

Couch fairways in winter – discussion for Ballarat Golf Club

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I was asked for some background to assist your decision-making on management of the fairways over winter. Before discussing the various options, a few points:

a) Couchgrass is a C₄ grass, and can survive our summers with no irrigation at all. Even in drought years. It will respond to any irrigation that is applied over summer, as required to maintain a level of colour and growth that the Superintendent wishes, but the fact remains that it will survive without any supplemental irrigation at all. This makes it a very flexible grass.

Note: Kikuyu is also a C₄ grass, but is vastly inferior to couchgrass in turfgrass density and quality.

b) In contrast, C₃ grasses such as perennial ryegrass, bentgrass, *Poa annua* and fine fescue all require 6-8 megalitres of supplemental irrigation per hectare per summer. In a mild summer like this one, that requirement will be much lower. But in drought conditions, the grass may require the full 8 ML. This requirement is very inflexible – if you don't give those grasses the irrigation they need, a lot of the grass will die.

It takes a drought every few years to remind people of this fact, and the huge advantage that couch has over C₃ fairway grasses.

c) There are many varieties of couchgrass, but several of them won't thrive in a climate like Ballarat. Santa Ana is a dense, high-quality variety that has a long track record of success in Victoria. It also has the shortest winter dormancy of the couch varieties.

d) Santa Ana has many other advantages over the C₃ grasses, especially the ability to control *Poa annua* and other weeds, and a generally low requirement for pesticides to control insects and fungal diseases.

So, Ballarat Golf Club is fortunate to have a fairway grass that is drought-proof and environmentally friendly, yet offers an excellent quality fairway surface. Sometimes clubs need to be reminded of these points.

However, couchgrass does have the drawback that it goes dormant over winter, losing all its growth and green colour. Normally, the dormancy period for Santa Ana in Ballarat is from May to September. That's the trade-off, lack of winter colour and growth versus excellent drought resistance and ability to provide a superior fairway surface with low inputs.

The lack of winter colour is aesthetically displeasing (which most people will accept), but the lack of growth also leads to an accumulation of divot marks, and problems with the sward becoming muddy and greasy in thin or poorly drained areas. Worm casts can add to the problem. Because the couchgrass is inactive, its roots aren't taking up and water and drying out the profile, like a C₃ grass would be doing. To maintain a reasonable fairway surface over winter, the drainage must be effective, and the grass sward must go into winter with a full cover of very dense turf. It helps to have a hot summer, and this current summer is anything but. A lot of Victorian clubs are struggling to get couch into prime condition, ready for this winter. Hopefully February and March will allow that to happen.

In the past, some Victorian clubs have looked for ways to improve the winter condition of couch fairways. Some examples are:

a) Royal Melbourne traditionally allowed *Poa annua* to invade naturally each autumn, to provide winter colour and growth on those old, common couch fairways. This was called the 'two-grass system'. Over winter the couch could hardly be seen, and the Poa provided a very dense cover of actively growing grass. In spring the Poa would go to seed, before dying out in early summer. The fairways would transition back to couch over the summer. The Poa seed would sit dormant through the summer, ready to re-invade each autumn with the onset of cooler soil temperatures and rainfall. So it was an annual transition. An obvious problem was that Poa seed would track onto the Browntop bent greens, which they were trying to keep Poa-free. So a lot of money was required to keep Poa from dominating the greens. You have to remember that back then golf was considered a winter game, so the traditional two-grass approach at Royal Melbourne suited that thinking. Nowadays, of course, golf is a year-round sport. In fact, the number of rounds and revenue for Victorian golf clubs is much higher through the warmer months, due to longer daylight hours and a desire to play golf in warmer weather.

Royal Melbourne no longer uses the two-grass system, their fairways are now on the Pure Couch system. They converted those old common couch fairways to an improved couch (Legend), so the presence of Poa over winter was no longer desirable.

