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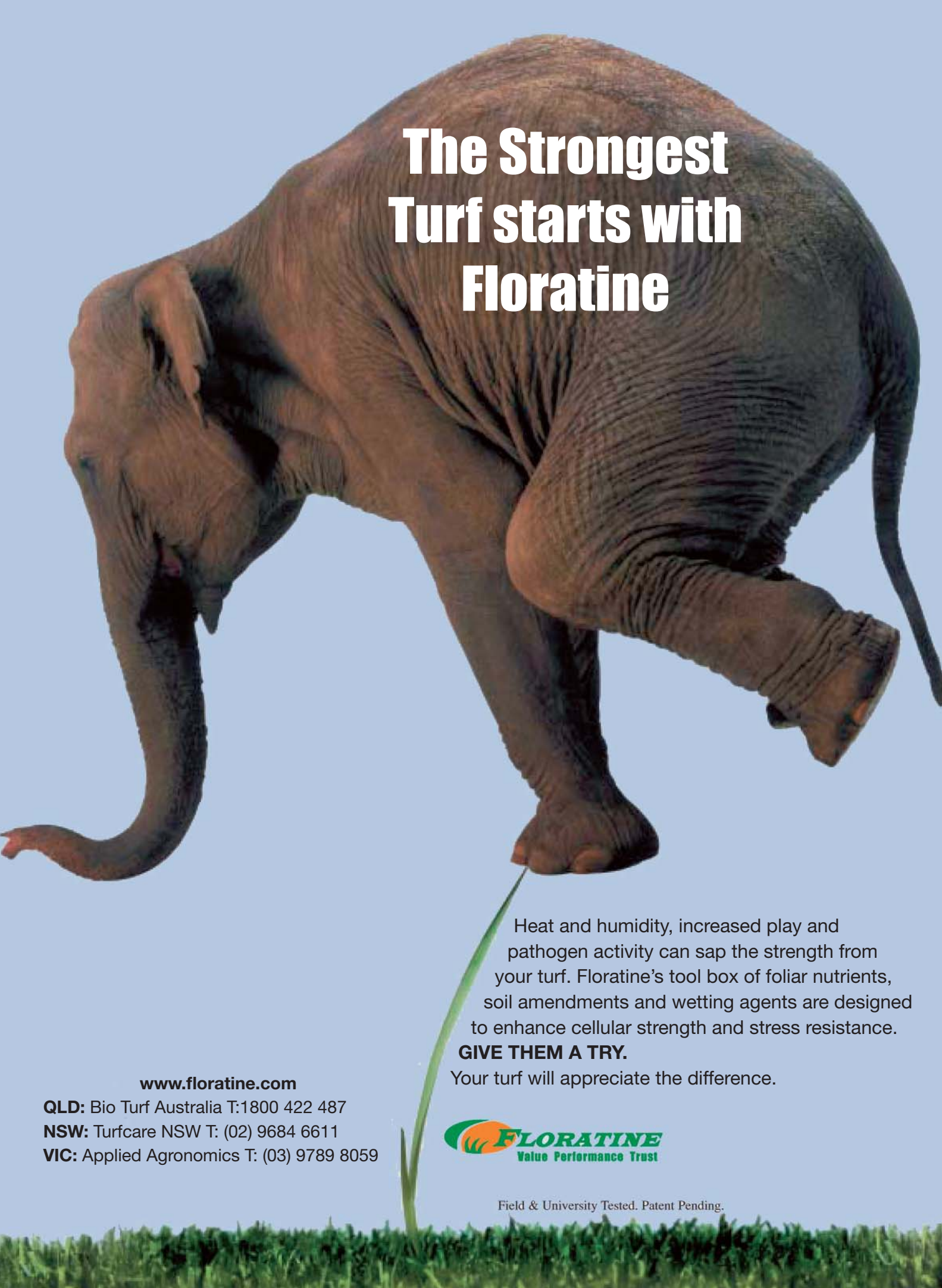
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COVER: The Melbourne 2006 XVIII Commonwealth Games

From 15-26 March 2006 thousands of elite athletes, officials and media along with hundreds of thousands of spectators will descend on Melbourne's major sporting venues as the city plays host to the XVIII Commonwealth Games. In this special Games edition, ATM takes an extensive look at how turf management has played a crucial role in the lead-up to one of the world's major sporting spectacles.

Photo: Brett Robinson

MELBOURNE 2006 XVIII COMMONWEALTH GAMES TM©

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OPINION

THE PULSE **36**

In this instalment of The Pulse, ATM tackles the issue of potable water. With its use for irrigating fine turf surfaces becoming increasingly limited, The Pulse asked five members of the turf community what they were doing to deal with the likelihood that one day potable water could no longer be an option for irrigation and what challenges that presents.

RESEARCH

THE EFFECT OF NITROGEN RATES ON ULTRADWARF BERMUDAGRASS QUALITY **48**

New ultradwarf bermudagrasses have the promise of providing improved putting performance for warm-season golf courses. Comparative documentation of their performance under an array of management conditions and environments is needed to identify optimum strategies for these grasses. Three varieties – Tifeagle, Champion and Floradwarf – were compared for turfgrass quality over a four-year period in subtropical south Florida at different nitrogen rates and N:K ratios.

In Every Edition

let the games begin

There is little doubt that the Melbourne Cricket Ground has a special place in Australia's sporting and cultural psyche. The list of significant and history-making sporting events the MCG has witnessed is imperious. In fact, look on the MCG website and the history document that outlines some of those major moments in sport extends past eight pages!

Even hailing from across the Ditch as I do, one could appreciate the ground's hallowed stature. I have fond memories as a kid of watching Lance Cairns smashing six sixes off a dazed D.K Lillie and Rodney Hogg at the MCG in 1983 and then of course there was the infamous underarm incident in the 1981 World Series (time to call my therapist).

Regardless of the many amazing sporting feats the ground has witnessed over the years, there is a very good reason why the MCG is fondly called the 'people's ground'.

I am fortunate to live next door to an MCC member, a charming octogenarian who has been a member of the MCC for some 50 years. Despite his aging years, two days a week you will see him purposefully stroll down the driveway resplendent in his red and blue striped MCC blazer en route to the 'G' where he conducts tours through the ground.

For him it's a duty, paying back the ground for the wonderful moments it has afforded him over the many years. Talking with him recently about the transformation the ground has gone through for the upcoming Commonwealth Games, he regaled me with stories of how he and his wife had front row seats in the then Grey Smith Stand when the Olympics came to Melbourne in 1956. Just like hundreds and thousands of others come March, he will take his place in the stands to witness the ground host yet another massive sporting spectacle.

The MCG is in his blood, as is the case for many Melburnians, but there is one man who over the past 15 years has developed a much more special relationship with the ground. I'm talking of course about Tony Ware, the MCC's head curator since 1990. Ware has become synonymous with the MCG and over the past couple of years he has played an instrumental role in helping transform the arena into one that will host some of the world's finest athletes.

What has been achieved at the MCG in recent times is quite phenomenal. It's an incredible story and in this special Games edition Ware gives ATM a unique insight into how the project has come together and the many facets which have made it a groundbreaking triumph for the turf industry.

Our 14-page Games spread also looks at the role the Telstra Dome will play both in the lead-up to and during the Commonwealth Games. With the MCG out of commission due to the Games, the Dome has a much busier start to the year than normal which will put arena manager Gavin Darby and his crew to the ultimate test.

Elsewhere in this edition we trace the formation of the AGCSA, which celebrates 25 years in 2006, while superintendent John Geary gives us an inside look into the creation of The Golf Club, St Andrews Beach on Victoria's Mornington Peninsula. With increasing restrictions on the use of potable water and the very real threat that one day it will no longer be an option for irrigation, The Pulse asks what turf industry practitioners are doing to deal with this, while in Tech Talk the issue of recycled water quality is examined. Enjoy the read.

Brett Robinson
Editor

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Richard Winter (MCC)

foreword thinking

AGCSA CHIEF EXECUTIVE, STEVEN POTTS

The golfing industry in Australia has responded to environmental pressures by increasing its investment in environmental research and development, and by demonstrating a capacity to adapt to changing conditions and societal demands.

The industry wants a best practice model through the adoption of a systems-based environmental management approach which will ensure management processes are linked together in a logical structure that:

1. Ensures all important aspects of the organisation that can affect its ability to deliver excellent performance on its objectives and targets are addressed;
2. Procedures exist to ensure that key operations are effectively managed;
3. Management is based on data rather than general concepts;
4. Problems are addressed promptly and solutions, that to the greatest extent possible, prevent the problem from reoccurring are identified; and
5. Performance is continually evaluated at senior levels of the organisation and that there exists a continuous learning and improvement process based on the analysis of past performance

Our industry has been striving to meet its environmental responsibilities by encouraging members to adopt systems-based management practices. This is being achieved through positive engagement with government at all levels and we are excited by the support of the NSW DEC.

In June 2004 the golfing industry established an environment committee and the industry recently signed an environmental policy statement committing to the ISO14001 environmental management systems framework. That statement details our aspirations of achieving environmental excellence.

To work towards our goal of environmental excellence we:

- Developed a golf-specific environmental management system that conforms to the ISO14001 framework;
- Committed to developing a national environmental reporting tool;
- Will have all clubs submit annual environmental performance returns;
- Committed to producing a State of the Environment report for regulatory bodies (annually in year one and then bi-annually). This will enable us to document, report on and set new performance indicators;
- Will be able to report data in a meaningful manner that will provide feedback to superintendents about their practices and the needs to change practices to meet the industry's environmental objectives;
- Have programmed for all superintendents to attend EMS workshops where they will be trained in the development of their system – day one in early 2006 and day two July 2006;
- Have proposed to audit 5 per cent of clubs across Australia in the field and conduct desk top audits on 10 per cent of the clubs and report the outcomes as part of the State of the Environment report;
- Will issue conforming clubs with Certificates of Compliance;
- Will have sanctions and corrective actions for non-conforming clubs.

This national initiative represents a major change to the ways in which the golfing industry interacts with the environment. Rather than responding to environmental issues on an ad hoc basis, we have aligned ourselves to the implementation of a robust framework and structured approach for managing impacts and risks by introducing a series of programs, procedures, practices and controls.

We have been working to move to 'corporate self-regulation' and this has been affirmed by many regulatory agencies. As you know, industry-driven voluntary initiatives are more widely accepted than government initiatives. We look forward to working closely with state and local regulators as we begin the roll-out of this exciting project this year.

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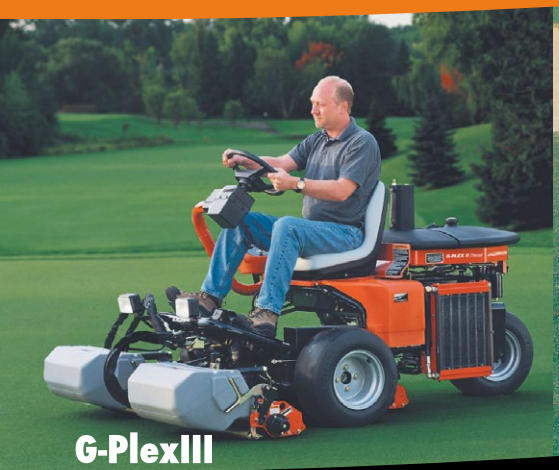

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BY BRETT ROBINSON

Ware puts MCG on the right

Mention the MCG in turf management circles and one name instantly springs to mind. Since 1990, head curator Tony Ware has been responsible for the upkeep of Australia's most iconic stadium and in recent times he has played an instrumental role in transforming the ground into what will be the hub for the upcoming XVIII Commonwealth Games. In this first article of a three-part feature on the Games, ATM catches up with Ware to review the past couple of years and discovers that it's not only the MCG where he has had a major influence in the lead-up to one of this country's biggest sporting spectacles.

track

Over the past 16 months the MCG surface has undergone a remarkable transformation. Combined with the $430 million stand redevelopment, the MCG is now one of the most advanced sporting arenas in the world. This photo was taken just two weeks out from the 2005 Boxing Day Test.

Tony Ware jokingly claims to have been born at the Melbourne Cricket Ground. Ever since taking over as head curator of the hallowed turf in 1990, Ware has grown to become synonymous with the art of turf management at the 'people's ground'.

Over that time Ware has undertaken many groundbreaking projects involving the surface and has witnessed the arena go through many transformations. He became curator at a time when the Great Southern Stand was being constructed and in 1992 oversaw the largest scale surface works ever performed.

All of those pale into comparison, however, when you look at the project which has consumed Ware for the best part of the last five years. We are talking of course about the XVIII Commonwealth Games and the transformation of the MCG into the principal venue for the event which hits Melbourne come March.

Little needs to be mentioned of the scale of works that have been undertaken recently at the MCG. In excess of $430 million has been spent turning it into one of the premier sporting arenas in the world. It all started with the demolition of the Ponsford Stand in late September 2002 and will come full circle when the Opening Ceremony explodes on to the arena on 15 March.

Such has been the transformation of the venue and its integral role in the Australian sporting and cultural psyche, it was announced during the 2005 Boxing Day Test that the MCG was to be added to the Australian Heritage Council's National Heritage List.

Down on the arena floor, Ware has supervised a mountain of work in order to accommodate the Games as well as maintain the venue's traditional schedule of AFL and cricket. Along the way there have been frustrating periods and moments of immense satisfaction, but now with the finishing line in sight all the hard work seems more than worthwhile.

A MASSIVE UNDERTAKING

Although the physical redevelopment of the MCG surface has only been going for the past 16 months, planning extended far back before 2000 when the overall MCG redevelopment ▶

MCC head curator Tony Ware (left) and recently appointed arena manager Richard Winter are looking forward to a busy schedule with the Games just a month away

project was first mooted. Right since then Ware has played a key role in project managing the transformation of the MCG surface through its various stages and even looking back now he is still impressed with the shear scale of works that have been achieved.

"It has been a challenge because of the complexity and the absolute deadlines we have had throughout the job," says Ware.

"Did we have a full appreciation of the scope of works when we started? Well, it has probably grown bigger because there have been more elements. As a project it has been extremely complex because we are dealing with the Commonwealth Games track while still maintaining our field for international cricket and AFL. Unfortunately, the three of those are just diametrically opposed.

"We always knew we would be able to deliver on the Boxing Day Test match because we had two key elements. With the Motz Stabilised turf from HG Turf we were able to put the outfield down extremely quickly and to a good standard, and combined with the portable wickets we could get the wicket block in and out and still have an international standard Test wicket.

"With a traditional wicket block and outfield we wouldn't have been able to do this project. So we knew we had the major tools to start with and the rest of it – the earthworks, the drainage and irrigation installation – were more a coordination exercise. And also, and just as important, we strongly believed we had the expertise to do it and as such we were able to comfort the government to a certain degree despite such an undertaking."

