

Australian National Turfgrass Evaluation Program (ANTEP)

Seeded Couchgrass

Progress Report Year 1

June 2011

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ANTEP 4: Seeded Couchgrass

Introduction

The Australian National Turfgrass Evaluation Program (ANTEP) was set up by the Australian Seed Federation (formerly the Seed Industry Association of Australia) in 1997. The main aim of ANTEP is to evaluate a range of turfgrass varieties under uniform maintenance practices and assessment criteria at different sites around Australia. There have been 3 previous ANTEP trials;

- ANTEP 1 (1998): Perennial Ryegrass (Melbourne & Sydney)
- ANTEP 2 (2002): Tall Fescue (Melbourne & Canberra)
- ANTEP 3 (2006): Perennial Ryegrass & Tall Fescue (Melbourne)

These trials have provided turf managers with useful data on which to make informed decisions on selecting varieties for their particular situation as well as providing an excellent educational resource for turf and horticultural students.

Warm-season grasses such as couchgrass (*Cynodon dactylon*) & kikuyugrass (*Pennisetum clandestinum*) are more efficient water users and have better drought tolerance than the cool-season grasses such as ryegrass (*Lolium perenne*), fescue (*Festuca sp.*) as well as Wintergrass (*Poa annua*) which have been traditionally used in sportsfields and on golf course fairways. A saving of approximately 40 to 50% in water use can be achieved with warm-season grasses compared to cool-season grasses and if the turf area is not being actively used over summer then the water savings may even be greater.

Another advantage of warm-season grasses is that without an adequate supply of water (e.g. under water restrictions), sports surfaces consisting predominantly of cool-season grasses will lose cover, become tufty, have excessive hardness and often become unsafe. Warm-season grasses have a greater capacity to maintain good density and have a creeping growth habit that is less likely to become tufty during periods of extreme heat and low rainfall.

With drought and water restrictions limiting the number of sports surfaces that can be watered many Municipal Councils have been converting their sportsfields to warm season-grasses. In cold environments or in situations with heavy winter use the playing surface is oversown in autumn with ryegrass to provide a winter surface. The ryegrass provides winter colour and prevents the couch and kikuyu from wearing out during the cooler months when it is not actively growing with the ryegrass sprayed out in spring or stressed out during the following summer.

Couchgrass (oversown with ryegrass) is the preferred surface for most premier sports (football, soccer and cricket) due to its finer texture and lower thatch accumulation compared to kikuyu. It is commonly used in many high profile and irrigated sportsfields as well as on golf course fairways and tees. It can be established from vegetative material (e.g. by line planting or broadcast spreading) or from seed. Several of the commonly used couchgrass varieties, for example; Santa Ana, Legend, Conquest etc. can only be grown from vegetative material.

It is more than twice as expensive to establish a sports surface using vegetative material than from seed. This is a major issue for Municipal Councils that may have many sportsfields (often in excess of 50) when they want to convert to warm-season grasses.

For these reasons it was decided that the fourth ANTEP trial would evaluate seeded couchgrasses.

