



At Keysborough Golf Club, one of project's three trials sites, the plots are being subjected to wear treatments to provide further information on which varieties are able to tolerate a greater amount of wear and tear

In this instalment of AGCSATech Update, senior agronomist Andrew Peart reports on the AGCSA's bentgrass varieties trial which is coming up to the end of its second year and unveils details of a new golf course benchmarking study set to start this spring.

Bents and benchmarking

The AGCSA's creeping bentgrass varieties trial (HAL Project TU08002) has now been running for just under two years with a total of 11 assessment dates completed across the three trial sites at Keysborough Golf Club (Melbourne), Cromer Golf Club (Sydney) and Royal Adelaide Golf Club (Adelaide).

To recap, the trial is assessing, over a three year period, the following varieties for their performance under Australian conditions: Tye, 007, Dominant Xtreme, SR1150, SRP1RH93, T-1, Penn G2, Authority, Penn A1, Cobra 2, CY 2, Shark, Declaration, Mackenzie and SRP1GMC. A vegetative selection, called AGCSA1, has also been included as part of the trial, while an RAGC blend and Mariner are included at the Royal Adelaide site.

During the 11 assessments a variety of data has been recorded and includes:

- Turfgrass colour;
- Turfgrass density;
- Surface hardness;
- Thatch accumulation;
- Green speed; and
- Overall quality as a putting surface.

Generally there have been specific seeded varieties that have performed better at each venue with the vegetative variety (AGCSA1) a consistent performer at all three locations to date.

TURFGRASS COLOUR

At Keysborough, the seeded variety T-1 has provided the darkest green colour when averaged over the 11 assessment dates. It has provided a significantly darker green colour than all other varieties apart from Cobra 2.

At Cromer, the seeded varieties T-1 and SRP1RH93, as well as the vegetative variety AGCSA1, were significantly darker green than

all other varieties when averaged over the 11 assessments. There was no significant difference in turfgrass colour between the remaining 13 varieties during the same period. At Royal Adelaide there has been no one variety that has provided a significantly darker green colour since assessments began.

TURFGRASS DENSITY

At Keysborough, there were four varieties that were not significantly different from each other in terms of providing the densest turfgrass coverage, when averaged over the assessment dates. Those varieties were the vegetative variety AGCSA1 and the seeded varieties Shark, Authority and Declaration.

At Cromer there were also four varieties that were not significantly different from each other. The vegetative variety AGCSA1 was again among those as well as the seeded varieties SRP1RH93, Tye and Shark.

At Royal Adelaide, there were 14 varieties that were not significantly different from each other in terms of providing the densest coverage (there are a total of 18 varieties being tested at Royal Adelaide). It is interesting to note, however, that the additional two older varieties being assessed at this site – Mariner and an 'RAGC blend' which consists of Seaside, Highland, Penn G2 and Penncross bentgrasses – are exhibiting poorer turfgrass density, although not significantly sparser than six of the newer varieties. Overall turfgrass density results from this site are presented in Table 1.

TURFGRASS QUALITY

At Keysborough there has been very little difference in the overall turfgrass quality produced by all 16 varieties being assessed. There is no significant difference between 11 varieties in terms of providing the best turfgrass quality, while the three varieties with

TABLE 1. OVERALL TURFGRASS DENSITY – ROYAL ADELAIDE GOLF CLUB

Variety	29/10/09	16/12/09	11/03/10	22/04/10	9/07/10	15/09/10	30/11/10	3/02/11	21/03/11	24/05/11	14/07/11	Ave
AGCSA 1	6.8	8.8	9.0	8.3	8.8	8.0	3.0	7.7	7.7	7.8	8.2	7.5
Shark	6.8	8.5	8.0	7.5	9.0	8.0	5.0	7.7	7.2	7.5	7.8	7.4
Authority	6.8	7.0	7.2	6.8	7.3	7.0	6.0	8.0	7.7	8.3	8.3	7.3
007	7.2	6.8	7.7	7.0	7.0	6.8	5.7	7.8	7.5	8.3	8.2	7.3
Penn G2	7.0	6.8	7.8	6.8	7.8	7.5	5.3	7.3	7.5	7.7	7.7	7.2
SRP1RH93	6.8	6.8	7.3	7.3	8.3	7.8	5.0	7.3	7.3	7.5	7.7	7.1
Penn A1	6.8	7.2	7.8	6.8	6.7	6.8	5.7	7.8	7.2	7.5	8.0	7.1
MacKenzie	6.8	6.8	7.5	6.8	7.3	6.8	5.5	7.5	7.3	7.7	7.7	7.1
Tye	7.0	7.5	7.0	7.0	7.8	7.3	4.5	7.3	7.3	7.5	8.0	7.1
SR1150	6.8	6.5	7.3	7.0	7.5	7.0	5.5	7.5	7.0	7.3	8.0	7.1
CY 2	6.8	7.0	7.7	7.0	7.2	6.5	5.0	7.2	6.7	7.0	7.8	6.9
SRP1GMC	7.0	6.0	6.5	6.5	7.2	6.5	5.3	7.3	7.0	7.8	8.3	6.9
T-1	7.2	5.7	6.7	6.5	7.7	6.5	5.3	7.2	7.0	7.3	8.0	6.8
Cobra 2	6.8	6.7	7.3	6.7	6.8	6.3	5.0	7.5	7.0	7.5	7.2	6.8
Declaration	7.0	5.7	7.2	6.3	6.7	6.3	4.3	7.2	7.0	7.0	7.2	6.5
Dominant Xtreme	6.7	5.3	7.2	6.5	6.7	5.8	5.3	7.0	6.7	7.0	7.0	6.5
RAGC blend	6.5	5.5	7.5	6.5	6.8	6.0	6.0	6.2	6.5	6.7	7.3	6.3
Mariner	6.8	6.5	6.8	6.3	7.3	5.8	5.0	6.3	6.3	6.0	6.5	6.2
LSD (P<0.05)	ns	ns	ns	ns	1.0	0.8	ns	ns	ns	ns	ns	0.7

