

Warm Season

Newsletter No 4. September 2008

Grass Trials

Introduction

The warm season grass trials are now into the third year with the spilt plot treatments being applied at the QLD DPI&F, Redlands and regular assessments being undertaken for quality, colour, disease and thatch. There are now four regional sites established with another 2 – 3 in the early stages of establishment. The following newsletter details the results of the main trial at Redlands and the regional trials.

Management guidelines for new warm-season greens grasses in Australia - *Matt Roche, Research Scientist, QDPI&F*

The first split-plot fertiliser application was applied to the Centralised Greens Test Facility located at Redlands Research Station on 9 January 2008. NPK fertilisers including Liquid Blend (0:4:20), CoRoN® (35:0:0) and AutoFert™ K (0:0:30) with additional ATEP trace elements, were applied at rates recommended by the AGCSA technical staff and Globe Australia Pty Ltd.

One week following the first fertiliser application, DPI&F research staff conducted subjective colour, quality and thatch ratings on each of the 324 sub-plots. Previously colour, quality and thatch ratings were carried out on the 36 main plots only (Table 1).

Sub-plot colour ratings taken from January to March 2008 for the different mowing treatments are displayed in Tables 2a, 2b and 2c. There are seasonal and fertility trends evident for all cultivars. Averaging all mowing treatments (M1, M2 and M3) between January and March 2008 resulted in the following scores for the Cynodon hybrids: MiniVerde™ (6.5), Novotek™ (6.3), 'MS-Supreme' (6.1), 'TifEagle' (6.0), 'Tifdwarf' (5.9) and 'Tifgreen' (5.5); and

Paspalum cultivars: 'Sea Isle Supreme' (6.9) Velvetene™ (6.7) and 'Sea Isle 2000' (6.6).

Turfgrass Quality from January to March 2008 (Tables 3a, 3b and 3c) for all mowing treatments show no significant difference ($P>0.05$) between monthly inspections within the individual species, however significant differences were evident between the species, with the paspalums displaying superior turf quality.

Subjective thatch measurements for January to March 2008 are presented in Tables 4a, 4b and 4c. Quantitative thatch measurements (Table 5) were taken on the 23-24 January 2008. Average thatch depth (mm) for the Cynodon hybrids and Paspalum groups was 16.25mm and 18.18mm respectively. 'Tifdwarf' (13.06mm) and 'Tifgreen' (15.03mm) had significantly ($P<0.05$) less depth of thatch (mm) than all other cultivars.

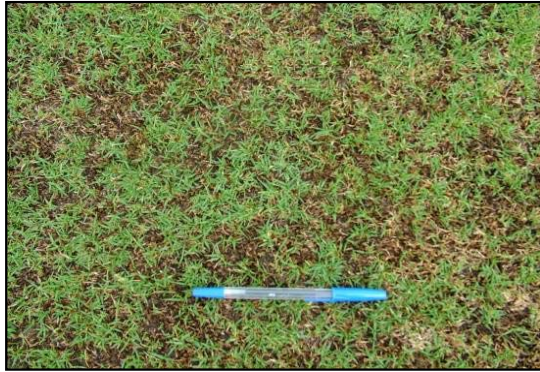
Green speed measurements (Plate 3) were taken on 13 February 2008 using a modified stimpmeter and a laser distance meter (Prexiso laser distance meter). Stimpmeter readings, surface temperature readings and percentage moisture volume tests were taken for each sub-plot (Table 6).

Regular maintenance will continue on the varietal plots located at Redlands Research Station. Mowing [3.5mm without rolling (Plate 4), 3.5mm with rolling and 2.7mm without rolling] and fertiliser treatments (1kg N, 2kg N and 3kg N per m² per year) are to be applied as scheduled to emulate practices representative of the lawn bowls and golf.





Overview of the Redlands research green looking East to West on 28 March 2008



Plant regrowth following scalping of the *Paspalum vaginatum* cultivar 'Sea Isle 2000'



Plate 3: Use of the modified stimpmeter to measure greens speed (13 February 2008)



Plate 4: The Tru-Turf Greens Roller in operation on the 3.5mm cut and rolled plots

Warm Season Grass Trials at Chisholm Institute Rosebud Victoria - Bruce McPhee (Senior Lecturer)

In October 2007 a warm season grass trial was established at Chisholm Institute's Rosebud Campus in conjunction with the QLD Department of Primary Industries and Fisheries and the Australian Golf Course Superintendents Association.

The trial assesses a range of Hybrid Couch grasses *Cynodon dactylon* x *transvaalensis* and Sea Shore Paspalums *Paspalum vaginatum* for their adaptation to Melbourne's climate.

The trial consists of five *Cynodon dactylon* x *transvaalensis* hybrid couch grasses Tifdwarf, Tifgreen, Tifeagle, MS-Supreme and Mini Verde and two *Paspalum vaginatum* Cultivars, Sea Isle 2000, and Velvetene. Some of these grasses, such as Tifdwarf and Tifgreen, have been used quite successfully in Melbourne in the past and the newer varieties will be assessed against these for quality, density, disease and insect susceptibility.

