

## Factsheet on the use of Compost for Golf Course and Sports Turf

Produced by REMADE Scotland  
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### Commercial Scale Composting

Commercial composting is a science-based process, based on engineering principles. It is a 'manufacturing' process that utilises monitoring techniques and controls, based on proven industry standards and in 2004-2005 around 100,000T of quality compost was produced in Scotland.

Compost, as defined by WRAP (The Waste and Resources Action Programme) consists of "recycled green and woody plant materials that are composted at sites throughout the UK to produce a well decomposed, crumbly, soil-like product that is a good source of organic matter and nutrients, and can be beneficially applied to most soil types. The process involves a period of rapid decomposition and self-heating which sanitises the material followed by a cooler, slower decay of the woodier plant organic matter. The composting process is driven by the population of microbes found within the composting feedstocks. To optimise the composting process, commercial composters often formulate a specific composting pile recipe (mixture of organic feedstocks) which provides the microbes with optimal amounts of food (carbon, nitrogen), water and oxygen. When the composting process is complete, the compost is graded (screened) to achieve a suitable particle size. Compost is sampled and tested to ensure the product conforms to the compost specification BSI PAS 100 and is "fit for use."

Commercial scale composting takes the "natural" process of organic matter degradation, and uses engineering principles to optimise it. By doing so, composting can manufacture a beneficial and replenishable source of organic matter that has many uses for the greenskeeper and turfgrass professional.

### Compost Use on the Golf Course

Compost has many uses on the golf course. It can be used anywhere from general landscaping applications, to tee and green construction, to topdressing and more. Essentially, any place where soil, peat or other soil ameliorants have been traditionally used, so can compost.

Here are few of the uses of compost on the golf course. Always refer to the recommendations of your compost supplier for specific application rates:

**General Landscaping Use** - Apply about 50 mm of compost to soil, and blend with existing soil to a depth of approximately 150mm, before planting flowers, ground cover, shrubs and small trees. This same technique can be used in turf establishment and renovation applications. [The pictures below illustrate the renovation of soil-based greens using garden waste compost. This field research project, which compared two renovated greens (one with compost and one without), found faster turf knitting and more extensive rooting on the compost amended green.]

## Applying Compost to Golf Courses



### Allerton Golf Course – Liverpool, England

**Tee/Green Construction Mix** - Prepare a mix consisting of approximately 10-20% compost, by volume, with 80-90% sand (STRI/USGA approved) for a well drained, yet organic matter rich construction mix.

**Fairway Topdressing** - Apply approximately 5-10mm of a finely screened compost on fairways and other tired turf areas. Use an aeration device of some type to create holes for the compost, then smooth the area and backfill the holes with compost using a drag mat or rake. [The pictures below illustrate fairway topdressing. the renovation of a soil-based green using garden waste compost. In 4 weeks, the fairways possessed a darker colour, thicker grass and better play.]



### Epping Golf Course - Epping

**Mulching** - A coarser grade of compost can be used as effective and aesthetically pleasing surface mulch. Apply as you would any conventional mulch product.

#### Benefits of Compost Use

The use of compost in any of the applications listed above will yield an array of benefits to the soil, the plants and the environment. Here are just a few, as listed on the WRAP website:

1. *Increases nutrients and reduces the need for artificial fertilisers*
2. *Helps plants grow better and survive longer*
3. *Reduces soil compaction*
4. *Improves moisture retention*
5. *Increases microbial activity*
6. *Boosts soil temperatures*
7. *Reduces erosion*
8. *Prevents root disease*
9. *Reduces nutrient losses*
10. *Improves plant quality*

## Sports Turf Trials Prove Effectiveness of Recycled Compost

(WRAP, Jan. 2006)

### The Research

New research, released by WRAP illustrates that the application of compost made from recycled garden waste in a variety of sports turf environments can offer numerous and significant performance, growth and commercial benefits. WRAP commissioned the Sports Turf Research Institute (STRI) and Glendale Services to investigate the use of compost in turf maintenance. The project began with a programme of scientifically-controlled trials undertaken at STRI's research site in Bingley. The aim was to compare the effectiveness of compost with that of commercial fertiliser and topdressing products.

This initial work provided the basis for commercial trials that followed at six sports venues across England. This work complimented the technical trials and allowed the project team to test the practicalities of using the product as part of normal working practices. This incorporated a range of different turf types, including golf fairways, close mown golf greens/bowling greens, low maintenance football grounds, and general amenity lawns and parks. A fine grade of BSI PAS 100 compost was used as a stand-alone fertiliser and was also mixed with sand as a top dressing.

