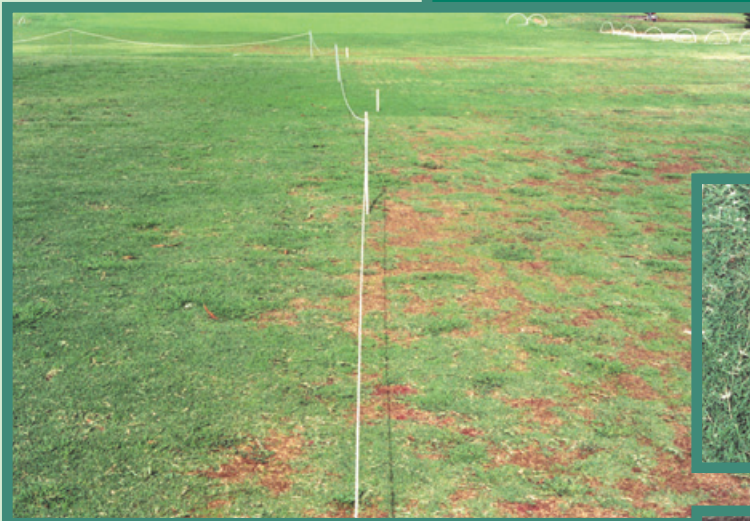


Comparison of Couchgrass Establishment Methods (Year 2)



Victorian Golf
Association



A research initiative of
the Victorian Golf
Association Turf
Research and Advisory
Board.

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Couchgrass Fairways

The Victorian Golf Association Turf Research and Advisory Board initiates and funds turf research trials with potential benefit to Victorian golf clubs. A previous project that ran from Summer 96/97 until mid-1999 investigated grasses for fairways maintained under low inputs, especially low or no irrigation. It compared a wide range of turfgrass species, including Ryegrasses, Fescues, Bents and several Couchgrass varieties.

The results clearly demonstrated the superiority of couchgrasses on fairways - they offer excellent quality in terms of ball lie and ball presentation, combined with a much reduced irrigation requirement. In fact watering of established couchgrass fairways could be considered optional. Drought stress will not kill established couch, even in northern Victoria. Some golf clubs in Melbourne have not irrigated their couch fairways for many years. There are a number of other advantages that couch offers - the great range of cheap and effective herbicides, for example.

On the negative side, couchgrass goes into a dormant, discoloured state over winter. During this phase divots won't recover, and in some cases poorly drained areas can become boggy. Worm castes can also create winter problems. Improved drainage and management can solve these to a large extent, as will the selection of short dormancy varieties. The success of couchgrass fairways on the many clubs in Victoria that have gone down that road is testament to the superiority of the grass.

The trial work showed that the common couch selection 'Legend' and the hybrid couch cultivar 'Santa Ana' both had the best combination of fairway quality, drought tolerance, short winter dormancy, good competitiveness against weeds and suitability in either a 'Pure Couch' situation or a '2 Grass' fairway (where *Poa annua* provides the winter cover). The common couch selection 'Wintergreen' was also excellent.

'Legend' couch produces less thatch than 'Santa Ana' and 'Wintergreen', however, and the trial concluded that the 'Legend' (previously known as 'C1' couch) was the best choice for clubs wishing to maintain low input fairways.



Converting to Couchgrass

The expense and disruption of couchgrass planting has inhibited many clubs from embarking on a couch conversion program. The best couchgrass varieties (including Legend, Santa Ana and Wintergreen) must be planted from sprigs, not seed. The sprigging process involves obtaining fresh sprig material (the usual rate being 10 cubic metres of sprigs per hectare), spreading these evenly over the fairway, getting the sprigs into contact with the soil somehow, and keeping them wet for some weeks until they have successfully struck.

The conventional method used by many clubs has been to kill out the existing grass with glyphosate, cultivate the soil using a rotary hoe or power harrows, then spread the sprigs by hand or using a muck spreader. The area is then cultivated again, rolled, and kept wet for some weeks. This system works extremely well, and should provide sufficient coverage to allow opening for play in 8 weeks or so (say mid-December to mid-February).

Good follow-up weed control will be necessary. The herbicide oxadiazon (Ronstar®) gives excellent results here, but at a cost of around \$1,500 per hectare. Great care should also be taken that machinery wheel marks are rolled out and a smooth surface is established.