Methodology

- Location:**
- Mount Scopus Memorial College, Burwood, Victoria
 - North east corner of the main oval – an out of play area away from school buildings & outside the boundary line of the oval
- Soil type:**
- Sand profile
- Trial design:**
- Randomised block design with 3 replicates
 - Plot size is 2.0m x 1.5m (3m²)
 - 20 entries (18 seeded & 2 vegetative couchgrasses)
- Varieties:**
- **Advanced Seeds**
La Paloma; SR 9554; Veracruz; Yukon
 - **DLF Seeds**
Dune; Mirage II; IS-CD 10
 - **Heritage Seeds**
BAR 7 CD5; BAR C291-1; Riviera; Herit T2; Transcontinental
 - **PGG – Wrightson**
PSG 9BAN; PST-R60N-Foundation; PST-R6FLT; Sovereign (SWI-1012); SWI 1057; SWI 1070
 - **Vegetative Standards**
Legend; Santa Ana
- Site preparation:**
- The trial area was sprayed with glyphosate, rotary hoed, and levelled
 - The pH was amended to 6.0 - 6.5 (initial pH 5.3) using Dolomite lime
 - Starter fertiliser was incorporated into the profile prior to seeding
 - Starter fertiliser and a granular wetting agent were broadcast over the surface at seeding
- Seeding:**
- The trial was sown on the 6th January 2010
 - Seeding rates were 10g/m² for bare seed and 20 g/m² for coated seed (adjusted for 100% germination and for a 1:1 coating)
 - Plots were seeded using “shakers” and then lightly raked
 - The two vegetative couchgrasses were “line-planted” (7 rows, 10 - 15cm apart per plot) at a rate of approximately 1m² of washed sod per 20m²
- Maintenance:**
- **Nutrition**
 - A standard fertiliser program is being followed and is based on a low to moderate level of nutrition (1.7 kg N/100m²) that closely reflects the maintenance level of the majority of couchgrass sportsfields.
 - Fertiliser applications are made in spring, summer & autumn.
 - **Irrigation**
 - The trial was irrigated on a daily basis for the first 4 weeks and then every second day for the next 3 weeks. Irrigation was then reduced to an as needed basis to prevent wilt.
 - The trial is being irrigated under a Water Conservation Plan approved by Yarra Valley Water

- **Mowing**
 - The trial is being maintained with a cylinder mower at a height of 20 to 25mm (the same height of cut of the rest of the oval)
- **Pesticides**
 - Post emergent herbicides were applied last winter (Kerb, propyzamide) and this autumn (Coliseum, rimsulfuron) for *Poa annua* control

Assessment

Establishment: The trial was assessed during establishment for germination (% of replicates germinated assessed 6 days after seeding), vigour (visual estimate based of ground cover, plant height, maturity and health assessed 10 days after germination/emergence) and turf cover (visual estimate of ground cover (%) at 4, 8 and 12 weeks).

The full establishment report can be downloaded from the Australian Seed Federation's website (<http://www.asf.asn.au>).

Full Sward: Once full cover was attained the trial was assessed quarterly for;

- **Quality:** visual estimate integrating colour, uniformity, density, texture, growth habit and smoothness
0 = poor and 5 = excellent quality
- **Colour:** visual estimate of the inherent colour of the variety
0 = straw white and 5 = very dark green
- **Density:** visual estimate of living plants per unit area
0 = bare ground and 5 = very dense

Colour retention / Dormancy & Green Up: The trial was assessed regularly from April to June (colour retention / dormancy) and August to September (green-up).
0 (none / completely straw white) to 5 (completely green)

The incidence of insect pests, disease and weed invasion is also monitored (*visual estimate of the % area damaged or taken up by weeds*).

Rainfall, minimum & maximum air temperature and soil temperature (at each assessment) were also recorded and are summarised in appendix 1.

Statistical Analysis

Analysis of variance was used to compare varieties and the Least Significant Difference (LSD) calculated. The LSD is used to determine statistical differences between varieties by subtracting one variety's mean from another variety's mean. Statistical differences occur when this value is larger than the corresponding LSD value.

At each assessment, varieties that are in the top grouping of significance have been shaded to assist in identifying the better performing varieties - the shaded varieties are not statistically different from each other.