A trial area was established, where soils are similar to those used in greens construction throughout the local area, being free draining calcareous sands with a pH of 8.5. The trial area was set up with the seven varieties randomly placed in plots measuring 1.5m x 1.5m with two replications, giving a total of 21 plots.

Vegetative material arrived on the 26th of October 2007 and was divided into three equal amounts for planting out in the replicated trial. Due to the fine nature of the material it was decided to work the scarifyings into the surface with a rake and then simply pack them down to ensure they had good contact with the soil.



Plate 5: Chisholm Institute – Finished plot after planting

An application of Turf starter fertiliser 18.10.10 at a rate of 2kg per 100m² and Urea form 38.0.0 at a rate of 1kg per 100m² were made prior to planting of the grasses.

Irrigation was applied three times daily during the grow in period to ensure the soil was kept moist and sprigs were not allowed to dry out. It was up to five weeks before there were any real signs of growth from either the *Cynodon* or *Paspalum* varieties. This slow establishment period could be as a result of the fineness of planting materials made up of scarifyings with very few rhizomes or stolons intact.



Plate 6: Chisholm Institute - Hybrid couch growth 47 days after planting

With temperatures through late November and early December in the thirties, there was good growth from all varieties including an array of weeds, which were judiciously removed by hand from the trial plots.

At fourteen weeks after planting, coverage across all plots was at 60 - 70% with the Paspalums being slightly more advanced. By March most plots had achieved full cover and were maintained at 5.0 mm, being cut twice per week. The Paspalums demonstrated a dark even colour, with comparable quality.

The couch varieties were all relatively even in their growth rate and quality with Tifgreen and Tifdwarf exhibiting higher colour ratings than the newer varieties, both during active growth and entering dormancy period.

April continued to provide above average temperatures and the grasses showed little sign of slowing down until the first real cold snap in May, where growth appeared to slow dramatically. With plants having moved into dormancy, Tifdwarf and Tifgreen were still exhibiting greater colour retention. Overall the hybrid couches have all had similar quality ratings.



Plate 7: Chisholm Institute - Turf trial 10/6/07 showing winter colour retention

Warm Season Grass Trials at Horton Park Golf Club Maroochydore Queensland - Pat Pauli (Golf Course Superintendent)

The warm season grasses used in this trial are Tifgreen (328), Tifeagle, Tifdwarf, MiniVerde, MS Supreme, Champion Dwarf, Sea Isle 2000, and Velvetene.

This trial plot consists of 2 sections (A & B) side by side each with 8 warm season grasses planted in 2m x 1m plots with three replicates. There are 48 plots in total. The trial area has been built similar to a sand-based putting green using 300mm deep Southern Pacific GTS 1000 sand amended with Envirorganics and Nutri-mate Organic Humate as the growing medium over a 100 mm deep gravel drainage layer.

All grasses were sourced from the DPI at Redlands planted as stolons on the 14 November 2007. The entire plot was covered with grow cloth to prevent stolons from being blown around and contaminating other plots. Covers were removed on the 21 November 2007.

Tifgreen, Sea Isle 2000 and Velvetine established the quickest. Champion Dwarf was the slowest but still covered in reasonable time. Champion looked to be the most prostrate with Tifgreen having the tallest growth habit.

All grasses displayed a different colour and more easily distinguishable at the higher height before being cut. As the mowing height was lowered it was harder to see the difference in colour between the ultra dwarf couches apart from Tifgreen and to some extent Tifdwarf. During the heat of summer, Tifgreen started to display signs of stress not unlike what was happening to the greens (Tifgreen) on the golf course, which was in some ways a little reassuring.

During this time Sea Isle 2000 and Velvetene had great color and looked like they could have been mowed even lower which we were unable to do due to the set up of the plots.

At the end of March 2008 and the beginning of May 2008 there was an irrigation malfunction and the whole plot was without irrigation for some time and all the couches showed signs of stress. The Sea Isle 2000 and Velvetene were unaffected. Once the irrigation was fixed it was expected to see all the couches return to their original condition, but this did not happen. Closer inspection using a hole changer to take profile samples revealed all couch plots had about 50% dry area in the plugs whilst the all Sea Isle 2000 and Velvetene were saturated. These observations indicate that there is a greater accumulation of thatch in the ultra dwarf couches that became hydrophobic when there was no irrigation and failed to wet up when irrigation was returned.

The plot area has had numerous topdressings over this period to remove the indentations between the different grass plots and it has had one mini coring since the dry patch problem. It has had no fungicide application and one light grooming in two directions, with the greens mower dethatching heads. All plots have recovered well from these practices.

In June there was 324mm of rain over 5 days, and all plots of Sea Isle 2000 and Velvetene received considerable damage due to Dollar Spot. Sea Isle 2000 and Velvetene plots have had some degree of damage due to disease since January 2008. In mid-June the couch plots had good color for this time of the year. The Tifgreen plots are all a lighter shade of green and appear a little more open.



Trial plots – Horton Park Golf Club

Warm Season Grass Trials at Bermagui Country Club - *David Thomson (Golf Course Superintendent)*

The warm season grasses used in this trial are MS Supreme, MiniVerde, TifEagle, Velvetene, Sea Isle 2000 and Sea Dwarf. The trials have been established on native sandy soil in a tidal area which is approximately 700 – 1000mm above sea level and the soil sodium levels are approximately 1000 – 1500 ppm.