### The Results

- compost provides a quick source of nitrogen to football pitches and, by keeping the soil healthy, prompts faster green up and increases the wear tolerance;
- over the trial period, controlled application of compost caused no significant change in soil pH on golf courses so it can be used to prevent over-acidification of soil without the negative effects associated with lime application;
- in heavy wear situations, such as a football pitch or public sports ground, compost treatments are effective in protecting turf and promoting grass recovery;
- compost used in a topdressing mix performs in a similar manner to a conventional peat or soil-containing product;
- the costs of using compost for maintenance of golf fairways, football fields and parks & lawn applications were comparable to using a long term controlled release fertilizer product.

### Feedback to Research

The STRI managed the project and Glendale Services, a leading provider of green service solutions, were sub-contracted to manage the commercial trials. Compost was provided by Premier Waste Management and Glendale's compost production company, Ecological Sciences Ltd. Dr David Lawson, Senior Research Officer at STRI, stated: "We were really encouraged by the results of these trials. On football pitches and golf fairways in particular, compost supported fast growth, great colour and increased wearability – results that all demonstrate how compost can be a valuable tool for any groundsman or greenkeeper."

Nick Templehead, Managing Director of Glendale Services, said: "We were really pleased to be involved with the trials because Glendale sees green waste recycling as a major part of responsible green management. During the open days, the local authorities showed a really keen interest in the project and that's one of the best results we could have hoped for."

Mike Lawrie, Glendale Contracts Manager for Manchester South, oversaw one of the six trials at Houghend Playing Fields. He said: "We split the field into three sections and applied a nitrogen based fertiliser to one, left one bare, and laid compost on the third. The area laid with compost produced thicker, cleaner grass and we are now in negotiation with Manchester City Council to use compost on football pitches and bowling greens across the city."

Louise Hollingworth, Organics Technical Manager at WRAP Organics, said: "While we had reams

of positive comments from groundsmen who had already used compost, we recognised the importance of verification of the benefits through controlled testing. We have been very encouraged by the results and believe that this will give many more sports turf professionals the confidence to use compost.”

To access a full copy of the sport turf trials report, please visit [www.wrap.org.uk/organics](http://www.wrap.org.uk/organics) or call the freephone helpline on 0808 100 2040.

### **18 Month Trial at Dundee and Perth Polo Club, Perthshire Racecourse, Scone Palace (REMADE Scotland, 2006)**

#### **The Research**

On 12th July 2004, Remade Scotland commenced an 18-month trial to monitor turf improvement from the application of compost on Pitch number 2 of Dundee and Perth Polo Club, Perthshire Racecourse in the grounds of Scone Palace. The aim of the trial was to generate sufficient information to provide an indicative quantification of the benefits of using compost as part of turf management practices.



Topdressing of turf is used by sports turf managers as a routine maintenance and renovation practice in order to improve turf and soil quality. Topdressing is often completed along with aeration and reseeding, and entails the application of a thin, uniform layer of sand, soil, organic materials, or various mixtures of these materials. Topdressings are applied at a variety of application rates, ranging from 1 to 12mm depth. Application rates are dependant upon the intended use of the turf, mowing height and the specific purpose for the topdressing.

The benefits of topdressing include:

- Levelling of the playing surface
- Reduced soil compaction
- Improved moisture penetration and infiltration
- Improved oxygen and moisture movement in the root zone
- Proper distribution of fertiliser nutrients and pesticides
- Reduced disease incidence

Compost has been shown to have a stabilising effect on the moisture content of soils. When wet, it creates a mulch – porous organic content within the compost as it swells and retains the moisture in a sponge-like effect, therefore making the ground less waterlogged. (USCC, 2005) It is the same sponge-like effect which allows compost to deliver moisture to the soil in dry periods. Friend (2004) showed that compost provided drought resistance and lower irrigation costs. He also showed that compost has the ability to provide long-term moisture dispersion deep within the soil structure, thereby reducing the necessity to irrigate as often. Erhardt (2005) found that compost had a more beneficial effect on nitrogen supplementation to the soil when compared to standard fertiliser applications. This was due to the slow release of nitrogen over the growing

period which resulted in an increased yield within the compost-treated plots over a 10-year period by 7% compared to the fertilised plots.

Research has indicated that topdressing with some composts biologically suppresses specific lawn diseases such as red thread and snow mould (Boulter, 2002). Red thread occurs in spring and autumn during humid periods when the air temperatures are between 16°C and 24°C (60°F and 75°F). It is caused by a fungus that produces pink to red threads among the grass, which can be seen on close examination. The disease is especially severe on slow-growing nitrogen-deficient turf. The grass may become bleached in the affected area but is rarely killed. Snow mould (fusarium) is caused by a fungus that turns the grass yellow in patches, which may coalesce to form larger areas. In damp weather a white fungal growth may be visible. The disease is worst in late autumn and winter, especially if the grass has been covered with snow.