Results

Table 1: Quality

Variety	Winter 2010	Spring 2010	Summer 2011	Autumn 2011	Average Year 1
SANTA ANA	3.8	4.3	3.7	4.5	4.1
SWI 1070	3.3	3.5	4.0	4.3	3.8
SWI 1057	3.2	4.0	4.0	4.0	3.8
VERACRUZ	3.3	3.7	3.5	4.3	3.7
LEGEND	3.0	3.3	4.3	4.0	3.7
HERIT T2	3.5	3.2	4.0	4.0	3.7
RIVIERA	3.2	4.0	3.7	3.8	3.7
BAR C291-1	3.0	3.3	4.0	4.2	3.6
PSG 9BAN	3.2	3.7	3.5	4.0	3.6
BAR 7 CD5	2.7	3.3	3.8	3.8	3.4
IS-CD 10	2.2	3.2	3.5	4.0	3.2
MIRAGE II	3.0	2.8	3.2	3.8	3.2
SOVEREIGN	2.8	2.5	3.3	3.8	3.1
PST-R6FLT	3.0	2.3	3.2	3.7	3.0
YUKON	2.0	3.0	3.2	3.7	3.0
PST-R60N	2.2	2.0	3.3	4.0	2.9
LA PALOMA	2.3	2.0	3.5	3.7	2.9
DUNE	2.5	2.3	3.0	3.7	2.9
TRANSCONTINENTAL	2.7	2.2	2.7	3.7	2.8
SR 9554	2.2	2.2	2.5	3.8	2.7
LSD (p<0.05)	ns	0.9	0.6	ns	0.6

Shaded varieties are in the top grouping of significance & not statistically different

Table 2: Colour

Variety	Winter 2010	Spring 2010	Summer 2011	Autumn 2011	Average Year 1
SANTA ANA	2.3	3.5	4.0	4.0	3.5
SWI 1057	1.5	3.5	4.0	4.2	3.3
LEGEND	1.0	3.5	4.5	4.0	3.3
HERIT T2	1.2	3.5	3.8	4.0	3.1
RIVIERA	1.5	3.5	3.5	4.0	3.1
VERACRUZ	1.5	3.5	3.5	4.0	3.1
PSG 9BAN	1.0	3.5	3.7	4.0	3.0
SWI 1070	1.2	3.5	3.5	4.0	3.0
BAR C291-1	0.7	3.5	3.8	4.0	3.0
MIRAGE II	0.8	3.5	3.5	4.0	3.0
BAR 7 CD5	0.2	3.5	4.0	4.0	2.9
PST-R6FLT	0.5	3.5	3.7	4.0	2.9
IS-CD 10	0.7	3.5	3.5	4.0	2.9
YUKON	0.0	3.5	4.0	4.0	2.9
LA PALOMA	0.5	3.5	3.5	4.0	2.9
DUNE	0.5	3.5	3.5	4.0	2.9
TRANSCONTINENTAL	0.5	3.5	3.5	4.0	2.9
SOVEREIGN	0.3	3.5	3.5	4.0	2.8
SR 9554	0.2	3.5	3.5	4.0	2.8
PST-R60N	0.0	3.5	3.5	4.0	2.8
LSD (p<0.05)	0.9	ns	0.2	ns	0.2

Shaded varieties are in the top grouping of significance & not statistically different

Table 3: Density

Variety	Winter 2010	Spring 2010	Summer 2011	Autumn 2011	Average Year 1
SANTA ANA	3.0	5.0	4.5	4.8	4.3
SWI 1070	2.8	3.7	4.0	4.2	3.7
SWI 1057	2.5	3.7	4.2	4.2	3.6
HERIT T2	2.7	3.5	4.5	3.7	3.6
VERACRUZ	2.5	3.7	4.2	4.0	3.6
RIVIERA	2.7	3.8	3.8	4.0	3.6
BAR C291-1	2.2	3.5	4.0	4.0	3.4
PSG 9BAN	2.7	3.5	3.8	3.7	3.4
LEGEND	1.8	3.3	4.5	3.8	3.4
IS-CD 10	2.0	3.5	3.7	3.8	3.3
BAR 7 CD5	2.0	3.2	3.8	3.8	3.2
YUKON	1.8	3.2	3.5	3.5	3.0
DUNE	2.2	1.8	3.7	3.8	2.9
PST-R6FLT	2.3	1.8	3.5	3.8	2.9
MIRAGE II	2.0	2.5	3.3	3.7	2.9
SOVEREIGN	1.8	2.2	3.7	3.7	2.8
PST-R60N	1.2	1.8	3.5	3.8	2.6
LA PALOMA	1.7	1.7	3.0	3.7	2.5
TRANSCONTINENTAL	1.7	1.7	3.0	3.7	2.5
SR 9554	1.3	1.2	2.8	3.8	2.3
LSD (p<0.05)	ns	1.2	0.6	ns	0.7

