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**GREEN ACRES GOLF CLUB**  
**ASSESSMENT OF PUTTING GREENS**

**March 2009**



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## 1. INTRODUCTION

A site investigation of the greens at the Green Acres Golf Club was undertaken in November 2008 to assess the condition of the putting surfaces and surrounds and to determine the factors affecting their performance and maintenance. This most recent inspection undertaken on the 31 March 2009 is a follow up report on where the greens are at and what improvements have been made over the past 4 months.

The assessment involved:

- i. Assessing all the greens in terms of;
  - a. Turf composition and turf health.
  - b. Proportion of *Poa annua*.
  - c. Quality as a putting surface.
  - d. Turf composition and presentation of the greens surrounds (including factors such as shape of surrounds, traffic routes, *Poa annua* control and influence of trees).
- ii. Review current work practices in achieving that grass policy.

This report describes the present condition of the greens and surrounds, the factors affecting the condition of the turf and the quality of the playing surfaces and the maintenance program undertaken to get the greens to their current condition.

## 2. DESCRIPTION OF GREENS AND SURROUNDS

All greens and surrounds were inspected to assess their condition in terms of turf quality, presentation as a playing surface and the local influences (shade, trees, traffic etc.). The notes for each green site are detailed in appendix 1.

### 2.1 Greens

Overall the greens had a very good turf cover of high density and were providing a firm and consistent putting surface. There was a noticeable improvement in turf vigour and density compared to the November inspection when the greens were affected by the endothal (for *Poa annua* control) applications. The condition and quality of the turf and the quality of the playing surface had improved significantly since the November inspection.

There were some greens that had suffered from localised dry spot and the effects of disease (*Leptosphaerulina* and Fairy Ring) which was mainly having an affect on the visual appearance of the turf, however, there was little turf loss associated with it. The *Leptosphaerulina* was mainly associated with the shaded greens and the Fairy Ring is generally associated with the older greens. The greens affected by shade include the 2<sup>nd</sup>, 6<sup>th</sup>, 7<sup>th</sup>, 11<sup>th</sup>, 12<sup>th</sup> and 14<sup>th</sup> and tended to be those most affected by disease.

There was very little *Poa annua* in any of the greens and the control program has been very successful. During the inspection in November, greens 4, 5 and 18 appeared to have the highest *Poa annua* population. On this occasion the *Poa annua* population was very low and no worse than any of the other greens.

While there has been a general improvement in the affects of traffic around the greens it still remains a significant issue on the golf course.

Moss has been a significant problem on several greens including the 3<sup>rd</sup>, 8<sup>th</sup> and 18<sup>th</sup> and on this occasion there has been very good control achieved.

The following comments are made regarding specific greens;

- The surface on the 2<sup>nd</sup> green is a good benchmark for the golf course despite the location and shade effects.
- The 3<sup>rd</sup> green is very difficult to maintain due to the location and in particular the influence of the trees.
- The 7<sup>th</sup> green has a good surface, however, there is high wear around the pin areas. The green has a limited number of pin placements. Pitch marks still remain a problem.
- Most greens are of good fertility though greens 12, 13, 14 and 18 require fertilising.

**Soil analysis results:** Soil nutrient data from several greens sampled in April 2009 was reviewed and the following comments are made;

- Magnesium and potassium are generally moderate to low.
- Some trace elements are low to marginal.
- Phosphorus is elevated.
- Salinity was low.
- The absolute amount of sodium is elevated, however, in reference to the other key cations such as calcium it is not a significant concern at this time. The applications of calcium are maintaining a good balance between calcium and sodium and at this time I do not consider the sodium to be a major concern.

## 2.2 Surrounds

The surrounds were inspected and the cover and density of the couchgrass was generally very good and has improved since the November inspection.

The aprons of the greens have improved with the notable aspect being the reduced amount of *Poa annua*.

During the November inspection several greens were identified as having tight surrounds where there is a concentration of both pedestrian and vehicular traffic. Greens affected in particular include the; 4<sup>th</sup>, 5<sup>th</sup>, 8<sup>th</sup>, 10<sup>th</sup>, 12<sup>th</sup>, 14<sup>th</sup> and 16<sup>th</sup>. The effects of traffic are still obvious though the couchgrass is growing sufficiently to recover from the wear. It is expected that during the winter the wear/traffic routes will be more obvious.

