Now for the

There's still a long way to go before we know all we need to know about growing grass for the golfer. HUGH TILLEY reports

The term 'conditioner' means different things to different people, and 'turf conditioners' tend to encompass a wide range of growth promoting substances which cannot legally be called fertiliser, while 'soil conditioners' include an equally diverse range of materials such as lime and pulverised fly ash, as well as chemical (soil) modifiers such as various wetters and gypsum, keserite etc, and the widest possible interpretation which can include machinery such as subsoilers or mole ploughs. While fertilisers are defined in law with required and stated nutrient levels, conditioners are not, although trading standards legislation would ensure that misleading statements are not made. Talking to many of the suppliers of conditioners it is obvious that preferred and more appropriate than 'conditioner' would be words such as stimulant, modifier, improver or enhancer.

The realisation that golf is a growth sector has resulted in several companies switching their attentions and resources from agriculture to turf, and has also led to the establishment of a number of new 'businesses' specifically to produce and market organic fertilisers and turf conditioners for golf and other amenity turfs. Several of these 'businesses' are little more than farmyard operations, with little if any back-up service for soil or tissue analysis, nor do they all have any real knowledge of agronomy or soil science, and a few are very hazy over what their product is, let alone precisely what elements it contains.

This should worry the greenkeeper and he should consider what protection he has if something goes wrong, for instance if some toxic (to grass or humans) substance is applied. Suppliers state there is minimal risk, but are they insured? Normally at worst all that happens if a spray fails to produce the results expected is that you lose your money – although it is possible you could get a refund or even more product.

There are those who imply that their products are a cure for all ills, – they should know that a plant's requirements are many and varied. Sometimes – far too often for the credibility of organic conditioners – enthusiastic salesmen have advised applying 'their' product when what is really needed is drainage, aeration or a bit of warm weather. If turf conditioners are to retain credibility it must be stressed by the seller that these products are just one aspect of a multi-part equation, that success is the sum of optimising all parts of the plant environment, and that turf conditioners can't remedy basic management and soil structure failings. What they can do very effectively is to provide a wide spectrum of ingredients to plants and/or soils that are deficient or out of balance, or provide 'catalysts' to enable the plant to utilise or optimise existing materials more effectively, and by this means they can even offer some defence against adverse soil or weather conditions.

Soil Conditioners

In contrast, 'soil conditioners' work in the soil and are usually more specific, modifying it mechanically or chemically. While the majority of these conditioners are intended to improve the soil structure there are others which are applied to improve the soil by adjusting the balance or availability of micro nutrients, minerals etc. Mechanical methods include slitting, subsoiling etc., but it also includes incorporating inert matter such as sand, Iytag and other materials into the soil to 'open' it up. Traditional chemical means of opening up a heavy clay soil is the incorporation of gypsum, which flocculates clay particles to form a larger crumb structure. However, this material is also being seen as a source of calcium and sulphur for lighter acid soils.

Perhaps the most important chemical soil modifier of all is lime, used to reduce soil acidity or pH. Several types are available, the commonest being ground calcium carbonate, which has a very high neutralising effect. Other materials include magnesium limestone and calcified seaweed with lesser or slower neutralising effect, however they also provide other essential elements. Not being fully or instantly soluble in water means that most of these products are slow release, thus application may only be needed once in a decade.

Turf Conditioners

Turf conditioners aim to affect the plant more directly, with most being foliar feeds. They used to be categorised in the realms of 'muck and mystery', however they are coming out of the cold as an increasing number of greenkeepers and their advisers realise that grass needs more than NPK to thrive. There is no argument that healthy grass, like healthy humans, needs a complete diet, and this is the position that most of the seaweed and manure derived conditioners see for themselves, – as providers of a wide range of organic elements and enzymes etc. It is a shotgun approach – aim wide and hope to nail the problem – however is it any the worse for that?

Some of the claims made for turf conditioners are rather vague and unsubstantiated by independent trials, and even where there are trial results these generally pertain to specific conditions and locations, for instance on links courses or sand constructions which are inherently infertile and on which it is easy to apply a product and get results. Getting results in high fertility with good growing conditions may be more difficult unless there is a specific deficiency. Producing reliable trials data requires evidence in black and white, but it is not easy or cheap to carry out a fully comprehensive and replicated trial, especially when you don't how the conditioner produces its effect. Many of the suppliers of these materials are small and without significant budget for trials work, however this will change perhaps as the larger and more predatory ones gobble up the smaller suppliers – this will happen as the market grows. Many greenkeepers, (not just marketers), have found that turf conditioners do work, even if they can't always predict when and where.