Some clubs have done this to whole fairways by either closing them down completely, or setting them up as a short Par 3 while the couch establishes. Other clubs have done half fairways, roping off the sprigged area as GUR until it is ready for play.

However the 'standard' sprigging process has proved impossible or undesirable for many golf clubs. Some simply don't have the water to see the couch through the establishment phase. Others are reluctant to cultivate fairways because of underlying rocks or drains. Other clubs have decided they can't afford to lose revenue and membership by disrupting the course in such a way.

Recognising these problems, the VGA Turf Research Advisory Board initiated a two year project to investigate sprigging options. The aim of these is not to come up with the 'best method', but to generate information that clubs can factor into their decision making. No two golf clubs are alike, so there is no single recipe for couch conversion. But with good information the Superintendent and Committee of each club can formulate a program that best suits their situation.

Trial Work, Summer 1999-2000, Ballarat Golf Club

The first year's trial work was planted in early December at Ballarat Golf Club. It compared conventional cultivation (as described above) with the less disruptive technique of 'oversprigging'.

The oversprigging machine cuts a slot into the killed out fairway, and presses the couch sprigs into that slot. The process is usually done by a contractor, at a cost of around \$1,800 per hectare (not including sprigs, which can be obtained for no cost if you're lucky, or can cost up to \$6,000/ha). The contractor can do around 2 hectares in a day. Oversprigging causes minimal disruption to the fairway surface, which is a great benefit if the fairway surface contours are good, or if the soil profile is very stony, or if the fairway has existing drainage lines that shouldn't be disturbed.

All Victorian clubs and their Superintendents should have received the report from this trial, which showed that the establishment rate using conventional cultivation was around one month faster than oversprigging (60 days vs around 90 days to 'open for play' status). The trial demonstrated that oversprigging is a feasible planting option, despite the slower establishment rate.

The trial also showed that Ronstar at a rate of 200kg/ha caused a slight retardation of couch establishment (8%), and its use should only be considered where a germination of weeds is expected.

Trial Work, 2000 - 2001, Werribee Golf Club

Two main questions about oversprigging were still to be answered:

1. can a fairway be oversprigged and then brought straight back into play? and
2. can a fairway be oversprigged under minimal irrigation?

The trial site selected was a Par 4 fairway at Werribee Golf Club. The whole fairway was oversprigged on December 8th, using 'Legend' couchgrass at a rate of 10 cubic metres per hectare. The oversprigging was done by Tony Sinclair of Turf Renovations, Australia, and the 'Legend' sprigs were supplied by Strathayr, Australia.

A strip of Ronstar (at 150kg/ha) was broadcast and watered in along a line down the fairway the day before oversprigging. Another strip was done immediately after the oversprigging operation. The weed control in both of these strips was the same, and the establishment rate figures seen in the following table and photographs was from the 'before oversprigging' strip. Applying Ronstar the day before the contractor moves in has the benefit



that the area can be rolled and irrigated immediately the contractor moves off the area.

After oversprigging the fairway was closed for play and well irrigated for 3 days. After that time the area was divided in half by a rope line down the centre of the fairway. The right hand side of the fairway was brought back into play, and the left hand side was signposted as GUR. Players could retrieve their ball but could not hit a shot off the GUR side.

The fairway had a single line of six sprinkler heads down the centre. The irrigation supplied averaged 50mm/week for the first two weeks, reducing to around 25mm/week after that. The irrigation kept the soil quite moist without creating a rice paddy. The central line of sprinkler heads provided good uniform irrigation coverage down the centre (assessed as the 'wet' zone), tapering off to the outside edges of the fairway (assessed as the 'dry' zone). The Dry Zones received virtually no irrigation, especially on the north side because of the prevailing wind.

Measurements of couchgrass establishment rate were conducted in a line across the fairway at each sprinkler head, creating six replicates for assessment. Differences in establishment rate started to emerge from 9 weeks onwards (9th February, 2001), and the main data for analysis was collected at 9, 12, 15, 18 and 21 weeks after sowing.