I'm not aware of any major golf courses in Victoria that still use the transitional two-grass system. In fact, I can only think of one golf course in mainland Australia (the Moonah Course) that doesn't follow the Pure Couch system (excepting those courses using kikuyu). But there is another situation to mention:

b) The Moonah course at The National oversowed their GN1 couch fairways with fine fescue some years back. That was because the GN1 couch was simply not suited to southern Australia and was providing a very poor surface. Fine fescue was oversown into the couch, and it is left in there now as a permanent second grass. This is doing an excellent job, the members love the winter colour, and the fescue sward provides more ball run compared to couch. Drives landing on couch surfaces tend to prop, without much run. This can exacerbate the accumulation of un-repairing divots over winter, as a lot of shots can end up at the same

place down the fairway. The slicker surface of fine fescue provides greater run. The winter growth of fine fescue also dries out the sward, as the C₃ grass roots actively extract water from the profile over winter (dormant couch won't be extracting any water at all). Problems with worm casts are also reduced, due to the grass growth and drier profile. So there are some real benefits with that system. But those fairways need to be irrigated as if they were a pure C₃ sward, so they can require up to 8 ML/Ha of irrigation per summer. The National has access to Class A effluent water, so the availability of water isn't an issue, even in drought years.

The National are considering doing this system on the Gunnamatta course as well. But remembering, because the fine fescue is a permanent resident of the sward, water use will be up to that 8ML/Ha mark. If they go ahead and oversow with fine fescue at Gunnamatta, there's another problem. Fine fescue is very slow to establish, so the course would need to be shut down for perhaps 2 months (probably March and April). This wasn't a problem at The National, they could simply shut one course for as long as they needed. But if you only have a single 18 holes, establishing fine fescue would be a problem, as it's a slow process.

Those are the only two situations I could think of to discuss. As I said, I can't think of any Australian course that does a winter transition of couch fairways, or in fact adopts anything except a Pure Couch approach (barring those kikuyu courses). One other case worth mentioning: Royal Canberra sowed their re-designed fairways with a bentgrass mix a few years back (probably 2015, from memory). They did this because they have plenty of water, and wanted that elite bentgrass surface, and to differentiate from the other Canberra courses, that all had couch. That approach failed, has been a disaster in fact, and the club will probably return to Santa Ana fairways in the next couple of years (see <https://www.royalcanberra.com.au/cms/2020/10/grass-trials-conversion-of-7th-fairway/>) .

Despite the fact that no Australian golf course currently uses a transitional two-grass system, we can still discuss it. There could be several alternatives:

a) Two-grass transition using *Poa annua* (the old Royal Melbourne system). Simply allow the *Poa* population to build up in the fairways. If *Poa* control methods on the fairways were discontinued, within a few years there would be enough *Poa* to provide a full sward each autumn. The *Poa* would set seed in spring, and those plants would then die off in summer. The seed would sit dormant in the sward, and the fairways would revert to couch for the summer. Then *Poa* seed would germinate in the autumn, to dominate the sward again over winter. The program is free, of course. The main problem is the amount of *Poa* seed that would be tracked onto the greens. The *Poa* population needs to be managed, as well – too much *Poa* and the couch component might be thinned out. And a mild spring and summer could allow the *Poa* to persist into January, again to the disadvantage of the couch. If there isn't enough *Poa* in the fairways they will be spotty over winter with spaced out clumps of *Poa* instead of a dense sward. These are precisely the reasons that Royal Melbourne finally went away from their traditional two-grass system.

b) Two-grass transition using perennial ryegrass: this system is being used widely and successfully on football grounds. Ryegrass germinates very quickly, so on a football ground an oversowing in autumn after the cricket season will provide a rapid transition to perennial ryegrass for the winter, with all the benefits of colour, growth and recovery. It also protects the underlying couch sward from winter traffic. However, the ryegrass has to be removed with a herbicide in spring. If left in, it will outcompete the couch and badly thin it out, or even eliminate it. The typical football ground program is shown below, with an indication of materials costs on a per hectare basis:

- i) In late March or so, apply Primo growth regulator to slow down the couch (\$50)
- ii) Oversow with perennial ryegrass seed at 300kg/Ha (\$1,800). On football grounds, the field has to be kept out of play for 2 – 3 weeks to allow the ryegrass to establish.
- iii) Regular fertilizing over winter (\$300). Ryegrass needs to be kept well fertilized.
- iv) Possibly two fungicide applications (\$1,000), for rust, Fusarium and other diseases.
- v) Three herbicide (ethofumesate) applications for *Poa annua* control (\$750)
- vi) Herbicide application to remove ryegrass in spring (\$750). The course will look unsightly for three weeks or so, as the ryegrass dies out.

