BARENBRUG

Overseeding
Golf & Bowling Greens

Our overseeding guide presents a step-by-step process to help you assess the merits of, and get the best out of, an overseeding programme for golf and/or bowling greens.

The guide is arranged in five sections, which should all be considered as key criteria to ensure your overseeding applications are a success. Together with our expertise, you will also find the results of an overseeding trial conducted in conjunction with the Sports Turf Research Institute (STRI) in Bingley, UK.

Course Conditions

There are several factors that can impede successful overseeding that relate to the environmental conditions of the greens in question. Assuming overseeding is taking place predominantly with the "fine-grass" species (red fescues and bents), it must be noted that these species are not likely to outcompete *Poa annua* in wet or dark places. It is therefore prudent to address the following points before committing to a species exchange programme:

- **Sub-surface drainage** in the greens must be at a level that the sward does not sit waterlogged for prolonged periods of the year.
- **Surface drainage** must also be adequate to ensure water moves through the rootzone profile and into the sub-surface drains. Essentially this means maintaining the organic thatch layer that accumulates at the base of the grass sward at a minimum.
- This is achieved predominantly by hollow-coring or similar method and regular top-dressing. The organic matter layer should ideally be a minimal 20mm or, at the very the least, open enough to allow for successful optimum sowing depth. An excessive thatch layer will also impede establishment of new seedlings and it is vital to overseed below the thatch layer if possible.
- Greens should have good **access to sunlight and good air movement** across their surfaces. The fine grasses, particularly bentgrasses have an increased susceptibility to poor light quality than for example, *Poa annua*.

In low level light conditions and shade, a greater proportion of light present is in blue or far red wavelengths, with a deficiency in red wavelength, known as photosynthetic active radiation (PAR), resulting in greatly reduced photosynthesis opportunity which negatively impacts on the plants capability to establish.

Insufficient air movement is likely to result in the sward being damp for long periods, which will adversely affect the fine grasses (particularly red fescue).

In both these scenarios, the solution to the problem is often the removal or thinning out of surrounding trees or scrub.

Timings and Weather

Overseeding in favourable conditions is an important consideration to ensure successful germination and establishment. Germination will only commence when sufficient temperatures are present and adequate moisture is available for absorption. The following points are paramount:

- Guidelines for **germination temperature** in the rootzone for individual species are as follows:

Bent grass
minimum 12˚C; optimum 16-22˚C

Fine fescue
minimum 10˚C; optimum 14-18˚C

Perennial ryegrass
minimum 5˚C; optimum 10-20˚C

- Germination sheets and nurse crops can assist new seedling establishment by providing much needed protection, warmth and moisture retention. For example, using fescue to help with establishment and early density when overseeding bent grass, can improve success rates.
- **Sufficient water** is critical during germination AND establishment, so the facility to irrigate must be present to guarantee success in times of low rainfall. It is, however, possible to over-water and this can create disease pressure, cause shallow rooting and flush vital nitrogen too quickly through the profile.

Creating Space

A tight, dense green sward is a very competitive environment for young seedlings to successfully establish in. Creating space in the turf canopy is an important factor to consider, particularly if the long-term goal is one of species exchange. Doing this in the middle of the playing season may not be popular with golfers, but it will dramatically speed up a species exchange programme if conditions are right for the introduced species. It can be achieved in two main ways:

- **Mechanically** – surface preparation by way of micro-tining/hollow-tining, needle-tining/sarell rolling, verti-cutting/thatchaways, verti-draining or Graden, either as a single operation or in combination is recommended, depending on your existing sward density, organic layer or degree of compaction. These operations allow for water and air infiltration and ensure seed can make good contact with the rootzone below the thatch layer.
- **Chemically** – graminicide applications (e.g. Rescue®) to remove unwanted grass species in the sward can be very successful in combination with overseeding, particularly with red fescue in links courses. A growth regulator to slow down the existing sward prior to overseeding may also be a benefit in *Poa annua* – dominant greens.

Figure 1: **Photo showing browntop bentgrass overseeding results from precision Graden method.**

Overseeding Method, Seed Mixture and Frequency

There are several factors to consider here, which mainly relate to what is trying to be achieved by the overseeding application or programme. The following points are all relevant:

Renovation or Species Exchange?

If you are fortunate enough to already have a high percentage of your chosen desirable species, annual overseeding is recommended to maintain that balance. One or two applications during renovation procedures are recommended, particularly in fescue-dominant swards.