Results and Discussion

The results and photographs refer to the following treatments:

- 1. Ronstar** : this treatment strip was within 5 metres of the sprinkler heads, so received 'wet' irrigation. It was on the GUR side, so it received no traffic. Ronstar was applied at a rate of 150kg/ha applied the day before oversprigging.
- 2. No Traffic, Wet:** plots on the GUR side of the fairway, immediately beside the sprinkler heads.
- 3. No Traffic, Dry:** plots on the GUR side of the fairway, at least 20 metres out from the sprinkler heads.
- 4. With Traffic, Dry:** plots on the 'in play' side, at least 20 metres out from the sprinkler heads.
- 5. With Traffic, Wet:** plots on the 'in play' side, immediately beside the sprinkler heads.

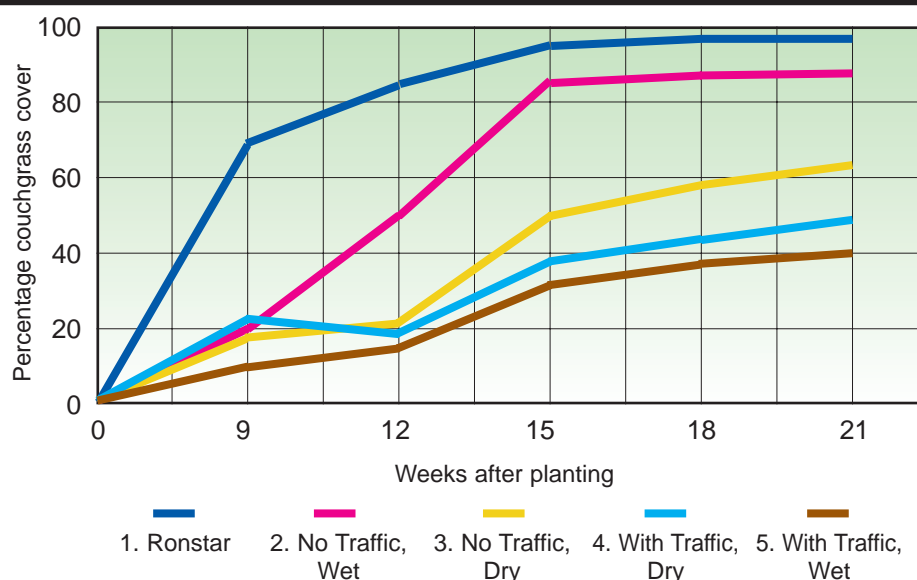
The overall results of the couch coverage assessments are shown in Table 1 and the Summary Graph.

Table 1: The average percentage couchgrass cover. Figures followed by the same letter are not statistically significantly different.

Treatment	Weeks after planting				
	9	12	15	18	21
1. Ronstar	68% a	84% a	96%a	98%a	98%a
2. No Traffic, Wet	20% b	50% b	86% b	88% b	89% b
3. No Traffic, Dry	19% b	21% c	49% c	58% c	63% c
4. With Traffic, Dry	21% b	19% c	38% b	43% c	48% c
5. With Traffic, Wet	10% b	16% c	33% b	36% c	40% c
LSD (P = 0.05)	11%	11%	18%	11%	12%

