



Mother Nature puts bents to the test

In this instalment of AGCSATech Update John Neylan looks at the latest results from the AGCSA bentgrass trials and recounts his involvement with the SAGCA delegation to St Andrews for the World Forum for Golf Architects in March



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Since October 2009, the AGCSA bentgrass variety trials at Keysborough, Cromer and Royal Adelaide golf clubs have been rated bi-monthly for turfgrass colour, sward density and overall quality as a putting surface. Other characteristics that are being measured 3-4 times a year include thatch accumulation, green speed and surface hardness.

The trial plots have been suffering somewhat from the elements, with flooding and *pythium* at Cromer and heat stress at Royal Adelaide. However, while Mother Nature has had an influence it does provide a more realistic view of the performance of the respective cultivars. The following summarises some of the results to date, with results from all sites to be presented at the 26th Australian Turfgrass Conference on the Gold Coast.

TURFGRASS QUALITY

At Cromer, the vegetative variety AGCSA1 showed the best overall turfgrass quality for the December assessment and was significantly greater than all seeded varieties with the exception of the variety Shark. Shark had significantly greater turfgrass quality than all other seeded varieties with the exception of Tye, SRP1RH93, SR1150 and SRP1GMC (see Table 1).

At the Keysborough site there is less variation in overall turfgrass quality between the varieties, however, the vegetative variety AGCSA1 has produced one of the poorest overall turfgrass qualities, primarily due to the low cutting height and scalped surface it has produced. AGCSA1 has the

TABLE 1: TURFGRASS QUALITY CROMER GOLF CLUB

Variety	27/10/09	15/12/09	15/3/10
AGCSA 1	7.7	8.0	7.2
Shark	8.0	7.5	6.8
SRP1RH93	7.0	7.3	7.2
SRP1GMC	7.5	7.2	6.8
Tye	7.3	7.0	6.7
SR1150	6.7	7.0	6.3
Penn A1	7.2	6.8	6.5
Mackenzie	6.7	6.8	6.3
Authority	7.3	6.8	6.3
Penn G2	7.0	6.7	6.2
Cobra 2	6.7	6.7	6.3
007	6.8	6.7	6.5
T-1	6.8	6.5	6.7
Declaration	7.2	6.5	6.3
CY 2	6.8	6.2	6.5
Dominant X-treme	6.0	5.7	6.3
LSD (P<0.05)	0.5	0.5	0.5

Disease pressures and heavy rain have really tested the AGCSA bentgrass trial plots, in particular the Cromer Golf Club site which was partly under water following a heavy deluge in Sydney

potential to produce a high quality turf, however, compared to the seeded types it has been difficult to keep up with its growth rate in the early stages of establishment.

TURFGRASS COLOUR

At Keysborough and Cromer the seeded variety T-1, along with the vegetative variety AGCSA1, have proven to have the darkest green colour and on some occasions have been significantly darker green than all other varieties (Table 2). At the January assessment at Keysborough there was no

TABLE 2: TURFGRASS COLOUR - KEYSBOROUGH GOLF CLUB

Variety	19/8/09	26/10/09	29/1/10	15/3/10
T-1	6.7	8.0	5.2	7.3
AGCSA 1	8.0	7.8	5.7	7.0
SRP1RH93	6.2	7.2	5.5	6.8
Dominant X-treme	6.8	6.5	5.5	6.8
Cobra 2	7.2	7.7	6.2	6.8
Authority	6.7	7.0	6.0	6.7
Penn A1	6.7	7.2	5.7	6.7
007	6.5	7.2	5.8	6.7
Penn G2	6.7	6.7	6.5	6.5
Declaration	6.0	7.0	5.8	6.5
CY 2	5.7	7.0	5.7	6.5
SR1150	6.2	6.8	5.5	6.3
Shark	6.3	7.5	6.2	6.3
Mackenzie	6.5	6.8	5.5	6.3
Tyee	6.2	6.3	5.7	6.2
SRP1GMC	6.3	7.5	6.2	6.2
LSD (P<0.05)	0.5	0.6	ns	0.5