If the goal of overseeding is to CHANGE the grass species of the greens, this can only be achieved by following a dedicated programme, usually over a number of years. Overseeding regularly (as much as once a month) during the active growing season (approx. end of April until early October) is recommended in this scenario.

Species, Cultivars and Mixtures

Red Fescue (*Festuca rubra*) and bents (*Agrostis sp.*) are the traditional choices, but dwarf rye cultivars (*Lolium perenne*) are also suitable in some circumstances, particularly for bowling greens. There are a number of different bent and fescue sub-species available, so it is important to make the choice that is right for your particular course, and be aware of the implications (as well as the benefits) that some of the lesser known species may have.

In terms of cultivars and mixtures, the BSPB/STRI Turfgrass Seed Booklet can be used as a broad guideline, but it is equally important to choose a synergistic mix from a reputable grass breeder to ensure the blend works well together and high quality seed is provided.

Sowing Rates and Depths

It is vital to ensure that seed is sown in contact with the rootzone below any organic thatch layer. Seed on the sward surface may germinate, but has little chance of successful establishment. Recommended sowing depths are in the BAR Range catalogue; please remember they are BELOW any thatch layer, for example a recommended sowing rate depth of 6-8mm means an actual sowing depth of 21-23mm if you have 15mm of thatch. In terms of species, bent grass should be sown at 2-4 mm and red fescue at 8-12mm below the thatch; it is therefore generally recommended to oversow with EITHER bent or fescue (rather than both together) in a single application.

In terms of sowing rates, they are typically calculated in terms of weight per unit area, e.g. g/m². The rate will depend on the species in question (the seed sizes of bent and fescue are dramatically different), the objectives of your overseeding application and the method you use. The table below is a guideline for rates of a SINGLE application; in a species exchange programme, these should be multiplied 4-5 times for annual usage.

Overseeding Methods and Machinery

These can be broadly split into two groups; precision (machinery) methods and "surface preparation and drop-spread" methods. Precision methods physically place the seed at a specific depth in the rootzone and predominantly involve disc-seeders and machines like the Graden Sand-Injector. "Surface preparation and dropspread" can be undertaken in one pass of various dimple seeding machines or manually after hollow-coring or solid tining.

Both methods can produce excellent results; generally speaking a precision method will require less seed, but the relative merits in terms of surface disturbance, man-power, timings etc. should be considered when choosing which is best for you.

Species	Number of seeds per g	Rate (overseeding machine)	Rate (dropspread)
Bentgrass	14,000	4-6g/m²	8-12g/m²
Red fescue	1,000	10-20g/m²	20-40g/m²
Perennial ryegrass	700	10-20g/m²	15-30g/m²

Figure 2: **Photo showing red fescue overseeding results from precision disc-seeding method.**

Figure 3: **Photo showing red fescue overseeding results following solid tining and drop-spreading method.**

Subsequent Maintenance

Following overseeding applications, steps should be taken to help successful establishment of the young seedlings in the competitive environment of a fine turf sward. The following points are of particular note:

Nutrition

It is more beneficial to the emerging new seedlings to apply fertiliser AFTER germination rather than applying a pre-seed fertiliser. This helps reduce the competition from the existing sward.

Providing the new seedlings with fertiliser components and micro-nutrients that help rooting can also be very beneficial. Sufficient nutrition during the establishment phase is crucial, even for those species which have lower nutrition demands in the longer-term.

Height of Cut and Mechanical Disruption

Raising mowing heights by 1-2mm will help establishment as there will be more chlorophyll for photosynthesis and a significant reduction in mowing height stress.

Surface aeration and verticutting should also be reduced if possible until the rooting system of the seedlings is well established.

Top Dressing

It is common to top-dress immediately following overseeding but this should not be considered an absolute requirement. If using top dressing as part of your thatch control programme, do not apply too thickly over the newly sown seed or emerging seedlings.

Take care with abrasive sands when overseeding with fescues, apply very lightly and avoid aggressive brushing/dragging.

If overseeding into a very sand-dominant rootzone, ensure sufficient moisture is available where the seed sits to initiate germination and fulfil establishment.

Chemical Applications

Read labels on any chemicals applied to greens with existing seedlings or planned overseeding applications. The most common issues here are with selective herbicides; those with a residual action applied before seeding can also be problematic. Sulphate of iron applications can dessicate young seedlings also.

Overseeding Results

If the preceding steps are followed, meaningful success will be obtained from overseeding applications.

Productive overseeding is a sound investment that should in the long-run reduce maintenance costs (predominantly fungicide and fertiliser applications), as well as increase golf club revenues by allowing more winter play in better conditions.

