



AGCSATech senior agronomist Andrew Peart looks at the results from the first year of the AGCSA's three-year bentgrass variety trials at three sites around the country, while John Neylan recounts some of his recent travels to South East Asia where he caught up with a number of expat-Australian superintendents



It has been just over a year since the bi-monthly ratings for turfgrass colour, sward density and overall turfgrass quality as a putting surface started as part of the AGCSA's latest bentgrass variety trial (HAL Project TU08002 – Evaluation of new bentgrass cultivars compared to Australian vegetative selections).

Other attributes that have also been measured at the three trial sites – Keysborough Golf Club (VIC), Cromer Golf Club (NSW) and Royal Adelaide Golf Club (SA) – include thatch accumulation, green speed and surface hardness and on one occasion wear tolerance at the Keysborough site. Two field days were also held last autumn at the Cromer and Royal Adelaide sites while a more recent spring field day was conducted at Keysborough.

Establishment results from the trials sites were presented in Australian Turfgrass Management Journal Volume 11.6 (Nov-Dec 2009), which also included a summary of the varieties being trialled, while in Volume 12.3 (May-Jun 2010) initial quality, colour, density and thatch accumulation figures were reported on. This edition we summarise the overall results from the first 12 months of the trial.

TURFGRASS COLOUR

At Keysborough, the seeded variety T-1 provided the darkest green colour when averaged over the

six assessment dates of the first year. While T-1 provided the darkest green colour there, it was not significantly darker than another nine varieties.

T-1 also fared best at Cromer along with the vegetative variety AGCSA1, both being significantly darker green than all other varieties when averaged over the six assessment dates. At Royal Adelaide Golf Club there has been no one variety that has provided a significantly darker green colour during the first year.

TURFGRASS DENSITY

At Keysborough, the seeded variety Declaration provided the greatest turfgrass density, although it was not significantly denser than Authority, Penn G2, Cobra 2 or SRP1RH93. The variety Dominant Extreme was significantly less dense than all varieties for the first year with the exception of SR1150.

At Cromer, the vegetative variety AGCSA1 provided the greatest turfgrass density although it was not significantly denser than Shark or SRP1RH93. Dominant Extreme was again significantly less dense than all varieties for the first year with the exception of Penn G2.

As with colour readings, at Royal Adelaide Golf Club there has been no one variety that has provided a significantly greater turfgrass density when averaged over the first year. At certain

assessment dates the seeded variety Shark, along with the vegetative variety AGCSA1 have provided significantly denser turf than other varieties, although this was not sustained over the entire year.

TURFGRASS QUALITY

The results for turfgrass quality at each location are presented in Tables 1-3. At Keysborough the seeded variety Declaration provided the greatest turfgrass quality when averaged over the first year. However, it was not significantly greater than another seven varieties (Table 1). The vegetative variety AGCSA1 provided a turfgrass of the least quality although it was not significantly less than another seven seeded varieties.

At Cromer, the vegetative variety AGCSA1 and seeded variety Shark provided the greatest turfgrass quality when averaged over the first year. However, they were not significantly greater than another five varieties (Table 2). Dominant Extreme demonstrated least quality although it was not significantly less than Penn G2.

At Royal Adelaide, not one variety has provided a significantly greater turfgrass quality reading when averaged over the first year. However, on one assessment date (9 July 2010) the seeded variety Shark provided a significant greater turfgrass quality than all other varieties, with the exception of CY2, AGCSA1, SRP1RH93, T-1 and Tyee (Table 3).

THATCH ACCUMULATION

There has been no significant difference at either the Keysborough or Royal Adelaide sites during the trial's first year in regards to thatch accumulation. At Cromer, only one assessment date (27 October 2009) provided a significant difference with the vegetative variety AGCSA1 accumulating more than all other varieties with the exception of 007, Shark and SRP1GMC.

GREEN SPEED AND SURFACE HARDNESS

Results for green speed (ball roll) have been variable at all sites during the first year. At Cromer there was no significant difference recorded for green speed for the first two assessments, however, for the third (28 September 2010) Penn G2 provided the furthest ball roll and it was significantly more than the varieties 007, Dominant Extreme, SR1150, SRP1RH93, T-1 and Tyee.