Plate 9: Bermagui Country Club - establishment

The growing medium was not amended and a starter fertilizer was used at establishment only. The plots have not received any nutrients since. Ronstar was applied @ 2kg/100m² after the plots were stolonized on the 7 December 2007.



Plate 10: Bermagui Country Club

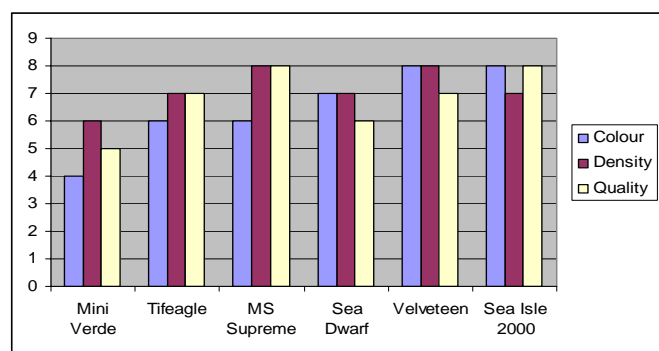
The plots were irrigated for establishment, but have not been irrigated since.

The TifEagle and MS Supreme established within the month after planting with MiniVerde being a little slower. Of the paspalums, the Sea Isle 2000 was the fastest to establish and the Sea Dwarf the slowest.

In terms of turfgrass quality, colour and density the Tifeagle and MS Supreme are far superior to the MiniVerde with MS Supreme being the stronger looking couch out of the three. Mini Verde went into dormancy earlier than the other two cultivars.

The Sea Isle 2000 was the quickest of the Seashore Paspalums to establish and looked the better grass for a considerable period. The other two Seashore Paspalums "porpoised" (i.e. stolons arch upwards rather than remain prostrate) quite badly. Slowly the Velvetene caught up to the Sea Isle 2000 and is now similar in turf cover. The Sea Dwarf has improved but not on par with the other two cultivars.

Colour and density are all very similar with the the Sea Dwarf being marginally behind. There is definite yellowing of the older leaves in the paspalums, which is to be expected given that there have been no applications of nitrogen.



Mycelium has been observed on paspalum plots, but nothing eventuated. Dew formation on the paspalums is very minor compared with the hybrid couches.

Even after Ronstar was applied @ 2kg/100m², the normal flat weeds for this area appeared though only at low numbers.

Report on Warm Season Grass Trials SA - June 2008 by Daryl Sellar, Consulting Superintendent, Glenelg Golf Club

From the outset these trial plots have struggled to establish well, due to the late planting (June 2008).

As a result, the speed of establishment was extremely slow, with a full coverage barely achieved by the end of summer.

Nonetheless, the observations have been interesting from the perspective the grasses are growing in a southern location with localised challenges;

- Morning shade, prolonged in the winter
- Irrigated with marginal quality bore water
- Grown on low lying section of the course -
 - water table normally within 1 metre of the surface
- Site within sheltered amphitheatre, limiting air movement

Speed of establishment

MS Supreme by far the quickest initially, despite heaviest shade influence.

Tifdwarf very slow with still poor coverage.

Quality

Due to limited viability of material and in fairness to the samples, quality of surface has been based on better areas rather than overall plot quality. Lowering of mowing heights has been slow and compromised due to uneven growth and density, and topdressing has been restricted to some degree by lack of growth. Lowering of mowing heights in late summer was detrimental to surface quality, and highlighted a limitation of the grasses in this situation.

Density

All plots have retained reasonable density despite lowering of mowing heights and reduction in temperatures.

Disease

No significant outbreaks. No treatments applied.

Colour

Lowering of mowing heights appears to have reduced plot colour, but this could also be a seasonal response.

Dew formation

The paspalum varieties have shown a natural tendency to repel dew, whereas the couch varieties accumulate dew on the foliage. This is potentially an advantage in terms of disease management and playability at certain times of the year.

Indooroopilly Golf Club - Charles Giffard (Course Superintendent)

Trials were established in May 2008 and to date there has been good establishment.



Further information on the project "Management Guidelines for New Warm-Season Greens Grasses in Australia" can be found at www.dpi.qld.gov.au/turf or by contacting John Neylan, General Manager, AGCSATech, Environment and Education on (03) 9548 8600 or via email john@agcsa.com.au.

Acknowledgements

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- Golf Course Superintendents Association of Queensland
- Australian Golf Course Superintendents Association
- Horton Park GC
- Sanctuary Cove
- Indooroopilly GC
- Twin Waters GC
- Jimboomba Turf Group
- Tropical Lawns Pty Ltd
- Southern Pacific Sands
- David Burrup Golf Course & Sports Turf Design
- Twin View Turf
- John Deere & BHM Machinery
- Jacobsen
- Tru Turf
- Hydro Pumping & Control Pty Ltd (David Hanby)
- Rainbird
- Root Barrier
- Globe Australia (John Cooper)
- Moreton Institute of TAFE
- Chisholm TAFE Rosebud
- Bermagui Country Club

Table 1: QDPIF Colour and quality ratings¹ (June-September 2007).