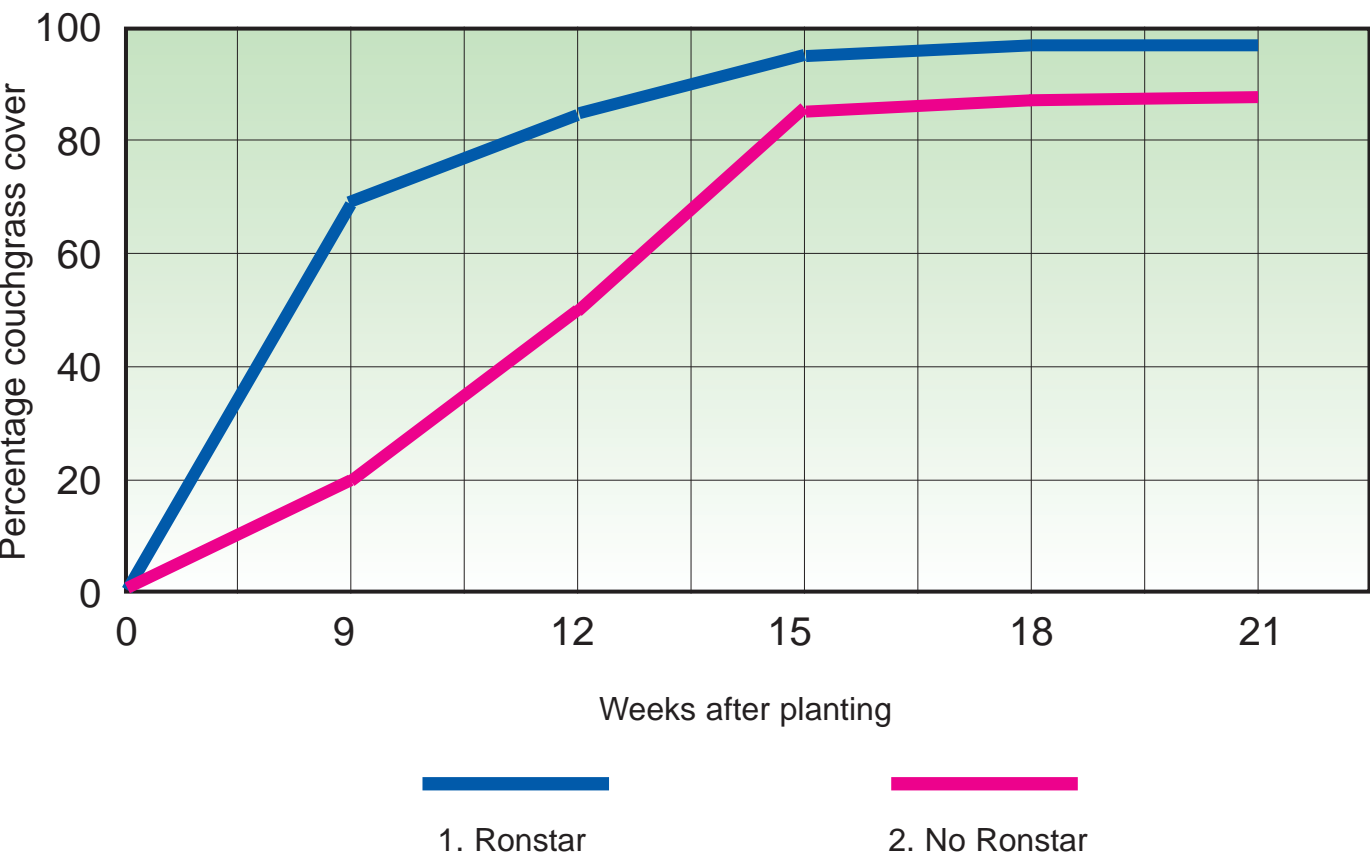
Summary Graph: Increase in couchgrass cover over time.

Three separate factors can be distinguished from this data - the Ronstar effect, the Traffic effect, and the Irrigation effect. These effects can be highlighted by simplifying the data to 'with' and 'without' graphs and photographs, as shown on the next page



1. Ronstar vs No Ronstar

Graph 1: The average couch grass coverage in the Ronstar plots compared to their equivalent 'without' Ronstar plots



In the critical early phase of establishment the Ronstar has allowed the couchgrass to rapidly cover the ground, reaching the critical 80% coverage (when the fairway should be 'ready for play') three weeks earlier. In the later stage of establishment the Ronstar has allowed the plots to get near 100% establishment, where the No Ronstar plots are stalled at 90% or so due to weed competition.

Last year's trial work at Ballarat showed some slight retardation of couch from Ronstar at 200kg/ha. This year's trial at Werribee used a lower rate (150kg/ha), which costs considerably less but still provides excellent, long term weed control. The lower rate would also be expected to reduce any couch retardation, although this wasn't measured at Werribee.

To conclude on Ronstar, this year's trial clearly demonstrated the benefits of this herbicide and it is strongly recommended in couch establishment work.



