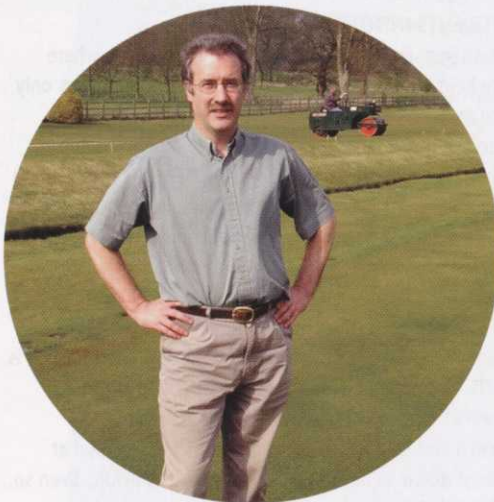


A QUESTION OF FERTILISERS

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From the many talks, seminars and conversations that he has had with greenkeepers over many years, David Lawson has compiled a list of some of the most commonly asked questions on turf fertilisers. The answers are based on direct knowledge from research carried out at STRI, as well as some of the basic facts of plant nutrition.

WHAT EXACTLY IS THE RIGHT AMOUNT OF FERTILISER FOR FINE TURF?

Firstly, the most important fertiliser nutrient is nitrogen (N) and it is this we should be most concerned about. Where turf is growing on an unamended loam soil, it is unlikely that other nutrients such as phosphate (P) or potassium (K) will be deficient. However, if necessary, their levels can be determined by soil testing.

On a golf green or bowling green, the main component of the turf is ideally bentgrass along with red fescue. It is these species which need to be encouraged and weed species (annual meadow-grass) discouraged. The amount of nitrogen fertiliser applied has a major impact on the proportions of these grasses present. For most soil-based rootzones, an annual application of 8 to 16 g N per sq. metre (g N/m²) is adequate. Most commercial granular fine turf fertilisers, applied at recommended rate, supply 4 g N/m² on each application – so two to four dressings would be needed during the main growing season. On newer USGA, sand dominated rootzones, the amount of nitrogen applied each year should be within the range of 24 to 30g N/m².

WHAT ABOUT LIQUID FERTILISERS?

With the advent of highly sophisticated spraying equipment, it is possible to apply liquid feeds accurately to turf. They are now often used on golf greens in order to avoid granules prevailing on the turf surface. A proportion of the nutrients will be taken up directly by the grass leaf to provide a quick-acting effect. Some products are formulated in such a way that a high proportion of fertiliser nutrient is leaf absorbed. They do provide a good means of applying a small amount of nitrogen fertiliser evenly.

Some caution should be exercised in using liquid fertiliser, as the amounts of nitrogen applied are usually significantly lower than from most granular fertilisers – so more applications are needed. Because of this, many greenkeepers sensibly use a combination of granular and liquid fertiliser over the year.

AND CONTROLLED RELEASE FERTILISERS?

These can be useful in reducing the number of applications required. They are, therefore, of most value on sand-dominated, USGA type rootzones where the amount of nutrient required is relatively high.

ARE THE TYPES OF NITROGEN IN LIQUID FEEDS AND CONTROLLED RELEASE FERTILISERS THE SAME AS IN ORDINARY GRANULAR PRODUCTS?

The most obvious requirement for liquid fertilisers is that the nitrogen source dissolves in water. This tends to restrict the materials to urea and ammonium nitrate; although sometimes other materials are used. It is worth remembering, however, that ammonium sulphate has been found to be the best source of nitrogen for fine bent-dominated turf. It is particularly effective at encouraging bentgrass growth and discouraging the ingress of annual meadow-grass. Unfortunately, few liquid products use ammonium sulphate as the N source.

Controlled release fertilisers may be derived from a number of materials, probably the most common being methylene urea. This product breaks down in the rootzone to release urea; the higher the soil temperature, the quicker the release. Coated products depend on a soluble nitrogen source such as ammonium nitrate or urea to diffuse through the coating into the soil/rootzone. Again, the higher the temperature, the quicker the release.

Used on their own such slow release products do not have the same suppressive effect on annual meadow-grass as ammonium sulphate.

MANY FERTILISERS NOW CONTAIN EXTRA ELEMENTS SUCH AS MAGNESIUM, COPPER, ZINC, MANGANESE, ETC. ARE THEY NEEDED?

The only situation where the possibility of deficiency in magnesium or trace elements exists is on sand-dominated rootzones. However, in the UK, deficiency symptoms in turf have never actually been reported. On normal soil rootzones, deficiency in these elements is highly unlikely.

WHAT ABOUT IRON?

Iron is contained in many fertiliser products to produce a quick green-up effect. It reacts with the leaf to produce a black pigmentation. It is not actually acting as a fertiliser nutrient since turfgrasses normally contain more than enough iron for growth. It is only on alkaline soils (i.e. high pH) that an actual deficiency of iron might occur.



