

Sand and Dressing

Roland Taylor sets about investigating the requirements for bunker sand and top dressing and comes up with some interesting results

BUNKER SAND

The modern greenkeeper has to thank, barren windswept terrain and animals for the development of the bunker. In the dim distant past the first courses were links courses, ones which were often situated in fairly hostile locations.

Sheep, cattle and rabbits devoured the grass cover leaving tracts of exposed sand and then through erosion, pits were formed that became traps for the wayward shot.

This added interest to the game and led to bunkers being introduced as part of inland courses. One factor at the time, which could well have not been taken into account, was the sand that went into these bunkers - sand will not do.

The grain size defines sand and there are various theories and figures of between 0,2mm and 1.6mm are suggested. It can be composed of various minerals but quartz makes up most of the world's sand. It is evolved by the action of water and ice on rock and is resistant to being broken down by mechanical and chemical means.

As far as bunkers are concerned there are a number of factors that make high quality sand.

These include:

- Particle size and shape
- Free draining ability
- Standard of playing surface (Penterometre)
- Low lime content
- Colour

Out of these, 'the standard of the playing surface' is the most important. If a ball lands on it how far does it sink into the surface (fried egg test)? The shape of the particles plays a major part in this aspect. Angular shaped particles compact close together so are more resistant to a ball penetrating them.

However, a playing surface must not be so hard that the ball bounces off it. Rounded sand is softer and a ball is likely to be buried in it. These types of particles tend to move more freely, so the playing surface and bunker face can become unstable.

Good drainage is also important. Soaking wet sand is going to cause all kinds of problems. Likewise, if it becomes contaminated with a run-off of soil after an exceptionally heavy down pour. In both instances the playability will be affected.

In the case of the soil contamination, replacement is the only answer, but this is unlikely to be practical, so it is then a case of leaving it until an appropriate time and taking any flak from players.

The STRI have laid down specifications for bunker sand and a good supplier will regular test their products to ensure they meet these parameters.

At present trials are being carried out by STRI in conjunction with WRAP (Waste Resources Action Programme) to determine the viability of using sand derived from recycled glass as an alternative for bunkers.



▲ Fairway one month after treatment, July 2003

Bunkers are the bane of many golfers lives and likewise they may be a headache for some greenkeepers because they need a lot of attention. Finding the right quality sand and having the equipment to dress and maintain it, is a major part in winning the battle.

COMPOST TOP DRESSING

It had to come to an end - applying tons of artificial chemicals into the soil in the form of fertilisers, pesticides and weed killers.

The indications are that legislators recognise the folly and each year are implementing more stringent controls on what can and cannot be used. Increasingly man is beginning to realise that he will have to turn to natural solutions for the answers.

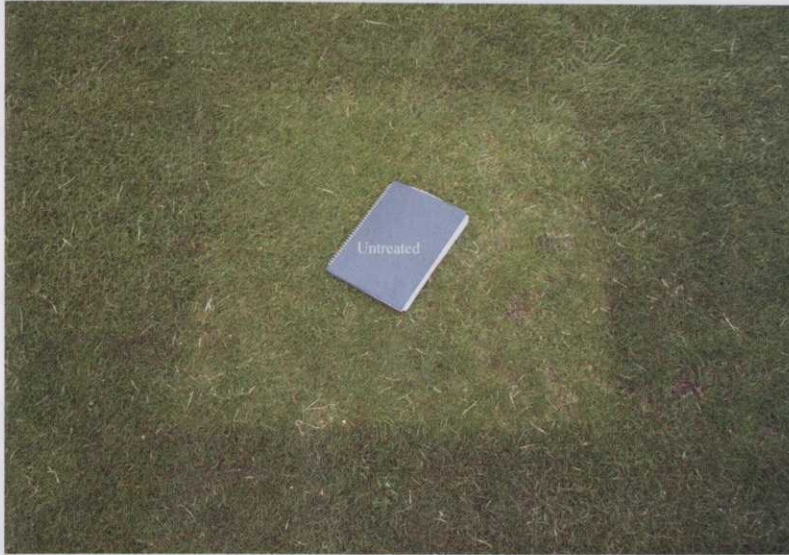
No golf course is the same and during the boom period when they were springing up across the country, like mushrooms, many were built on farmland with very little consideration given to the underlying soil structure, especially as far as fairways were concerned. More attention was paid to the greens.