There was no mite activity obvious in any of the couchgrass surrounds.

There has been good compaction control in the surrounds and consequently the turf cover has been improved and there was little evidence of localised dry spot.

## 3. GREENS MAINTENANCE PROGRAM

A summary of the greens maintenance program provided by the Golf Course Superintendent was reviewed and is summarised below.

Fertility program:

- The greens were fertilised regularly throughout the summer months.

*Poa annua* control program:

- Control for *Poa annua* continued during November and December with some recent applications to selected greens using endothal.

The maintenance program is in keeping with the strategy of treating the *Poa annua* in the late winter/spring and fertilising the bentgrass through the summer to develop a strong bentgrass turf.

**Fertility program:** Fertility program is maintaining good turf health, though there were some greens that required fertilising to improve turf density.

***Poa annua* control:** The *Poa annua* control program has been very successful, however, some *Poa annua* will reoccur over the winter months. The use of pre-emergent herbicides will assist in reducing the germination and establishment of *Poa annua* seedlings.

It is noted that carfentrazone was used for moss control. In some situations where bensulide has been used followed by an application of carfentrazone, some turf burn is possible. Where bensulide is used do not apply carfentrazone over the ensuing months.

**Maintenance of surrounds:** The surrounds are of good density and the pre-emergent herbicide program is keeping them clean of *Poa annua*. The pre-emergent herbicides should be applied over the winter months in order to keep them clean.

#### 4. WATER QUALITY

The water analysis report from the 7 March 2009 has been reviewed and the following comments are made regarding the water quality;

- Very low salinity.
- Low chloride.
- The concentration of sodium is low, however, the proportion of sodium compared to the other cations is very high. Consequently, it could be expected that there may be some accumulation of sodium and additional applications of calcium may be required. The soil results indicate that any excess of sodium is being counteracted by the calcium applications.

#### 5. CONCLUSIONS AND RECOMMENDATIONS

An inspection of all greens and greens surrounds on the golf course was undertaken to assess their current condition and the factors affecting the quality of the turf and the playing surfaces. As an overall observation there has been a significant improvement in; health and density of the bentgrass, reduced *Poa annua* in the highly infested greens, improved density in the couchgrass surrounds and reduced *Poa annua* in the bentgrass apron.

The condition and presentation of all the greens complexes were very good.

The particular issues apparent during this inspection were the occurrence of disease and localised dry patch.

**Disease:** The occurrence of the diseases Pythium and Leptosphaerulina is in part due to the affects of shade and restricted air movement around the heavily treed greens and also due to the increasing thatch levels.

The presence of Fairy Rings is due mainly to thatch levels (organic matter) and the age of the greens.

**Localised dry spot:** Many of the greens have been affected by localised dry spot where the soils/thatch become hydrophobic (water repellent) during dry weather. The main contributing factor is the accumulation of thatch.

The following recommendations are made;

### Putting surfaces

- i. The most critical aspects affecting the greens at this time relate to the thatch levels in the greens. There has been a minimalist approach to renovations as part of the *Poa annua* control program and the greens have not been hollow cored since 2004. It is strongly recommended to hollow core and topdress in late November/early December to remove some of the thatch which will improve water penetration and reduce the incidence of localised dry patch and the conditions that suit disease infections.

From an agronomic perspective the following is to be expected to occur over time if the thatch and organic matter is not controlled;

- Increasing moisture retention.
  - Deteriorating root systems.
  - Greater incidence of disease.
  - Increased incidence of localised dry patch.
  - Greater difficulty to control *Poa annua*.
  - Bentgrass health and density will deteriorate during winter.
  - Greater difficulties in managing irrigation (i.e. increased hand watering and dry patch control).
  - Increasing salinity and sodium accumulation and resulting detrimental affects on turf health.
- ii. Maintain the general principles of the current maintenance program in terms of minimal nitrogen over winter and initiating the *Poa annua* control program at the end of winter. It needs to be noted that irrespective of how diligent the *Poa annua* control program is, it is expected that some *Poa annua* will come through during the winter months. It is essential that the greens have high density and good fertility before going into the winter months.
  - iii. Continue with the vertidrainage and dusting program. Dusting in particular should be continued while there is strong bentgrass growth.
  - iv. The maintenance program must continue to be flexible so that the program can be altered depending on changing circumstances.
  - v. Use a pre-emergent herbicide such as bensulide in the late summer/early autumn to reduce the establishment of new *Poa annua* plants over the winter. Where bensulide is applied do not apply carfentrazone in the following months.
  - vi. The soil test results indicate that:
    - Continue with light applications of calcium – use soil tests to regulate application frequency.
    - Magnesium should be applied at about 0.25 kg/100m<sup>2</sup> each time the greens are fertilised.
    - Increase the potassium applications to achieve an annual rate of about 4 kg/100m<sup>2</sup>/year.
    - Make adjustments to the application of trace elements.
    - Reduce and possibly eliminate the application of fertilisers containing phosphorus. Phosphorus has at times been implicated with the presence of *Poa annua*.