The first stage of the transformation began following the completion of the 2004 AFL season. The entire surface and subgrade was excavated and as is normally the case when you dig a big hole in Melbourne, it rained which caused major delays.

With the best part of a fortnight lost waiting for the site to dry out, it proved to be an extremely frustrating period for Ware and although the ground was ready for the 2004 Boxing Day Test, it was not at the level Ware had hoped.

"We got to the Test match in 2004 but not in the sort of shape we wanted," recalls Ware. "Although the outfield and the pitch were okay, aesthetically we didn't look as good as we liked and we worked hard to rectify that for the 2005 Test. But we always knew there was that risk of the weather and it was one that we could only mitigate to a certain level. Unfortunately the worst case scenario happened, but we reprogrammed and got things done."

In contrast, 2005 proved much less problematic even despite the major works surrounding the laying of the athletics track for the Games and the exacting standards required to get it approved.

Most pleasing for Ware during that time was keeping intact the integrity of the ground's USGA sand profile. At one stage it was looking likely that a crushed rock road base would need to be put down in order to lay the track, something that concerned Ware because of the necessity to cut through sand and gravel layers which heightened the risk of contaminating the profile.

A system was devised where the asphalt was laid directly over the top of the sand which enabled the profile to remain relatively untouched. The system worked perfectly and resulted in the track being accredited by Games officials in early December.

But the challenges still remain. After covering the track with a drainage cell and turfing the arena for the Boxing Day Test, the exact reverse has been done to the ground during January in order to present the track back to the Commonwealth Games on 12 February for a test event. Then there are the Games between 15-26 March before the race against time really begins to remove the track and re-lay the field in time for round four of the AFL on 25 April. (**See pages 10 and 11 for an in-depth stage-by-stage look at how the MCG has been transformed**).

"Those three-and-a-half weeks between the Games finishing and ANZAC Day will be the most complex part," predicts Ware. "It will involve a lot of round-the-clock work and night work which I don't particularly like because of quality control issues.

"What was originally going to be a six-to-seven week project (we were going to have the ground delivered to AFL by 13 May) we have decided to bring it forward so we will be including almost twice the amount of work elements in half the time. So it's going to be a fun, busy time.

"But it's a great challenge. This is the sort of work that hasn't been done before and it's great to be a part of that and see it delivered. We are now a flat gravity field and will remain so forever. It's a great achievement for the industry as a whole.

"For example, being able to put in a very shallow profile over the top of a drainage system and know that it's going to sit there for a few months without any affect on the turf opens up a whole lot of opportunities.

"This project shows that if you had an indoor stadium that wasn't turfed and you wanted to put a grass surface in, it's quite achievable. It has been done here and to the highest level. Hopefully as an industry, and for us as an independent body within that industry, we can build on that."

CONTINUED ON PAGE 12

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In recent editions ATM has closely followed the fascinating progress of redevelopment works at the MCG. In Volume 7.1 Hamish Sutherland from HG Turf outlined the construction of the new surface, while in Volume 7.6 ATM looked at the construction of the athletics track for the XVIII Commonwealth Games. Here ATM provides a stage-by-stage account of the most recent transformation the 'G' has undergone in the lead-up to the Games as well as the race against time to get the venue back up for AFL immediately after the Games.

Transforming the 'G'

Countdown to the XVIII Commonwealth Games

The MCG outfield was laid on a shallow profile of just 100mm

AND THEY'RE RACING...
LEAD-UP TO BOXING DAY TEST

After the athletics track was accredited in early December 2005, it was covered with black plastic and an Atlantis drainage cell system across which a shallow profile of 100mm was spread. HG Turf then laid the outfield with Motz Stabiliser turf and 10 days out from the Test it was rolled and groomed.

"Hydraulically it was a bit of a problem, but it settled down beautifully and to put it all together in two weeks and then play an international Test was very satisfying," says MCC head curator Tony Ware.

"That turnaround was very pleasing because normally with these sorts of track and these sorts of builds, the Commonwealth Games authority in whatever country they are being hosted would normally shut down the whole venue for a year in order to build the track and put everything in place. So it was pleasing that we not only achieved a real good standard with the track but also for the Test."

Outside of the main arena, the new practice facilities were constructed in the third week of November. Located outside the Ponsford Stand, the facility can fit 32 full-length practice wickets, is fully netted and has exceptional public viewing areas as it is built below the concourse level. In order to be ready for the Test, just one end of the facility was laser-levelled, grassed and pitches prepared.

FIRST BEND...
2005 BOXING DAY TEST

Despite having the Commonwealth Games track underneath the outfield, the Boxing Day Test went by pretty much as normal for MCC groundstaff. One portable test wicket was dropped in immediately after the AFL grand final in September and after the outfield was laid upon completion of the track, the arena went through a final groom.

"What we did find with having the turf laid over the track was that we had to be careful about what we watered," says Ware. "Because the profile of the outfield was only 100mm, the water sat almost to the surface so it was important that we didn't over-water. Having said that 100mm only holds 8-9mm of water, but if we had a big evaporation day it could dry out very quickly, so it was difficult to manage.

"It was also important for us to get our fertilising practices right to harden the plants off as much as we could while trying to get them established at the same time and reduce the cutting heights from 15mm to 12mm. So we were putting the turf under a fair bit of pressure because of the short amount of time we had to play with."

THE BACK STRAIGHT...
LET THE GAMES BEGIN

On 31 December following the Boxing Day Test, the portable wicket was lifted and transported across to the MCC's nursery adjacent to Punt Road Oval.

On 16 January, MCC staff began stripping the turf from the outside of the arena, uncovering the track and scraping off 1200m^3 of the sand profile. The Atlantis drainage cell was picked up, the edges of the infield trimmed and tided up and the track cleaned all in readiness to be handed back to the Commonwealth Games by 12 February. The removed turf went back to HG Turf's Alexandra-based farm and recycled.

Apart from that, there is very little from a turf operation point of view that is required. At the same time there is a huge overlay of works in the stands with facilities being constructed for media, officials and competitors, while out in the middle preparations will begin for the Opening Ceremony stage build.

The MCG, as a fully functional athletics facility, will get its first test when it hosts the Victorian Championships on 16 February.

The final part of the athletics track is covered ahead of the Boxing Day Test

Immediately after that the 7000m^2 of turf in the centre will be removed as it would more than likely be destroyed with the heavy traffic the area will experience during the Opening Ceremony on 15 March.

Once the Opening Ceremony concludes and the extensive build torn down, there will be just 24 hours to put the infield profile back down, laser-level it, re-lay the turf and then roll, cut and groom it in preparation for the for first day of athletics on Sunday, 19 March (the infield will used for the women's hammer, men's shot put and women's javelin final on that opening day of competition).

"There is a fair bit of framework required for the Opening Ceremony build so it's going to be a challenge to get the turf back in and to make sure we aren't tripping over each other as they're pulling everything down and we're coming in," says Ware.

"The other interesting element which could prove a bit problematic is the high level of security. Obviously we'll be bringing semi-loads of turf in at a time and a lot of gear to lay the turf which all has to be searched and checked off, so that in itself could result in possible delays.

"And I'm sure there will be a lot of other elements that we will need to contend with as we go along. And that's another example of Richard Winter's role. Obviously there are going to be a lot of distractions, but I know that even though we will be having a full cricket program (Pura Cup) at the Junction Oval during the Games, Richard and the crew will be able to look after that."

As for the Games, there isn't a great requirement from a turf perspective. As soccer is not part of the Games, groundstaff will only have to prepare the infield for the field events, while the maintenance of the track is in the hands of a dedicated Commonwealth Games track crew.

"We'll cut it (the infield) and roll it and repair divots from the hammer, discus and shot put," says Ware. "But even that becomes complex with all the electrical equipment out there. When it comes to watering we will have to be a little bit careful to coordinate things.

"Ironically, during the actual Games will probably be the only time where I'll get a bit of a break."

The Games conclude with the Closing Ceremony on Sunday, 26 March which won't be on the same scale as the Opening Ceremony and at this stage Ware is confident of being able to protect the turf with a covering yet to be determined.

THE TURN FOR HOME... AFTER THE GAMES

The race against time truly begins straight after the Games. "That's when the fun begins," laughs Ware. "It will take Commonwealth Games about three days to get all their equipment off the field and we will start excavating on 1 April. We then have to present the ground ready for the Essendon vs Collingwood ANZAC Day AFL match."

When ATM spoke with Ware it was still undecided whether the Games track would be salvaged. To do so would take around 15 days and involve rolling the track back bit by bit and literally knifing it off the asphalt underneath.

"If we want to be back by 25 April then we will need to destroy the track," says Ware. "It's too time-consuming to salvage and even if we try there will still be a lot of wastage."

The asphalt base of the track will be picked up using a road profiler following a successful series of trials held during 2005 in the western Melbourne suburb of Deer Park. The trials showed that using a road profiler was not only a quick method by which to remove the asphalt but more importantly minimised contamination of the USGA sand profile underneath (the asphalt was laid on the sand profile rather than a crushed rock base – see page 8).

"Aside from that we also have a bit of work to ensure that the pits under the ground are sealed so that nothing leaks into them," adds Ware. "What people don't realise is that underneath the field there are kilometres of conduiting and pits and we have to make sure they're all secure. Once they are, then we will start to rebuild the field.

"We do have to lift the turf in the centre of the field again because it is 100mm artificially higher and we did that so we had enough sand to cover the track and keep our levels right. We will take it back down 100mm and push some of that extra sand into the outfield and then re-grade the field and re-turf the entire arena.

"It's a lot to do in a three-and-a-half week project. Even as a volumetric exercise there is a lot of material to come out and a lot to come back in. I guess one of the advantages though is that we won't be cutting through the drainage system so if it rains it means it won't affect us as much. From there it's full steam ahead to ANZAC Day."

Long-serving MCC groundsman Roger Wade grooms the arena three days out from the Test

CONTINUED FROM PAGE 8

HIRED GUN

It's not only the MCG where Ware has played a major role in preparations for the Games. In March last year Ware was called in to oversee some major rectifying works to the bowling greens at the Darebin International Sports Centre which will play host to nine days of lawn bowls during the Games.

At that stage the facility was experiencing a number of problems and suffered the embarrassment of Bowls Australia pulling events scheduled at the venue due to substandard greens, including the high-profile Trans-Tasman Series and the inaugural Australian Open. At the request of one of the state government's Games committees, Ware was asked to inspect the greens and make recommendations in order to have them ready for the Games.

"There had been a few issues about getting the greens delivered to Commonwealth Games standard," says Ware. "The greens were poor to fair at best and my view was that they weren't going to be in any condition to be used for the Games.

"There had been a number of recommendations made but I had a view that the tops needed to come off. That was really the only solution. There was a lot of thatch build-up in the greens and just like with a golf green, as soon as the thatch dried out the greens started to die.

"You couldn't get any pace into them. They had to be wet all the time and that caused moss and algae to grow and it meant that the guys who were managing the greens would never be able to get them up."

"The greens were poor to fair and the tops needed to come off" – *Tony Ware*

Conscious of the narrow window of opportunity to undertake any major works on the surfaces and then have enough time to get the greens back up to standard for the Games, Ware made the call to leave the drainage and irrigation systems in place and completely reconstruct the tops of the four rinks.

HG Turf ripped the tops off and then 150mm of sand was removed as it was contaminated with a lot of organic root matter and thatch which in parts was 60mm deep. A new sand profile using the original sand specifications was then incorporated and re-levelled with the help of McMahons and the greens sown with Penncross. At the same time a lot of work was done to the ditches to make sure they complied with international standards.

"We re-did everything except the drainage and irrigation," says Ware. "To do that would have meant a total reconstruction and we simply didn't have time. It worried me a bit because we had a lot of work to rip the tops off and get them re-sown and established by April or May. Luckily for us we had the best autumn possible and we got a terrific strike from the grass we put down."

With an initial hand-back date to Commonwealth Games of March this year, it was decided to have the greens ready for the start of the 2005/2006 Victorian pennant

▶

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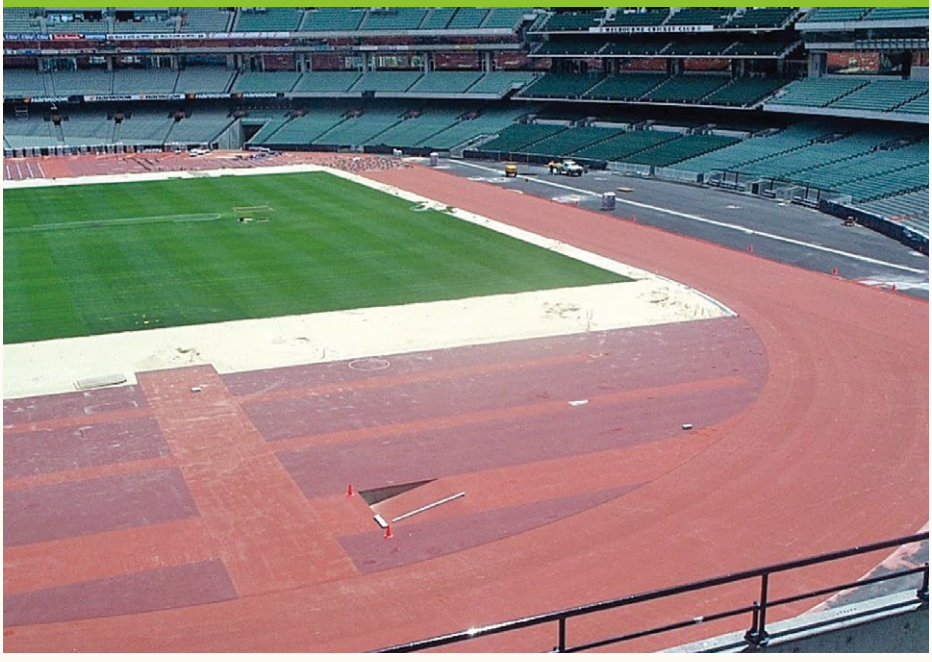
Being able to lay the asphalt base of the athletics track without affecting the integrity of the USGA sand profile underneath has been a huge bonus



season, effectively six months earlier than planned. Ware says he was more than happy to do that as it gave an opportunity to see how the reconstructed surfaces would perform.

The real acid test came when the venue hosted the Asia Pacific Championships in mid-November, which included 10 days of play and five days of practice. The greens were cut at 2.5mm and ran between 13 and 13.5 and for the Commonwealth Games will run between 14.5 to 15.5.