Keysborough has provided the most variable results with the vegetative variety AGCSA1 having the least ball roll for the first assessment (16 December 2009) but the furthest ball roll on the second (4 June 2010). During the last assessment (10 September 2010) SRP1GMC provided the furthest ball roll and was significantly more than all other varieties with the exception of 007, Cobra 2, Dominant Extreme and AGCSA1.

At Royal Adelaide there was only one out of the four assessment dates that provided a significant

TABLE 1. KEYSBOROUGH GC - TURFGRASS QUALITY RESULTS

Variety	26/10/09	29/1/10	19/3/10	4/6/10	16/7/10	10/9/10	Average
Declaration	7.8	7.0	6.5	6.8	7.2	8.0	7.2
Authority	7.5	6.5	6.8	6.8	7.0	7.8	7.1
Mackenzie	7.0	6.8	6.8	6.5	6.7	7.5	6.9
SRP1RH93	7.2	6.2	6.5	6.5	7.0	7.7	6.8
Penn G2	7.0	6.7	6.5	6.3	6.8	7.5	6.8
CY 2	6.8	6.5	6.5	6.7	6.8	7.3	6.8
Shark	7.7	7.2	6.5	5.7	6.5	7.0	6.8
Cobra 2	7.3	6.3	6.5	6.0	6.7	7.2	6.7
Penn A1	7.0	6.0	6.3	6.3	6.7	7.5	6.6
SRP1GMC	7.3	6.8	6.5	5.8	6.2	6.8	6.6
Dominant Xtreme	6.5	6.2	6.2	6.3	6.5	7.3	6.5
007	7.2	6.2	5.8	6.2	6.2	7.0	6.4
SR1150	6.8	6.5	6.3	6.0	5.8	6.8	6.4
T-1	6.8	6.0	6.0	5.7	6.7	7.2	6.4
Tyee	6.8	6.2	6.0	5.8	6.2	7.0	6.3
AGCSA 1	5.8	6.5	5.5	6.0	6.0	6.8	6.1
LSD (P<0.05)	0.7	0.6	0.7	ns	ns	ns	0.5

TABLE 2. CROMER GC - TURFGRASS QUALITY RESULTS

Variety	27/10/09	15/12/09	15/3/10	18/5/10	15/7/10	28/9/10	Ave
AGCSA 1	7.7	8.0	7.2	7.0	7.2	6.8	7.3
Shark	8.0	7.5	6.8	7.3	7.0	7.0	7.3
SRP1RH93	7.0	7.3	7.2	7.3	7.0	7.0	7.1
SRP1GMC	7.5	7.2	6.8	6.8	7.0	7.0	7.1
Tyee	7.3	7.0	6.7	7.0	7.0	7.0	7.0
SR1150	6.7	7.0	6.3	7.3	7.2	6.8	6.9
T-1	6.8	6.5	6.7	7.0	7.3	6.8	6.9
Penn A1	7.2	6.8	6.5	7.3	7.0	6.3	6.8
Authority	7.3	6.8	6.3	6.7	6.8	6.5	6.8
CY 2	6.8	6.2	6.5	7.0	6.7	6.7	6.6
Mackenzie	6.7	6.8	6.3	6.8	7.0	6.3	6.6
Declaration	7.2	6.5	6.3	7.5	6.8	6.3	6.6
007	6.8	6.7	6.5	7.0	6.3	6.2	6.6
Cobra 2	6.7	6.7	6.3	6.5	6.5	6.7	6.6
Penn G2	7.0	6.7	6.2	6.5	6.5	6.3	6.5
Dominant Xtreme	6.0	5.7	6.3	6.3	6.5	6.2	6.1
LSD (P<0.05)	0.5	0.5	0.5	ns	ns	ns	0.4

difference in ball roll. On that occasion, SRP1GMC provided the furthest ball roll and it was significantly more than all other varieties with the exception of 007, Declaration, and T-1.

In relation to surface hardness, there has been no significant difference at any of the trial sites over the first year.