THERE SEEMS TO BE A RESURGENCE OF INTEREST IN ORGANIC FERTILISERS. WHAT ADVANTAGES DO THEY HAVE?

Organic fertilisers, based on materials such as poultry manure, dried blood and rapeseed meal, have been used in turf maintenance for many years. They provide a slow release of nitrogen along with other nutrients such as phosphate. Apart from these nutrients, such products also supply some organic matter to the soil, which can aid moisture retention in dry weather conditions. Because their nitrogen contents tend to be low, in relation to inorganics, a lot of material has to be applied to provide adequate amounts of nutrient. This often means that they are expensive to use.

It is also worth mentioning that trials with organic fertilisers on fine golf-green type turf have shown that they may encourage fungal disease, weeds and surface casting by earthworms. It is, therefore, advisable only to use such products as a small part of the overall fertiliser programme, usually with acidifying nitrogen fertilisers such as ammonium sulphate.

SO IS THERE REALLY NO NEED FOR ANY OTHER NUTRIENTS APART FROM NITROGEN?

In ordinary loam soils, nitrogen is likely to be the only nutrient required for mature turf. The soil itself will contain adequate amounts of phosphate, potassium, sulphate, calcium, magnesium, and trace elements. It should also be remembered that rainfall in the UK naturally contains significant amounts of nutrient such as potassium, calcium and magnesium.

However, in seedbeds it is important that there are adequate supplies of available phosphate in order to encourage seedling development and rooting. It is, therefore, often advisable to apply phosphate within the seedbed fertiliser.

On sand-dominated constructions, or where the rootzone has become sand-dominated from topdressing, it is possible that phosphate will be so low as to restrict turf growth. This can be checked for by soil analysis. If it is inadequate, then a small amount of phosphate (2g/m² of P2O5) should be applied.

BUT WON'T THE APPLICATION OF PHOSPHATE ENCOURAGE ANNUAL MEADOW-GRASS?

Phosphate fertiliser will encourage the establishment of annual meadow-grass only if it is applied regularly and at relatively high application rates. It is certainly not the most important causal factor in meadow-grass infestation. Surface moisture, soil pH and inappropriate nitrogen source are the most important factors. It should never be forgotten that phosphate can be deficient for bentgrass growth on sand-dominated rootzones and, if the problem is not addressed, then you can expect to lose bentgrass cover. As an aside – in early spring,

when the rootzone temperatures are still low, the turf may take on a darker colour with a bluish tinge, this despite no fertiliser or iron being applied. The reason for this is almost certainly lack of phosphate in the turf. In such circumstances, the soil phosphate level should be checked.

IS IT WORTH REGULARLY CHECKING SOIL NUTRIENT LEVELS?

On ordinary unamended loam soils, it is worth checking nutrient status and pH if there is any specific problem occurring. On sand-dominated rootzones, it is worth checking on a more regular basis. In such rootzones, the concentrations may rapidly change and so should be checked more frequently; perhaps every one or two years until levels appear to 'settle down'. This is particularly important for rootzone pH.

WHAT ABOUT THE NUTRIENTS IN TOPDRESSINGS?

It is the organic portion (e.g. peat, compost, soil) of topdressings where most of the nutrients are held. As this organic fraction normally comprises only a small proportion of the material, the amounts of nutrient applied will be relatively small. This is to the good. If the topdressing **did** contain significant amounts of nutrients, they would be released at the surface of the rootzone, to the advantage of the shallow rooted annual meadow-grass. In contrast, the nutrients from ordinary granular and liquid fertilisers will quickly move downwards from the surface to feed the deeper rooting bents and fescues.

JUST HOW IMPORTANT IS SOIL PH?

It is always worth remembering that the natural habitat of browntop bent is the soil of acid moorlands. Therefore, it tends to out-compete most other turfgrasses if the rootzone pH is slightly acidic. (The acidity also reduces infection by Fusarium patch and take-all disease). On one particular trial at STRI, the rootzone pH went down as far as 3.5. This is seriously acidic. Even so, at such a low pH value, the bentgrass still grew, although it did struggle to provide adequate cover. The interesting point was that on the areas without bent, no other grass species would grow (including annual meadow-grass) – it was simply too acid.

On links courses and golf greens naturally formed from chalk soils, the rootzone pH is normally high, i.e. above 7.0. Red fescue will normally thrive in such circumstances as long as it is given a helping hand by increasing the cutting height and applying lower rates of nitrogen fertiliser.

Fertiliser rates, the type used and the nutrient status of the rootzone all have a large impact on fine turf quality.

If you have any other questions on these matters, then get in touch with David Lawson at The Sports Turf Research Institute, St Ives Estate, Bingley, West Yorkshire BD16 1AU. Telephone: 01274 565131 or e-mail: david.lawson@stri.co.uk

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