die down, the object being to maintain even growth throughout the season. The fixture card should be borne in mind so disturbance of play is minimised.

Still and showery weather is best suited to the application of either powder or granular fertilisers but the lack of wind is not so critical with the granular types. Artificial watering removes some of the doubts regarding when to fertilise but excess water can lead to uneven distribution.

Where Fertiliser?

As stated previously fertilisers are required regularly on greens, surrounds and approaches, tees and, as often as necessary, on fairways. Selective fertilising of weaker areas of finer turf is not generally recommended but on fairways more frequent treatment can be carried out on weaker parts.

In organising the fertiliser treatment on one's particular course, a soil analysis should occasionally be carried out as a check; one of the services provided to member clubs by the Research Station. Poor results can be obtained by using too little fertiliser or the wrong material, just as too much fertiliser can create an amount of top growth far in excess of requirements and in the latter case there is obviously room to prune the budget.

Note: This article first appeared April/May, 1971.

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