Ronstar

No Ronstar

Ronstar

No Ronstar



At 4 weeks



At 6 weeks



With Ronstar At 12 weeks



Without Ronstar At 12 weeks



With Ronstar At 15 weeks



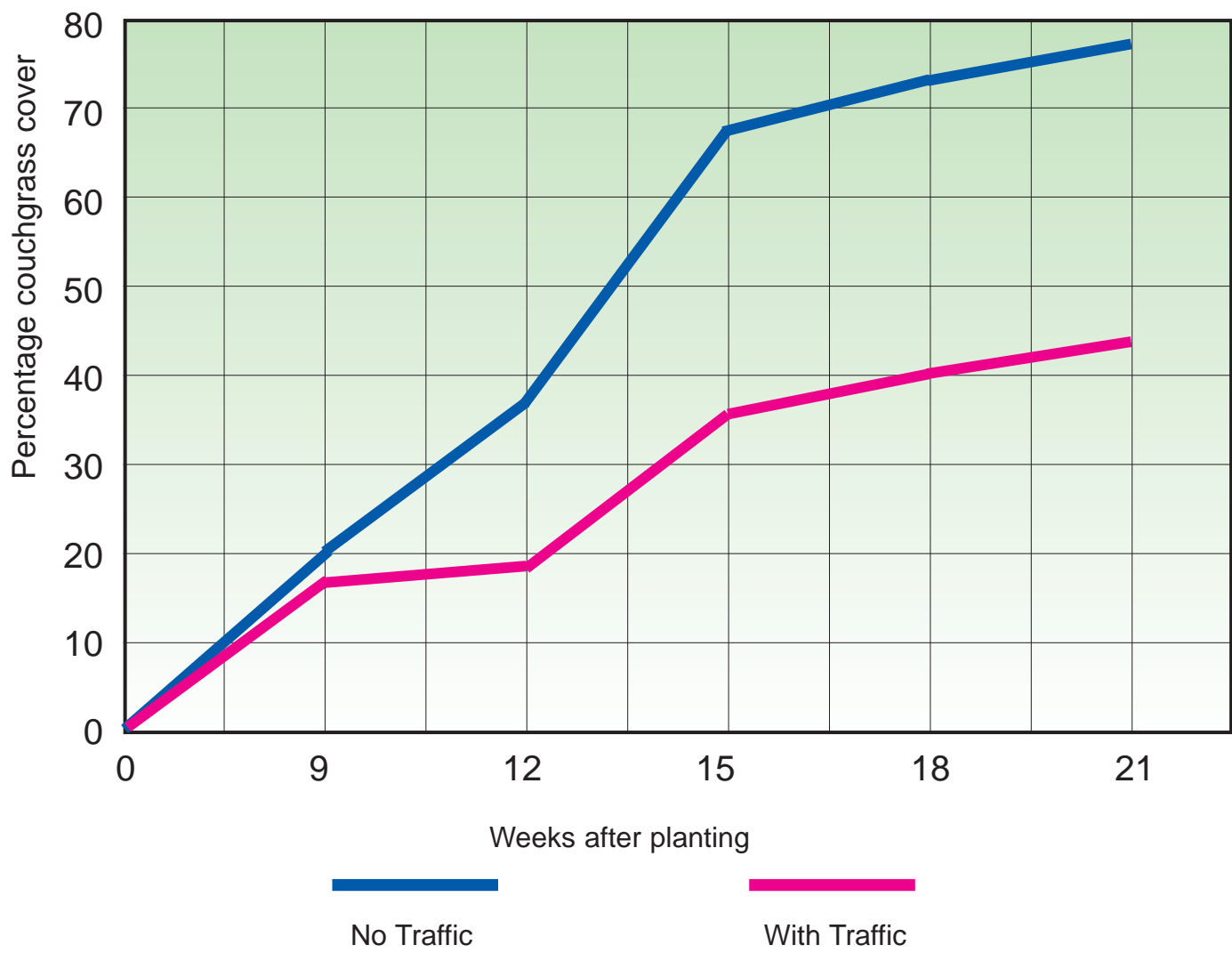
Without Ronstar At 15 weeks



2. Traffic vs No Traffic

The Traffic effect is best demonstrated when all the plot assessments are simplified to either Traffic or No Traffic. These figures are graphed:

Graph 2: Average % Couch Cover from plots receiving Traffic or No Traffic



The effect of traffic is severe, pretty well halving the couch establishment rate. No one really wanted to see this, but the evidence is quite conclusive, and strongly suggests that fairway areas need to be taken out of play following planting. Experience and advice from other states suggests they have no problems bringing fairways straight back in, but their better couch growing conditions may account for this.

The effect of traffic is clearly seen in the photos as a compression in stolon length, which reduces its ability to colonise the ground. The couch hasn't been killed by the traffic, and there are just as many plants in the ground, but their ability to cover is hampered.

It could be argued that closing half the fairway in our trial doubled the traffic, as the same number of players are confined to half the area. This is true, but this data is just proving one fact - traffic reduces couchgrass establishment rate. Obviously the reduction in establishment rate will be proportional to the amount of traffic.