WEAR RESISTANCE

Prior to the 28 October 2010 field day held at Keysborough Golf Club, all plots received 160 passes with the simulated wear machine over four days. The wear machine provided extensive wear and there was a significant reduction in turfgrass density of all varieties with the exception of Dominant Extreme, Mackenzie, AGCSA1, Shark and SR1150 (see Table 4.)

While the reduction in turfgrass density provided a significant difference to the majority of the bents, the rate of recovery was very good with all varieties bouncing back within a two week period.

Far left: Condition of the bentgrass plots at the Keysborough Golf Club trial site following 160 passes with a specialised wear machine to one edge of the replicate. While the reduction in turfgrass density was significant, recovery of all varieties within a two-week period was very good

TABLE 3. ROYAL ADELAIDE GC - TURFGRASS QUALITY RESULTS

Variety	29/10/09	16/12/09	11/03/10	22/04/10	9/07/10	15/09/10	Ave
007	7.0	7.0	6.8	6.8	7.3	6.5	6.9
Penn A1	7.0	7.2	7.2	6.7	7.3	6.3	6.9
Authority	7.0	6.7	6.8	6.8	7.3	6.7	6.9
CY 2	7.2	6.7	7.0	7.0	7.7	6.5	7.0
Cobra 2	7.2	6.5	6.7	6.8	7.0	6.5	6.8
Declaration	7.2	6.3	6.3	6.5	6.7	6.3	6.6
Dominant Xtreme	7.0	5.3	7.2	6.3	6.8	6.0	6.4
Penn G2	7.2	7.2	7.2	6.7	7.3	7.0	7.1
RAGC blend	6.7	5.0	7.0	6.5	7.0	5.8	6.3
MacKenzie	7.0	6.5	7.0	6.8	7.5	6.3	6.8
Mariner	7.2	6.8	6.3	6.5	7.0	6.0	6.8
AGCSA 1	6.5	8.5	6.8	6.3	8.0	7.3	6.8
Shark	7.2	8.0	7.5	6.5	8.5	8.0	7.2
SR1150	6.8	5.5	6.0	6.5	7.5	7.0	6.7
SRP1GMC	7.2	5.7	6.7	6.5	7.0	6.0	6.5
SRP1RH93	6.8	6.8	7.0	7.0	8.0	7.8	7.0
T-1	6.8	5.7	6.8	6.7	7.7	6.7	6.7
Tyee	7.2	7.0	6.5	7.0	7.8	7.5	7.1
LSD (P<0.05)	ns	ns	ns	ns	0.9	ns	ns

TABLE 5. FIELD DAY TURFGRASS QUALITY COMPARISONS

Variety	Cromer GC		Keysborough GC		Royal Adelaide GC	
	18/05/10	Attendees	28/10/10	Attendees	22/04/10	Attendees
007	6.7	6.0	7.2	6.1	6.8	6.4
Penn A1	7.0	6.0	7.0	5.8	6.7	6.4
Authority	6.2	5.9	7.7	6.9	6.8	6.2
CY 2	6.8	7.0	7.0	6.4	7.0	6.4
Cobra 2	7.5	7.5	7.5	6.7	6.8	6.4
Declaration	6.8	6.0	8.3	7.2	6.5	5.8
Dominant Xtreme	7.0	6.1	6.5	5.9	6.3	6.2
Penn G2	7.2	6.3	7.5	6.5	6.7	6.2
RAGC blend	-	-	-	-	6.5	5.8
MacKenzie	6.7	6.9	7.7	6.6	6.8	5.8
Mariner	-	-	-	-	6.5	6.1
AGCSA 1	7.2	6.7	7.0	5.8	6.3	4.5
Shark	7.0	5.9	7.7	6.6	6.5	6.0
SR1150	7.3	6.8	6.3	5.4	6.5	5.1
SRP1GMC	7.0	6.9	7.2	6.2	6.5	5.6
SRP1RH93	6.8	6.1	7.7	6.8	7.0	6.0
T-1	6.9	6.2	7.0	6.3	6.7	5.4
Tyee	7.0	7.0	6.7	5.8	7.0	5.9
LSD (P<0.05)	ns	ns	ns	0.9	ns	ns

FIELD DAYS

At all field days, attendees were asked to rate the plots for their perception of quality as a putting surface on a scale of 0-9, with 0 being equivalent to completely unacceptable and 9 being excellent. The results of each assessment at each location can be seen in Table 5. Generally the attendees rated the plots with a slightly lower figure than the regular bi-monthly assessments, however, the overall trends remained similar.