## **Bentgrass collars**

- i. Maintain bentgrass collars on a similar program as the putting surfaces. The exception is that a higher level of fertility during the winter would be beneficial in maintaining a turf of higher density and increased wear resistance.
- ii. Use a pre-emergent herbicide such as bensulide in the late summer/early autumn to reduce the establishment of new *Poa annua* plants over the winter.

## **Couchgrass surrounds**

- i. Before the couchgrass surrounds go into dormancy, apply an NPK (8:10:10 or similar) fertiliser at 2 – 3 kg/100m<sup>2</sup>. This will assist in improving turf wearability over winter.
- ii. Pre-emergent herbicide has been applied and a follow up application will be required. A post-emergent treatment in early spring will be required to remove any persistent plants.
- iii. Commence fertiliser applications in early spring to stimulate green up and recovery from wear.
- iv. Shade and the influence of trees will always be a problem on the golf course, however, it is recommended to continue to prune branches and roots where appropriate. Selective tree removal must also be considered where appropriate.

## Appendix 1: Description of greens and surrounds

Green No.	Age (Yrs)	Putting Surface	Greens Surrounds
1	5 - 6	<ul style="list-style-type: none"> <li>▪ Excellent bentgrass cover - healthy</li> <li>▪ Turf of high density</li> <li>▪ Surface putting well</li> <li>▪ Firm surface</li> <li>▪ Some localised dry spot present</li> <li>▪ Fairy ring present (dry spot associated with it)</li> <li>▪ Little or no <i>Poa annua</i> present</li> <li>▪ Green due to be fertilised</li> </ul>	<ul style="list-style-type: none"> <li>▪ Very good couchgrass cover of high density</li> <li>▪ Pre-emergence herbicides applied</li> <li>▪ Rear RHS walk off area compacted</li> </ul>
2	>10	<ul style="list-style-type: none"> <li>▪ Heavily shaded green</li> <li>▪ Excellent bentgrass cover - healthy</li> <li>▪ Turf of high density</li> <li>▪ Surface putting well</li> <li>▪ Firm surface</li> <li>▪ Fairy ring present</li> <li>▪ Little or no <i>Poa annua</i> present</li> <li>▪ Green has been affected by a severe outbreak of Pythium disease (RHS)</li> <li>▪ Small amount of disease still active</li> <li>▪ <b><i>Despite shade issues consider the surface to be a benchmark for the golf course</i></b></li> </ul>	<ul style="list-style-type: none"> <li>▪ Very good couchgrass cover of high density</li> <li>▪ Rear surrounds have recovered from Spring Dead Spot disease noted in November and is in excellent condition</li> <li>▪ Pre-emergence herbicides applied</li> <li>▪ RHS apron thinned out due to traffic effects – area had been affected by disease</li> </ul>
3	9 - 10	<ul style="list-style-type: none"> <li>▪ Heavily shaded green</li> <li>▪ Green was struggling during the last inspection</li> <li>▪ Very good bentgrass cover - healthy</li> <li>▪ Turf of high density</li> <li>▪ Surface putting well</li> <li>▪ Moderately firm surface though soft on LHS (in high moss area)</li> <li>▪ Good moss control achieved</li> <li>▪ Some disease damage present</li> <li>▪ Fairy ring present</li> <li>▪ Little or no <i>Poa annua</i> present</li> <li>▪ Green has been treated with endothal to control</li> </ul>	<ul style="list-style-type: none"> <li>▪ Surrounds generally very good though rear surrounds and apron are affected by tree roots</li> </ul>