### **The Results**

Different applications of topdressings were applied to Dundee and Perth Polo Club, Perthshire Racecourse to assess the effects of applying compost compared to conventional turf management practices. The trial was performed on a polo pitch. It was, however, anticipated that the findings would be transferable and of relevance to other turf and sports-pitch industries.

The compost provided an excellent, and somewhat immediate, greening of the turf, which was superior to the chemical fertiliser treated plots. The compost is known to contain both nitrogen and iron.

Root growth on the compost and compost/sand treated plots was also superior to plots only treated with chemical fertiliser. The compost also seemed to suppress specific soil borne diseases, such as red thread and fusarium, for much of the summer growing season.

The data suggests that the plots treated with compost-containing topdressings sustained less drying. It can therefore be deduced that compost application to turf can significantly increase the moisture-retaining capacity of the underlying soil.

Perhaps the greatest benefit has been the increased density of the sward on the compost treated plots. There was a noticeable difference between the density of the turf on the compost and fertiliser treated plots. This improved turf density should reduce the damage caused by the horses' hooves. When a polo pony accelerates or stops suddenly, their hooves slide over the turf. On neighbouring untreated plots, the hooves cut through the grass blades, leaving large tears in it. Where the tears have occurred on the compost treated plots, the regrowth of the turf has been accelerated. On some of the untreated plots, however, there are injured areas of the pitch that still have not completely filled in six months later.

### **Polo Pitch Conclusions**

The results of this trial indicate that compost is superior to fertiliser, in sward growth, colour, and biomass and moisture retention of the soil, for sports turf. The turf chosen for this trial suffered significant trauma throughout the course of the study, due to frequent use by polo ponies, and appeared to regenerate faster in the composted areas. It has also been shown that the effects of compost are longer-lived than that of fertiliser, and if the frequency of application of compost is increased or sand is added to the mix, then these effects are further prolonged.

The compost used for this trial was Discovery Compost, derived from green garden waste in the City of Dundee. This trial has shown that the compost derived from green waste has a higher efficacy in sports turf management than traditional topdressings. Due to its abundance, it is significantly lower in price than topdressings and fertiliser products and therefore, should confer marked cost-savings for the turf management industry. If topdressing with compost worked on a polo pitch, just imagine what it can do for your golf course!

## Current Compost Use and Markets

REMADE Scotland contracted with an international compost market research and development firm (R. Alexander Associates, Inc, USA) to evaluate current and future markets for composted products in the Glasgow and Clyde Valley region. The research surveyed the market in order to develop both an understanding of current compost usage and to determine issues surrounding compost use by particular end users, such as golf courses and other sports grounds. The conclusions and recommendations of that study are listed below:

The current estimated usage of compost, 28,557 cubic metres, in the Glasgow and Clyde Valley region is relatively small at the existing time. The survey indicated that this is primarily due to the fact that end users either didn't know that the products exist or really didn't understand how to use them. This survey included 13 golf courses, of which only 3 are currently using compost. All of these courses are using it in a topdressing application as described above in the section on compost use. All of the greenskeepers contacted expressed an interest and a willingness to try compost, if it were high quality and locally available.

Although current compost usage in the Glasgow and Clyde Valley region is limited, the latent market demand potential was estimated to be 94,107 cubic metres. This latent demand represents the current usage of compost, plus the realistic volume that could be used to replace other products currently being used. Compost has the ability to replace existing competing products, such as topsoil, topdressing and peat based products. These products are already being used in significant quantities by the market segments surveyed. Therefore, since applications and requirements for the use of green compost do exist in latent form, composters must educate and demonstrate to end users, including golf courses, about the many benefits of compost and how it can replace other more established products.

Compost has proven to be an excellent alternative to a variety of mainstream horticultural and agricultural products, and it has proven that it can compete with these products on the 'open market'. REMADE Scotland believes that the same can be achieved in the Glasgow and Clyde Valley region, as well in the whole of Scotland. However, it is also understood that success will take commitment from end users (like you), regional composters, and us (REMADE Scotland).

## Remade Scotland – Future Work

If you believe there is other research or trials REMADE Scotland (or WRAP) should do to promote compost usage on golf courses or if you would like to host an event or turf trial at your golf course or sports pitch, please contact Remade Scotland at the address below or email [Simon.Glen@gcal.ac.uk](mailto:Simon.Glen@gcal.ac.uk) with your ideas and suggestions.

For more information on compost and other recycled material markets in Scotland go to [www.remade.org.uk](http://www.remade.org.uk)

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