"It gave us the chance to see how they ran and what we needed to do to get them up to Games standard," says Ware. "It also meant that everyone was more comfortable with them because at one stage it was looking doubtful whether they would be able to use Darebin at all for the Games.

"Because we brought the greens in a lot earlier there was some bruising of the turf in the first couple of weeks, but they hardened up well and we have been continually dusting over the summer. But there's a good grass cover and they are durable. We had an intensive schedule during the Asia Pacifics and despite being young they performed well.

"Although we were using them when they were still in an establishment phase, since Christmas we have started to work them up to Games standard. There are quite a number of Australian camps so we want to get them up for those and so far we are on schedule."

Ware and his team will oversee the maintenance and preparation of the greens right through until the conclusion of the Games after which the venue will be handed back to Darebin Bowling Club and Darebin City Council.

STEPPING UP

Ware's intimate relationship with the MCG began back in 1990 when he took over from Peter Semos as head curator. Already a part of the MCC team, Ware stepped up at a time when plans were underway to completely overhaul the playing surface as well as expand the MCC's cricketing facilities, including the development of the Albert Reserve as a first class ground and the construction of dedicated outdoor practice wickets.

"There has been a lot on since 1990 and a lot of it we needed to do," says Ware. "We were sitting a little bit underdone in our turf development but the club was really proactive in getting up to the standard where we are at now. Peter (Semos) had done a lot of good things here before I started and he really instigated that shift in perception that curators weren't just grass cutters but professional turf managers. He had also done a lot of the initial research into the full ground reconstruction in 1992.

"Even though the last year has been busier, I still probably rate that 1992 reconstruction as one of the most challenging projects I've been involved with here. I had just been appointed to the job and we were putting in a sand field at the MCG for the first time and no one had any great deal of confidence that we would be able to deliver it and have it stand up to heavy football traffic. Everything was an unknown and it was more challenging because we had to try and convince people that this was the way to go.

"The Games project has been challenging in a different way because there have been so many enormous elements involved, but it has also been a great learning experience. When you first become involved you say to yourself, 'How am I going to deal with all these elements', but you manage to prioritise properly and work with the right people. They're the sort of skills that stay with you forever.

"So from my point of view, if we were going down a track of managing multiple venues or expanding our roles and doing a lot of other things, I would be quite comfortable about doing that now whereas 12 months ago I might not have been sure we could do that. We can now manage a multitude of things and still deliver a high quality product."

Despite its transparent roof, the new stand will have major implications for the MCG surface, particularly in regards to shade management

Before becoming part of the MCC team, Ware completed a trade certificate in turf management and then did an associate diploma. He then completed 90 per cent of horticulture degree, which was since been put on the backburner, and is currently undertaking further study in business.

"The business studies have been a bit of a parallel thing," says Ware, who is married to wife Leanne and is father to Jessica (18) and 16-year-old twins Catherine and Luke. "One, I've wanted to go that way because it's my interest and second it has been almost a requirement with this project. I need to be able to talk to our committees and government about how we are going performance-wise, research-wise, financially and how we are going with our business structures. Without some training that is difficult."

MANAGEMENT CHALLENGES

Even with the MCG now set up as one of the premier sporting facilities in the world, there is still plenty of work ahead for Ware and the arena team.

Turf management practices will need to be altered in line with the changed climatic conditions created by the new stand while Ware is also looking at improving systems within the arena team. Shade management is perhaps the single biggest factor that will impact upon the surface in the coming years and it is here where Ware will be dedicating a lot of his time.

"We will be under more constraints than in the past so we will need very proactive turf management practices to combat those," says Ware. "One of our challenges with the new stand with it being so big and with the roof is that we now have a different microenvironment than in the past.

Tony Ware

"We are going to have reduced wind movement in the stadium and we are going to have an increased shade percentage on the grass which is something we need to deal with. Architecturally we couldn't design around it because the stand is on the northern side and it was always going to have an impact on the field with shade.

"We saw a bit of it (shade) last year, but we didn't have too many major issues with large areas of the field. We've got a little bit on the northern side 10 to 15 metres out from the fence that is under quite heavy shade for the whole of winter. That's something we're going to have to manage and whether we treat that with extra turf replacement or something else remains to be seen.

"Obviously we are not going to grow grass well in those shaded areas and that's going to be a problem, but we need to grow it and mange it to an acceptable level so we can still have our international sport. In that respect we have to do a lot of homework on turfgrass varieties, fertiliser practices and understanding the inter-relationships of all these factors and how we manage that."

One area that has been looked into is the use of growth retardants which Ware says has proven extremely positive and exciting to date.

"I know it seems a little bit strange with shade-affected turf to apply growth retardants to manage it, but people will know that with anything affected by shade how elongated the cells get and it artificially becomes a very weak plant, particularly if you are applying a lot of fertiliser at the same time," says Ware.

"What we want to do is reverse that. We don't want to use the growth retardants to stunt the plant, but we want to use them to the levels where we reduce the natural elongation of the grass. Obviously there's a lot of work still left to do because if we do that we aren't quite sure of the response we are going to get from the plant.

"But that's the challenge in front of us over the next year. So we're not solely relying on a turf replacement strategy. We will have some, no doubt, but we are scouring far and wide to see what's out there around the world and maybe we can make some relationships and conclusions that people may have missed before."

CHANGING CULTURE

With Ware's shift to a more strategic and project management role in recent times, last July he appointed former WACA curator Richard Winter as arena manager. Since joining the MCC team, Ware has been able to rely on Winter to take care of the day-to-day turf management operations which has enabled him to concentrate on the Games and future planning strategies. In fact, the 2005 Boxing Day Test was the first time Ware hadn't been involved in the preparation of the wicket, which he admits took some getting used to.

"Richard's role is vital and he has been terrific since coming on board," says Ware. "Obviously with all the things that we've got on, my role has changed into more major project planning as well as a strategic planning role with us moving forward as a venue and how we are going to manage the MCG in the future.

"Obviously we are going to have more pressures on the field with other people wanting to use it and there are going to be some shade issues that we need to deal with. I need to dedicate some time to planning that and having Richard on board means that I can now leave the turf operations in his capable hands.

"Looking ahead I want to strengthen our current systems, things like internal training and making sure our staff are happy and being looked after, which is something that is not always done in the turf industry.

"That's something I want to make sure we spend a bit of time on because we can't realistically benchmark against other stadiums around the world unless we can measure ourselves properly and we can see whether we are improving or not. I think that's the exciting aspect for us is getting ourselves organised over the next couple of years.

"It will be interesting to see what happens over the next 12 months. The past 18 months have been extremely busy and I've enjoyed the hustle and bustle of what we have done so far. Whether we say at the end, 'Phew, I'm glad that's over, let's relax', or whether we still have the drive to do some other things, I'm not quite sure.

"But if there is one thing that I have learned over the past year, no matter how big the project is, if you have a committed team with the same sort of vision and a spirit of cooperation, it's amazing how quickly and successfully things can come together."

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BY BRETT ROBINSON

Telstra Dome Steps Up

With the MCG out of commission due to the Commonwealth Games, Melbourne's other major sporting arena the Telstra Dome is set to experience one of its most intensive starts to a year in its short history. ATM catches up with arena manager Gavin Darby to look at the challenging months that lie ahead.

If Telstra Dome arena manager Gavin Darby isn't a U2 fan before their upcoming March tour of Australia, then chances are he probably won't be afterwards either. One of the world's biggest rock outfits is set to descend on the Dome for two massive shows, the first time the multi-purpose venue has hosted back-to-back concerts.

The U2 concerts land smack bang in the middle of what is set to be one of Darby's most challenging periods at the Dome. Not only will the much-talked about surface play host to U2 on two nights, but their visit is wedged between the venue's hosting of the Commonwealth Games sevens rugby and the first round of the AFL. Add to that a chock-full program of cricket and the preseason NAB Cup competition (formerly the Wizard Cup) and Darby and his crew have their work cut out.

"There's never a dull moment at the Telstra Dome with the variety of events we host," laughs Darby, who has been at the Dome since December 2004. "It's going to be a busy couple of months but it's pretty exciting and something we're looking forward to."

Arena manager Gavin Darby

With a busy December and January behind them, which included three stage builds in eight days (the RMIT graduation ceremony and Green Day concert among them) and three matches in the VB Series between Australia, South Africa and Sri Lanka, the upcoming schedule is even busier.

The portable wickets used for the VB Series were lifted after the final match on 3 February and then there is a break before the NAB Cup kicks off with a doubleheader on Saturday, 25 February (Hawthorn vs Richmond and Carlton vs Geelong). The following day sees Collingwood play St Kilda while the following Friday the winners of the Brisbane/Essendon and Bulldogs/Melbourne matches square off at the Dome. The arena is more than likely get a semi-final (10 or 11 March) if a Melbourne team makes it through the knock-out stages.

From there it's a quick turnaround for the Commonwealth Games which take over the venue from Monday, 14 March. The Dome will play host to the rugby sevens competition over two days (Thursday, 16 and Friday, 17 March) with two full days of training between 7am-7pm beforehand.

Each day of competition during the Games is split into a morning and afternoon session with a two-and-a-half hour break in between which will enable Darby and his crew to repair divots and re-pattern the turf. If the NAB Cup final (18 March) is in Melbourne it will be played at the Dome which will mean an overnight changeover following the gold medal sevens match.

A week later U2 drop by and then there is less than a week to get the venue back into peak condition for an intensive start to the 2006 AFL season. With the MCG out of commission until ANZAC Day (round four), the Dome will host four matches in the opening round and 11 matches within the first three weekends. Even though there is that early season glut of games, the Dome will host just one more AFL game this year than it did in 2005 (50 games compared to 49).

Later on this year the Dome will host a rugby union Test between Australia and England on 17 June and on 5 July rugby league comes to town with the venue hosting the final match in the State of Origin series. The union Test will involve another overnight transformation as it is sandwiched between two AFL fixtures, while the midweek Origin match is flanked by two weekend matches either side.

INTO THE UNKNOWN

Darby says without a doubt the biggest challenge ahead will be the U2 concert and the short downtime between that and the first AFL game between the Western Bulldogs and Richmond on Friday, 31 March.

The U2 stage build will start on the morning of Sunday, 19 March and be ready for sound check on Thursday. After the last concert on Saturday the set should be pulled down by the end of Sunday which leaves just four and a half days to get the surface prepared for the first AFL game.

"Concerts cause a lot of wear and tear and obviously there is going to be concentrated stage damage after U2 which means we will have to replace some turf," says Darby, who originally hails from New Zealand where he

The Telstra Dome is gearing up for a hectic couple of months as it hosts two U2 shows, the Commonwealth Games and a stack of AFL matches

was a golf course superintendent before coming over to Australia in 2003.

"The U2 stage is a normal size but it has a horseshoe shaped area out the front that extends 20-25m. We will protect the remainder of the arena with turf protection products as best we can.

"We tried something new for the Green Day concert in December which was quite successful. We cordoned off the northern end of the ground, where we have all our problems in the winter, so we managed to contain patrons in the front half of the arena. Even though we will have more on the arena itself for U2 (about 25,000) we think we can fit them in the front half and protect that 5500m^2 section of turf which will be a big plus for us come the start of the AFL season.

"The stadium has never staged back-to-back concerts so the damage we will suffer is a little bit unknown. The flooring is going to be down for between three and four days and the time frame of the two concerts doesn't allow us to lift that in between. So it's a case of wait and see."

SYNTHETIC SET-UP

Helping to reduce the impact such concerts have on the surface is a new synthetic turf system which was installed around the arena's boundary last November.

Over the past one-and-a-half AFL seasons trials on various synthetic surfaces have been in place to remedy problematic areas around the boundary. Following the trials, which involved extensive video analysis and consultation with the AFL, the AFL Players' Association and the Dome's tenant clubs, a surface was chosen following a couple of minor modifications.

"The boundary areas have always been a real problem," says Darby. "The interchange was a high wear area and new turf would often struggle to get through the weekend if it had just been laid. In the middle of summer some of those areas still only get a couple hours of light a day and are in shade by midday.

"There is also a lot of media activity along the boundary and with the scrolling advertising signs they're changed every match so there's further wear there. Having the synthetic turf there can negate that and will also be very useful when we have stage constructions. We can get forklifts around there and it will protect the arena from more damage.

"The trials we had were very beneficial and we made a few modifications before installing the synthetic surface. We had initially thought on having it out three-and-a-half metres from the fence but we brought that back to three metres, so there's now a two-metre buffer zone between the painted boundary and the start of the synthetic surface."

The surface, called Poligras MT and manufactured by Dandenong-based Sports Technology International, is constructed on a full road base. The existing sand profile was excavated down to the gravel layer over which a geotech fabric was laid along with 150mm of crushed rock and 30mm of asphalt. A 20mm paved rubber shock pad was then laid with the turf system sitting on the top.

The synthetic fibres in the grass system are 60mm long with the bottom 20mm of the profile filled with sand to weight it and then there is a 20mm of fine shredded rubber with the remainder of the fibres sticking out the top.

GROUND BREAKING TECHNOLOGY

Aside from the new synthetic turf system around the boundaries, in the latter part of 2005 the Dome trialled the use of a climate control system to help extend the life and improve the recovery potential of the turf (**see AGCSATech Update, ATM Volume 7.6**).

Called the Perennial Climate Control system, it was used initially to help in the preparation of the portable wickets for the Johnnie Walker Super Series and following the three matches, trials were established to see how it could be adapted and used elsewhere on the surface.

"It was a very worthwhile exercise bringing it over here from New Zealand," says Darby. "We did a lot of work with it and once we finished using it for the pitches we set it up more as a lighting rig to use on other parts of the ground. We changed the type of light and intensity the unit produced and we made some interesting discoveries.

"It has gone back to the developers who are now trying to progress it further. They're working in conjunction with our seed producers PGG who have some trial works set up in Christchurch looking at improving efficiency.

"We also have a hydroponics contractor looking at producing some lighting systems for future trials. We are always looking at trying to find solutions for sure because the Telstra Dome is a very challenging arena to grow turf."

Australian Golf Course Superintendents' Association - Celebrating 25 Years

The old course at St Andrews is generally considered to be the world's oldest golf course. The oldest known golf club, the Honourable Company of Edinburgh Golfers, was formed in 1744 followed by the Royal and Ancient Golf Club of St Andrews 10 years later.

It took a further 100 years before courses were constructed in Australia. It began with rough hewn golf courses where holes were cut in the best bits of available paddock and moved to more carefully selected sites. Purpose designed and built courses followed, and while course architects were lauded very little was said of those who toiled for hours with a horse and plough to make the dream a reality.

As people became more interested in golf, the demand on facilities grew. Inevitably, maintaining a course became a task for a whole team led by the skills of what we now know as golf course superintendents. This is the story of how they came to form an Australia-wide association.