Cultivars	Turf Colour					Turf Quality				
	5-Jun	6-Jul	2-Aug	5-Sep	29-Sep	5-Jun	6-Jul	2-Aug	5-Sep	29-Sep
Hybrid <i>Cynodon</i>:										
MiniVerde	7.6	5.7	4.5	5.5	6.3	7.6	6.7	6.8	6.2	6.4
MS-Supreme	6.4	4.9	3.5	4.5	5.6	7.0	6.3	6.4	5.0	5.7
Novotek	6.4	5.1	3.6	5.2	5.6	6.6	6.0	5.8	5.6	6.1
Tifdwarf	4.9	3.7	3.2	4.7	5.4	5.0	5.1	5.4	4.6	5.0
TifEagle	6.8	4.8	3.7	4.6	5.6	6.8	5.7	6.0	5.4	6.0
Tifgreen	6.1	4.8	4.6	4.8	5.9	6.8	6.8	6.5	5.3	5.8
LSD (P=0.05)	0.7	0.4	0.5	0.4	0.7	0.8	0.6	0.3	0.5	0.7
<i>Paspalum</i>:										
Sea Isle 2000	7.5	5.3	6.5	6.3	7.7	7.1	5.9	6.0	5.1	6.4
Sea Isle Supreme	7.5	5.5	6.5	6.0	7.1	7.0	6.3	6.0	4.7	6.6
Velvetene	7.5	5.5	6.6	5.9	6.8	6.5	6.2	6.0	4.6	6.6
LSD (P=0.05)	-	0.2	0.3	0.2	0.5	0.3	0.4	-	0.3	1.0

¹ 0 (= worst) to 9 (= best); 6 = acceptable.

Table 2a: QDPIF Subjective colour ratings¹ for mowing treatment M1 (3.5mm cut and no roll) for January-March 2008

Cultivars	1 Kg N			2 Kg N			4 Kg N		
	16-Jan-08	14-Feb-08	12-Mar-08	16-Jan-08	14-Feb-08	12-Mar-08	16-Jan-08	14-Feb-08	12-Mar-08
<i>Cynodon</i> Hybrid:									
MiniVerde	6.5	6.2	5.9	6.6	6.4	6.1	7.0	6.9	6.8
MS-Supreme	6.2	6.2	5.6	6.1	6.2	5.9	6.3	6.5	6.3
Novotek	6.3	6.2	5.9	6.4	6.3	6.1	6.6	6.8	6.9
Tifdwarf	5.5	6.3	6.1	5.7	6.6	6.6	5.7	6.8	6.8
TifEagle	6.2	6.0	5.5	6.3	6.2	5.6	6.4	6.7	6.2
Tifgreen	5.1	5.4	5.4	5.4	5.8	6.1	5.3	6.0	6.3
LSD (P=0.05)	0.7	0.4	0.5	0.5	0.5	0.5	0.6	0.4	0.6
<i>Paspalum</i>:									
Sea Isle 2000	7.3	6.5	5.1	7.3	6.9	5.3	7.3	7.2	5.6
Sea Isle Supreme	7.0	6.7	6.5	7.1	6.9	6.8	7.1	7.3	7.1
Velvetene	6.9	6.4	6.3	6.8	6.6	6.5	6.9	7.2	6.9
LSD (P=0.05)	0.3	0.4	0.7	0.2	0.3	0.9	0.4	0.5	0.9

¹ 0 (= worst) to 9 (= best); 6 = acceptable

Table 2b: QDPIF Subjective colour ratings¹ for mowing treatment M2 (3.5mm cut and roll) for January-March 2008.

Cultivars	1 Kg N			2 Kg N			4 Kg N		
	16-Jan-08	14-Feb-08	12-Mar-08	16-Jan-08	14-Feb-08	12-Mar-08	16-Jan-08	14-Feb-08	12-Mar-08
Cynodon Hybrid:									
MiniVerde	6.9	6.4	5.8	6.7	6.3	6.1	7.0	7.0	6.8
MS-Supreme	6.4	6.0	5.8	6.5	6.3	6.1	6.5	6.5	6.3
Novotek	6.6	6.3	6.1	6.3	6.3	6.3	6.8	6.7	6.8
Tifdwarf	5.4	6.0	5.9	5.5	6.1	6.3	5.6	6.2	6.5
TifEagle	6.2	5.8	5.3	6.2	6.0	5.8	6.4	6.3	6.2
Tifgreen	5.4	5.4	5.9	5.4	5.5	6.2	5.5	5.9	6.3
<i>LSD (P=0.05)</i>	<i>0.5</i>	<i>0.6</i>	<i>0.7</i>	<i>0.6</i>	<i>0.6</i>	<i>0.5</i>	<i>0.5</i>	<i>0.7</i>	<i>0.7</i>
Paspalum:									
Sea Isle 2000	7.3	6.7	5.6	7.3	6.8	6.2	7.3	7.0	6.4
Sea Isle Supreme	7.0	6.5	6.6	7.2	6.8	6.8	7.2	7.1	7.0
Velvetene	6.8	6.3	6.4	6.8	6.6	6.6	6.8	7.0	7.0
<i>LSD (P=0.05)</i>	<i>0.3</i>	<i>0.6</i>	<i>0.7</i>	<i>0.4</i>	<i>0.6</i>	<i>0.8</i>	<i>0.3</i>	<i>0.5</i>	<i>0.5</i>

¹ 0 (= worst) to 9 (= best); 6 = acceptable

Table 2c: QDPIF Subjective colour ratings¹ for mowing treatment M3 (2.7mm cut and no roll) for January-March 2008.