Still at this point in time the main demand from greenkeepers is for fertiliser, and as a result most of the suppliers (manufacturers?) of turf conditioners actually add N P or K and perhaps other minerals to make an analysis which has sufficient nutrient to be effective as well as making a sales justification for use, – these additions may not be organic, although this will not be stressed on the packaging, so that many will believe they are buying a pure 'natural' product. This should not matter as there is no evidence to say that a plant has any preference for (natural) organic rather than (synthetic) inorganic feed. Of course it makes logistic sense to apply a complete feed, rather than to apply separate materials at differing times, and some greenkeepers already have 'cocktail time', adding a little of this and some of that to the sprayer tank. This can be dangerous unless there is a printed recommendation for tank mixing of each specific product.

The two most common bases for turf conditioner are sea-

conditioner

weed and animal excrement, both are plentiful and allow the innovative several means of processing it into an acceptable sterile product which can be bagged or otherwise packaged. Precise details of the processes are normally kept secret, but include drying and milling, distillation, bacterial action and sedimentation. Bacterial action must be the cheapest option because it is the most natural and only requires the product to be held in a tank for the bacteria to work. Temperature control may be needed to manage the process, and then it is mainly a matter of separating the liquid from the solid – both factions can then be sold.

The main claims for most turf conditioners is that they enhance root systems, increase tillering and improve grass colour. How they do this remains largely a mystery, although research is currently being undertaken into this. Certainly response is usually greater than would be anticipated from applying any pure element, and while one supplier suggests that it is the 'cytokinins' which are responsible, others suggest that it is the addition of other micro flora – bacteria, fungi, moulds, yeasts etc. – which stimulate the plant, but until research proves conclusively the what, why and when of these products the greenkeeper's best option is to keep an open mind, use what has been proven to work, and to try other options tentatively.

Strong, prolific rooting where before it was weak: treated grass from Maxicrop

One of the most common additives to turf conditioners, partly due to its very effective greening effect, is iron. It is a main constituent in seaweed and has several important effects on turf, hardening it, adding colour and at the same time helping depress moss. The colourising effect is useful to the greenkeeper preparing for a tournament and it is likely to last for a couple of months, while the hardening of the grass is useful when preparing the turf towards winter. Of course the form that the iron takes is critical: it has to be soluble and it also needs to be chelated or 'buffered' so that it does not get hijacked or locked-up by other chemicals before the plant utilises it.

Possibly sitting between the two camps of soil and turf conditioning are wetters. In original form these were little more than washing-up liquids in disguise, however there has been a vast change and today's wetter is a more complex material: organic, non-ionic and bio-degradable, and of course it needs to produce the minimum of foam. Non-ionic is seen as required to avoid it reacting with other chemicals – unlike industrial cleaners. The basic purpose of a wetter is to reduce surface tension so that water spreads more readily, thus with foliar sprays it aids the spray to spread over the leaf and be more effective, while with soil applications (and composts) it is aimed at reducing the surface tension around soil particles so that the water is more readily assimilated into it, which should make irrigation more effective and economic.

In the past the worse soils have been devoted to golf because they were of little use for agriculture, in fact almost by definition they were the poorest of soils, Now, however, increasing pressure for more rounds per day, 364 days of the year, means that grass is having to be 'stretched.' Fortunately most of the poorer soils respond particularly well to all forms of conditioning. In recent times agriculture has found itself with land which is not required for food production and aided by 'a suggestion' from the R&A it has looked on golf as a more productive diversification. Again this is seldom the best land, usually being the hardest and most expensive to work, so again turf or soil conditioners could be required.

Soil (or tissue) analysis and a dig into the soil structure may give clues over precise requirements, however the normal scientific criteria (of soil analyses etc) are often no better than the subjective judgment of a good greenkeeper, and he is likely to judge any action or application by the response of the turf simply by asking 'is it better?' – better meaning greener, stronger, more disease resistant, thicker, faster growing, or any of many other desirable criterion. There is still a long way to go before we know all we need to know about growing grass for the golfer, but perhaps the greenkeeper is better off while there remains a high level of art and some chance in turf preparation, – that way he has good reasons why the greens are not what others judge they should be.