That's getting up to \$5,000 per hectare, and that doesn't include labour and machinery use for the spraying and fertilizing, and more importantly for the mowing (2 – 3 times per week). Pure Couch fairways require minimal mowing between May and October, whereas perennial ryegrass will need constant mowing over winter. Another point - the herbicides for *Poa* control would only be partially successful. In contrast, *Poa* control in a Pure Couch sward is much more effective, and can include pre-emergent herbicides which are becoming increasingly important to manage herbicide resistance in *Poa* (those pre-emergent herbicides couldn't be used if perennial ryegrass was present).

c) Two-grass system using *Poa trivialis*: this species is used a lot in the US to oversow couch greens, tees and fairways. A small amount is used for winter oversowing of couch greens in Qld. The scenario is much the same as for perennial ryegrass, but *Poa trivialis* dies out much faster in early summer in climates like Florida or Qld, so a herbicide removal isn't necessary. The problem with *Poa trivialis* is that only a few tonnes are imported to Australia each year, and that quantity usually all goes to Qld.

d) Oversowing with fine fescue: this grass germinates and establishes very slowly, so it isn't really suited to an in-and-out transition, like perennial ryegrass is. An oversow would need to be done in March, and the establishment would probably take 2 months. There would then be the problem of how to control *Poa annua* through the winter. While the benefits of fine fescue as a permanent second grass in a couch sward are clearly seen at the Moonah course, the problem is it needs the full amount of water that any C₃ grass requires – i.e. up to 8ML/ha per summer.

So, looking to introduce a C₃ grass to improve fairway quality over winter is problematic. It can be done - a perennial ryegrass program is quite feasible. It just comes down to costs and benefits. The fact that there aren't any Australian clubs I can think of that do it speaks for itself. It's pretty clear the sensible approach is to maintain the best quality Santa Ana fairways you can, and put up with the winter dormancy.

Having said that, there are a couple of ideas that the club might trial. The growth hormone Gibberellic Acid is available as a synthetic GA product (e.g. ProGibb). When applied in autumn (May or so, before the couch goes dormant) at 80gai/Ha it will stop the couch losing its colour. It doesn't do anything for growth, but it does keep colour. The product can also be applied in September, to get dormant couch to green up earlier than normal. So it is possible to reduce the time that couch is lacking colour. On the negative side, that rate of GA provides a massive stimulation to *Poa annua* and other weeds, which can cause problems. The weed problem is the main reason that Victorian golf clubs aren't adopting that product. Some golf clubs have used carbon powder products to try to reduce winter dormancy, but this is an extremely expensive product and provides only minor benefits.

Another approach is to use a green pigment. I saw the couch fairways at Royal Auckland Golf Club in the middle of winter a couple of years back, and they had a beautiful, natural green colour. The product was called GreenPig. At that time it wasn't available in Australia, but it is now. There are a few other colorants on the market that are pretty ordinary, more of a blue-green fake look, but GreenPig was excellent.

Both these approaches only work on colour, they don't cause extra growth. There is no way to improve couch growth over winter, it's entirely up to mother nature and soil temperature.

An issue that is often raised is the question of mowing height – will raising the mower height in autumn provide better ground cover through the winter? The answer is counter-intuitive. Low mowing increases the density of the sward, and it's density that is key. Raising the mowing height on Santa Ana can actually lead to a loss of density, exactly what you're trying to avoid going into winter. Santa Ana is a dwarfy variety, and performs best and provides the greatest density at mowing heights of 12mm and under. Above 15mm, you can see the reduction in density.

I hope these discussion points are helpful, I'm happy to provide more input if required.

Regards

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