Cultivars	1 Kg N			2 Kg N			4 Kg N		
	16-Jan-08	14-Feb-08	12-Mar-08	16-Jan-08	14-Feb-08	12-Mar-08	16-Jan-08	14-Feb-08	12-Mar-08
Cynodon Hybrid:									
MiniVerde	6.4	6.5	6.0	6.4	6.4	6.0	6.6	7.0	6.8
MS-Supreme	5.6	5.8	5.4	5.8	6.2	5.6	5.8	6.3	5.9
Novotek	6.0	6.2	5.8	6.0	6.3	6.1	6.1	6.7	6.6
Tifdwarf	4.7	5.9	5.6	4.9	6.2	6.1	4.8	6.3	6.3
TifEagle	5.8	5.8	5.3	5.8	6.1	5.5	6.0	6.4	5.9
Tifgreen	4.5	5.0	5.3	4.6	5.0	5.6	4.6	5.3	5.9
<i>LSD (P=0.05)</i>	<i>0.7</i>	<i>0.4</i>	<i>0.5</i>	<i>0.6</i>	<i>0.5</i>	<i>0.4</i>	<i>0.6</i>	<i>0.5</i>	<i>0.7</i>
Paspalum:									
Sea Isle 2000	6.8	6.6	6.0	7.0	6.8	6.1	6.9	7.0	6.6
Sea Isle Supreme	6.6	6.7	6.3	6.6	6.8	6.5	6.8	7.3	6.9
Velvetene	6.5	6.4	6.4	6.7	6.8	6.6	6.7	7.2	7.0
<i>LSD (P=0.05)</i>	<i>0.3</i>	<i>0.3</i>	<i>0.5</i>	<i>0.3</i>	<i>0.5</i>	<i>0.9</i>	<i>0.3</i>	<i>0.6</i>	<i>0.8</i>

¹ 0 (= worst) to 9 (= best); 6 = acceptable

Table 3a: ODPIF Subjective quality ratings¹ for mowing treatment M1 (3.5mm cut and no roll) for January-March 2008

Cultivars	1 Kg N			2 Kg N			4 Kg N		
	16-Jan-08	14-Feb-08	12-Mar-08	16-Jan-08	14-Feb-08	12-Mar-08	16-Jan-08	14-Feb-08	12-Mar-08
Cynodon Hybrid:									
MiniVerde	6.2	6.0	6.2	6.0	6.2	6.5	6.6	6.6	7.2
MS-Supreme	5.8	5.5	6.0	5.0	5.4	5.9	5.5	5.7	6.4
Novotek	5.8	6.1	6.3	5.9	6.0	6.4	6.0	6.4	6.7
Tifdwarf	5.4	5.8	5.9	5.3	6.0	5.9	5.5	6.1	6.3
TifEagle	5.7	5.8	5.8	5.7	5.9	5.9	5.8	6.2	6.1
Tifgreen	5.5	5.4	5.7	5.7	5.4	6.0	5.8	5.7	6.1
<i>LSD (P=0.05)</i>	<i>0.9</i>	<i>0.6</i>	<i>0.7</i>	<i>0.8</i>	<i>0.7</i>	<i>0.7</i>	<i>0.7</i>	<i>0.6</i>	<i>0.8</i>
Paspalum:									
Sea Isle 2000	7.3	6.3	4.9	7.5	6.8	5.3	7.5	6.9	5.1
Sea Isle Supreme	7.1	6.3	5.8	6.9	6.5	5.9	7.3	7.0	6.4
Velvetene	6.8	6.2	5.5	6.9	6.2	5.7	7.0	7.0	6.4
<i>LSD (P=0.05)</i>	<i>0.3</i>	<i>0.6</i>	<i>0.6</i>	<i>0.5</i>	<i>0.4</i>	<i>0.7</i>	<i>0.4</i>	<i>0.7</i>	<i>1.4</i>

¹ 0 (= worst) to 9 (= best); 6 = acceptable

Table 3b: ODPIF Subjective quality ratings¹ for mowing treatment M2 (3.5mm cut and roll) for January-March 2008

