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Eddie Connaughton continues his article on annual meadowgrass by looking at ways of managing it

When it is realised that annual meadowgrass is no longer just an annual plant, then it is possible to manage strategies to either eradicate it or live with it. The very nature of classifying plants such as *Poa annua var annua* and *Poa annua var reptans* is recognising that it is no longer just plain annual meadowgrass we are dealing with. Therefore it is necessary to manage the turf to the condition that prevails.

As an example, when new greens are sown out with fescue and bent grass, the first invading grass is *Poa annua var annua*, which is coarse in texture, shallow rooting and bunch type. Conversely, established greens will usually have a fine-leaved, low-growing, deeper-rooting grass, with stolons present which will most likely be the perennial biotype. Therefore, either for control or management of meadowgrass, it is necessary to determine what variety is present in your turf.

In my opinion, there are different classifications for the way meadowgrass is managed and all are applicable to individual situations. The three main categories of management are:

1: NEW GREENS

These are invariably built on free-draining sandy rootzones and are sown with predominantly fescue/bentgrass or, in more recent times, creeping bentgrass (*Agrostis stolonifera*) of American design. Whether it is fescue/bent or creeping bentgrass, the same challenges exist in preventing the meadowgrass from encroaching the new surfaces. If a good density of whatever grass is sown is established, then the encroachment of meadowgrass is reduced. However, in all fine turf surfaces the real challenge occurs when the height of cut is reduced to produce the speed on the greens that is invariably dictated by television coverage, and in turn good surfaces are subjected to undue early stress.

It is at times like this that the

grass thins out, algae appears and the next step is meadowgrass. The 'traditional' way of encouraging the fescues and bents is through aeration and depletion of nutrients, because the meadowgrass are 'opportunistic' grasses and always invade an over-fertile area, thus suggesting that poverty will eliminate meadowgrass. This 'theory' is probably the most misleading of all the management policies that have been discussed over the past few years.

Of course, once a perennial grass like fescue or bent has declined and meadowgrass has appeared, the battle is on for which one will survive. In our climate, once the fescue/bent has declined, the meadowgrass will tolerate the practical conditions, ie:

- Continuous close mowing on a regular basis;
- Frequent bad weather including cloudy days;
- Year-round play;
- Compacted soils.

Having said all this, the fescue/bent and indeed the pure creeping bentgrass greens can compete with annual meadowgrass once they are healthy enough to prevent the invasion of the annual strain from establishing. Therefore to prevent encroachment on new greens, the turf sown (ie fescue/bent or a combination of both or creeping bent) should be kept in a healthy condition with good fertility management. This does not mean over-fertilising which has been attributed to meadowgrass invasion in the past, but more keeping the desirable grasses healthy to fight off the 'weed' grasses.

The other main advantage of meadowgrass encroaching new greens is that it is invariably the *Poa annua var annua* species. This strain is possible to manage through cultural methods such as scarifying, verti-cutting and top-dressing to reduce its impact. Certain chemicals have an inhibiting effect on the annual strain of meadowgrass in this country but

management



of *Poa annua*

there are no labels for such applications. The most effective way of controlling annual meadowgrass at this stage is through hand-weeding out the invasive plants as they appear. All other methods risk invasion and if the ultimate desire is to prevent meadowgrass, then cultural control such as hand-weeding is the most effective. This coupled with an actively growing healthy sward of fescue/bent or pure bent is the way to ensure meadowgrass-free greens. It is also important to remember that as greens are cut lower for the desire of faster greens, then the risks are increased proportionately for meadowgrass invasion.

2: LINKS/HEATHLAND GREENS

Traditionally these greens are associated with free-draining rootzones and sub-bases (ie sand

on links, gravel outwash on heathland) and therefore fescue/bent management should be possible. However, the reality is not so simple and these types of courses go through the same problems of controlling annual meadowgrass. By their very nature and length of time established, the majority of these courses have meadowgrass in the greens. This meadowgrass is most likely the perennial biotype because it will have gone through many years of cultural management and it is surviving because of its ability to adapt to the surrounding environment.