Shaded varieties are in the top grouping of significance & not statistically different

Table 4: Green-Up 2010

VARIETY	30-Aug-10	06-Sep-10	15-Sep-10	27-Sep-10	11-Oct-10	25-Oct-10
SANTA ANA	2.5	2.5	3.2	3.5	5.0	5.0
PSG 9BAN	1.0	1.0	1.3	2.2	4.3	4.7
SWI 1057	1.5	1.5	1.8	2.3	4.2	4.7
VERACRUZ	1.0	1.3	1.5	2.3	4.0	4.5
RIVIERA	1.2	1.2	1.3	2.0	4.0	4.5
MIRAGE II	0.7	1.0	1.3	2.2	3.8	4.5
LEGEND	1.3	1.3	1.8	2.7	3.8	4.3
IS-CD 10	0.7	0.7	0.8	1.5	3.7	4.3
BAR C291-1	0.7	0.8	0.8	1.8	3.8	4.2
BAR 7 CD5	0.7	0.7	0.8	2.0	3.7	4.2
PST-R60N	0.2	0.5	0.8	2.0	3.5	4.2
HERIT T2	1.0	1.0	1.0	1.5	3.5	4.2
SWI 1070	0.8	0.8	0.8	1.7	3.3	3.8
DUNE	0.3	0.3	0.5	1.2	2.5	3.3
SR 9554	0.3	0.3	0.3	1.0	2.3	3.3
SOVEREIGN	0.5	0.7	0.7	1.2	2.5	3.2
LA PALOMA	0.3	0.5	0.5	1.0	2.5	3.2
PST-R6FLT	0.3	0.5	0.5	1.0	2.3	3.2
TRANSCONTINENTAL	0.3	0.3	0.5	1.0	2.2	3.0
YUKON	0.3	0.3	0.3	1.0	2.5	2.8
LSD (p<0.05)	0.5	0.5	0.6	0.8	0.9	0.8
Soil temperature (° C)	10	10	12	14	15	15

Shaded varieties are in the top grouping of significance & not statistically different