HUMBLE BEGINNINGS

The Australian Golf Course Superintendents' Association (AGCSA) grew out of the state associations. In Victoria, an association of curators is widely believed to have formed in 1927. In the mid-1920s, before a greenkeepers' association was formed in New South Wales, committees, head greenkeepers and secretaries met regularly to discuss problems at their clubs. In 1932 the New South Wales Greenkeepers Association (NSWGA) was formed.

Seven years later, The Australian Greenkeeper, a quarterly journal published in Sydney and established in 1936, announced that the Queensland Greenkeepers' Association had been formed along similar lines to the NSW association.

Anecdotal evidence suggests that Alan Barlow, a greenkeeper who moved from Victoria to Royal Perth Golf Club after World War II, attempted to start a curators' association in Western Australia. In the late 1960s or early 1970s Barlow kept in contact with the NSW and Victorian associations, which was made all the more easier because his brother Les was the president of the Victorian association.

Although the South Australia meeting minutes have gone astray, Bob Dellow, who became a greenkeeper in 1964, believes that an association existed in SA throughout the 1950s.

While attending a conference in Melbourne in 1974, Tasmania delegates were told if they wanted to continue to attend conferences, they should form an association. They did a year later.

COMMON AIMS

Education has been a constant thread running through the story of all the state associations. The tradition of getting together to learn from each other dates back to the beginning of the NSWGCSA. From the 1930s the association also teamed up with the NSW Department of Agriculture to provide a diploma course in greenkeeping at Sydney Technical College.

In 1939 the QGA wished to set up a diploma course in greenkeeping in co-operation with the Queensland Golf Council. The QGA also planned to conduct educational field days for greenkeepers, taking over this responsibility from the Queensland Board of Greenkeeping Research. During the 1960s, these field days were held four times a year.

From the late 1950s through to the late 1980s the Victorian association held general meetings four times a year, with a round of golf following each meeting. Various state associations started inviting guest speakers to meetings and in South Australia in the 1970s, scientific education was the emphasis of such meetings.

Former South Australian association president Bob Dellow recalls that meetings took place at different courses every two months or so and usually included a course inspection, speaker, luncheon and association meeting. ▶

2006 marks the 25th anniversary of what the turf industry now knows as the Australian Golf Course Superintendents' Association. Since its first incarnation in September 1981, the association has continually developed and is now recognised as one of the wider turf community's foremost industry bodies. In recent times the AGCSA commissioned a document outlining the development of the organisation and what follows is a short summary of that history.

Known by a number of names, it wasn't until 1981 that the Australian Golf Course Superintendents' Association changed its name to the one the industry knows today

TIMELINE

1920s FIRST INCARNATIONS OF NSW AND VICTORIAN GREENKEEPER ASSOCIATIONS FORMED.

1932 NEW SOUTH WALES GREENKEEPERS ASSOCIATION (NSWGA) FORMED.

MID 1930s START OF FORMAL GREENKEEPING EDUCATION. NSWGA TEAMS UP WITH NSW DEPARTMENT OF AGRICULTURE TO PROVIDE DIPLOMA COURSE IN GREENKEEPING AT SYDNEY TECHNICAL COLLEGE.

1939 THE AUSTRALIAN GREENKEEPER, A QUARTERLY JOURNAL PUBLISHED IN SYDNEY, ANNOUNCES QUEENSLAND GREENKEEPERS' ASSOCIATION FORMED. QGA LOOKS INTO SETTING UP A GREENKEEPING DIPLOMA IN CO-OPERATION WITH THE QUEENSLAND GOLF COUNCIL.

1950s ANECDOTAL EVIDENCE SUGGESTS EXISTENCE OF SA ASSOCIATION. EASTERN SEABOARD STATE ASSOCIATIONS BEGIN TOURS, VISITS AND CONVENTIONS.

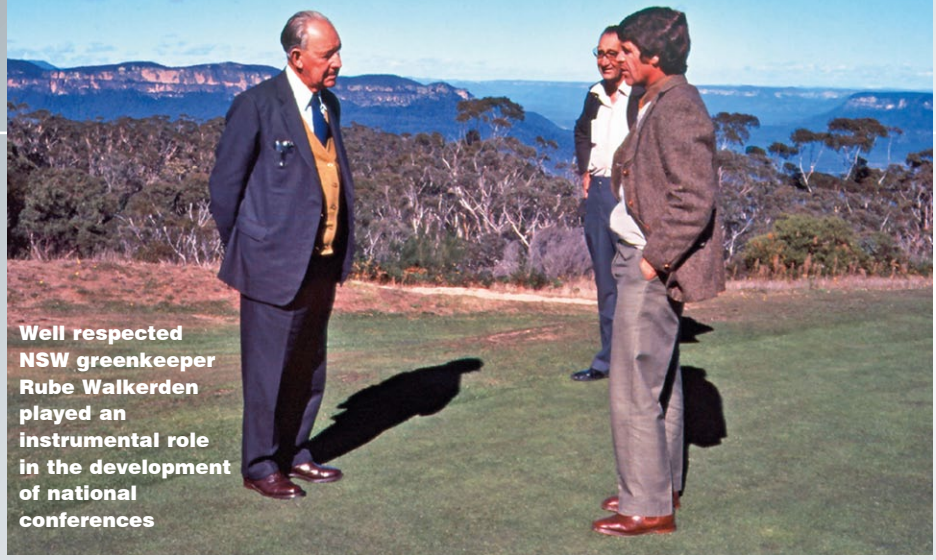
1969 1ST NATIONAL TURF CONFERENCE HELD IN SYDNEY FROM 12-16 MAY.

1972 NATIONAL CURATORS' CONFERENCE IN ADELAIDE SEES DECISION TO FORM NATIONAL BODY - THE AUSTRALASIAN GOLF COURSE TURF MANAGEMENT ASSOCIATION (AGCTMA). LES BARLOW ELECTED PRESIDENT ALONGSIDE BILL POWELL (VICE-PRESIDENT) AND RUBE WALKERDEN (SECRETARY/LIAISON OFFICER).

1975 TASMANIA FORMS ASSOCIATION.

Speakers were usually 'scientific types' including CSIRO soil scientist Jack Harris. Members wanted agronomic information so speakers from companies tended to be chemists and productions people instead of sales representatives.

Curators in Tasmania during the 1970s would meet at a different course every month or so to examine problems and discuss solutions together and by the 1980s monthly meetings of the Western Australian association were usually combined with golf days.



Well respected NSW greenkeeper Rube Walkerden played an instrumental role in the development of national conferences

FROM INTERSTATE TOURS TO NATIONAL CONFERENCES

The state associations also co-operated to run national conferences which had their origins in tours by delegates. From 1957 to 1969 at least five tours, visits or conventions were formally organised by eastern seaboard state associations. A typical tour would include inspections of various golf courses, providing opportunities for greenkeepers from different states to learn from one another.

Occasionally, tours included venues other than golf courses. In 1964 for example, the Victorian tour included a visit to Burnley Horticultural College and the Melbourne Cricket Ground.

The conference dubbed the 1st National Turf Conference was held in Sydney from 12-16 May, 1969. Delegates visited 13 golf courses and the Ryde College of Horticulture, and inspected turf machinery. From 1969 to 1972, tours became increasingly formalised with one consistent element being the involvement of long-serving organising secretary Rupert 'Rube' Walkerden of the New South Wales association. He determined national conference venues and was involved in other national activities.

Dene Goldsack from South Australia recalls: "In the early conferences state bodies would organise buses – they would tour club to club, inspect courses, have a meal and a drink and then go to bed. And then you'd do it all again the next day."

Conferences provided the opportunity for greenkeepers to learn informally from the experience of others, and to make important discoveries. Reg McLaren, a head greenkeeper in New South Wales, identified the first infestation of Argentine stem weevil on a course inspection in Adelaide in the early 1980s.

During the 1970s the conferences changed with more scientists presenting papers. In 1978 more than 170 people attended the 5th National Turfgrass Conference which introduced a 'new product parade' and had an open forum session. Then in 1982 a conference segment entitled 'Thinking Superintendents' was introduced to encourage superintendents to present papers.

The move to a truly national association occurred during preparations for the 1988 Perth conference. Minutes of a telephone meeting on 12 September, 1987 mention that the national president should promote conferences if the national association was going to run them.

The 1990 conference held at the Hilton Hotel, Sydney and Bonnie Doon Golf Club was the last one to be run by a state body. From 1992, conferences were run by the newly incorporated Australian Golf Course Superintendents' Association.

The financial success of the conferences has helped the AGSCA to move forward as an organisation in its own right, and they continue to grow in stature each year.

In 2004, the 20th Australian Turfgrass Conference attracted over 850 delegates for a week-long program of seminars, a two-day tradeshow which attracted over 80 of the turf industry's largest companies and 1000 visitors. With a cast of speakers that included some of the world's foremost agronomists, the conference was lauded as the largest turf industry gathering ever in the Southern Hemisphere.

THE AGCSA COMES OF AGE

The AGCSA, which began as a loosely associated national body that allowed the states to co-operate in running biennial conferences, has today become a company limited by guarantee.

In mid-1967 the president of the New South Wales association Cliff Meredith invited the Queensland Greenkeepers Association to unite with them but it wasn't until the National Curators' Conference in Adelaide in 1972 that a decision was made to form a national body.

To be known as the Australasian Golf Course Turf Management Association, then Victorian association president Les Barlow made the announcement at the conference and reported that three office bearers had been elected Les Barlow (president), Bill Powell (vice president), and Rube Walkerden (secretary/liaison officer).

Making the choice to form an association proved easier, however, than implementing the decision. Disagreements between state associations on various issues were to be part of the process of forging an association. One of the main objections was over the name of the national organisation.

The cumbersome title Australasian Golf Course Turf Management Association eventually

The tradeshow has become a key component to the successful running of the annual turfgrass conferences

gave way to Golf Course Superintendents Association of Australia, a name change which the Queensland association endorsed in March 1978.

Vince Church, a prominent NSW greenkeeper and superintendent, stated in his 1978 national president's report that 'most delegates agreed that golf course management in Australia became more professional when it was resolved by the executive committee that the national association name be changed to the Golf Course Superintendents Association of Australia. A reshuffle of words brought the name around to what is known today as the Australian Golf Course Superintendents' Association (AGCSA) in September 1981.

After decades of ongoing debate, the AGCSA was finally incorporated as a company limited by guarantee on 1 August, 1991. Members of the association were to elect four office bearers – president, vice-president, secretary and treasurer – at the inaugural annual general meeting during the 12th National Turfgrass Conference in Launceston.

The part-time appointment of an executive officer was seen as a highly significant development that would result in the AGCSA becoming recognised as a major contributor to the turf industry in general and to golf in particular. Euan Laird became the association's first chief executive officer and held the post until 2002 when he stood down and was replaced by current chief executive Steven Potts.

ENTERING A NEW ERA

Since 1991, the AGCSA has continued to grow from strength to strength in not only the promotion of the industry but as an organisation servicing a wide and varied membership base.

One of the association's key roles has been to raise the profile of the industry. It has done this through the advent of a national ▶

1978 MORE THAN 170 PEOPLE ATTEND THE 5TH NATIONAL TURFGRASS CONFERENCE WHICH INTRODUCES A 'NEW PRODUCT PARADE' AND 'OPEN FORUM' SESSION.

1978 AGCTMA CHANGES NAME TO GOLF COURSE SUPERINTENDENTS ASSOCIATION OF AUSTRALIA.

1981 NAME CHANGE TO AUSTRALIAN GOLF COURSE SUPERINTENDENTS' ASSOCIATION (AGCSA) IN SEPTEMBER.

1990 CONFERENCE HELD AT HILTON HOTEL AND BONNIE DOON GOLF CLUB IN SYDNEY THE LAST ONE TO BE RUN BY A STATE BODY.

1990 AGCSA BEGINS AWARDS PROGRAM. GREG SMITH WINS INAUGURAL FELLOWSHIP AWARD.

1991 AGCSA BECOMES INCORPORATED AS A COMPANY LIMITED BY GUARANTEE ON 1 AUGUST. DOUG ROBINSON ELECTED AS PRESIDENT.

1992 AGCSA BEGINS TO RUN NATIONAL CONFERENCES.

1992 EUAN LAIRD APPOINTED FIRST CHIEF EXECUTIVE OF AGCSA IN NOVEMBER.

1994 WAYNE HINTON ELECTED AGCSA PRESIDENT.

1996 INAUGURAL CLAUDE CROCKFORD ENVIRONMENTAL AWARD GOES TO RODNEY FENTON.

Celebrating 25 Years

awards program, the publication of a national turfgrass magazine, the development of an agronomic wing, and the introduction of the AGCSA website.

The AGCSA Awards have grown to be an integral part of the annual conferences, and started in 1990 with the introduction of the Fellowship Award, which was first won by Greg Smith. In 1996 the AGCSA introduced the Graduate of the Year Award and the Claude Crockford Environmental Award (named after the famous Royal Melbourne Golf Club superintendent) and a year later added the Distinguished Services Award bestowed by the AGCSA Board. In 2000, the Fellowship Award became the Excellence in Golf Course Management Award.

The AGCSA has also been heavily involved in the publication of a national turfgrass magazine. After initial dealings with TurfCraft International and Golf and Sports Turf Australia, the AGCSA launched its own publication Australian Turfgrass Management magazine in 1999.