		<p><i>Poa annua</i> – there has been some turf thinning as a result</p> <ul style="list-style-type: none"> <li>▪ Green needs to be fertilised to improve bentgrass density</li> </ul>	
4	9 - 10	<ul style="list-style-type: none"> <li>▪ Good bentgrass cover - healthy</li> <li>▪ Turf of high density</li> <li>▪ Surface putting well</li> <li>▪ Firm surface</li> <li>▪ Some minor localised dry spot present</li> <li>▪ Fairy ring present</li> <li>▪ Little or no <i>Poa annua</i> present</li> </ul>	<ul style="list-style-type: none"> <li>▪ Very good couchgrass cover of high density – rear section of lower density</li> </ul>
5	>10	<ul style="list-style-type: none"> <li>▪ Very good bentgrass cover - healthy</li> <li>▪ Turf of high density – some minor turf loss at rear of green</li> <li>▪ Surface putting well</li> <li>▪ Firm surface</li> <li>▪ Some localised dry spot present</li> <li>▪ Little or no <i>Poa annua</i> present</li> </ul>	<ul style="list-style-type: none"> <li>▪ Very good couchgrass cover of high density</li> <li>▪ Approach to green has improved considerably due to vertidrain</li> <li>▪ Less <i>Poa annua</i> between bentgrass collar and couchgrass</li> <li>▪ Rear RHS walk off area compacted</li> </ul>
6	9 - 10	<ul style="list-style-type: none"> <li>▪ High shade on RHS</li> <li>▪ Very good bentgrass cover - healthy</li> <li>▪ Turf of moderate to high density</li> <li>▪ Surface putting well</li> <li>▪ Firm surface</li> <li>▪ Some minor localised dry spot present</li> <li>▪ Fairy ring present – localised dry spot associated with it</li> <li>▪ Some disease present – may still be active</li> <li>▪ Little or no <i>Poa annua</i> present</li> </ul>	<ul style="list-style-type: none"> <li>▪ Very good couchgrass cover of high density</li> </ul>
7	3	<ul style="list-style-type: none"> <li>▪ Very good bentgrass cover - healthy</li> <li>▪ Turf of moderate to high density</li> <li>▪ Front half of green has turf cover of less density – high number of pitch marks</li> <li>▪ Surface putting well</li> <li>▪ Firm surface</li> </ul>	<ul style="list-style-type: none"> <li>▪ Very good couchgrass cover of high density</li> <li>▪ Rear couchgrass has been replaced and will be kept free of <i>Poa annua</i></li> </ul>

		<ul style="list-style-type: none"> <li>▪ High wear around pin placements</li> <li>▪ Little or no <i>Poa annua</i> present</li> </ul>	
8	5 - 6	<ul style="list-style-type: none"> <li>▪ Excellent bentgrass cover - healthy</li> <li>▪ Turf of moderate to high density</li> <li>▪ Surface putting well</li> <li>▪ Firm surface</li> <li>▪ Fairy ring present</li> <li>▪ Good moss control achieved – turf has less density</li> <li>▪ Little or no <i>Poa annua</i> present</li> </ul>	<ul style="list-style-type: none"> <li>▪ Very good couchgrass cover of high density</li> <li>▪ Wear still apparent at rear of green but couchgrass cover has improved significantly</li> </ul>
9	>10	<ul style="list-style-type: none"> <li>▪ Very good bentgrass cover - healthy</li> <li>▪ Turf of high density</li> <li>▪ Surface putting well</li> <li>▪ Firm surface</li> <li>▪ Localised dry spot on RHS of green</li> <li>▪ Little or no <i>Poa annua</i> present</li> </ul>	<ul style="list-style-type: none"> <li>▪ Very good couchgrass cover of high density</li> </ul>
10	8 - 9	<ul style="list-style-type: none"> <li>▪ Very good bentgrass cover - healthy</li> <li>▪ Turf of high density</li> <li>▪ Surface putting well</li> <li>▪ Firm surface</li> <li>▪ Some localised dry spot</li> <li>▪ Fairy ring (localised dry spot associated with it)</li> <li>▪ Some minor <i>Poa annua</i> present</li> <li>▪ Tree roots in rear of green</li> </ul>	<ul style="list-style-type: none"> <li>▪ Good couchgrass cover of high density</li> <li>▪ Couchgrass in rear surrounds is dry due to influence of tree</li> <li>▪ Bentgrass/ryegrass apron has some localised dry spot</li> </ul>
11	>10	<ul style="list-style-type: none"> <li>▪ Very good bentgrass cover - healthy</li> <li>▪ Turf of high density</li> <li>▪ Added section (SR 1020 bentgrass) has improved</li> <li>▪ Surface putting well</li> <li>▪ Firm surface</li> <li>▪ Very little localised dry spot</li> <li>▪ Little or no <i>Poa annua</i> present</li> <li>▪ Walk on areas of high wear</li> </ul>	<ul style="list-style-type: none"> <li>▪ Very good couchgrass cover of high density</li> </ul>