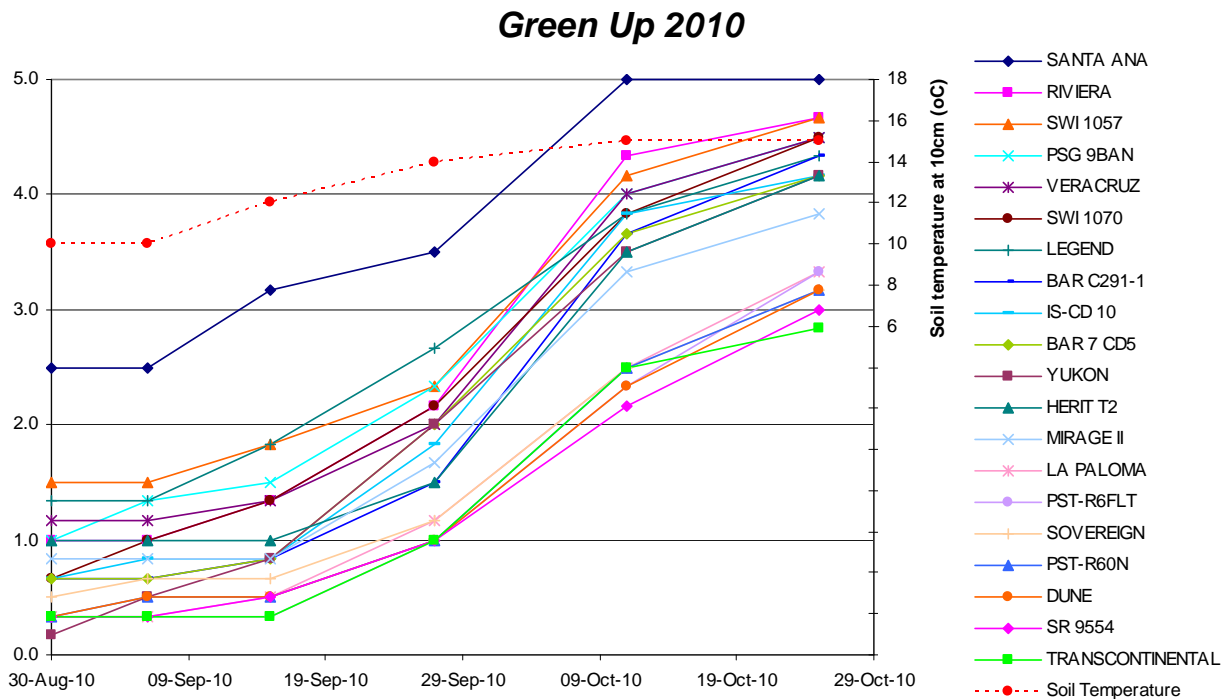
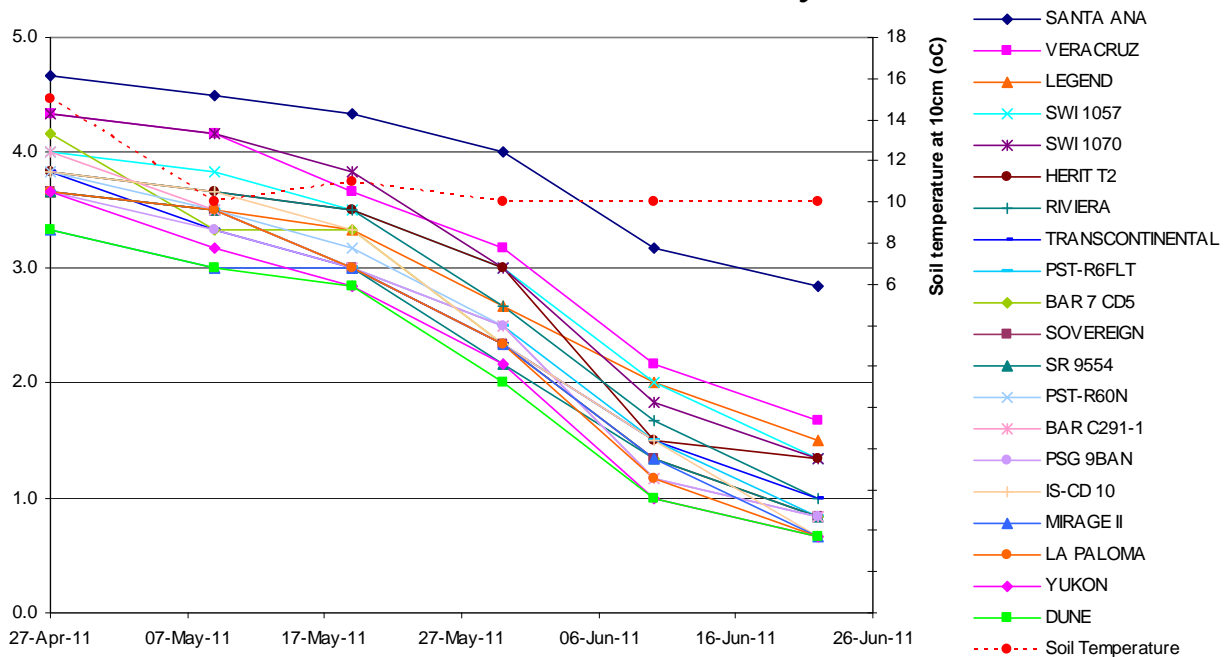