One of the biggest developments in recent times, however, was the formation of the association's agronomic wing. AGCSATech is a self-funding division that enables the AGCSA to embark on research programs directed

Education was a key component of the national association and from humble beginnings today's education seminars and conferences attract some of the biggest names in the industry

AGCSA Presidents (1991-Present)

1991-1994: Doug Robinson
1994-1996: Wayne Hinton
1996-2001: Peter Frewin
2001-2004: Mark Couchman
2004-Present: Jeff Gambin

AGCSA Award Winners

AGCSA Distinguished Service Award
1997: Bill Powell
1998: Vince Church
1999: Neil Adams
2000: Peter McMaugh
2001: Peter Martin
2002: Doug Robinson and Peter Sawyer
2003: Dene Goldsack
2004: Ray Keane
2004 Posthumous: Claude Crockford, George Rüb, Rupert 'Rube' Walkerden, Mick Morcom, Vernon Morcom
2005: Peter Brown

AGCSA Claude Crockford Environmental Management Award
1996: Rodney Fenton
1997: Jon Penberthy (Gainsborough Greens Golf Club, QLD)
1998: Kevin Wellard
1999: Mick Russell (Werribee Park Golf Club, VIC)
2000: Ben Tilley (Beewah Golf Club, QLD)
2001: Andrew Baker (Sanctuary Cove Golf Resort, QLD)
2002: Jeff Austen (El Caballo, WA)
2003: Spiros Skaftouros (Growling Frog Golf Club, VIC) and Darren Watson (Horizons Golf Club, NSW)
2004: David Warwick (Avondale Golf Club, NSW)
2005: Scott McKay (North Lakes Golf Club, QLD) and Ben Marshall (Club Pelican, QLD)

AGCSA Excellence in Golf Course Management Award
1990: Greg Smith
1991: Gary Dempsey
1992: Darren Cribbes
1993: Trevor Strachan
1994: Richard Forsyth
1995: Jeff Gambin
1996: Jeff Lane
1997: John Geary
1998: Wayne Marland
1999: Pat Pauli (Horton Park Golf Club, QLD)
2000: Allan Devlin (Secret Harbour Golf Club, WA)
2001: Mark Gahan (The Dunes/13th Beach Golf Club, VIC)
2002: Gary Bass (Croydon Golf Club, VIC)
2003: Idris Evans (Western Australian Golf Club, WA)
2004: Peter Schumacher (Elanora Golf Club, NSW)
2005: Darren Jones (St. Michael's Golf Club, NSW)

AGCSA Graduate of the Year Award
1996: Jason Blacka
1997: Ian Johnston
1998: Jason Garbutt
1999: Stephen Heskett (Federal Golf Club, ACT)
2000: Brett Barsby (Royal Queensland Golf Club, QLD)
2001: Scott Carruthers (Pennant Hills Golf Club, NSW)
2002: Glenn Dawson (Federal Golf Club, ACT)
2003: James Dalton (13th Beach Golf Club, VIC)
2004: Craig Webley (Lakelands Country Club, WA)
2005: Damien Bell (Wellington Golf Club, NSW)

at providing independent data and solutions to some of the most important problems confronting Australian superintendents. One of its main roles is to provide a host of research and technical/advisory services.

AGCSATech was formed in March 2000 and one of Australia's foremost agronomists John Neylan was brought on board to head the new division. Andrew Peart joined AGCSATech in 2002 as the division's first technical officer.

While AGCSATech provided another way in which the association could service its members, another important step was taken in 2004 with the redevelopment of the AGCSA website www.agcsa.com.au. The website was revamped to include a host of new features, which means the association can better service and disseminate information to its growing membership base.

The AGCSA has also taken a proactive role in major issues including environmental management and education. At the 19th Australian Turfgrass Conference in Adelaide, the National Turf Education Working Group was formed.

Comprising members of education institutes and the wider turf industry, the committee's major focus is to monitor the educational pathway within the turf industry and make recommendations to the Australian National Training Authority by means of representation on the national amenity/horticulture advisory committee. At the 20th Australian Turfgrass Conference the group celebrated its first major achievement with the Certificate III Horticulture Delivery and Assessment Guides.

In 2004, the AGCSA also formulated the Environmental Management Working Group in conjunction with the Australian Golf Union. This group has been charged with developing a long-term strategy that not only increases environmental management within the industry, but boosts awareness of the public about the advances made on golf courses and the positive environmental impact.

CONCLUSION

From its first incarnation in 1981, the AGCSA has grown steadily to now boast almost 700 members from all states of Australia, New Zealand and the Pacific Rim. The continuing role of the AGSCA is to promote the profession of turfgrass management, provide continuing educational opportunities to members, and ▶

1996 PETER FREWIN ELECTED AGCSA PRESIDENT.

1997 BILL POWELL BESTOWED FIRST DISTINGUISHED SERVICE AWARD.

1999 AGCSA LAUNCHES AUSTRALIAN TURFGRASS MANAGEMENT MAGAZINE.

2000 FELLOWSHIP AWARD BECOMES EXCELLENCE IN GOLF COURSE MANAGEMENT AWARD.

2000 AGCSATECH FORMED WITH JOHN NEYLAN AS MANAGER.

2001 MARK COUCHMAN ELECTED AGCSA PRESIDENT.

2002 STEVEN POTTS BECOMES AGCSA'S SECOND CHIEF EXECUTIVE AFTER EUAN LAIRD STEPS DOWN.

2003 NATIONAL TURF EDUCATION WORKING GROUP FORMED DURING ADELAIDE CONFERENCE.

Celebrating 25 Years

The beginning of a national awards program in the 1990s has helped highlight and promote the excellent work of industry practitioners

provide support services and information to turf managers to assist them in their professional development.

The overall goal of the AGCSA was best described by Indooroopilly Golf Club superintendent and long-time industry member Peter Sawyer in 1991 when he said, "The fact is…we're not trying to give dollar value out of this association – we're trying to give support to superintendents. That is the key to all of this… we're here supporting the superintendents of Australia."

ACKNOWLEDGEMENTS

The AGCSA wishes to thank Fiona Walters and Bruce Pertzel who compiled the original historical material and to all those who took part in the project.

2004 THE 20TH AUSTRALIAN TURFGRASS CONFERENCE ATTRACTS OVER 850 DELEGATES AND 1000 TRADESHOW VISITORS, THE LARGEST TURF INDUSTRY GATHERING EVER IN THE SOUTHERN HEMISPHERE.

2004 AT THE 20TH AUSTRALIAN TURFGRASS CONFERENCE THE AGCSA POSTHUMOUSLY BESTOWS THE DISTINGUISHED SERVICE AWARD UPON FIVE INDUSTRY LEGENDS – CLAUDE CROCKFORD, MICK AND VERNON MORCOM, RUBE WALKERDEN AND GEORGE RÜB.

2004 AGCSA FORMS ENVIRONMENTAL MANAGEMENT WORKING GROUP IN CONJUNCTION WITH THE AUSTRALIAN GOLF UNION.

2004 JEFF GAMBIN ELECTED AGCSA PRESIDENT.

2005 THE NATIONAL TURFGRASS CONFERENCE IS HELD AT A REGIONAL VENUE FOR THE FIRST TIME. OVER 400 DELEGATES ATTEND THE WEEK-LONG CONFERENCE IN ECHUCA-MOAMA.

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AGCSATech Update

BY JOHN NEYLAN

In this instalment of AGCSATech Update, John Neylan reviews the 2005 Australian Open at Moonah Links and details the results of a *Poa annua* seed bank trial conducted in the latter half of last year.

The presence of extensive amounts of basalt rock has added an extra challenge in the construction of the new Sunshine Golf Club.

2005 AUSTRALIAN OPEN

In 2005 AGCSATech was again privileged to have a close association with the Australian Golf Union and Moonah Links in the lead up to and during the Australian Golf Open. It was the second time the tournament had visited the Mornington Peninsula course, hosting it back in 2003.

During 2003 there was a lot happening around the complex. Not only were groundstaff conditioning the Open course for the tournament, there were a raft of side projects including the completion of the Legends course, the construction of the Australian Institute of Sport facilities as well as a large putting green in the middle of the hotel complex. For 2005 there was more time available to be spent on conditioning the turf rather than growing it in and developing a mature surface.

Superintendent Leigh Yanner once again expertly managed the maintenance at Moonah

The new site of the Sunshine Golf Club in Melbourne's West

Links with his very capable assistants Scott Calder and Nathan Bennett. The groundstaff was hard working and enthusiastic and it was great to see how the 'old hands' had developed since the 2003 Open. Several of the crew in 2003 had come from non-turf backgrounds and it was pleasing to see that for this event they had taken on more responsibility.

The turf condition for the 2005 Open was excellent, with the Penn A1 greens providing a putting surface that was of a very high quality. The surfaces were of a moderate pace, smooth and true. The Legend couchgrass fairways had matured considerably since 2003 and provided a uniform and high quality playing surface.

In 2003, Spring Dead Spot caused damage on some fairways and it again appeared in 2005, but on different fairways despite a program of fungicide treatments, vertidraining, dethatching and fertilising. The spring was relatively warm and humid and the couchgrass responded with good green up and early growth.

Given that the Mornington Peninsula appears to be the mite capital of Australia, the fairways also had to be treated so as not to retard the growth of the couchgrass, particularly where there had been Spring Dead Spot damage.

The tournament week was very windy and the Moonah beast certainly bared its teeth. While there was hope for some wind, there was definitely no desire to experience such strong winds.

The greatest challenge was on the Friday when there was a strong north-east wind and high temperatures. The much-publicised 12th green was the most vulnerable under these conditions with the gusting wind blowing directly down a slope through the line of the pin and on a drying surface there were issues with balls potentially being blown off the green.

The 12th green, with its back to front slope and very steep surrounds, is very difficult to keep the ball near the hole when playing from the back of the green. A decision was made early on by the head rules official to syringe the green between groups, which held the ball up sufficiently to prevent it from potentially blowing off the surface.

The remaining 17 greens behaved themselves and demonstrate what a fine line it can be when design, pin placement, weather and preparation combine to increase the degree of difficulty. During this very challenging period the groundstaff handled the situation very well and most professionally.

Moonah Links copped plenty of comment from golfers during the tournament that it was all too difficult. As an observation, the point needs to be made that the players that were mentally tough made a good fist of it while others that were less composed collapsed.

There has been much discussion about how the turf may be prepared to 'ease' some of the challenges presented by design and weather. However, it is apparent that it would be easy to over-compensate and then have the whinge that "the greens are too slow and do not putt true". Would the 8-9 foot green speeds that one professional was calling for be acceptable?

GOLF COURSE CONSTRUCTIONS

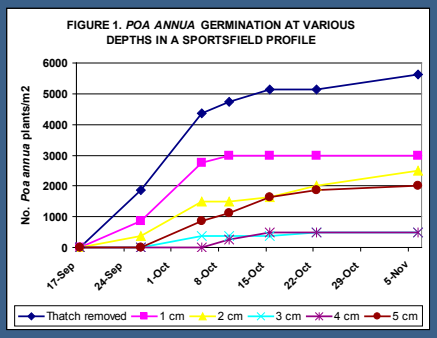
In recent months I have inspected two new golf courses under construction in Victoria. The courses – Sandhurst No.2 and the new Sunshine golf course – are both being constructed on challenging sites.

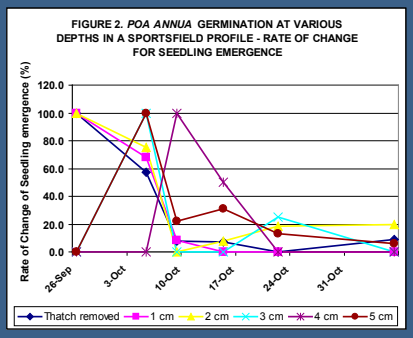
Sandhurst No.2 is a Thomson Perrett design and is being built on fine-textured and dispersive soils with the site having very little good quality topsoil for fairway construction.

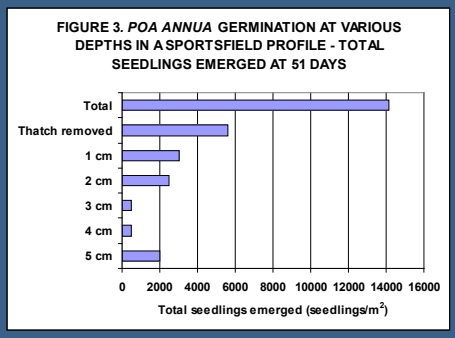
A decision was made that fairway drainage was critical and that sand capping the fairways was required with sand being imported from Rye on the Mornington Peninsula (in the same region as Moonah Links, The Dunes, Eagle Ridge etc.). Turnpoint is undertaking the construction works with the first few holes taking shape.

The new Sunshine golf course is the relocation of the Sunshine Golf Club in Melbourne's western suburbs, which is part of a residential redevelopment on the old site. The new golf course is on the site of what was the University of Melbourne's agricultural research station and any agricultural scientists that graduated in the 1970's and 1980's would ▶

BY JOHN NEYLAN







have spent their second year of studies at the Mt. Derrimut field station. The new course is designed by Pacific Coast Design and being constructed by Densal.

The Mt. Derrimut site is on the start of the western plains of Melbourne, which are characterised by their fine-textured volcanic soils and subsoil basalt 'floaters'. The presence of extensive amounts of basalt rock has made it difficult to construct the golf course, however, excellent progress has been made to date.

POA ANNUA SEED BANK

With the recent conversion of many cool-season sportsfields to couchgrass and kikuyu using the field top maker to strip the existing vegetation prior to planting, there is always the issue of how much *Poa annua* will germinate and how that may be best controlled. The simplest solution is to use the pre-emergent Oxadiazon at planting, however, for economic or other reasons this does not always take place.

A suburban sportsfield was recently being prepared for resurfacing and there was discussion regarding what depth of material should be removed and how this would affect the germination of *Poa annua*.

A small trial was undertaken to determine the effects of removing different depths of material on the number of plants germinated. Fifty millimeter diameter core samples were taken from a sportsfield that was heavily infested with *Poa annua*. There were six treatments as follows;

- T1: Removing the thatch layer only.
- T2: Removing the thatch plus 1cm of soil below the thatch.
- T3: Removing the thatch plus 2cm of soil below the thatch.
- T4: Removing the thatch plus 3cm of soil below the thatch.
- T5: Removing the thatch plus 4cm of soil below the thatch.
- T6: Removing the thatch plus 5cm of soil below the thatch.

The plugs were planted into pots and arranged in a completely randomised block design, watered and fertilised to stimulate germination. The number of seedlings that emerged was counted on six occasions over a period of 51 days. The results are detailed in Figures 1-3 and Table 1.

As would be expected the highest seedling population occurred where the thatch only was removed though there are still substantial numbers of viable seeds even at 5cm below the thatch layer.

There were significant differences in seedling numbers between the various depths on the first three assessment dates. At nine days after planting, treatment one had significantly greater seedling numbers than all other depths except for treatment two.

At 18 days after the treatments commenced, treatment one had significantly greater seedlings compared to treatments four, five and six. By 22 days after treatments commenced, treatment one had significantly greater seedlings compared to treatments four and five. At the remaining assessment dates there was no significant difference between treatments.