Cultivars	1 Kg N			2 Kg N			4 Kg N		
	16-Jan-08	14-Feb-08	12-Mar-08	16-Jan-08	14-Feb-08	12-Mar-08	16-Jan-08	14-Feb-08	12-Mar-08
Cynodon Hybrid:									
MiniVerde	6.5	6.3	6.4	6.5	6.3	6.8	6.8	7.0	7.0
MS-Supreme	5.8	5.9	6.2	5.7	5.9	6.0	5.6	6.0	6.3
Novotek	6.3	6.2	6.3	5.9	6.1	6.3	6.5	6.4	6.9
Tifdwarf	5.3	5.8	5.9	5.7	6.0	6.2	5.6	6.0	6.1
TifEagle	5.9	6.0	5.9	5.7	5.9	6.1	6.1	6.4	6.3
Tifgreen	5.7	5.4	6.0	5.8	5.6	6.1	5.9	5.8	6.3
<i>LSD (P=0.05)</i>	<i>0.7</i>	<i>0.7</i>	<i>0.7</i>	<i>0.8</i>	<i>0.7</i>	<i>0.8</i>	<i>0.8</i>	<i>0.6</i>	<i>0.7</i>
Paspalum:									
Sea Isle 2000	7.1	6.4	5.3	7.3	6.5	5.6	7.2	6.9	5.9
Sea Isle Supreme	7.0	6.2	5.8	7.0	6.5	6.4	7.2	6.8	6.4
Velvetene	6.7	6.2	5.6	6.7	6.2	5.8	6.6	6.8	6.4
<i>LSD (P=0.05)</i>	<i>1.0</i>	<i>1.1</i>	<i>0.4</i>	<i>0.6</i>	<i>0.6</i>	<i>0.8</i>	<i>0.6</i>	<i>0.5</i>	<i>1.2</i>

¹ 0 (= worst) to 9 (= best); 6 = acceptable

Table 3c: QDPIF Subjective quality ratings¹ for mowing treatment M3 (2.7mm cut and no roll) for January-March 2008

Cultivars	1 Kg N			2 Kg N			4 Kg N		
	16-Jan-08	14-Feb-08	12-Mar-08	16-Jan-08	14-Feb-08	12-Mar-08	16-Jan-08	14-Feb-08	12-Mar-08
Cynodon Hybrid:									
MiniVerde	6.7	6.4	6.4	6.4	6.3	6.3	6.8	7.0	7.1
MS-Supreme	5.3	5.6	5.7	5.7	5.8	5.7	5.4	5.7	5.9
Novotek	5.7	6.0	5.9	5.8	6.0	5.9	5.8	6.3	6.6
Tifdwarf	5.0	5.4	5.3	5.0	5.6	5.6	4.8	5.5	5.7
TifEagle	5.7	5.5	5.6	5.8	5.9	5.9	5.9	6.1	6.1
Tifgreen	4.8	4.9	5.3	5.0	4.8	5.5	5.4	5.2	5.7
<i>LSD (P=0.05)</i>	<i>0.8</i>	<i>0.7</i>	<i>0.6</i>	<i>0.7</i>	<i>0.7</i>	<i>0.5</i>	<i>0.8</i>	<i>0.8</i>	<i>0.7</i>
Paspalum:									
Sea Isle 2000	6.5	5.8	5.1	7.1	6.2	5.3	6.4	6.3	5.7
Sea Isle Supreme	6.5	5.8	5.4	6.3	5.9	5.5	7.0	6.6	6.4
Velvetene	6.1	5.5	5.4	6.5	6.0	5.4	6.4	6.6	6.7
<i>LSD (P=0.05)</i>	<i>1.2</i>	<i>0.7</i>	<i>0.6</i>	<i>0.7</i>	<i>1.0</i>	<i>0.6</i>	<i>1.0</i>	<i>1.1</i>	<i>1.2</i>

¹ 0 (= worst) to 9 (= best); 6 = acceptable

Table 4a: QDPIF Subjective thatch ratings¹ for mowing treatment M1 (3.5mm cut and no roll) for January-March 2008)

Cultivars	1 Kg N			2 Kg N			4 Kg N		
	16-Jan-08	14-Feb-08	12-Mar-08	16-Jan-08	14-Feb-08	12-Mar-08	16-Jan-08	14-Feb-08	12-Mar-08
Cynodon Hybrid:									
MiniVerde	2.3	2.4	1.6	2.2	2.6	1.5	2.3	2.7	1.9
MS-Supreme	1.7	1.9	1.3	1.5	1.8	1.3	1.6	1.8	1.5
Novotek	1.8	2.0	1.5	1.8	2.0	1.4	1.9	2.0	1.6
Tifdwarf	1.1	1.5	1.1	1.1	1.6	1.1	1.2	1.6	1.2
TifEagle	1.5	1.8	1.3	1.6	1.9	1.5	1.8	2.0	1.6
Tifgreen	1.5	1.5	1.1	1.4	1.4	1.1	1.4	1.5	1.3
<i>LSD (P=0.05)</i>	<i>0.5</i>	<i>0.4</i>	<i>0.3</i>	<i>0.5</i>	<i>0.5</i>	<i>0.2</i>	<i>0.3</i>	<i>0.5</i>	<i>0.3</i>
Paspalum:									
Sea Isle 2000	1.9	2.4	0.2	1.8	2.4	1.2	1.8	2.5	1.2
Sea Isle Supreme	1.6	1.9	1.3	1.5	1.8	1.3	1.6	1.9	1.3
Velvetene	1.5	1.8	1.2	1.5	1.8	1.3	1.5	1.9	1.3
<i>LSD (P=0.05)</i>	<i>0.5</i>	<i>0.6</i>	<i>0.1</i>	<i>0.4</i>	<i>0.6</i>	<i>0.2</i>	<i>0.3</i>	<i>0.5</i>	<i>0.2</i>

¹ 0 (= bare ground) to 9 (= spongy, extreme thatch).