TABLE 3: TURFGRASS DENSITY - CROMER GOLF CLUB

Variety	27/10/09	15/12/09	15/3/10
AGCSA 1	8.0	8.3	7.2
Shark	8.0	7.5	6.8
Tyee	7.3	7.3	6.7
SRP1RH93	7.2	7.3	7.3
SR1150	6.8	7.3	6.3
SRP1GMC	7.7	7.2	6.8
Declaration	7.5	7.2	6.3
Penn G2	6.8	7.0	6.2
Mackenzie	7.0	7.0	6.3
CY 2	6.7	7.0	6.7
Cobra 2	6.8	7.0	6.3
Authority	7.3	7.0	6.3
007	7.2	7.0	6.5
T-1	6.8	6.8	6.7
Penn A1	7.3	6.8	6.8
Dominant X-treme	6.2	6.5	6.3
LSD (P<0.05)	0.6	0.4	0.6

TABLE 4: TURFGRASS DENSITY - KEYSBOROUGH GOLF CLUB

Variety	19/8/09	26/10/09	29/1/10	19/3/10
Shark	7.0	7.5	7.3	7.3
AGCSA 1	5.0	6.8	6.8	7.2
SRP1GMC	7.2	7.5	7.3	7.0
Declaration	7.2	7.8	7.0	7.0
Authority	7.0	7.5	6.5	7.0
SRP1RH93	6.8	7.3	6.2	6.8
CY 2	7.2	6.8	6.3	6.8
Cobra 2	6.7	7.3	6.7	6.8
Mackenzie	7.0	7.2	7.0	6.7
Penn G2	7.0	7.0	6.7	6.7
007	6.8	7.3	6.2	6.7
Tyee	6.8	6.8	6.3	6.5
SR1150	6.8	7.0	6.5	6.5
Dominant X-treme	6.8	6.8	6.2	6.5
Penn A1	6.8	7.0	6.0	6.5
T-1	6.3	7.0	5.8	6.3
LSD (P<0.05)	0.5	0.6	0.7	0.4

TABLE 5: THATCH ACCUMULATION - CROMER GOLF CLUB

Variety	Thatch depth (mm)	
	27/10/09	15/3/10
AGCSA 1	14	15
Shark	12	13
SRP1GMC	12	13
007	12	12
Tyee	10	13
CY 2	10	13
Authority	10	13
SRP1RH93	10	14
T-1	9	13
Penn G2	9	13
Penn A1	9	14
Cobra 2	9	11
SR1150	9	12
Declaration	9	12
Mackenzie	7	13
Dominant X-treme	7	11
LSD (P<0.05)	3	ns

significant difference in turfgrass colour between any varieties due to some drought stress that was affecting all varieties. At Royal Adelaide there has been no significant difference or trend seen between any varieties based on turfgrass colour.

TURFGRASS DENSITY

At Cromer, the varieties Shark, Tyee, SRP1RH93 and SR1150 have shown very good turfgrass density although at the time of the December assessment they had significantly less density than the vegetative variety AGCSA1 (Table 3). The table is sorted after the December assessment as the trial area was badly affected by *pythium* spp. disease and water inundation during February meaning the March assessment (15/3/10) may not have been



As well as being rated for turfgrass colour, sward density and overall quality as a putting surface, other characteristics being measured during the three-year trial include thatch accumulation, green speed and surface hardness



Above: In April the AGCSA conducted the first of three workshops where superintendents had the opportunity to assess the trial plots. Pictured is the Royal Adelaide site

Right: Thatch depth has been measured on at least one occasion at all sites and so far there has been little significant difference observed between cultivars



a true reflection of overall density. The main photo on page 32 shows the plots at Cromer Golf Club and the severe effect that the excessive rainfall and humidity had on the bentgrasses.

At Keysborough, the same four varieties as Cromer have all shown very good overall turfgrass density with the addition of Declaration and Authority (see Table 4), while at Royal Adelaide there has been no significant difference between any varieties based on turfgrass density.