TABLE 1. *POA ANNUA* SEEDLINGS/M²

TREATMENT	26/09/2005	5/10/2005	9/10/2005	15/10/2005	22/10/2005	6/11/2005
Thatch removed	1875	4375	4750	5125	5125	5625
1 cm	875	2750	3000	3000	3000	3000
2 cm	375	1500	1500	1625	2000	2500
3 cm	0	375	375	375	500	500
4 cm	0	0	250	500	500	500
5 cm	0	875	1125	1625	1875	2000
LSD (P<0.05)	1480	3350	4000	NS	NS	NS

The results of the trials indicate that;

1. There can be a large seed bank in sportsfields dominated by *Poa annua*;
2. A combination of stripping the thatch layer and then cultivation of the surface layers exposes a very large seed bank;
3. Seeds close to the surface germinate relatively quickly;
4. Over time, seeds deeper in the profile germinate indicating that there is relatively strong dormancy in these seeds and they require greater exposure to light, air and water before germination occurs;
5. The total seedling numbers vary from 2000-5625seeds/m²;
6. At 29 days after treatment there was no significant difference in the seedling numbers between the various depths. This is a reflection of the variability between the replicates but also indicates that there are substantial seed numbers at 5cm depth, which will eventually germinate;
7. The lag time between the germination of the seeds at or near the surface and those deeper in the profile will affect the weed control program; and
8. The extended period of germination indicates the value of using pre-emergent herbicides wherever possible, particularly on warm-season grasses rather than multiple applications of post-emergent herbicides.

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In this instalment of Tech Talk, Andrew Peart examines the use of recycled water for irrigation and the implications that turf managers need to take into consideration.

Recycled water quality – Is it good enough?

It is not uncommon that many golf courses are facing the prospect of having to use alternative water sources to ensure their future. This trend has already begun with many courses securing effluent water as their major water source. Effluent water, recycled, reclaimed or wastewater are all terms used for water that has undergone some treatment that is then seen fit for use as irrigation water.

The level of treatment differs from primary through to tertiary but the additional treatment rarely improves the parameters required for turfgrass growth. Water treatment is highly centred on issues that concern public health, and deservedly so, and are therefore centred around bacteria and other biological factors as well as suspended solids.

Therefore when the terms Class A water or tertiary treated water are suggested as being high quality water this is purely in regards to their impact on public health and not necessarily their suitability for irrigation purposes.

Factors that most affect suitability for irrigation are salinity, sodium and bicarbonate levels. These all tend to be higher in recycled water than potable water and require additional management if there is not to be a deleterious affect on turfgrass quality.

SALINITY

When the term water quality is mentioned, the first question people tend to ask is what is the salinity or salt content of the water. Salts that contribute to total salinity include sodium and chloride but also calcium, potassium, magnesium, sulfate, nitrate and bicarbonate. Most are beneficial to turfgrass growth, but others can become toxic at too high concentrations.

The rate at which salts accumulate to undesirable levels in the soil depends on the concentration in the irrigation water, the amount of water applied via irrigation, precipitation and the soil's chemical and physical characteristics.

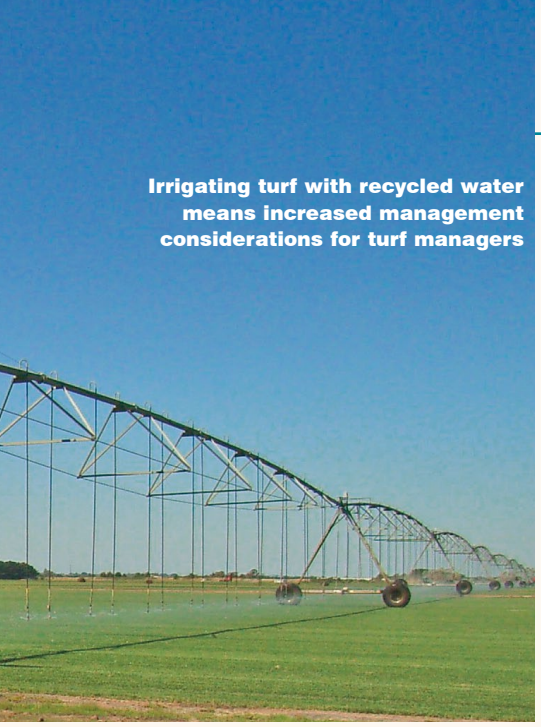
Salinity can be referred to in two ways. Firstly as its electrical conductivity (EC) which is directly related to the amount of salt in the water – the higher the salt content the higher the EC or its ability to conduct an electrical current. This is often expressed as decisiemens per metre (dS/m) or millimhos per centimetre (mmhos/cm). Both these terms are equal to each other i.e 1 dS/m = 1 mmhos/cm = 1000uS/cm.

The second reference to salinity is the term total dissolved solids (TDS) and this can be reported as parts per million (ppm) or milligrams per litre (mg/L). Where 1ppm = 1 mg/L. The following equation is used to convert EC to TDS:

EC (mmhos/cm or dS/m) x 640 = TDS (ppm or mg/L)

Most water that is acceptable for turfgrass irrigation contains from 200 to 800ppm soluble salts. Water with higher salinity levels can cause saline conditions that inhibit water uptake by turfgrasses and cause a salt-induced drought stress. Symptoms include reduced growth, discolouration and wilting. These symptoms are witnessed if salt water accumulates in the rootzone or previously accumulated salts below the rootzone rise up through capillary action into the rootzone.

This tertiary treatment plant in south east Melbourne supplies Class A water to turf facilities and other agricultural properties in the region



Irrigating turf with recycled water means increased management considerations for turf managers

This second scenario could well occur in a golf green with a perched water table where salts have accumulated and may rise during periods of high evaporation. To avoid capillary rise, sufficient water must be applied to break the tension of the perched water table and periodically flush the accumulated salts out.

Management of saline irrigation water relies on irrigation quantity, leaching, drainage and selection of the most appropriate turfgrass species. Drainage becomes an important factor when high volumes of water are required to effectively leach salts from the profile. However, this additional leaching to remove salts also removes beneficial nutrients from the rootzone. This affects mobile ions, particularly with respect to potassium, magnesium, nitrate, iron and manganese.

Not only is water management critical in dealing with saline water but so to is cultivation, deep and shallow aeration. Cultivation will aid infiltration and percolation which will dictate how quickly salts can be removed from the profile rather than accumulating and possibly later rising through capillary action. Leaching should always follow cultivation practices so the affects of the cultivation can maximise leaching. However, prior to leaching ensure aeration holes have been backfilled so as not to leave behind a salt stressed zone in between aeration holes with water simply allowed to pass freely through open holes.

When irrigating with salt-affected water, apply more water than generally necessary to keep the salts moving down and avoiding salt layers near the turfgrass rootzone. Duncan et. al. 2000 state that the rule of thumb to minimise salt accumulation is to increase water volume by 12.5 per cent for each 640ppm rise in total dissolved salts in the irrigation water.

SODIUM

Sodium concentration in irrigation water has an affect on the plant directly but also indirectly through its interaction with the soil.

Sodium can be taken up by plant roots and transported to the leaves where it can accumulate and cause injury (similar symptoms to salt burn). It can also be absorbed directly through the leaves from sprinklers. However, this accumulation within the plant is less likely in turfgrasses because they are regularly being mown and sodium is therefore being removed from the plant.

The greater concern to turfgrass managers should be the effect sodium has on soil structure. Calcium is the primary ion that stabilises soil structure. When excessive amounts of sodium are present in the water it can dominate the exchange sites on colloid surfaces and displace the calcium ions. Therefore soil structure can be reduced through deflocculation of soil colloids (sodium ▶

TABLE 1: RECLAIMED WATER GUIDELINES – RECOMMENDED MAXIMUM VALUES

(Adapted from L.J. Stowell, 1999, Pointers on reclaimed water contract negotiation)

TDS (ppm)	960	Cl (ppm)	250
ECw (dSm^{-1})	1.5	Na (ppm)	200
SARw	5.7	Fe	5.0
adj SARw	11.6	Mn	0.2
RSC (meq L^{-1})	<1.25	Zn	2.0
HCO_3 (ppm)	250	Cu	0.2
B (ppm)	0.5	Ni	0.2

displacing calcium and magnesium) that reduces soil aeration and water infiltration.

This is calculated based on the ratio of sodium ions compared to calcium and magnesium ions and is called the Sodium Adsorption Ration (SAR). The SAR is more likely to be of concern on fine-textured soils where deflocculation is far more likely than on sand constructions. This can lead to the formation of sodic soils which tend to seal the surface because there has been a complete breakdown of the soil structure. Very few turfgrasses are then able to survive due to little or no water permeability.

BICARBONATES

Bicarbonate and carbonate levels in the water also affect the influence of sodium. Recycled water is likely to contain substantial bicarbonate levels and depending on pH will also contain amounts of carbonates.

During hot weather, bicarbonates may precipitate out and leave deposits of calcium carbonate (CaCO3) on the leaves from overhead sprinklers. This precipitation increases the SAR in the soil solution because it lowers the dissolved calcium and magnesium concentrations. A reduced amount of calcium and magnesium then restricts the amount of competition for sodium on the exchange sites. The remaining bicarbonates that are not precipitated out can then reduce the effectiveness of gypsum or sulphur treatments to the soil.

Therefore sodium permeability hazard can also be assessed from the term Residual Sodium carbonates and as a general rule should be calculated when bicarbonates (HCO_3^-) are greater than 120ppm. It is not necessarily the absolute figure of bicarbonates but also the amounts of carbonates, calcium, magnesium and sodium that can have a negative impact on turf growth. Duncan et. al. 2000 state that when HCO_3^- and CO_3^- concentrations exceed soluble Ca and Mg concentrations, water acidification may be needed if residual sodium carbonate and adjusted sodium adsorption ratios exceed 1.25 and 6 $meqL^{-1}$ respectively.

NUTRIENTS

All irrigation, particularly recycled water, will contain a certain amount of nutrients. This nutrient load must be taken into account and the fertiliser program modified. To calculate the amount of nutrients being applied through the irrigation water the total volume of irrigation water must be known. For example if the water contains 29mg/L of nitrogen then for every megalitre of water applied 29kg of N is being applied.

Not only are nutrients being supplied in the irrigation water, often sodium (depending on its concentration) may well be displacing them. This is generally the case with potassium so irrespective of the potassium in the water additional potassium may need to be applied on a 2-4 week basis to maintain a nutritional balance within the plant.

CONCLUSIONS

A greater number of golf courses and turf facilities will be required to use recycled water as their primary water source in the future. All these water sources will vary in terms of quality from one treatment plant to another and even within the treatment plant during the irrigation season.

Table 1 outlines reclaimed water guidelines for recommended maximum values. It would not be uncommon though for turf managers to have to use water that is higher than these values.

Poor quality water can be managed, but the quality of the water must be regularly monitored to ensure the correct management practices are being pursued to limit any deleterious affects of poor water quality on the overall quality of the soil and turfgrass plant.

CORRECTION

Last edition's instalment of Tech Talk 'Getting to the core of organic matter accumulation' contained a table on the impact of tine size and spacing on the amount of surface area impacted by core aerification. The bottom three rows of that table should have related to a tine size diameter of 5/8" and not 3/8" as was published. All other figures given in those three rows were correct, but correlate to 5/8" tines not 3/8". ATM apologises for any confusion caused.

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THE PULSE

The use of potable water for irrigating fine turf surfaces in Australia is becoming increasingly limited. Water restrictions are now permanently enforced in many states and the turf industry is coming to terms with the fact that one day potable water will no longer be an option for irrigation. In light of that, The Pulse asked five members of the industry how they are preparing for this eventuality and what challenges they face in doing so?

Richard Kirkby
Supt. Pennant Hills GC

Pennant Hills Golf Club currently relies 100 per cent on town water for irrigation but envisages that permanent water restrictions are imminent.

Pennant Hills commissioned Connell Wagner to explore irrigation options, develop a concept design for the preferred option and undertake an environmental impact assessment of this option. The three main options highlighted were on-site stormwater storage, sewer mining with a wastewater treatment plant (WWTP) and bore water.

The on-site stormwater option has been discounted because approval would be very difficult to achieve without costly and uncertain litigation. The bore water option would not meet the required demand and would also require costly treatment to reduce salinity. The sewer mining and WWTP option is both feasible and achievable and a concept design has been developed. The sewer mining option will involve extracting sewage from the 300mm sewer main that runs through the golf course along Devlin's Creek. A draft contract agreement with Sydney Water is being sought for a 30-year term with a further 30-year option to extract 98 per cent of the sewage for zero dollars.

The effluent would be pumped from an underground wet well pump station to a WWTP about 100m away. Storage will be 3 megalitres. The final treatment stage will involve chlorination of the treated water and, if necessary, ultraviolet disinfection. The treated water would be of a high quality and would support sustainable irrigation of the course. The WWTP would have the capacity to produce 17 megalitres per month.

Six companies will be short-listed and construction will hopefully start in May with a time frame of about 3-4 months and a cost around $3-3.4 million.

John Neylan
Manager AGCSATech

The use of high quality potable water for irrigating recreational turf is, in my opinion, no longer environmentally or socially acceptable. While recreational turf provides many community benefits, it is not essential for sustaining life – it enhances our lives. The demands of an increasing population and climate change, is forcing a reprioritisation of how this scarce resource is used to maximum benefit.

Recent droughts and widespread water restrictions have highlighted how scarce our water resources are and how essential water is in sustaining acceptable quality turf surfaces. The response to the long-term availability of water in general is variable depending on the immediate pressures and restrictions. Most of the planning at club/municipal level appears to be reactive rather than proactive and long-term planning to secure sustainable water supplies is almost non-existent.

Let us be realistic. The lack of a secure water supply for recreational turf is the single greatest threat to our industry. The question is, what are the options? The only realistic option is going to be the use of treated effluent.

While there have been numerous policies written about reclaimed water use and grand plans proposed, few have come to fruition outside of the immediate vicinity of wastewater treatment plants. Given the dire conditions with water supplies, why haven't there been pipelines constructed and reclaimed water piped into key recreational turf areas? There are several reasons – bureaucracy, apathy, a lack of commitment by potential users, who will pay, and the need to improve reclaimed water quality. Potable water for irrigation is not a long-term option. Water management planning is a matter of urgency and there has been a lack of planning for the future. However, it is not too late to start the process.

SYNGENTA VALUES THE OPINIONS OF THE TURF INDUSTRY AND RECOGNISES THE CONTRIBUTION OF SUPERINTENDENTS' RESPONSES WITH A $50 EDUCATIONAL VOUCHER

Justin Sheehan
Supt. Beverley Park GC

The use of potable water will never be the same as it has been in previous years. Since my appointment two years ago I have been unable to water fairways with only limited watering of greens and tees. As such, the club has looked at a few options including stormwater run-off, ground water and water reclamation. The stormwater option was expensive and not secure. The ground water option is still being looked at and the club is seeking advice from geotechnical consultants.

More recently our landlord, Kogarah Council, has been looking at an alternate water supply to service the golf course, Oki Jubilee Stadium, numerous playing fields, parks and gardens. While the club has limited funds, the council has financed a water reclamation project starting with a pilot plant that will produce 80kl/day. The council has also worked closely with Sydney Water to draw up contracts to extract sewer water. The pilot plant should be operational by early February.

