

## ***Best Management Practice Guide Using Compost for Sport Pitch Renovation in Ireland within a Sustainable Sport Pitch Maintenance & Management System***

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### ***Introduction & Overview:***

A compost-based topdressing is a key ingredient in the effective maintenance or renovation of sports pitches in Ireland. In trials conducted in both Tralee and Limerick during 2011, pitches treated with compost far outperformed the control plots which represented the traditional method of renovation (aeration, application of chemical fertiliser and over seeding). The results were quite impressive: denser and fuller growth, less weeds, improved soil qualities & structure, good colour and healthy lush grass. When done in combination with an effective maintenance and management programme, the renovation with compost works well to keep sport pitches at their optimum level of performance for consistent use.

### ***Purpose of this Guide:***

To illustrate how to use compost as a topdressing for the renovation of sport pitches in Ireland and explain how to integrate it into a overall management programme in order to maintain sport pitches to the highest possible standard.

### ***Compost Specifications:***

For compost to be effective, the key is to use the right topdressing material. Compost can be refined to create an ideal topdressing material due to its high organic matter and nutrient content. It must be stable, fine in texture and free from weed seeds, contaminants and pathogens. Before purchasing any topdressing, insist on viewing a copy of the laboratory test results for the batch to be purchased in order to see if they meet the standards or limits listed in the chart below:

**Table 1: Recommended Compost-Based Topdressing Specifications**

Parameter	Topdressing Specification or Limit
Particle Size	<5mm to <10mm (shorter grass requires smaller particles)
pH	6.5 to 8.7 pH
Electrical conductivity	250mS/m maximum
Organic matter content	>25%
Moisture or dry matter content	30-40% Moisture or >60-70% total dry matter content
Stability: microbial respiration rate	<8 mg/CO <sup>2</sup> /gram organic matter/day
Stability: seed germination	80% tomato seed germination versus control 80% average plant mass of tomato seed germination versus control No abnormalities of plants compared to control
Stability: C:N ratio	<20:1
Pathogens: <i>Salmonella</i>	Absent
Pathogens: <i>E. Coli</i>	<1,000 CFU/gram
Contaminants: Glass, metal, plastic	<0.25% by mass of which <0.12% is plastic
Contaminants: Stones >4mm	4% by mass
Contaminants: Weed seeds	Absent
Heavy Metals: Cadmium	<1.3 mg/kg dry matter
Heavy Metals: Chromium	<92 mg/kg dry matter
Heavy Metals: Copper	<149 mg/kg dry matter
Heavy Metals: Lead	<149 mg/kg dry matter
Heavy Metals: Mercury	<0.4 mg/kg dry matter
Heavy Metals: Nickel	<56 mg/kg dry matter
Heavy Metals: Zinc	<397 mg/kg dry matter

## **Renovation Activities**

A renovation using a compost-based topdressing consists of the following general steps or activities:

1. Mow grass to 2-3"
2. Fertilise and allow grass to grow for up to two weeks.
3. Mow grass again, but shorter and pick up cuttings
4. Aerate with Vertidrainer machine or plugger
5. Spread compost: 6-8mm for natural soils and 10-12mm for sand carpets
6. Brush compost into holes and even out surface
7. Over seed the pitch with grass seed
8. Mow in two weeks and pick up cuttings to allow new seedlings to emerge and grow
9. Apply herbicide, as necessary

10. Cut grass every week and leave cuttings on pitch being sure not to allow clumping due to cutting grass that is too long or wet.

These steps are detailed and shown below.

### Steps 1-3: Prepare Pitch for Renovation:

Mow grass to 2-3" and fertilise. Make sure that it rains a bit before cutting again to allow the fertiliser to dissolve and leach into the soil. Mow grass again in two weeks time, picking up the cuttings as shown in the photo below. This is important because you don't want the cuttings to be brushed into the holes that are vertidraind into soil in the next step.



### Step 4: Aerate with Vertidrainer or plugger

Use a Vertidrainer or plugger to open up the soil by driving holes into soil or by extracting plugs from the pitch. A Vertidrainer attachment is shown to the right. A tractor of at least 40hp is needed to properly operate this machine. As can be seen, the holes should be 15 to 20cm deep and a 10-20mm wide in diameter.



### Step 5: Spread Topdressing

This can be accomplished in many ways with different pieces of equipment. A manure, fertiliser, sand or salt spreaders can be used. The important consideration here is an even spread of material 6-12mm thick. A modified



sand spreader is shown on the next page showing what an even application looks like.



### Step 6: Brush in the Compost

The photo below shows a small tractor with grass tyres using a yard brush attachment to work the compost into the holes and even out the surface. The brush action of this attachment was very effective in mixing things and working the compost to the top of the soil while pushing material into the holes, more so than a drag matt. This represents an innovation over traditional methods.



## **Steps 7-9: Over seed, mow and apply herbicide**

After the topdressing has been brushed in, overseed immediately or within one or two days. Allow the grass to grow and the seed to germinate for a couple of weeks before cutting. Always cut young grass with sharpened mower blades. Pick up the cuttings so they do not suffocate the new seedlings. Apply herbicide after the first cutting, as necessary.

## ***Maintenance Activities***

Cuttings can be effectively recycled on the pitch to reduce disposal and fertiliser costs. This is called GrassCycling. The pitch is mowed more often so the small bits that are cut can easily fall through the grass canopy and onto the soil to decay. These release nitrogen which helps keep the pitch green. If you let the grass grow too long, over 4-5" then the grass starts to grow stem to support the larger and taller leaves. When the stem is cut, it does not degrade in place as easily and must be collected. If it is allowed to clump and sit on top of the pitch, the grass will suffer and can develop bare spots and become patchy. The point is, more frequent mowing actually cuts down on the overall work it takes to manage the pitch because you don't have to collect and manage the cuttings. Believe it or not, studies show a 30% reduction in time used to mow the pitch.