The reasons why meadowgrass would populate a links/heathland green are many and there was a period in the 1970s when fertilising and watering became popular, thus increasing the opportunity for meadowgrass to establish in such swards. Realising the errors

of our ways, the 1980s brought about policies of starvation and low water consumption with added aeration to eradicate the meadowgrass established in the 1970s. Perhaps this was too much too late because putting surfaces went through a bad period for smoothness and desirability. Great patience was required by golfers while the meadowgrass died and the fescues/bents were to fill in all the bare spaces created. This did not happen to any great degree of success and invariably meadowgrass colonised these areas again when some fertiliser was applied.

The reasons for the lack of success are many but in my opinion there are two factors that are rarely mentioned in this debate: a) height of cut and b) traffic.

The continual pressure to cut greens low for greater speed has stressed in particular the fescue

plants to the point where the meadowgrass becomes competitive and take-over occurs. The high volume of traffic that is so evident on our courses today compared to 25 years ago has an effect also. This is particularly true about winter and spring golf when bents and fescues are susceptible to wear and meadowgrass can easily invade surfaces in early spring. It is known that meadowgrass can grow at soil temperatures of 45°F while bentgrass needs 55°F to grow actively. These wear patterns also extend through the season. How often have you seen a green in late winter/early spring with the centre, where all the wear is, dominated with sickly-looking meadowgrass and the outer edges or contours, where the holes would not be placed, having fine fescues and bents present?

Such conditions prevail on

The management of *Poa annua*

many courses and the dilemma facing the golf course manager is 'Do I fight it or live with it?' I think that decision should be based on the amount of meadowgrass present and the biotype present. There are many different strains of *Poa annua var reptans* and if the fine-leaved types are present in the greens it will be almost impossible to eradicate them through cultural methods, ie low fertility, low irrigation and continuous aeration. In such situations, meadowgrass can be stressed to the point of death and if this choice is taken then a few useful tips would be:

- Aerate greens through hollow-tining to remove any excess fibre built up by meadowgrass;
- Overseed the greens in these bare areas with a seed mix dominated by bentgrass but with fescues present;
- Have soil tests taken and fertilise to establish the new grasses with a balanced fertiliser containing nitrogen, phosphorous, potassium and trace elements;
- Keep wear away from weak areas by using the edges of greens until establishment is complete;
- Keep height of cut at 1/4in minimum while recovery is taking place.

In managing the greens to reduce meadowgrass, I think it is important to maintain good density of the fine grasses so that they compete for existence. It is also important to carry out renovation programmes based on good greenkeeping principles of aeration, topdressing, overseeding, prevention of insect and disease damage and adequate fertility based on soil and/or tissue analysis. Even with all the above, if putting surfaces are desired during a renovation programme, the approach should be gradual reduction of meadowgrass over several years. Therefore an element of meadowgrass management is required while striving to get rid of the plant longterm.

3: PARKLAND GREENS

Traditionally shaped from the end of the fairway or built up with existing soil with no real subsurface drainage present. Invariably these greens retain water during periods of high rainfall and most times temporary greens are required for winter play. Without generalising too much, and everyone can make their own individual assessment, these types of

greens will be dominated with the *Poa* species. As outlined in the first part of this article, there are two different types of meadowgrass. Old parkland courses will be populated by the perennial biotype of meadowgrass which, as discussed earlier, can be very difficult to eradicate.

These fine-leaved meadowgrasses when managed properly can produce a good, firm, fast putting surface. They are rarely in 100% complete dominance and often will have bentgrass mixed through the sward. The combination of these species can be managed to provide the necessary quality of surface desired. Control of meadowgrass on parkland greens would follow the same guidelines as that on the links/heathland condition described above. The meadowgrass is very competitive in parkland greens because of the water retentive qualities of soil-based greens. The amount of meadowgrass that tends to be around a parkland course other than on greens is vast, therefore the seeds are always blowing and populating fertile areas where other grass species fail.