The site will be alongside our 14th hole and once water quality has been monitored we will be able to use water for irrigation. Extensive soil testing has already been carried out on the golf course and will be closely monitored during the 10-week operation of the pilot plant. If all goes well the full-scale plant will produce around 750kl/day. Operational costs are still to be finalised, but it is not a cheap treatment process (about $1.60/kl).

CDS Technology is the company used in the pilot stage and the biggest issue facing them is controlling the salt levels entering the sewer pipes from the nearby bay. Other problems include the funding of the full-scale plant which is around $1.8 million. If all goes well we should see a dramatic improvement in the golf course, and it will be nice to see our fairway sprinklers working again.

Wayne Brown
Rain Bird, Australia

I believe it is inevitable, sooner or later, that potable water will no longer be available for sports turf irrigation and that this change should be embraced by the turf industry. Our industry has a chance to be recognised as a leader in the use of alternative and recycled water sources and their management, and we should seize upon the positive environmental message this evokes.

Utilising recycled water is a means of overcoming limitations in fresh water availability, but along with this come many management questions that need to be addressed.

Dealing with these management challenges will have a major impact on irrigation equipment and scheduling practices. Successful irrigation companies will need to provide products and services that expressly address these needs. Rain Bird's position is that water-efficient irrigation is one practical way to address the world's growing water crisis. Through "The Intelligent Use of Water™" program Rain Bird is developing products and services that use water in the most efficient manner possible.

The use of recycled water has already become quite common practice in some areas and Rain Bird is continually evolving its product range to deal with this challenge. Two key areas of development currently being dealt with are the variances and chemical make-up of recycled water and the application and monitoring of its use.

Firstly, products used in irrigating with recycled water must be able to handle the increased and varied chemical composition of reclaimed water while still providing longevity, reliability and efficiency. Secondly, there is a very real need to monitor and report on recycled water usage and rates applied while dealing with public issues such as over-spray and runoff.

Mal Harris
Supt. Northbridge GC

The need to find an alternate supply of water to potable water has been of major importance for many years. In 2000 Northbridge Golf Club commissioned a consulting company to provide a detailed report on our options for finding a non-potable supply of water. This report concluded that construction of dams to harvest stormwater would not be a viable option and bore water or sewer mining would be better options.

Water restrictions which allowed only greens and tees watering in 2003 assisted in fast-tracking our preparations for life without town water. Initially we sank a test bore which revealed reasonable water quality with very low yield of only 400kl a week. From there we investigated sewer mining which unfortunately was only capable of supplying about 40 per cent of our peak requirement. Combined with expensive installation and ongoing water production costs, this made it an unattractive option. We then looked into desalination as Northbridge is situated on Middle Harbour. The plant installation was around $1 million with production costs in excess of $200,000 per year with significant environmental concerns as well.

It was necessary at this time to get a second and third opinion on the feasibility of constructing a dam. It was revealed that our initial advice on dam construction was incorrect and plans to build several dams were put into full swing. The project will incorporate the remodelling of three holes with 25 megalitres of water storage.

The challenges we face with this project are predominantly financial with the estimated costs around $1.2 million. While the dams will ensure the club's future to provide acceptable playing surfaces, careful monitoring of water use will still be required.

BY JOHN GEARY

A minimalist masterpiece - St Andrews

Mention the name of architect Tom Doak and many will associate it with the spectacular Barnbougle Dunes golf course in Bridport, Tasmania. However, there is another Doak design, his second in Australia, which is quickly generating just as much press. Called The Golf Club, St Andrews Beach, the minimalist layout adds yet another dimension to the impressive array of courses already nestled on Victoria's Mornington Peninsula. Here superintendent John Geary gives ATM an inside glimpse at the creation of this unique development.

The southern tip of Victoria's Mornington Peninsula has seen a tremendous amount of golf course development in recent times and one of the latest courses to be built is The Golf Club, St Andrews Beach.

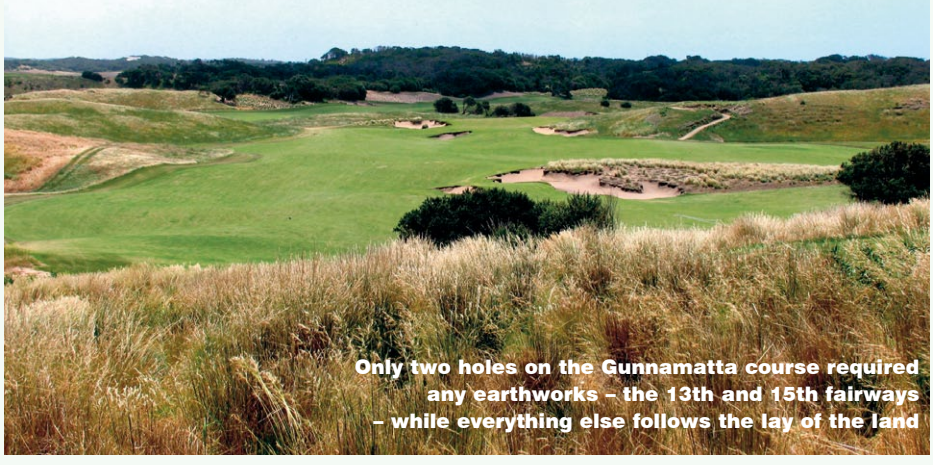
Owned and operated by Melbourne-based development company Golf Club Properties Limited (GCPL), the vision for the St Andrews Beach site is to create two world-class golf courses along with a members clubhouse, a five-star hotel combined with onsite villa accommodation.

The first course, known as the Gunnamatta course, was officially opened in November 2005, but has been unofficially open for limited play since March 2005. The second course, known as the Fingal Course, is due to start construction midway through this year.

The site itself can be best described as dramatic rolling sand dunes and it is of little surprise that in recent years many other notable golf courses have been constructed within close proximity, such as Eagle Ridge, The Dunes, The National as well as Moonah Links.

A MINIMALIST PHILOSOPHY

GCPL first acquired the sprawling 175 hectare site that was formerly pastoral land in 1996. After talks with a number of designers, GCPL commissioned renowned American architect Tom Doak to design the layout. Known for his minimalist approach, Doak and his team from Renaissance Golf design, in association



Only two holes on the Gunnamatta course required any earthworks – the 13th and 15th fairways – while everything else follows the lay of the land

In just a short time since its opening, The Golf Club, St Andrews Beach has won many admirers

Beach

with their Australian partners Michael Clayton Design, have done a wonderful job in highlighting the natural characteristics the site has to offer.

In an article written about the construction of the Gunnamatta course for Paul Daley's book "Golf Architecture: A Worldwide Perspective, Volume Three", Doak writes:

"The Gunnamatta course is a throwback to the sandbelt courses, which were built in the late 1920's and 1930's. The routing takes advantage of excellent topography and the personality of the holes is accentuated by the shaping of the greens and bunkers. It was as simple a construction job as I have ever participated in, and therefore the highest expression of my minimalist philosophy.

"Keeping things simple often means going against 'progress'. We did not build USGA greens because the native soils were perfect for turf management. We didn't build cart paths, which would be a blight on this landscape. And we chose a minimal irrigation system to keep the couchgrass in the roughs thin and manageable.

"From the standpoint of playing character, the Gunnamatta course features small greens, simply because they are one way to focus on precision, rather than length. The smallish greens and wide fairways will likely lead many first-time visitors to conclude that Gunnamatta is a 'second-shot course,' but the same has been said of Royal Melbourne, Pinehurst No. 2, and Augusta National. Hopefully, after playing a few rounds, players will agree that their second shots are much easier when they drive the ball in the right part of the fairway, and that short game skills will also play a significant role in scoring."

Construction of the Gunnamatta course began in earnest in December 2003. In all it took less than six months to shape, irrigate and seed/sprig all the playing areas such as greens, green surrounds and fairways. Tees were also shaped during this period but were sodded some four months after during October/November 2004.

The majority of the shaping work was undertaken by Renaissance design staff members. Tom Doak's associate Brain Slawnik, who was on site for close to five months, was the man responsible for undertaking and supervising the bulk of the shaping work with other Renaissance associates Eric Iverson ▶

and Brain Schneider (who were working at Barnbougle Dunes in Tasmania) brought in to help shape green sites. Jason McCarthy from Melbourne-based firm Golf Shaping Australia also played a vital role in helping Brian tie everything together.

Throughout the construction phase Doak made only two visits, but during his 14 days on site all 18 green and green surround sites were formed as well as all fairway work completed. Only two holes required any earthworks – the 13th and 15th fairways – while everything else follows the lay of the land and the design that had been mowed out prior to construction starting.

Also on site during this period was Just Irrigation which had won the tender to design and install a Toro Site Pro central decoder system. A range of Toro valve-in-head 800 series sprinklers have been installed on the playing areas while the pumping station is driven by Grundfos variable speed pumps. The source of water is a combination of bore water and recycled water drawn from the nearby Boag's Rocks ocean outfall pipeline.

Throughout the grow-in, both sources of water were shandied together to irrigate all playing surfaces. However, due to the inability to regulate the flow of nutrients, the recycled water will be restricted to use on fairways and tees only from this season on.

Working on a hole-by-hole basis, once the shaping and installation of irrigation was complete a separate crew undertook all fine finishing work and grassing of fairways. By this stage it was nearing the end of February 2004 and Tony Sinclair from Turf Renovation Australia was commissioned to flail mow, vacuum and line plant all fairways with Legend couchgrass. Initially a small crew from Turnpoint constructions undertook the fine finishing work.

"Keeping things simple often means going against 'progress'. We did not build USGA greens because the native soils were perfect for turf management" – *Tom Doak*

GROWING-IN

On 1 March, 2004 I was employed by GCPL as course superintendent and by mid-March we had assembled our own in-house maintenance crew which took over all onsite works such as fine shaping of fairways, grassing of greens, etc. I arrived after spending 17 years at the private nine-hole Frankston Golf Club, but the opportunity to work on a Tom Doak-designed course was too good an opportunity to pass by.

Sprigging of all fairways was completed by mid-April 2004 which left little time to maximise any growth prior to winter setting in. After planting, all fairways received an application of the pre-emergent herbicide Ronstar at 150kg/ha. Starter fertiliser was applied at 250kg/ha with follow-up applications of Pivot Hayboosta fertiliser (NPK 11.7:4.7:23.9) applied at a rate of 150kg/ha every 10 to 14 days.

As we moved into the winter months grass coverage on fairways varied enormously with those planted in February/March having approx 40 per cent coverage while those planted in April having less than 10 per cent coverage.

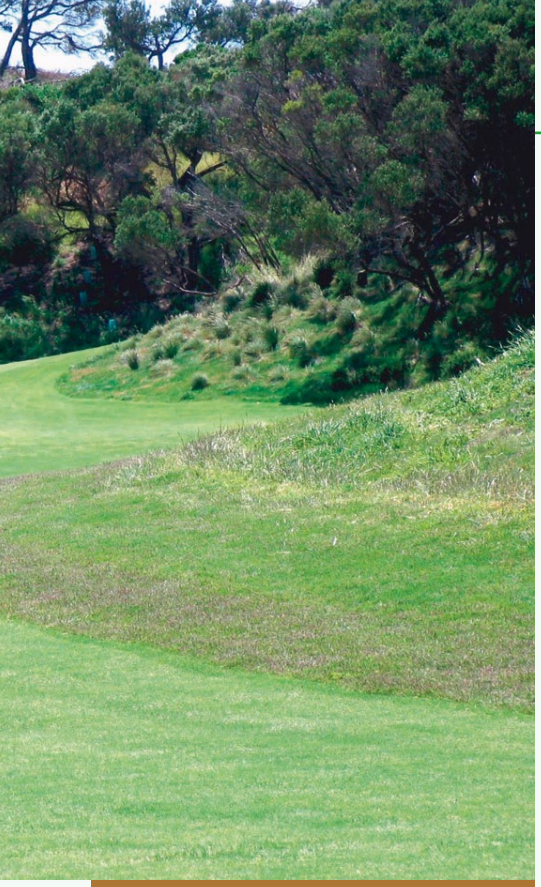
The germination of weeds became an issue but being a very exposed, windy site we were also suffering greatly from wind erosion. As the wind was causing greater damage it was decided to use the weed cover to our advantage to help reduce further erosion. With August and October being extremely windy, spraying of weeds was delayed until as late as possible. As spring approached light rates of Glyphosate was used to remove weed competition and the application of fertiliser recommenced.

Throughout the fairway grow-in period, miticides were also applied at regular intervals. Tip damage from couch mites at times severely restricted grass coverage which needed constant monitoring. By late February/March 2005 the majority of fairways had close to a 95 per cent cover.

Now in our second growing season, the 25 hectares of fairways are being mown at a height of 10mm, two to three times per week. Regular topdressing of uneven areas is scheduled to take place over the coming months while the long-term grassing strategy is to oversow the Legend couch with a combination of fine leaf fescues. The aim behind this decision is to provide better playing conditions throughout the winter months when the couchgrass will be dormant.

With regard to greens construction, extensive soil testing undertaken prior to and during construction indicated the soil profiles for the green sites are reasonably consistent. These profiles consist of at least 400mm of dark grey to grey fine sand that transitions into a yellow fine sand.

The soil physical analysis indicated a relatively consistent particle size distribution with a drainage rate varying between 130-180mm/hr. Based on the above information it



The Gunnamatta course comprises 25 hectares of Legend couch fairways while the greens were sown with Penn A4 creeping bentgrass

was decided that there was no reason to look at USGA or California type greens construction when such good materials were available in situ.

Once shaping was complete, all greens and green surrounds were treated with the soil fumigant Basamid at label rates. After a withholding period of 28 days a mixture of various amendments were applied followed by hydroseeding.

Greens, which in total cover an area of one hectare, were sown with Penn A4 creeping bentgrass at a rate of 500g/100m^2, while green surrounds, which in total cover an area of two hectares, were sown with a mixture of 10 per cent Penn A1 creeping bentgrass, 45 per cent Chewing's fescue and 45 per cent Creeping Red fescue at a rate of 3kg/100m^2.

Having little prior experience managing the newer bentgrass varieties it has been interesting to observe these surfaces over the past 18 months. Throughout the grow-in period little if any problems were experienced.

Over the summer months the Penn A4 displayed excellent heat and drought tolerance, while it is also extremely aggressive suggesting it will tolerate high wear and tear as well as weed invasion. No doubt a downside to this aggressiveness is that it will require greater inputs in the way of regular sand dustings and grooming.

The bent, fescue grass mix chosen for greens surrounds has also displayed excellent playing characteristics. These areas are being mown at 7mm in height and are providing firm, smooth playing surfaces requiring a high level of finesse.