Table 4b: QDPIF Subjective thatch ratings¹ for mowing treatment M2 (3.5mm cut and roll) for January-March 2008)

Cultivars	1 Kg N			2 Kg N			4 Kg N		
	16-Jan-08	14-Feb-08	12-Mar-08	16-Jan-08	14-Feb-08	12-Mar-08	16-Jan-08	14-Feb-08	12-Mar-08
Cynodon Hybrid:									
MiniVerde	2.6	2.4	1.7	2.2	2.0	1.7	2.5	2.5	1.8
MS-Supreme	1.7	1.8	1.4	1.7	1.8	1.4	1.7	1.8	1.4
Novotek	1.7	2.0	1.4	1.5	1.8	1.3	2.0	2.1	1.6
Tifdwarf	1.0	1.5	1.1	1.2	1.5	1.1	1.3	1.5	1.1
TifEagle	2.0	2.0	1.4	1.7	1.8	1.3	2.0	2.2	1.6
Tifgreen	1.3	1.4	1.1	1.3	1.3	1.1	1.4	1.5	1.1
<i>LSD (P=0.05)</i>	<i>0.8</i>	<i>0.6</i>	<i>0.3</i>	<i>0.6</i>	<i>0.5</i>	<i>0.2</i>	<i>0.6</i>	<i>0.5</i>	<i>0.4</i>
Paspalum:									
Sea Isle 2000	1.8	1.8	1.1	1.8	2.0	1.1	1.9	2.0	1.1
Sea Isle Supreme	1.5	1.8	1.3	1.5	1.7	1.3	1.6	1.8	1.4
Velvetene	1.4	1.8	1.1	1.4	1.6	1.1	1.4	1.7	1.2
<i>LSD (P=0.05)</i>	<i>0.4</i>	<i>0.4</i>	<i>0.1</i>	<i>0.3</i>	<i>0.3</i>	<i>0.1</i>	<i>0.3</i>	<i>0.6</i>	<i>0.3</i>

¹ 0 (= bare ground) to 9 (= spongy, extreme thatch).

Table 4c: QDPIF Subjective thatch ratings¹ for mowing treatment M3 (2.7mm cut and no roll) for January-March 2008)

Cultivars	1 Kg N			2 Kg N			4 Kg N		
	16-Jan-08	14-Feb-08	12-Mar-08	16-Jan-08	14-Feb-08	12-Mar-08	16-Jan-08	14-Feb-08	12-Mar-08
Cynodon Hybrid:									
MiniVerde	2.3	2.4	1.5	2.3	2.3	1.6	2.3	2.5	1.8
MS-Supreme	1.5	1.7	1.1	1.5	1.8	1.1	1.4	1.7	1.3
Novotek	1.7	1.8	1.3	1.6	1.6	1.1	1.5	1.8	1.3
Tifdwarf	0.9	1.4	1.1	1.0	1.3	1.1	0.9	1.2	1.1
TifEagle	1.6	1.8	1.2	1.7	1.8	1.3	1.8	2.0	1.4
Tifgreen	1.0	1.2	1.1	1.1	1.1	1.1	1.1	1.2	1.1
<i>LSD (P=0.05)</i>	<i>0.5</i>	<i>0.4</i>	<i>0.3</i>	<i>0.5</i>	<i>0.4</i>	<i>0.2</i>	<i>0.5</i>	<i>0.3</i>	<i>0.3</i>
Paspalum:									
Sea Isle 2000	1.1	1.6	1.1	1.1	1.8	1.1	1.1	1.6	1.1
Sea Isle Supreme	1.1	1.4	1.1	1.0	1.4	1.1	1.1	1.5	1.2
Velvetene	1.0	1.3	1.1	1.0	1.3	1.1	1.1	1.5	1.1
<i>LSD (P=0.05)</i>	<i>0.3</i>	<i>0.4</i>	<i>0.2</i>	<i>0.3</i>	<i>0.4</i>	<i>0.1</i>	<i>0.2</i>	<i>0.4</i>	<i>0.2</i>

¹ 0 (= bare ground) to 9 (= spongy, extreme thatch).

Table 5: QDPIF Quantitative thatch measurements (mm) for all mowing treatments on 23-24 January 2008

