

## HOW TO GET THE BEST OUT OF OVERSOWING GOLF GREENS

Dr Ruth Mann, STRI, discusses recent research on seed germination.

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Often golf greens in the UK are heavily dominated by annual meadow-grass, a weed grass that may not perform well in winter, produces copious seedheads and is very susceptible to disease such as anthracnose and microdochium patch (fusarium patch). It is slow to begin growing in spring, when more desirable grass species are growing, creating a growth differential in the sward. Many golf Course Managers will oversow with desirable grass species, such as red fescue and bentgrass to try to obtain optimal sward compositions for playing golf. However, obtaining a good strike when oversowing can be difficult, with many factors affecting the seed germination and establishment of the seedlings in the existing sward. Recent research at STRI has looked at some of the factors affecting seedling germination and establishment and how the grass surface performs following treatment.



(Plate 1: Aeration using the Graden sand injection)

Aeration and top dressing opens up the rootzone allowing air to penetrate and removes organic matter (Plate 1). Excessive organic matter (thatch) is one of the most common features of golf greens that are most susceptible to winter disease outbreaks. Organic matter dries out in the summer months, becoming hard and hydrophobic. The surface then becomes very difficult to rewet and the grass can suffer, especially as annual meadow-grass is short rooted and can suffer from drought easily. However, during wet months of the year, the organic matter is much more like a sponge, holding water at the surface, plugging and slowing the ball roll.

To begin with, the organic matter should be measured to benchmark the current position. It is important to know where the organic matter is in the profile. Therefore, samples of known volume are preferable that can be cut into exact depths for analysis. This means when you come back to complete the next analysis after remedial treatment you can be sure you are assessing equal samples. Also, if your results describe the organic matter in layers in the rootzone (0–20 mm, 20–40 mm, 40–60 mm), you can decide which aeration treatment is most suited for removal of the organic matter. Research at STRI has shown that on average 15% of the organic matter was removed per pass of the Graden sand injection compared to 5.5% removed by hollow-coring with 15 mm diameter cores at 2 inch spacing and filling the holes with sand by hand. Therefore, more surface organic matter was removed using the Graden sand injection. However, below the 25 mm working depth of the Graden, little change in organic matter was observed and an aeration method such as coring may be required to remove organic matter at these depths. Targets for organic matter in golf course greens at each of the depths have been determined following the largest UK survey of factors affecting playability (Table 1).

Table : STRI Organic Matter Content – Target Values				
Depth	0-20 mm	20-40 mm	40-60 mm	60-80 mm
Target Range	5-7%	<4%	<4%	<4%

**Note** these figures are considered the maximum values. It is likely significantly lower values will be required where annual meadow-grass is dominant and/or in wet parts of the country.

Removal of the organic matter is also very important in preparation for oversewing. Grass seed needs soil contact for good germination and establishment. Often, seed sown into an area high in organic matter germinates but fails to establish as the roots are trying to grow into thatch rather than soil. Therefore, if the golf greens have high amounts of organic matter, it should be dealt with before embarking on a major oversewing programme to achieve optimal establishment of the sown grass seed. During trials assessing the Graden sand injection with oversewing attachment, significantly more bentgrass seedlings germinated compared to broadcast oversewing and brushing in (Figure 1). Therefore, placing the seed into the channels following organic matter removal to the depth of the thatch (around 2.5 cm) ensured soil contact and encouraged germination.

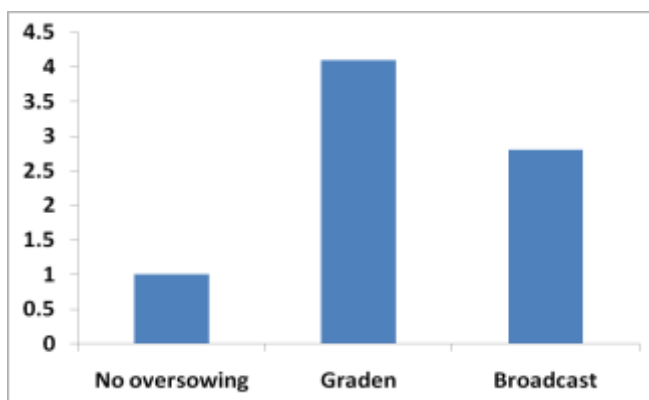


Figure 1: Seedling germination following oversewing with Graden sand injection and seedling attachment or broadcast and brushed in.

Plate 2: Aeration by hollow-coring

Treating the established grass to hold back its growth a little while the seedlings begin growing can also improve establishment. A number of trials with Primo Maxx at STRI have demonstrated that applying 0.4 l ha<sup>-1</sup> Primo Maxx in 300 l ha<sup>-1</sup> water five days before the oversewing operation allowed significantly better establishment of seedlings (Plate 2). Also continuing with the Primo Maxx programme after oversewing did not damage or prevent the seedlings from becoming established in the sward.



Plate 3: Seedlings following Primo Maxx application 5 days before oversewing with the Graden sand injection with oversewing attachment

Remember that the new grass seedlings will run out of nutrient quite quickly after germination. This is often seen when newly emerged seedlings turn yellow shortly after germination. It is important to apply some fertility just after germination to allow the seedlings to continue strong growth. At this time root growth is particularly important and so ensuring phosphorus is available by applying a high phosphate but low nitrogen pre-seeding fertiliser, such as 6.9.6 N.P.K., may be optimal.

Golf green renovation tends to be being pushed back later and later in the calendar to prevent it affecting the golfing season. In an ideal world, aeration and oversewing would be completed around late August or early September, depending on your location, when the soil temperatures are high and rainfall likely to allow good germination and establishment, with less risk of seedling blights occurring. Even during summer months, providing sufficient water can be supplied, quicker germination, establishment and recovery will be observed. However, pushing back into late September and October, soil temperatures may not remain high enough to allow good growth of the new seedlings and so the visual effect of oversewing may be apparent for some time.

Finally, removal of organic matter creates extra airflow into the rootzone and allows microbes to proliferate and feed on the organic matter remaining (helping to reduce it further). Nitrogen is often released as a by-product of this organic matter breakdown by the microbes and the grass uses this nitrogen for growth. However, some of these microbes are those fungi we think of as pathogens. In the right weather conditions, these pathogenic fungi will infect the grass plants and the symptoms of disease will develop over the next few days, especially if the weather remains conducive to fungal growth. The easiest way to deal with this is to apply a suitable preventative fungicide a few days before aerating the golf greens. Remember that it may take up to a couple of days for a systemic fungicide to be completely taken up and distributed around the grass plant, giving full protection. This fungicide can also often form the start of a preventative fungicide programme against microdochium (fusarium) patch.

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