At 9 weeks,
without traffic



At 9 weeks,
with traffic

At 15 weeks,
without traffic



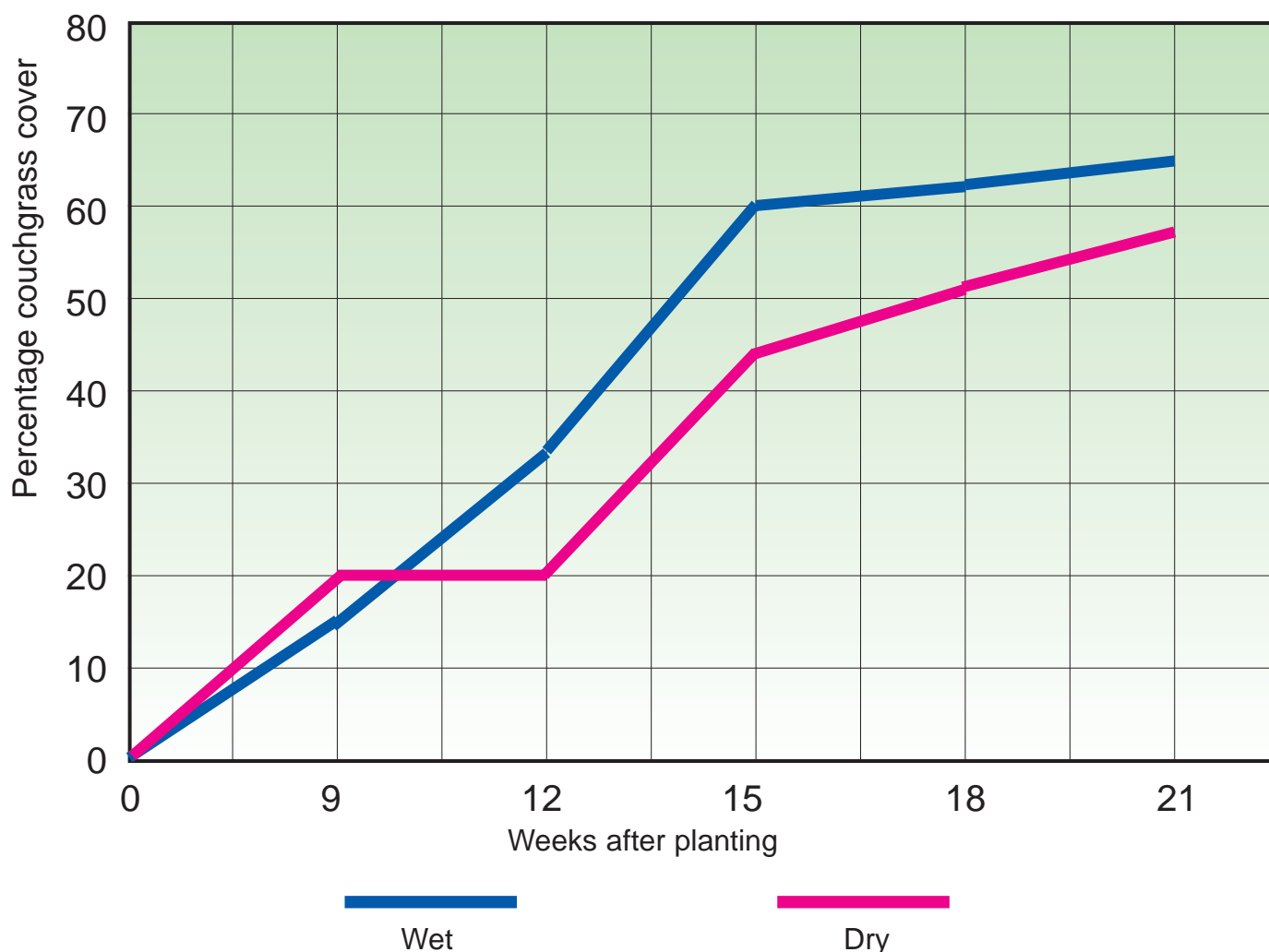
At 15 weeks,
with traffic



3. Wet vs Dry

The Irrigation effect is best demonstrated when the average of all the 'Wet' plots are compared to the average of all the 'Dry' plots, as shown below.

Graph 3: Average couch cover for all 'Wet' plots vs all 'Dry' plots.