Cultivars	2.7mm cut (no roll)			3.5mm cut (no roll)			3.5mm cut & roll		
	1 Kg N	2 Kg N	4 Kg N	1 Kg N	2 Kg N	4 Kg N	1 Kg N	2 Kg N	4 Kg N
<i>Cynodon Hybrid:</i>									
MiniVerde	20.8	19.5	20.8	16.5	20.8	18.0	20.5	17.8	17.5
MS-Supreme	15.8	18.0	13.8	16.0	16.0	15.3	16.5	14.8	14.5
Novotek	19.0	17.0	16.5	16.8	19.5	17.0	21.0	15.3	17.8
Tifdwarf	13.5	13.3	12.5	12.0	11.8	13.0	13.0	15.8	12.8
TifEagle	16.3	14.5	17.0	17.3	17.5	20.5	16.0	16.8	16.8
Tifgreen	12.5	13.8	14.8	17.8	15.3	15.8	15.0	14.3	16.3
<i>LSD (P=0.05)</i>	<i>5.2</i>	<i>5.8</i>	<i>6.1</i>	<i>5.1</i>	<i>5.0</i>	<i>4.2</i>	<i>3.5</i>	<i>4.2</i>	<i>3.0</i>
<i>Paspalum:</i>									
Sea Isle 2000	17.5	17.8	17.5	19.3	18.8	20.0	20.3	18.3	16.8
Sea Isle Supreme	17.0	15.3	19.5	17.5	18.5	17.8	17.8	21.5	19.8
Velvetene	17.3	17.0	17.3	18.0	18.8	17.3	18.8	17.5	18.5
<i>LSD (P=0.05)</i>	<i>3.1</i>	<i>3.5</i>	<i>4.6</i>	<i>6.4</i>	<i>4.1</i>	<i>4.7</i>	<i>7.6</i>	<i>7.3</i>	<i>7.1</i>

Table 6: QDPIF Modified stimpmeter readings (m) for all mowing treatments on 13 February 2008

Cultivars	2.7mm cut (no roll)			3.5mm cut (no roll)			3.5mm cut & roll		
	1 Kg N	2 Kg N	4 Kg N	1 Kg N	2 Kg N	4 Kg N	1 Kg N	2 Kg N	4 Kg N
<i>Cynodon Hybrid:</i>									
MiniVerde	1.55	1.61	1.45	1.41	1.52	1.40	1.55	1.54	1.44
MS-Supreme	1.61	1.55	1.66	1.43	1.38	1.37	1.54	1.44	1.47
Novotek	1.56	1.57	1.62	1.35	1.43	1.35	1.46	1.51	1.40
Tifdwarf	1.57	1.54	1.49	1.29	1.29	1.24	1.38	1.38	1.33
TifEagle	1.61	1.64	1.48	1.44	1.46	1.40	1.50	1.55	1.59
Tifgreen	1.52	1.49	1.40	1.18	1.19	1.13	1.28	1.25	1.25
<i>LSD (P=0.05)</i>	<i>0.22</i>	<i>0.15</i>	<i>0.23</i>	<i>0.12</i>	<i>0.15</i>	<i>0.13</i>	<i>0.18</i>	<i>0.18</i>	<i>0.18</i>
<i>Paspalum:</i>									
Sea Isle 2000	1.71	1.16	1.23	0.93	0.97	0.93	1.01	1.00	0.97
Sea Isle Supreme	1.42	1.30	1.41	1.08	1.11	1.09	1.09	1.14	1.13
Velvetene	1.33	1.25	1.29	1.03	0.98	1.03	1.02	1.07	1.07
<i>LSD (P=0.05)</i>	<i>0.14</i>	<i>0.15</i>	<i>0.07</i>	<i>0.11</i>	<i>0.10</i>	<i>0.08</i>	<i>0.15</i>	<i>0.12</i>	<i>0.07</i>

**AGCSA WARM SEASON GRASS TRIALS
GLENELG GOLF CLUB, SA**

COLOUR	30.11.07	4.01.08	11.02.08	19.03.08	16.04.08	21.05.08	11.06.08
Sea Isle Supreme	6	7	8	8	6	6	5
Mini Verde	7	8	7	7	7	7	7
Flora Dwarf	7	7	8	7	7	7	7
Sea Isle 2000	6	7	8	7	7	6	6
Sea Dwarf	6	7	7	6	6	6	5
Champion	6	7	8	7	7	6	6
Tif Eagle	5	6	7	7	6	6	6
Tif Dwarf	5	6	7	6	6	6	6
MSS	6	7	7	6	6	6	6

QUALITY	30.11.07	4.01.08	11.02.08	19.03.08	16.04.08	21.05.08	11.06.08
Sea Isle Supreme	5	6	7	6	5	4	4
Mini Verde	7	7	7	7	6	6	6
Flora Dwarf	7	8	7	6	6	6	6
Sea Isle 2000	4	6	7	6	5	5	5
Sea Dwarf	5	6	6	5	5	5	5
Champion	7	8	7	6	5	5	5
Tif Eagle	6	7	7	6	5	4	4
Tif Dwarf	7	7	7	6	5	5	2
MSS	6	6	7	6	6	6	6

DENSITY	30.11.07	4.01.08	11.02.08	19.03.08	16.04.08	21.05.08	11.06.08
Sea Isle Supreme	5	5	6	6	6	6	6
Mini Verde	8	8	9	8	8	8	8
Flora Dwarf	8	8	8	8	8	8	8
Sea Isle 2000	4	6	7	6	6	6	6
Sea Dwarf	5	7	8	8	8	8	8
Champion	8	8	8	8	8	8	8
Tif Eagle	7	7	7	7	7	7	7
Tif Dwarf	8	8	9	9	9	9	9
MSS	7	8	9	9	9	9	9

Mowing
Fertility

20.0.16
1.5kg/100m2

6mm

3mm
N/K/Fe N/K/Fe