NB: Rated on a scale where 0 = open appearance, 9 = tight surface

the poorest turfgrass quality are only significantly less than Declaration, SRP1RH93, Authority, Shark and Mackenzie.

At Cromer, the vegetative variety AGCSA1 along with the seeded varieties SRP1RH93, Tye, Shark and T-1 are not significantly different from each other in terms of providing the greatest turfgrass quality when averaged over the initial assessment dates. Dominant Xtreme provided the surface with the poorest quality although it was not significantly less than six other varieties. Overall turfgrass quality results from Cromer are presented in Table 2.

At Royal Adelaide there was some significant difference observed in the overall turfgrass quality of some varieties on two assessment dates (9 July 2010 and 30 November 2010), however, there was no significant difference between varieties when averaged over the 11 assessment dates.

THATCH ACCUMULATION

There has been no significant difference at either Keysborough or Royal Adelaide golf clubs during the two years of the trial for thatch accumulation. Due to an irrigation failure during the first summer of the trial at the Royal Adelaide site, nine plots have been excluded from the ratings for thatch accumulation due to them being re-sown at a later date. Seven varieties have only two replicates being assessed while Shark has just one replicate.

At Cromer Golf Club there was only one assessment date (27 October 2009) that provided a significant difference for thatch accumulation. At that assessment the vegetative variety AGCSA1, had accumulated more thatch than all other varieties with the exception of 007, Shark and SRP1GMC.

SURFACE HARDNESS

There has been no significant difference at any of the trial sites for surface hardness over the

six assessments that have been made to date. It was expected that there may be some correlation between thatch accumulation and surface hardness. Therefore as there has been little difference in thatch accumulation, the lack of any difference for surface hardness is not unexpected.

GREEN SPEED

The results for green speed (ball roll) have been variable at all sites. At Cromer there was no significant difference recorded for green speed for the first, second and fourth assessments, however, for the third (28 September 2010) the variety Penn G2 provided the furthest ball roll and it was significantly more than the varieties 007, Dominant Xtreme, SR1150, SRP1RH93, T-1 and Tye.

During the May 2011 assessment, Penn G2 again provided the furthest ball roll, although it was only significantly further than the varieties AGCSA1, SR1150, SRP1RH93, Tye, T-1 and Shark.

During that assessment it was very noticeable that the six aforementioned varieties had rated the

The Cromer Golf Club plots showing differences in quality after they had been sprayed a month before the May 2011 assessment date with a pesticide combination that caused significant phytotoxicity