Some points need to be made about irrigation:

1. Substantial numbers of couch plants will survive after oversprigging even without irrigation. This is one of the advantages of oversprigging - couch sprigs are pressed down into slots in the soil where they won't blow away, and where they have good contact with the soil to enhance their chances of striking. There is a penalty to this - the couch sprigs have to grow back up to the surface before they can start to cover the ground, and this makes the oversprigging method slower than conventional cultivation, but the big benefit is their greater chance of survival in the oversprigging slots. In this case there was a light shower within 4 days of planting, and follow up rains through December totalling 31mm. The photo series shows good sprig survival even on the northern edge of the fairway, where no sprinkler irrigated reached at all.

2. Couchgrass establishment can proceed on natural rainfall. The graph shows the 'Dry' establishment rate stalling from 9 - 12 weeks (9th Feb - 2nd March). February

rainfall was only 12mm, about one quarter of the normal February average. Establishment rate picks up again during March, which had 87mm (double the March average).

3. In short, lack of irrigation doesn't necessarily affect survival of couch plants (although supplemental irrigation during the first week is highly recommended), but it does affect the growth and establishment rate.

4. While a generous irrigation regime does increase couchgrass growth, it also encourages weeds to germinate and compete, so without Ronstar the difference in couch coverage between well irrigated and dry areas is not that great. The photo series shows the weed competition caused by irrigation. The weeds are *Poa annua*, which germinates after repeated irrigation cycles (especially in low spots, where water puddles after rain or irrigation). Note the lack of *Poa* germination in the 'Dry' plots, and the extent of couch survival and coverage.





WET

At 6 weeks



DRY



WET

At 12 weeks



DRY



WET

At 15 weeks



DRY

Conclusions and Recommendations

The following general conclusions can be drawn from the trial, and apply to a range of couch conversion methods:

- Although an expensive chemical, Ronstar represents good value for money. On a project that may be costing \$3,000 per hectare, and possibly up to \$8,000 per hectare, the Ronstar cost of around \$1,500/ha is warranted.
- Traffic will not reduce the survival rate of couch sprigs, but clearly retards the establishment rate. A traffic management plan should be in place for full coverage to occur in a reasonable time.
- Irrigation is obviously recommended for at least the first week or two after sprig planting, but the trial has shown that even 'dry planted' sprigs will have a reasonable survival rate.
- The best combination of treatments provided Ronstar, generous irrigation and absence of traffic. This combination resulted in 'ready for play' status in 12 weeks or so, consistent with the oversprigging establishment rate found at Ballarat Golf Club last year.

Any findings and / or recommendations found in this report are based on a set of trials and conditions laid down within the report and should not be taken as decisive or conclusive. It is however hoped that this research assists clubs and superintendents to make relevant decisions best suited to their club and conditions.

Another Point for Discussion

Several clubs have held off on couch establishment projects for various reasons, notably the problem of water restrictions, the cost, and the lack of member support due to the disruption to play.

However even the worst plot in this trial (no irrigation, even at planting, no Ronstar, no disruption to play, and full traffic) managed a 40% 'Legend' couch cover by the end of summer. This cover will not disappear, and will probably finish its coverage next summer. Although our trial was looking at establishment rate over a single summer, some clubs have taken a longer term view where the couch may take two summers or even longer to cover the fairway.

So in fact some of the most important information on couch conversion has come from this trials worst plots - they are telling us that if your club has decided that couch fairways are the way to go, then forget all the reasons why you can't do it this summer and why you should hold off till next year - go ahead and plant it.

The Turf Research and Advisory Board intends to collate the information from this series of trials into a booklet in the near future. Included in that booklet will be a description of various successful couch conversion programs and methods undertaken by a number of Victorian golf clubs in past years.

Acknowledgement

The Victorian Golf Association Turf Research and Advisory Board wishes to thank the Horticultural Research and Development Corporation for their matching funding for this project. The Board also wishes to thank the Course Superintendent and committee of Werribee Golf Club, Mr. Tony Sinclair of Turf Renovations Aust., and Mr. Steve Cole of Strathayr for their assistance.

The Association also records it's thanks to the members of the Turf Research & Advisory Board and, in particular, to Mr Phillip Ford who designed and managed this project. In addition, the Association thanks the Victorian Golf Foundation which funded the publication of this report.



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