So here is a basic maintenance schedule for mowing, fertilising, weed control and aerating:

### **Mowing:**

The key to mowing is cutting the grass regularly and often. Regular mowing produces a dense pitch while infrequent mowing creates a thin and spotty pitch. The other essential tip is to avoid clumping of the cuttings on top of the lawn while GrassCycling. The can suffocate grass and create bare spots.

*Frequency:* In summer months when there is a lot of light and we have warm days, cutting may need to take place every 5-7 days. Other than that, every 7-10 days will work depending on weather, rainfall and time of year. The important thing here is to allow the grass to grow no more than 3" and then to cut it down to 2-2.5 inches, never taking more than an inch at a time. If the grass is cut too much, root growth stops while the lawn recovers and weakens the lawn.

**Mowing Height:** The length of the grass depends on the type of sport played on the pitch and the season of the year. Here are the recommended heights for cutting the grass by sport:

Sport	Recommended Mowing Height
Hurling	18mm or ¾"
Gaelic Football	50mm or 2"
Soccer	50mm or 2"
Rugby	50-75mm or 2-3"

For hurling, the grass is allowed to grow to 23-27mm and cut down to 18mm. Mowing may need to take place more often to maintain the pitch, similar to golf greens, but not as short or frequent. For Rugby, the grass can grow a bit longer, but don't let it grow more than 4" and try not to take more than an inch to an inch and a quarter off at a time.

### **Fertilising:**

**Type:** 18-6-12 in spring and then 10-10-20 the rest of the year. Due to Ireland's wet climate, the key is little bits of fertiliser often. So use the normal fertiliser. There really is not much advantage to the slow release variety in terms of longevity in the pitch plus it is much more expensive.

### **Frequency:**

- Sand Carpets Pitches:
  - Regular fertiliser every 6-7 weeks five to seven times per year
- Natural Soil Pitches
  - Regular fertiliser three times a year: March, May and September

### **Schedule:**

- Sand Carpets Pitches:
  - 18-6-12 in March and May
  - 10-10-20 every 6-7 weeks after until September
  - October half an application of 10-10-20 to hold the grass over winter
- Natural Soil Pitches
  - 18-6-12 in Spring
  - 10-10-20 in May
  - 10-10-20 in September

### **Weed Control:**

The renovation with compost as explained above in conjunction with an herbicide application can bring weeds under control. If weeds do become a problem, the selective weed killers containing 2-4 D, M.C.P.A. or Dicamba could be used.



### **Aeration:**

Aeration with a Vertidrainer or plugger should be undertaken every 1-2 years as part of a regular pitch maintenance programme. The frequency depends on soil type and pitch use. It not only opens up the soil and relieves compaction, but also allows for the addition of sand and/or compost to improve soil qualities and structure as well as fill in the divots and bare spots to even out the playing surface.

### **Management of Training Sessions**

Just a few tips to keep the pitch in optimal shape:

- ✓ Practice near the sidelines away from goalmouths and the centre of the pitch to avoid excessive wear and keep the pitch fresh for matches.
- ✓ In step and repetitive team workout exercises should be moved around to avoid excessive wear on the pitch. Try to do these off of the pitch if possible.

### ***Benefits from Using the Sustainable Sport Pitch Management System***

The use of compost in sport pitch maintenance and renovation combined with a frequent mowing regime based on GrassCycling is the most effective way to manage your sport pitch. Here is a summary of the benefits learned from the applications in Limerick and Tralee:

1. Only 6mm to 12mm of topdressing is needed every year or two.
2. Compost stimulates better seed germination by holding moisture on top and near the surface of the soil where the seeds are sown.
3. Compost helps encourage young and old grass growth to out compete the weeds right after renovation. When herbicide was applied on pitches where compost was used, weeds came under control.
4. The compost helps make the herbicide more effective. There was a greater reduction of weeds in pitches where compost was used in conjunction with the herbicide.
5. The compost encouraged dense deep green grass growth.
6. The compost helped keep the dark green colour longer by holding nutrients in the root zone, especially in sand carpets.
7. Compost can help reduce the need, quantity and/or frequency of chemical fertiliser application.
8. Compost was as effective as applying sand as a topdressing in evening out the playing surface giving the pitch a smooth, even and true finish.
9. Compost is an excellent source of nutrients and organic matter, while it also provides a small increase in soil pH which in turn increases nutrient exchange capacity in the soil.

This system saves both time and money. It's so easy clubs can do it themselves rather than relying on contractors. Contact us to find out more....



*Completely renovated pitch at Mounthawk Secondary School in Tralee, County Kerry*

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*This fact sheet has been developed by:*

Craig H. Benton, Composting & Recycling Consultants Ireland in Dublin at 01 828 3757 or  
[doctorcompost@earthlink.net](mailto:doctorcompost@earthlink.net)

*In Association with:*

Michael O'Shea, Sports Turf Consultancy in Killarney at 064 775-4316 or  
[mosheastc@eircom.net](mailto:mosheastc@eircom.net)

Ron Alexander, R. Alexander Associates, Inc. in Apex, North Carolina at 001 919 367-8350 or  
[alexassoc@earthlink.net](mailto:alexassoc@earthlink.net)



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