TABLE 2: OVERALL TURFGRASS QUALITY – CROMER GOLF CLUB

Variety	27/10/09	15/12/09	15/3/10	18/5/10	15/7/10	28/9/10	11/11/10	20/1/11	24/3/11	19/5/11	2/8/11	Ave
SRP1RH93	7.0	7.3	7.2	7.3	7.0	7.0	7.8	6.8	7.2	7.2	6.8	7.2
AGCSA 1	7.7	8.0	7.2	7.0	7.2	6.8	7.3	6.7	7.0	6.2	6.7	7.1
Tyee	7.3	7.0	6.7	7.0	7.0	7.0	7.7	7.0	7.5	6.7	6.0	7.0
Shark	8.0	7.5	6.8	7.3	7.0	7.0	7.7	5.5	6.8	5.8	6.3	6.9
T-1	6.8	6.5	6.7	7.0	7.3	6.8	7.7	6.3	7.0	6.0	6.3	6.8
SR1150	6.7	7.0	6.3	7.3	7.2	6.8	7.3	5.8	7.0	6.0	6.5	6.7
SRP1GMC	7.5	7.2	6.8	6.8	7.0	7.0	7.3	5.2	6.8	4.3	5.8	6.5
Mackenzie	6.7	6.8	6.3	6.8	7.0	6.3	7.2	6.2	6.8	5.7	6.2	6.5
CY 2	6.8	6.2	6.5	7.0	6.7	6.7	7.5	5.2	6.5	5.5	6.0	6.4
Cobra 2	6.7	6.7	6.3	6.5	6.5	6.7	7.3	5.7	5.8	5.2	6.3	6.3
Penn A1	7.2	6.8	6.5	7.3	7.0	6.3	7.0	5.7	6.5	4.0	6.3	6.3
007	6.8	6.7	6.5	7.0	6.3	6.2	6.8	5.5	6.3	5.3	6.0	6.2
Declaration	7.2	6.5	6.3	7.5	6.8	6.3	7.0	5.2	6.2	4.8	6.0	6.2
Authority	7.3	6.8	6.3	6.7	6.8	6.5	7.0	5.2	6.2	4.0	5.8	6.2
Penn G2	7.0	6.7	6.2	6.5	6.5	6.3	7.2	5.0	6.5	4.2	4.5	6.1
Dominant Xtreme	6.0	5.7	6.3	6.3	6.5	6.2	6.7	5.2	5.8	5.2	6.3	5.9
LSD (P<0.05)	0.5	0.5	0.5	ns	ns	ns	ns	1.0	0.5	1.3	0.7	0.4

NB: Rated on a scale where 0 = poor quality, 9 = best quality

TABLE 3. YELLOW TUFT DISEASE INCIDENCE

Variety	17/3/11	17/5/11
007	1.0	1.2
Penn A1	0.7	0.8
Authority	0.3	0.7
CY 2	2.0	2.8
Cobra 2	0.7	0.8
Declaration	0.0	0.7
Dom Xtreme	1.0	2.2
Penn G2	1.0	0.8
Mackenzie	0.3	0.8
AGCSA 1	0.3	1.3
Shark	1.3	1.7
SR1150	1.3	1.8
SRP1GMC	0.3	1.5
SRP1RH93	0.3	1.7
T-1	0.7	0.7
Tyee	1.0	2.5
LSD (0.05)	ns	ns

NB: Rated on a scale where 0 = no incidence to 9 = complete infestation

The machine used as part of the wear tolerance trials at the Keysborough site



highest for surface quality. During the previous month the trial area had been sprayed with a pesticide combination that had caused significant phytotoxicity to the plots, with some varieties being more affected than others. The six varieties that were significantly slower than the Penn G2 on this occasion suffered far less and had much greater turf vigour and hence far less ball roll. The photo on page 33 illustrates some of the differences in turfgrass quality that were observed at Cromer.

At Keysborough and Royal Adelaide there has been no significant difference recorded for ball roll for the two assessments undertaken during 2011.

YELLOW TUFT DISEASE

During the assessments undertaken in March 2011 and May 2011 at Keysborough, yellow tuft was observed in many of the plots. Yellow tuft, otherwise known as downy mildew, is caused by a water mould fungus *Sclerophthora macrospora*. It occurs on most turfgrasses and is often seen during periods of wet weather when the area remains wet for prolonged periods of time.

Symptoms on bentgrass initially appear like individual *Poa annua* plants, however, on closer inspection they are bentgrass plants that have just turned a green/yellow colour. They often develop excessive tillering caused by the production of hormones by the pathogen at the crown of the plant.

There was a variance to the susceptibility of all varieties to the yellow tuft during the autumn, although not one variety had significantly more yellow tuft than any other (Table 3).

WEAR TRIALS

As well as the above measurements, another round of wear trials has begun at the Keysborough site in an attempt to provide further information on which varieties are better able to tolerate wear.

This work is being conducted by the maintenance staff at Keysborough with each plot receiving 30

passes twice a week using a specialised wear machine. It is hoped that by the next bentgrass trial field day to be held at Keysborough in late spring 2011 that there will be a noticeable difference in the wear tolerance of each variety.

RECOVERY

Recently 50mm core holes were taken from the corner of each of the plots at Royal Adelaide and backfilled with sand. This is a similar process which occurred at Cromer last year and is designed to provide an indication on which of the varieties has the best recovery rate or lateral movement.

GOLF COURSE BENCHMARKING STUDY

In September 2011 the AGCSA will start a benchmarking study to investigate the performance of selected greens and fairways on nine Victorian golf courses over a 12 month period. The aim of the project, which has received part-funding from Horticulture Australia Ltd (HAL Project TU11003), is to determine the most appropriate test criteria for providing data on course quality as it relates to climate, maintenance and budget.

On greens, the trial will investigate, on a monthly basis, aspects such as green speed, surface firmness, moisture retention, infiltration rate and root depth. Organic matter accumulation will also be measured using a loss on ignition test, however, this will only be conducted at the beginning and end of the trial.

As well as the nine courses in Victoria, the project will also assess similar parameters at three golf courses in NSW and Queensland but not on a monthly basis.

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