The attendees combined assessments provided no significant difference between any of the varieties at Cromer or Royal Adelaide, however, combined assessments at Keysborough provided a significant difference. There the variety Declaration was deemed to provide the best quality surface but

TABLE 4. KEYSBOROUGH GC - TURFGRASS DENSITY BEFORE AND AFTER WEAR TREATMENT

Variety	18 - 22/10/2010		
	none	160 passes	
007	7.3	6.2	sig
Penn A1	7.0	5.7	sig
Authority	7.5	6.5	sig
CY 2	7.0	6.3	sig
Cobra 2	7.3	6.3	sig
Declaration	8.2	6.8	sig
Dominant Xtreme	6.5	6.0	ns
Penn G2	7.2	6.3	sig
Mackenzie	7.5	6.7	ns
AGCSA 1	7.8	6.3	ns
Shark	7.3	7.0	ns
SR1150	6.3	5.8	ns
SRP1GMC	7.3	6.3	sig
SRP1RH93	7.8	6.7	sig
T-1	7.0	6.0	sig
Tyee	7.0	5.5	sig
LSD (P<0.05)	0.8	0.7	

it was not significantly better than the varieties Authority, CY2, Cobra 2, Penn G2, Mackenzie, Shark, SRP1RH93 or T-1.

The AGCSA would like to thank the superintendents (Mark Couchman – Cromer, Jeff Kaines – Royal Adelaide and Brett Chivers – Keysborough) and their staff at each of the trial locations for their continued maintenance of the trial sites, as well as Horticulture Australia for its financial support with the project.

Over the next 12 months the trial sites will continue to be assessed bi-monthly to continue to gather data and information about these new bentgrass varieties under Australian conditions.

BLACK MOUNTAIN GOLF COURSE

When you have been involved with a golf course project from the very start it is always of great interest to observe how it has progressed over the ensuing years. I have had some involvement with the Black Mountain Golf Course in Hua Hin, Thailand since construction started in 2005 and during a recent visit it was gratifying to see how well it was performing.

Black Mountain was designed by Pacific Coast Design and constructed by ex-pat Aussie superintendent Gavan Wilson. Gavan was course superintendent at Anglesea Golf Club and then Northern Golf Club in Victoria prior to heading off to Bangkok about 20 years ago. The operation at Black Mountain is a little different to many golf courses in Thailand in that it has staff numbers typical of high-end Australian facilities rather than staff numbers up to 100-plus.

Hua Hin is south of Bangkok and has a slightly drier climate with average year round temperatures of about 28°C and annual rainfall of about 1000mm. The soils on the fairways are a peculiar silty sand



The Black Mountain Golf Course in Hua Hin, Thailand as it is today and (inset) as the site looked during construction in mid-2006

that is perfect at field capacity, rock hard when dry and liquid when saturated. This provided considerable challenges during the construction phase, particularly during heavy rainfall events when erosion presented a considerable problem.

The fairways, tees and greens and tees surrounds are grassed with Salam seashore paspalum which thrives in this tropical climate. It is a grass that forms a very high quality playing surface and can be beautifully presented. It is an interesting grass in that it can go into moisture stress quite quickly but recovers even more quickly with just a millimetre or two of moisture. It does suffer from dollar spot during cloudy, humid weather, but equally recovers very quickly under full sun.

The greens are TifEagle and the putting surfaces are as good a surface as I have seen anywhere in the world. The key aspects of the maintenance programme in producing such high quality surfaces are daily mowing, regular dustings, grooming and brushing. The recent introduction of new brushing heads has virtually eliminated grain from the surface.

SINGAPORE SWING

I also had the recent opportunity to visit Singapore to meet up with another expat Scott McKay who will be well known to many in the Australian industry. Scott now works for a large local company Jebesen and Jessen as a regional turf manager. With Scott I was able to visit the Sentosa Golf Club, home to the Barclays Singapore Open, and Tanah Merah Golf Club.