THATCH ACCUMULATION

Thatch depth has been measured on at least one occasion at all sites and so far there has been little significant difference observed between cultivars. At the Cromer and Royal Adelaide sites the vegetative variety AGCSA1 produced the most thatch of all varieties (see Table 5).

SURFACE HARDNESS AND GREEN SPEED

There has been no significant difference observed in surface hardness of the varieties for any of the assessment dates at any of the sites. The vegetative variety AGCSA1 has shown to have the slowest green speed at both Keysborough and Royal Adelaide. During the last assessment at Royal

Adelaide (11 March 2010) the vegetative variety AGCSA1 had significantly less green speed than all other varieties with the exception of Mariner and Shark (see Table 6).

The first of three field days was held at Royal Adelaide Golf Club on 22 April with a number of superintendents in attendance. AGCSA senior agronomist Andrew Peart provided an overview of the trials and then each of the attendees independently assessed the plots for quality as a putting surface. At the time of printing, the AGCSA had also planned for field days at the Keysborough and Cromer sites in mid-May.

WORLD FORUM OF GOLF ARCHITECTS

In March I was very fortunate to be invited by the Society of Australian Golf Course Architects (SAGCA) to the inaugural World Forum of Golf Architects held at St. Andrews University, St. Andrews, Scotland. The World Forum was jointly organised by the European Institute of Golf Course Architects (EIGCA) who initiated the event, the American Society of Golf Course Architects (ASGCA) and the SAGCA.

The World Forum of Golf Architects attracted over 170 golf industry delegates from around the world. As well as a sizeable turnout from European, American and Australian designers there were representatives from the Japanese Society of Golf Course Architects and other delegates from Mexico, China, Portugal and South Africa.

The forum provided opportunities to play golf at St Andrews with a two-day conference based at the historic St Andrews University, the oldest in the UK. The conference was split into three different sessions covering the economics of golf, the environment and design trends chaired by the SAGCA, EIGCA and ASGCA respectively. In addition delegates were

TABLE 6: GREEN SPEED - ROYAL ADELAIDE GC

Variety	Green speed (cm)	
	16/12/09	11/3/10
SRP1GMC	164	186
Declaration	160	180
007	161	171
T-1	163	170
Mackenzie	167	169
RAGC blend	163	169
SR1150	170	166
Authority	162	165
Dominant X-treme	150	165
Cobra 2	157	165
CY 2	162	164
Penn G2	161	164
Penn A1	157	159
SRP1RH93	156	159
Tyee	160	158
Shark	167	149
Mariner	154	146
AGCSA 1	167	140
LSD (P<0.05)	ns	16

given the chance to play golf with hickory clubs at Kingarock, Hill of Tarvit, near Cupar and to enjoy various other official functions, including the Gala Dinner and a private reception hosted by The R&A.

The conference programme was very interesting and generated a lot of debate around water, the environment, planning restrictions and course design. The Australian contingent presented a well organised programme on the economics of golf. Some of the key points to come out of the conference were;

ENVIRONMENT

- Increasingly stricter planning requirements are an impediment to golf course development;
- As an industry we must promote non-golf values as part of the design concept including green space, biodiversity, carbon; health and well-being; and rehabilitation of degraded sites
- The Golf Environment Organisation (GEO) is currently producing a document for golf course development that is focused on environmental planning.
- At the conference, the GEO outlined their draft "Guidelines for Sustainable Golf Development". This project commenced in 2009 and GEO has been co-ordinating a team of experts in the creation of globally applicable guidelines that will enable the diverse stakeholders in golf development to achieve higher standards of social, economic and environmental return on investment.



The Society of Australian Golf Course Architects delegation to the World Forum of Golf Architects

WATER

- The lack of a sustainable water supply is probably the greatest universal threat to the golf economy;
- Water management planning, introducing new technology and water conservation considerations need to be designed into every project.

DESIGN AND COURSE MAINTENANCE

Design aspects were debated very passionately and I must admit as not being too much wiser at the end of the discussion. One of the big issues was the excessive length of golf courses as a counter to

WHAT'S YOUR DIAGNOSIS?