12	>10	<ul style="list-style-type: none"> <li>▪ Very good bentgrass cover - healthy</li> <li>▪ Turf of high density</li> <li>▪ Surface putting well</li> <li>▪ Firm surface</li> <li>▪ Excellent result</li> <li>▪ Very little <i>Poa annua</i> present</li> <li>▪ Wear on LHS</li> </ul>	<ul style="list-style-type: none"> <li>▪ Very good couchgrass cover of high density</li> <li>▪ RHS couchgrass is very good despite the trees</li> <li>▪ Apron is very good – very little <i>Poa annua</i></li> </ul>
13	>10	<ul style="list-style-type: none"> <li>▪ Very good bentgrass cover - healthy</li> <li>▪ Turf of high density</li> <li>▪ Surface putting well</li> <li>▪ Moderate to firm surface</li> <li>▪ Excellent result</li> <li>▪ Very little <i>Poa annua</i> present</li> <li>▪ Wear on walk on and walk off areas</li> <li>▪ Green is heavily shaded and is difficult to get a firm surface</li> </ul>	<ul style="list-style-type: none"> <li>▪ Good couchgrass in new surrounds</li> </ul>
14	>10	<ul style="list-style-type: none"> <li>▪ Very good bentgrass cover - healthy</li> <li>▪ Turf of high density</li> <li>▪ Surface putting well</li> <li>▪ Firm surface</li> <li>▪ Some <i>Poa annua</i> present</li> <li>▪ Turf density has improved in low section of the green</li> </ul>	<ul style="list-style-type: none"> <li>▪ Very good couchgrass cover of high density</li> </ul>
15	9 - 10	<ul style="list-style-type: none"> <li>▪ Very good bentgrass cover - healthy</li> <li>▪ Turf of moderate to high density</li> <li>▪ Very good surface</li> <li>▪ Firm surface</li> <li>▪ Some localised dry spot</li> <li>▪ Fairy rings have caused problems over the summer – good suppression of Fairy ring</li> <li>▪ Some <i>Poa annua</i> present</li> <li>▪ Turf density has improved in low section of the green</li> </ul>	<ul style="list-style-type: none"> <li>▪ Very good couchgrass cover of high density</li> <li>▪ Apron is relatively free of <i>Poa annua</i></li> </ul>
16	>10	<ul style="list-style-type: none"> <li>▪ Very good bentgrass cover - healthy</li> </ul>	<ul style="list-style-type: none"> <li>▪ Very good couchgrass cover of high density</li> </ul>

		<ul style="list-style-type: none"> <li>▪ Turf of high density</li> <li>▪ Very good surface</li> <li>▪ Firm surface</li> <li>▪ Some localised dry spot</li> <li>▪ Some disease damage – generally has recovered</li> <li>▪ Some <i>Poa annua</i> present</li> </ul>	
17	>10	<ul style="list-style-type: none"> <li>▪ Very good bentgrass cover - healthy</li> <li>▪ Turf of high density</li> <li>▪ Good surface</li> <li>▪ Firm surface</li> <li>▪ Some localised dry spot</li> <li>▪ Some <i>Poa annua</i> present</li> </ul>	<ul style="list-style-type: none"> <li>▪ Very good couchgrass cover of high density</li> </ul>
18	8 - 9	<ul style="list-style-type: none"> <li>▪ Very good bentgrass cover - healthy</li> <li>▪ Turf of high density</li> <li>▪ Good surface</li> <li>▪ Firm surface</li> <li>▪ Localised dry spot generally over the green – high prevalence on RHS</li> <li>▪ Minor presence of <i>Poa annua</i></li> <li>▪ Good control of moss on RHS</li> </ul>	<ul style="list-style-type: none"> <li>▪ Very good couchgrass cover of high density</li> <li>▪ Couchgrass on RHS affected by trees</li> </ul>