In order to show how effective overseeding can be, a Barenbrug-funded trial was initiated in 2012, conducted by STRI at Bingley to determine the effects of overseeding methods and grass seed selection.

An established Poa annua/Highland bentgrass sward was created on a sand-dominant rootzone over a two-year period and the "green" was overseeded in spring and autumn 2014.

Six seed mixtures were used for overseeding using two different methods; a precision (Graden) and "surface preparation and drop" method (dimple seeder).

Details of the seed mixtures and sowing rates can be seen in Table 1.

Management of the trial was in accordance with good and standard practices and golf-green simulated wear was applied throughout trial.

Overseeding success was measured by botanical composition assessments before and after seed application and monthly visual merit assessments of the plots were also conducted.

Figures 4-6 show the sward composition of the plots before overseeding (April 2014), after overseeding (November 2014) and at the conclusion of the trial the following year (July 2015).

The following conclusions can be drawn from the trial:

- With good seeding rates and just two overseeding applications at appropriate times, the botanical composition has been influenced in the course of one golf season with respect to both fescue and bent.
- Red fescue populations increased from 0 to 15% on average during the year of overseeding.
- Approximately 10% of the red fescue remained up until summer the following year.
- Even these small gains in red fescue translated into significantly better independent visual turf merit during parts of winter and spring of 2014/15 (data available).
- Over the course of the trial, bentgrass populations in all plots declined while *Poa annua* continued to ingress. In "control" plots, bentgrass declined by 20% during 2014, but in those overseeded with browntop bent, this decline was limited to just 5%.
- There were no significant differences in overseeding success between the two methods in this trial.
- Using cultivars from BAR Range with higher BSPB Turfgrass Seed ratings produced better results at the conclusion of the trial in all six like-for-like treatments.

Spring and Autumn Treatment	Seed Rate
BAR ALL BENT	6g/m²
Highland bentgrass (Agrostis castellana)	6g/m²
BAR 2 (Highly rated 80:20 fescue:bent mix)	20g/m²
Poorly rated 80:20 fescue:highland bent mix	20g/m²
BAR FESCUE (Highly rated 50:50 slender:chewings mix)	25g/m²
Poorly rated 50:50 slender:chewings mix	25g/m²