With the plethora of courses that are now available, players have plenty of choice, so the condition of all the playing surfaces is constantly under the spotlight.

Any greenkeeper will tell you how pernicky golfers are, so maintaining high standards is a constant battle. To compound this situation significant weather changes have occurred. Long periods of drought and milder winters are becoming the norm.

This has meant courses that were built over difficult soil conditions suffer quicker than those where consideration was given from the start to drainage and root zone layers. Many of the older courses were designed and built at a time when nobody could envisage the climatic changes and the growth in the sport.

This must leave many greenkeepers in a dilemma as to how they can maintain acceptable playing surfaces. Their armoury of chemicals and fertilisers is rapidly depleting and for many, budget restrictions also curtail some of the programmes they would like to carry out.



▲ Area untreated against one that was treated with compost

In this type of situation, greens have the priority. So what can be done to improve the vast expanses of fairways and the tees? One answer is to investigate the possibilities of using high quality green organic compost as a regular top dressing.

At present it is relatively inexpensive, at least 50% less than a proprietary brand. Unfortunately, there is a slight problem when compost is mentioned, most people think of a heap at the bottom of the garden so it is important to point out this is not your run of the mill compost. This material is very different; it is made to the highest of standards and graded to meet the requirements of the turf industry.

The usage of organic waste in this country has been, and still is, slow on being taken up, compared to some of our European partners. Germany realised the need to develop composting and its uses well over three decades ago. Only in recent years have there been any significant developments in UK, but there is still a long way to go.

At least some organisations and golf clubs are beginning to look closer at the possibilities of using recycled material, as an alternative source of both soil improver and slow release fertiliser. This is mainly as a top dressing for their fairways.

By its nature, green waste compost contains various nutrients with Nitrogen being the main one. This is generally in a slow release form and there are micro-organisms present to work in conjunction with the soil bacteria to release the nitrogen for the plants.

Potassium (potash) is also present to help produce strong plants that are less prone to disease. The addition of plenty of organic matter is beneficial to all types of soil.

It improves the soil structure, thereby the flow of water and the levels of moisture are retained for longer periods. In a nutshell, it's a natural phenomenon to recycle organic matter; it is only when man starts changing the rules that the problems start occurring.

As far as compost for top dressing is concerned, the key to the right end product, is the company carrying out the composting and the quality of material from their suppliers.

Tree Fella who is based at Shoeburyness in Essex has recently made a considerable investment in the latest composting system to ensure the highest quality product.

All the base material is sourced from reputable suppliers to ensure that it is free of unwanted foreign bodies. In some cases to ensure this, it is sorted by hand. On reaching the composting site it is shredded and placed in large covered bays.

These are closed off when full and fans introduce air into the organic matter through a series of under-floor ducts. If the unit becomes too hot, air can also be supplied via an air pipe in the roof, this ensures that the active compost remains at the required temperature.

Regular monitoring of moisture levels is carried out to maintain optimum conditions for the micro-organisms to carry out their work of breaking down the organic matter.

After four weeks the compost is removed from the bays and placed in windrows outside where the process continues. During its remaining period of maturation, the windrows are regularly turned to maintain throughout the required oxygen and temperature levels.

Where compost is for golf course use it is left to mature for 16 weeks. At this stage the compost is a rich dark colour dark peat, it is then screened to the specified size and is ready for delivery.

The team at Tree Fella recognise the importance of quality control at all stages and are BSI PAS 100 approved. This scheme, which was launched in November 2002 was

sponsored by the Waste and Resources Action Programme (WRAP) and developed by The Composting Association.

BSI PAS 100 is published by the British Standards Institute and specifies the minimum requirements for the selection of suitable input materials, the processing of the compost, quality of the final material and labelling.

The main objectives in drawing up BSI PAS 100 are to give users confidence in the end products and enable producers to differentiate their products as safe, highly reliable and with a high performance level.

Records are kept at all stages of the process and there is a minimum frequency for sampling and analyses. Recommended guidelines are given regarding temperature control and turning for the sanitization of the compost.