Table 5: Colour Retention / Dormancy 2011

VARIETY	27-Apr-11	09-May-11	19-May-11	30-May-11	10-Jun-11	22-Jun-11
SANTA ANA	4.7	4.5	4.3	4.0	3.2	2.8
VERACRUZ	4.3	4.2	3.7	3.2	2.2	1.7
LEGEND	3.7	3.5	3.3	2.7	2.0	1.5
SWI 1057	4.0	3.8	3.5	3.0	2.0	1.3
SWI 1070	4.3	4.2	3.8	3.0	1.8	1.3
HERIT T2	3.8	3.7	3.5	3.0	1.5	1.3
RIVIERA	3.8	3.7	3.5	2.7	1.7	1.0
TRANSCONTINENTAL	3.8	3.3	3.0	2.3	1.5	1.0
PST-R6FLT	3.7	3.5	3.0	2.5	1.5	0.8
BAR 7 CD5	4.2	3.3	3.3	2.3	1.3	0.8
SOVEREIGN	3.7	3.5	3.0	2.3	1.3	0.8
SR 9554	3.7	3.5	3.0	2.2	1.3	0.8
PST-R60N	3.8	3.5	3.2	2.5	1.2	0.8
BAR C291-1	4.0	3.5	3.0	2.5	1.2	0.8
PSG 9BAN	3.7	3.3	3.0	2.5	1.2	0.8
IS-CD 10	3.8	3.7	3.3	2.3	1.5	0.7
MIRAGE II	3.3	3.0	3.0	2.3	1.3	0.7
LA PALOMA	3.7	3.5	3.0	2.3	1.2	0.7
YUKON	3.7	3.2	2.8	2.2	1.0	0.7
DUNE	3.3	3.0	2.8	2.0	1.0	0.7
LSD (p<0.05)	0.6	0.5	0.6	0.5	0.5	0.5
Soil temperature (° C)	15	10	11	10	10	10

Shaded varieties are in the top grouping of significance & not statistically different

Colour Retention / Dormancy 2011



Key Observations

- The two vegetative couchgrasses; Santa Ana & Legend are proven performers and in this trial Santa Ana is generally performing better than Legend.
- There are a number of seeded varieties that are performing as well as the two vegetative varieties.
- The performance of a variety can change during the year and this has implications when selecting a variety. For example if you require a variety to perform well during the football season then its summer performance will be of less importance than during autumn and winter.
- Care must be taken when using these results as the means presented are for the first year of a two year trial and the performance of a variety may change in the second year. Secondly, a variety's performance may vary from one location to another and in different soil types.

Future Project Directions

Weekly wear is now being applied to the plots with a modified walk behind mower that has studs on the back roller & rubber beaters on the cutting unit. Wear (4 passes per week) is being applied during the football season and approximately 20% of each plot is being worn.