Table 1: **Seed treatments and sowing rates of STRI overseeding trial**

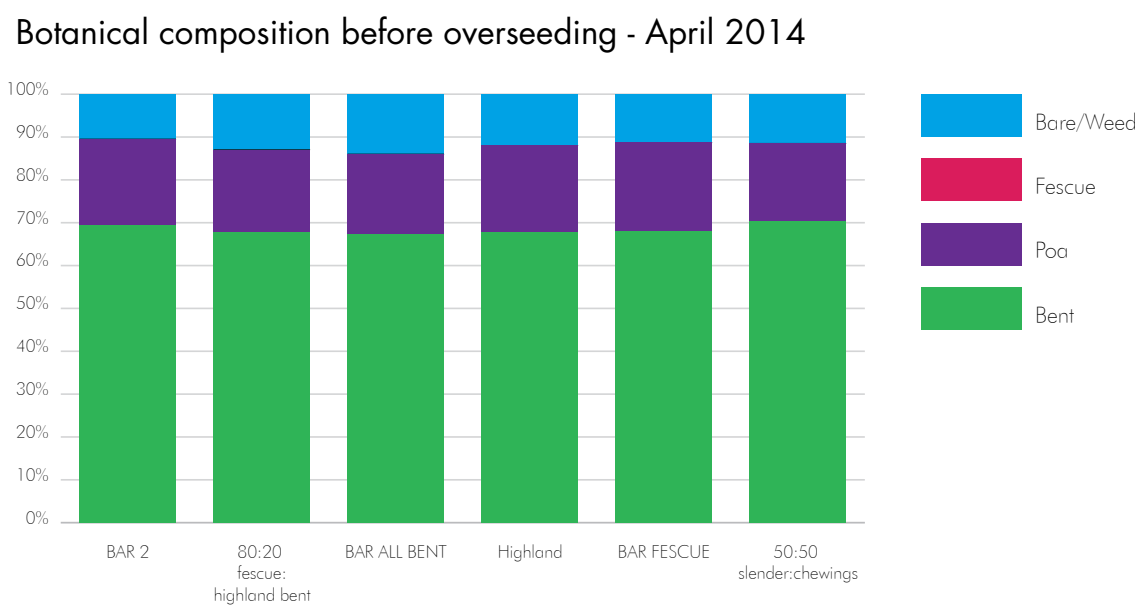

Figure 4: **Botanic composition of STRI trial before overseeding (April 2014)**

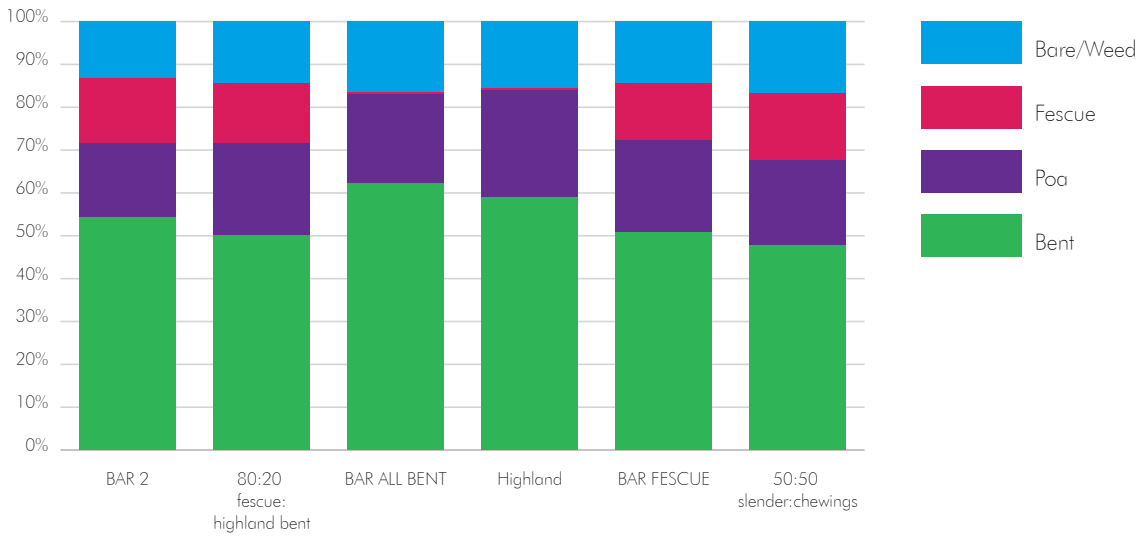

Figure 5: **Botanic composition of STRI trial after two overseeding applications (November 2014)**

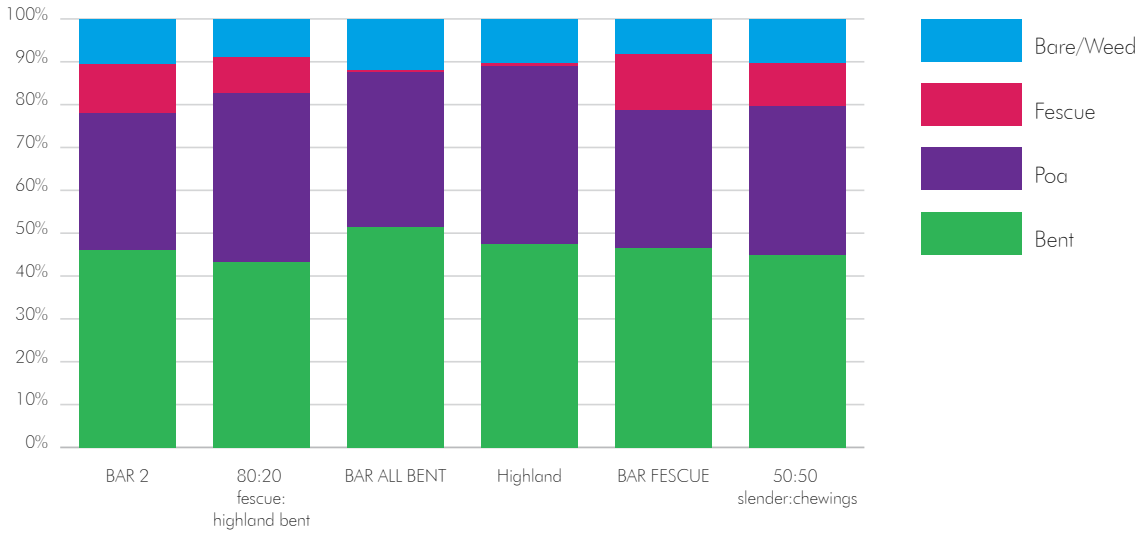

Figure 6: **Botanic composition of STRI trial at conclusion of trial (July 2015)**

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