Sentosa was being prepared by superintendent Andy Johnstone at the time of the visit and was in excellent condition for the tournament, which incidentally was won by Adam Scott. There are two golf courses, the Tanjong and Serapong layouts, and we spent time looking at the Serapong course.

The fairways are zoysia, the greens TifEagle and tees seashore paspalum. Andy was filling in as superintendent and he has an interesting history in that he was a golf course superintendent turned course architect and was responsible for the changes to the course he was now preparing for the Open.

The other course we visited was the beautiful Tanah Merah. We inspected the spectacular Garden course which was beautifully presented with incredible attention to detail and is a credit to golf course manager Min Yee and his staff. The fairways, tees and roughs were *Zoysia matrella* with Sealsle 2000 greens. The greens in particular were presenting a very high quality putting surface, with a very fine leaf and high density turf.

During my time in Singapore we met with representatives of North Parks which is the government department responsible for managing



AGCSA general manager John Neylan (right) with Gary Peterson (Profile) and Scott McKay (middle) at Tanah Merah GC



Some of the interesting landscape wall features that can be found in Singapore

North Parks, the government agency responsible for all greenspace in Singapore, is undertaking significant research into wear tolerance, shade tolerance and waterlogging



all the greenspace in Singapore. We met with another Aussie expat Neil Power who is the assistant director industry development, National Parks Board, as well as meeting up with Dr. Ken Marcum who is working with North Parks investigating soil and turf options for the Singapore environment. Dr. Marcum is well known for his research into the salinity tolerance of turfgrasses and spent time in Australia at Melbourne University.

North Parks is undertaking extensive research investigating the wear tolerance of *Axonopus compressus*, *Cynodon dactylon*, *Paspalum vaginatum*, *Stenotaphrum secundatum* and *Zoysia matrella* on various soil types as well as looking at the effects of waterlogging. Shade tolerance studies are also being undertaken to better understand the shade tolerance of 11 turfgrass species/genus/cultivars. 🌱

INVESTIGATION OF PLAYING SURFACE PERFORMANCE ASSESSMENT METHODOLOGY

Recently AGCSATech attended a workshop to discuss the methodology used to assess the playing performance of turfgrass playing surfaces. The rationale for the day was that there are numerous consultants, sports bodies and individuals throughout Australia who undertake performance testing or benchmarking of natural turf playing surfaces.

These benchmarking studies are undertaken for a range of reasons including impacts on injuries, safety and playability. With an increase in risk management a strategy being adopted at many levels of sport, testing of playing surfaces and interpreting what the data means has increased in importance.

There is little doubt that there is variation in the methodology used between operators and in how the data is interpreted. Each consultant/sport has tended to work independently and there is only limited standardisation of methodology, however, it has been based around similar principles. For example use of the Clegg Hammer (possibly the most popular of the testing methods) varies from consultant to consultant, both in terms of drop height and how the data is collected (e.g.: 1st or 4th drop, or some other combination). The question has now been raised by sporting bodies as to the varying methodology, the veracity of the measurements taken and the interpretation of the results.

To address the above concerns, a workshop was run by the Sports Turf Institute Australia (STI) and the Queensland Department of Employment, Economic Development and Innovation (DEEDI)

with funding from Horticulture Australia Limited (Project TU09039) to work through the devices being used, the methodology and the interpretation of the data. The workshop group consisted of consultants, scientists, representatives from the major sporting codes and an insurance expert.

The goals for the workshop were to:

- Review current sports field performance testing work being undertaken in Australia;
- To identify the requirements of our key sporting bodies in regard to playing surface performance testing;
- To scientifically evaluate specific performance testing methodology, in particular devices for measuring hardness and traction; and
- To identify priorities for future development of performance testing systems.

It was an interesting day in that once you load a room full of experts you can open up a lot of debate and opinion and not necessarily make much progress. The outcome of the day was that there are varying techniques used and that there is a major difference in the performance requirements for an elite level venue.

The other outcome was that there is a considerable gap between the purist scientific approach and what the field agronomist can practically achieve. Probably the most pertinent point for the day was that if local government built grounds correctly and were prepared to maintain them properly, there would be little need to undertake risk management assessments.