In 2002 ReMaDe Essex a local government funded recyclable market development project, commissioned Enviro Consulting Ltd to carry out compost trials at Lexden Woods Golf Course, Colchester.

Two plots were established, one on an extensively worn tee, the other on a fairway. These were treated with compost screened at 10mm and applied at depths of 6mm and 12mm.

Comparisons were drawn with other plots, an untreated area and one which had been top dressed with a standard sand based mixture. The trials demonstrated that the composted areas improved in colour, growth was not excessive and grass re-established itself on the worn tee more rapidly than the untreated and sand based areas.

A number of local course managers and greenkeepers were invited to a discussion and workshop regarding the trials.

From the information gathered, plus the findings of Enviro Consulting Ltd, a number of recommendations were drawn up regarding the use of compost top dressing on courses.

These include:

- Top dressing to be mainly carried out in spring and autumn when the soil is warm and moist.
- Only fine particle (10mm) compost should be used and worked into the turf.
- Application rates are up to 6mm deep on fine turfs and fairways and 12mm for tees and courser grass areas.

Neil Sjoberg, owner of Epping Golf Course, was one of those who attended the workshop. He decided compost could be the answer to his problem of 15 hectares of fairways with poor quality turf. This was largely due to the fact the course had been built on land left over from the construction of the M11, the underlying soil being heavy London clay.



▲ Fairway, May 2004

During March 2003, 100-tonnes of 10mm compost were purchased from Tree Fella and spread at the rate of 25-tonnes per hectare at a layer of 6mm thick. This disappeared in two days and within a month there were signs of a change. The grass had taken on a darker colour, was thicker and golfers were reporting that the playing surface had greatly improved. A second application was carried out in July 2003 and this spring has seen a marked improvement in all the treated fairways.

One of the main objectives of this exercise is, by regularly applying this relatively inexpensive compost, the underlying soil profile will be altered and opened up, so stronger root systems can develop and denser top growth will ensue.

Compost for turf applications is still fairly new, but as can be seen from the above, there is plenty of research taking place to increase both the standards and quality of the finished material.

In addition to the commercial sector, STRI are carrying out trials with some golf clubs regarding the viability of composting their own green matter.

In-house recycling is not new, as many greenkeepers in the past produced their own top dressing, simply because there was nothing else readily available. Modern composting methods have eliminated most of the problems that were experienced at that time.

For those course managers and green keepers interested in using composted organic waste there are some tips worth spending time following up.

- Finding the right composter is paramount. It is not the answer to simply contact a supplier. You need to ensure that the end product is made correctly and the raw materials are of the highest standard. If the composter is BSI PAS100 certified then this means the quality of the material is produced to the highest standard.
- Have a sample of the composted material analysed. STRI are one organisation that will carry out this work, but there are other labs throughout the country. The kind of information you will receive includes, NPK and pH levels, the presence of any contaminants plus overall particle size.

- If an outside contractor is used to spread the top dressing then it is important to ensure they are experienced in golf course work.
- It is worth finding out if there is a ReMaDe member in your locality. Contact them, as they can give you plenty of free advice and put you in touch with suitable composters. Your local authority or county council will tell you if there is one operating in your area.

Organisations that can be of help are:

- ReMade Essex (www.remadessex.org.uk)
- WRAP (www.wrap.org.uk): the contact is Louise Hollingsworth (Organics Technical Manager).
- The Compost Association (www.compost.org.uk). This website includes a summary of the BSI PAS100 requirements for certification and will have a list of member.

It is obvious that man is messing the planet up for their children and grand children and future generations.

Over the last five decades we have virtually filled every available hole in this country with waste and built hills and small mountains of the stuff.

Millions of tonnes of inorganic fertiliser and other chemicals have been applied to the land.

Our rivers streams and lakes have been polluted with nitrates, industrial waste, effluence and the life sustaining air we breathe is heavily contaminated.

It is now slowly dawning on humanity that something has got to be done. Recycling our green matter is miniscule compared to other steps that will, over the course of the next few years, have to be taken to slow the process of destruction down.

Using organic matter is a contributory factor and after all it is only emulating what nature has been doing for millions of years.

Using recycled organic matter in the form of a top dressing will not be to everyone's liking, but legislation is already curtailing a lot of past turf management practises and alternatives will have to be sought.

Is recycled green material not worth considering?