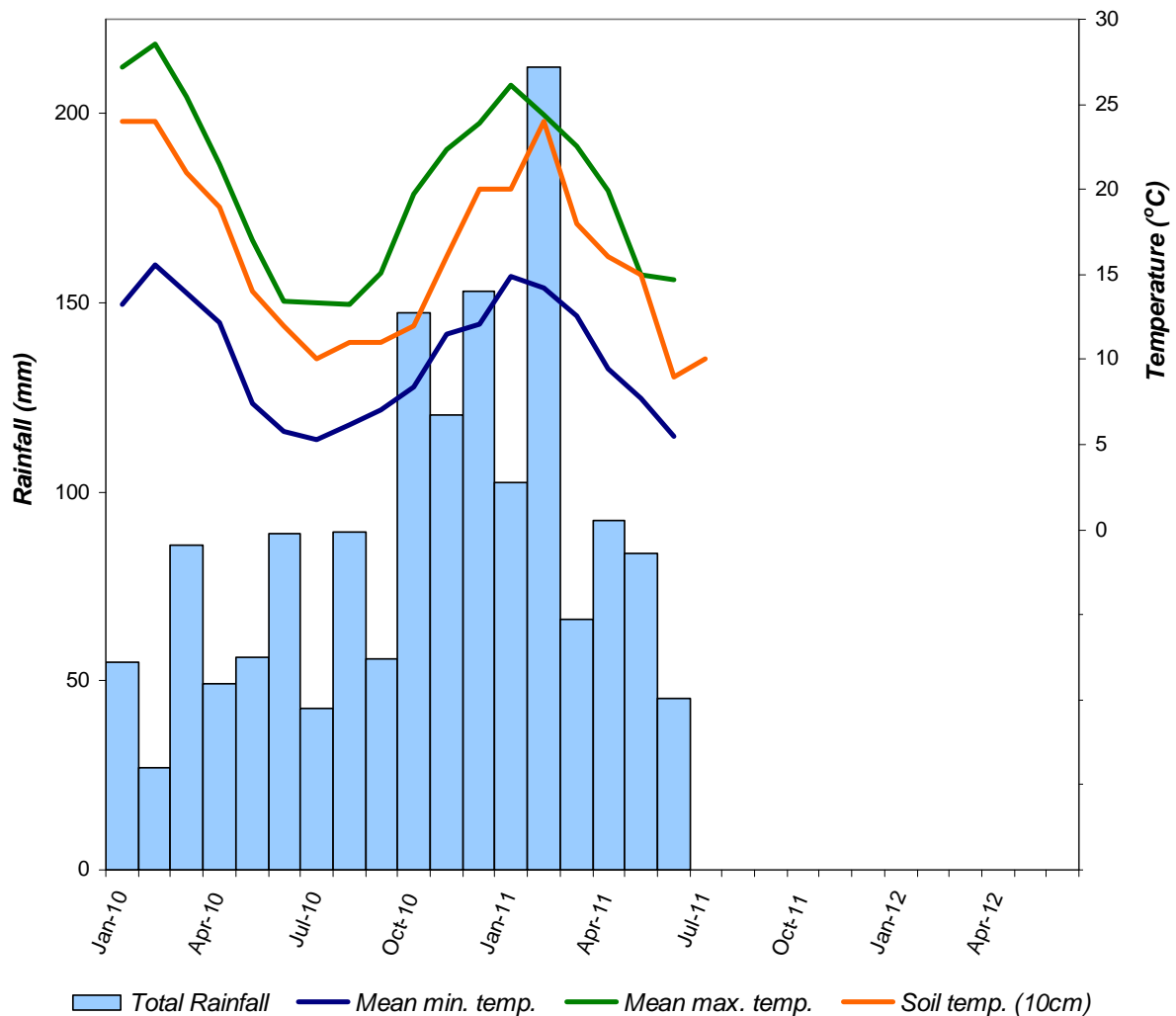
Full sward assessments will continue for another year with both the worn and unworn section of each plot assessed separately.

Acknowledgements

Thanks to Mount Scopus Memorial College for hosting and maintaining the trial site and to Nuturf for providing the fertiliser.

Appendix 1: Mean minimum and maximum air temperature & total rainfall

Date	Min.	Max.	Soil (10cm)	(mm)
Jan-10	13.2	27.2	24.0	55.0
Feb-10	15.6	28.5	24.0	27.0
Mar-10	13.9	25.4	21.0	86.0
Apr-10	12.2	21.5	19.0	49.4
May-10	7.4	17.0	14.0	56.4
Jun-10	5.8	13.4	12.0	89.0
Jul-10	5.3	13.3	10.0	42.8
Aug-10	6.2	13.2	11.0	89.4
Sep-10	7.0	15.1	11.0	56.0
Oct-10	8.4	19.7	12.0	147.6
Nov-10	11.5	22.3	16.0	120.4
Dec-10	12.1	23.9	20.0	153.2
Jan-11	14.9	26.1	20.0	102.4
Feb-11	14.2	24.4	24.0	212.4
Mar-11	12.6	22.5	18.0	66.4
Apr-11	9.5	19.9	16.0	92.4
May-11	7.7	15.0	15.0	83.8
Jun-11	5.5	14.7	9.0	45.4



Trial Photos



Summer



Winter



Spring green-up



Wear in late autumn

ANTEP 4 (2010)

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