It is possible to try to reduce meadowgrass on heavy parkland greens but to try and manage for complete eradication can be very challenging to say the least. I feel it is not sufficient to state that all meadowgrass should be eradicated no matter what the individual situations are and fescue/bent should be colonised. To achieve this on parkland courses where the fine-leaved meadowgrass is dominating is impossible culturally and the only way would be spraying out with a total weed-killer and reseeding with fescue/bent.

It is important to state that many course managers throughout Great Britain and Ireland manage their greens with meadowgrass present and produce excellent putting surfaces. The very thought of stressing that meadowgrass to the point of death with the obvious resulting bare and bumpy greens would not be attractive, in my opinion, to either the course manager or their memberships. It has been well documented over many years why this option of managing meadowgrass to form part of the green's surface should not be followed

and I will not go over it again. However, I will discuss methods of management that favour fine-leaved meadowgrass forming part of the putting surface on greens.

In managing meadowgrass, like any other grass, root structure is essential and therefore aeration is central to any management programme. The primary problem with meadowgrass is its ability to produce thatch and if this is not controlled, problems will always occur, from shallow rooting to excess disease like fusarium, and rapid drying out during drought conditions. To have any success with meadowgrass management, thatch must be controlled either through aggressive hollow-tining if it's present and/or aggressive scarifying/verti-cutting/grooming to help prevent its build-up. Aeration in the form of deep slit-tining and verti-draining is important in those soils that have hard pans or have water restrictions down to 300mm in the soil profiles. Unfortunately, on those greens that have deeper drainage problems it would be necessary to rebuild to modern drainage and sand-based rootzones to ensure year-round playability.

OTHER KEY AREAS IN MANAGING MEADOWGRASS ON PARKLAND GREENS

Fertility Proper applications of fertiliser to sustain growth and prevent die back of the plant. If the plant weakens due to poor fertility, it will invariably get anthracnose disease which hastens the decline of the plant. Base fertilisations on soil analysis but a little phosphorous is important in a spring feed and nitrogen and potassium can be utilised throughout the season to sustain growth. I am a convert of using seaweed liquid and meal type products for their conditioning of the soil and their benefits to root structure. Also, they can be used year-round to prevent meadowgrass from dying off and therefore good surfaces can be prepared early in the growing season. This is not over-fertilisation but rather spoon-feeding the grass to achieve the desired results without any harmful side effects.

Topdressing This is crucial to producing a consistent level surface and I favour frequent light sand topdressings to achieve this. Whatever topdressing material is to be selected for your

course, stay with it and do not chop and change as this can result in layering and eventually root restrictions.

Aeration This is discussed above and I would stress the importance of carrying out the correct type of aeration for your individual situation, ie there is not much point slit-tining and verti-draining if 2ins of thatch must be reduced – use hollow-tining.

Overseeding Even when managing meadowgrass, it is important to overseed with the fescues and bents to encourage these species to establish. In meadowgrass dominated greens, I see greater success with bent dominated seed mixes rather than fescue.

Pesticides Meadowgrass management needs careful monitoring for fusarium disease and the autumn of 1994 was a good example of greens growing late and disease attacking. Use of iron can be a big help in hardening off the grass but if the environmental conditions are such that fusarium outbreaks are common, then preventative

spraying is essential. I have witnessed two courses only three miles apart with almost identical soil and grass types and one is susceptible while the other rarely gets affected. The purists amongst us will say that fertilising after mid-August causes all the fusarium problems, but if the meadowgrass dies back in September/October, the greens are bumpy for the winter.

Therefore maintain the growth and prevent the disease for good winter greens conditions.

Irrigation Use only as determined by the weather conditions. Meadowgrass does not have to be over-watered, but a little when the plant is drying out will keep it alive.

■ **In conclusion, each golf course is individual and I do not intend this article to challenge anybody's personal management policies. I hope I have put across that there are alternative methods of management and indeed I have only scratched the surface, but hopefully this will generate discussion which ultimately leads to solutions.**