AGCSATech recently received this photograph of a hybrid couchgrass putting green. What is going on? Is it a disease, dry patch, nutrient deficiency or poor fertiliser application? One of the primary clues was a water report which contained the following analysis:

Element	Concentration	Comment
Total soluble salts (ppm)	2016	High
Bicarbonates (ppm)	246	Moderate - high
Sodium (ppm)	406	Very high
Sodium Absorption Ratio adj	21.5	Very high

The water source is of high salinity, has elevated bicarbonates and very high concentrations of sodium. Water of this type requires careful management, particularly in terms of calcium nutrition. The elevated bicarbonates will lock up calcium and magnesium and the high sodium will also displace much of the calcium and magnesium from the soil. The normal response is to maintain high levels of calcium applications, often in the form of gypsum. In this case there had been limited magnesium applied.

As you read, the answer to the problem is developing in your mind I am sure. However, an excellent article by James Camberato and Bruce Martin from Clemson University ("Magnesium is at the Heart of Your Green" www.clemson.edu/turfornamental/) provided the answer.

In this article they discuss where Ca-induced Mg deficiency can occur on coastal golf courses using poor quality irrigation water that is high in sodium. Application of calcium in conjunction with leaching



irrigation or rainfall is the antidote to sodium. After calcium displaces sodium from the cation exchange site it can be leached from the soil with excess water. Although this practice is necessary to manage the sodium problem, it may lead to high soil calcium levels and a calcium:magnesium imbalance because magnesium will be leached along with the sodium.

The answer to the problem, which is applicable to many soil and turf management situations, is to make sure that there are regular applications of magnesium applied with each application of calcium. Regular soil testing is also a key part of managing the situation so that imbalances can be rectified and remedial actions assessed.



TURF 10 FIELD DAY – HAWKESBURY RACE CLUB

In March Turf Australia and the Sports Turf Association (NSW) conducted the Turf 10 field day and conference at the Hawkesbury Race Club, Clarendon (near Richmond - Sydney NSW). The two day event was a mix of education, big machines, trade show and culminated in an afternoon at the races.

The education sessions covered turf and sports injury, minimising spray drift, erosion and sediment control and how the Sydney Harbour Bridge was turfed. The field day provided for the demonstration of a range of large pieces

of harvesting equipment, tractors, line marking equipment and mowers as well as a range of product suppliers.

The most interesting demonstration was Toro's PrecisionSense Technology (pictured) which is a piece of futuristic equipment that is towed behind a Workman type vehicle and measures soil moisture, turf health and soil compaction at multiple sites over a turf area. The data generated provides a detailed map which can be used to diagnose soil and moisture problems and to monitor the effects of remedial activities.

the changes in club and ball technology. The other consideration was the safety aspect as it also related to the modern drivers and balls (i.e.: a miss hit shot diverts further off the true line of play than it used to).

The only person to actually provide any scientific data was Dr. Steve Otto from The R&A, who shot down a lot of the anecdotal evidence of the architects by producing data that indicated that the ball is actually not going that much further for the 'average' golfer. What transpired out of the discussion was that it is likely that there are more high handicappers confident in using drivers today than ever before and the miss hit shot is straying further off line. The R&A will be producing a detailed report on their findings since 1996 towards the end of this year.

There were a few other practical points to consider that came out of the discussions;

- It is important to develop a sustainable golf model that considers the following values; economic – the golf club must be able to develop a viable business based around the design concepts; environmental – the design must build in environmental values (e.g. water conservation, biodiversity, restoration of degraded sites); and social – how does the golf course interact with the wider community.

- The maintenance requirements must be taken into consideration during the design and planning stages. Do not design a golf course that becomes too expensive to maintain.

It was a great event to be part of and I wish to thank the Society of Australian Golf Course Architects in particular president Graham Papworth and Phil Ryan (SAGCA organiser) for inviting me and sponsoring my attendance. 🌳