Construction of tees followed a similar path to that of the greens with the exception being that they were solid-turfed using Wintergreen couch sod brought down from Sydney. Kikuyu contamination has been an issue but constant monitoring and hand weeding has meant we have been able to control this quickly. Keeping in line with our grassing strategy for fairways, it is our intention to oversow the tee complexes with a mixture of fine leaf fescues in autumn.

Apart from the establishment of the playing surfaces we have also invested heavily in the revegetation of non-playing areas. A natural resource crew of three has been established who work solely on rehabilitating and restoring indigenous vegetation. Works include the collection of seed, preparation of sites, ▶

propagation of plants, planting and ongoing maintenance of planted areas.

An onsite nursery has been set up where we are propagating over 40 different varieties of indigenous stock and in the past 15 months over 120,000 trees, shrubs and mainly grasses have been planted onsite. Endangered species such as moonah trees, coastal beard heath and wirilda wattles are all being propagated and planted in large numbers.

We are also establishing a wildlife corridor some three kilometres in length along our southern boundary. Planting of the corridor is to be staged over a five-year period and it is expected we will plant in excess of 150,000 plants in this area alone.

Throughout the grow-in and maintenance phases, staff numbers have remained relatively consistent. Currently the maintenance crew consists of 13 people in total which is made up of myself and an assistant superintendent Craig McLachlan, three senior turf tradesmen, one groundsman, two apprentices, one casual and one mechanic. Joel Darlison heads the natural resource crew.

I'm sure most readers would relate to the fact that the success of any development depends largely on its employees and The Golf Club, St Andrews Beach is no different. We have been fortunate to have a number of highly skilled and motivated people who have all contributed enormously throughout the different phases of the project. I would particularly like to thank Craig, Joel and Tony Gordon for their sustained effort over the past 18 months. Also, a special mention to Robert Swift, Conrad Jones, John O'Neill, Trevor Grigglestone and Matt Tetteroo who make up the backbone of the maintenance team.

Following extensive soil physical analysis it was decided that there was no reason to look at USGA or California type greens construction when such good materials were available in situ

Now that the official opening has been and gone we look forward to more golfers experiencing what The Golf Club, St Andrews Beach has to offer. As for the future, 2006 promises to be another hectic year with the construction of the Fingal course due to start mid-year. No doubt many challenges lie ahead, but I'm sure having been involved throughout the construction of the Gunnamatta course will hold us in good stead for all future works.

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PHOTOS: BRETT ROBINSON AND JOHN NEYLAN

Perfect harmony on the 13th fairway

Above: The start of a great three weeks for Robert Allenby

Main pic: The 18th on a stormy Saturday morning

A thirsty trap

AGCSA president Jeff Gambin shows his expert raking style

The monster bites

The 2005 Australian Open hosted at Moonah Links during the last week of November will go down as one of the toughest on record. After benign conditions on Thursday saw eventual winner Robert Allenby shoot a course record nine-under 63, windy conditions for the remaining rounds tested the patience and skill of not only the professionals but also the maintenance crew at Moonah Links. Superintendent Leigh Yanner and Open course assistant superintendent Scott Calder had their hands full after strong northerly winds and

Royal Perth superintendent Michael Dennis tracks his tee shot on the 14th

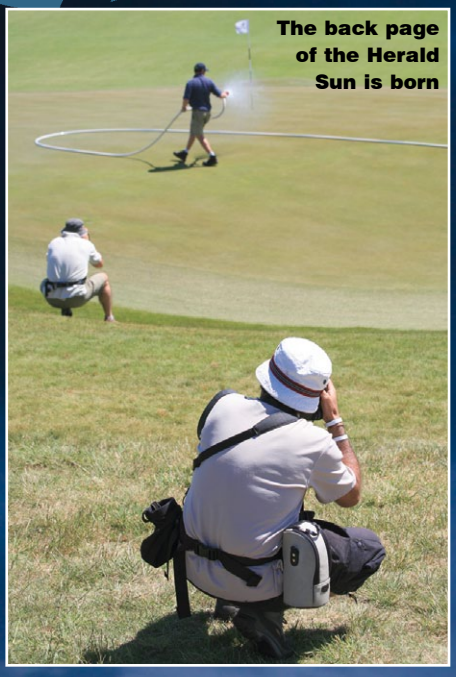

Want to know how to change a hole? Just ask assistant super Nathan Bennett – 72 holes in four days.


CQOs had the best seat in the house

Travis Cumming, from Anglesea GC, makes quick work of the bunker surrounds

a tricky pin placement caused dramas on the 12th green during Friday's second round, while in the week leading up to the tournament a number of the course's irrigation pumps went out of commission. Despite the conditions, Allenby clung on to claim his second Stonehaven Cup by one shot and in his acceptance speech paid Yanner and his crew the ultimate tribute by proclaiming the turf surfaces at Moonah Links as among the best he had seen anywhere in the world.

PHOTOS: BRETT ROBINSON AND JOHN NEYLAN



The back page of the Herald Sun is born

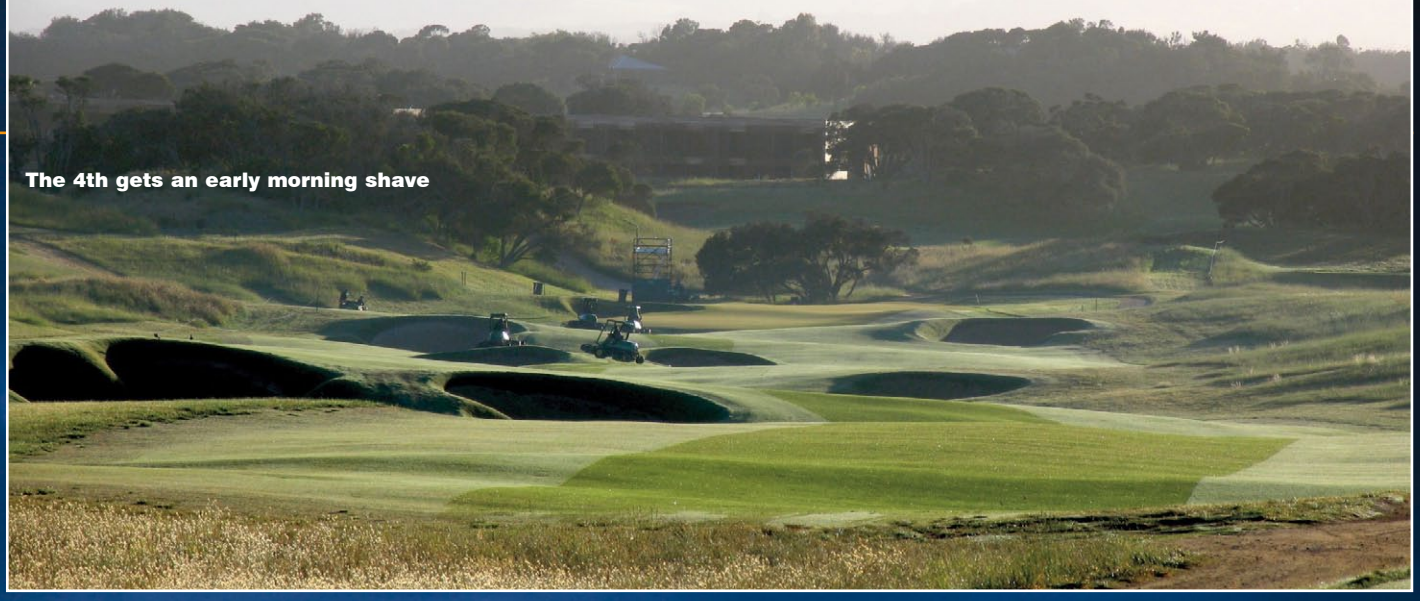
Andrew Coles (left) and Simon Page earn their keep

The fairway units take to the 3rd after the first round

Angus McCulloch notched up 10 years on the rake at the 2005 Open

Moonah proves tough to master

◀Peter Thomson's Mornington Peninsula 'leviathan' certainly lived up to its name for the 2005 Open which meant a long and tough weekend for those who turned out as part of the AGCSA's Course Quality Officials program. Around 80 registered to rake bunkers and repair divots, with those earning a rake on Friday put through a stern test after the dramas on 12 caused a considerable backlog. For the likes of Angus McCulloch and husband and



The 4th gets an early morning shave

Superintendent Leigh Yanner gives the troublesome 12th green a douse during Friday's second round

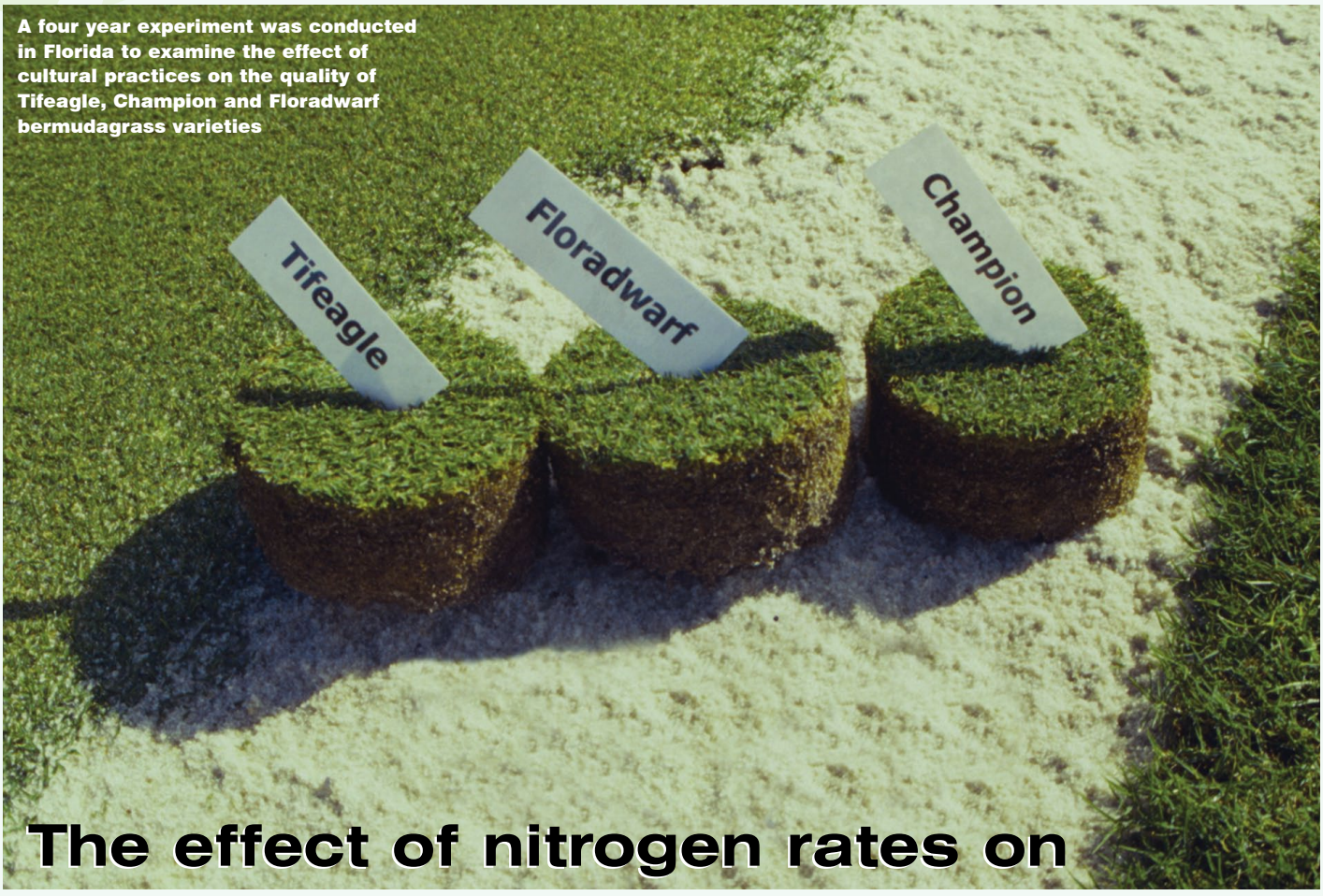
Yanner and assistant superintendent Scott Calder prepare to swing into action

Which way chaps?

Nathan Bennett, Andrew Coles and Scott Calder with the biggest cheque they'll ever hold

wife team Harry and Margaret Douglas, the 2005 Open marked their tenth year as CQOs. While they got the best seat in the house, Royal Perth superintendent Michael Dennis got an even better view – he qualified for the Open as an amateur! After posting an opening round one-over 73 he faded to miss the cut by just six shots.

BY JOHN CISAR, GEORGE SNYDER AND DARA PARK



A four year experiment was conducted in Florida to examine the effect of cultural practices on the quality of Tifeagle, Champion and Floradwarf bermudagrass varieties

The effect of nitrogen rates on ultradwarf bermudagrass quality

Three ultradwarf bermudagrass varieties – Tifeagle, Champion and Floradwarf – were compared for turfgrass quality over a four-year period in subtropical south Florida at different nitrogen rates and N:K ratios. Tifeagle had the highest annual average turfgrass quality ratings and in three of the four years was significantly higher than the other two varieties.

Since the 1990's, new ultradwarf bermudagrasses [*Cynodon dactylon (L.) Pers. X C. transvaalensis* (Burtt-Davy)] have been developed for better putting performance and have been planted in new and reconstructed greens. Tifeagle, Champion, Floradwarf, Miniverdi, MS Supreme are examples of commercially-available ultradwarf-type putting green bermudagrasses (NTEP, 2002; Hartwiger, 2001).

According to White et. al (2004), factors that have improved putting performance for these grasses include increased shoot density, tolerance to close mowing, high wear tolerance, and fast recovery.

One concern about ultradwarf cultural management is thatch accumulation (White, et al. 2004, Hanna 2005). Research on cultural management of ultradwarf bermudagrasses is beginning to emerge in the literature. For example, Hanna (2005) investigated the effect of vertical mowing blade width, nitrogen level and Primo growth regulator on turfgrass quality in Tifeagle bermudagrass. Hanna reported that increasing nitrogen rate (113.4g v 226.8gN/93m^2 per application – 93m^2 is equal to 1000ft2) resulted in better Tifeagle turf colour yet was coupled with an increase in thatch accumulation.

Other research has focused on determining appropriate N rates on a regional scale in the United States (White et al., 2004; O'Brien and Hartwiger, 2001). An experiment that investigated several cultural management practices on selected ultradwarf bermudagrasses was conducted over a multi-year period in Texas (White et al, 2004).

In that study, comparisons were not assessed between ultradwarfs however the authors concluded that an annual nitrogen

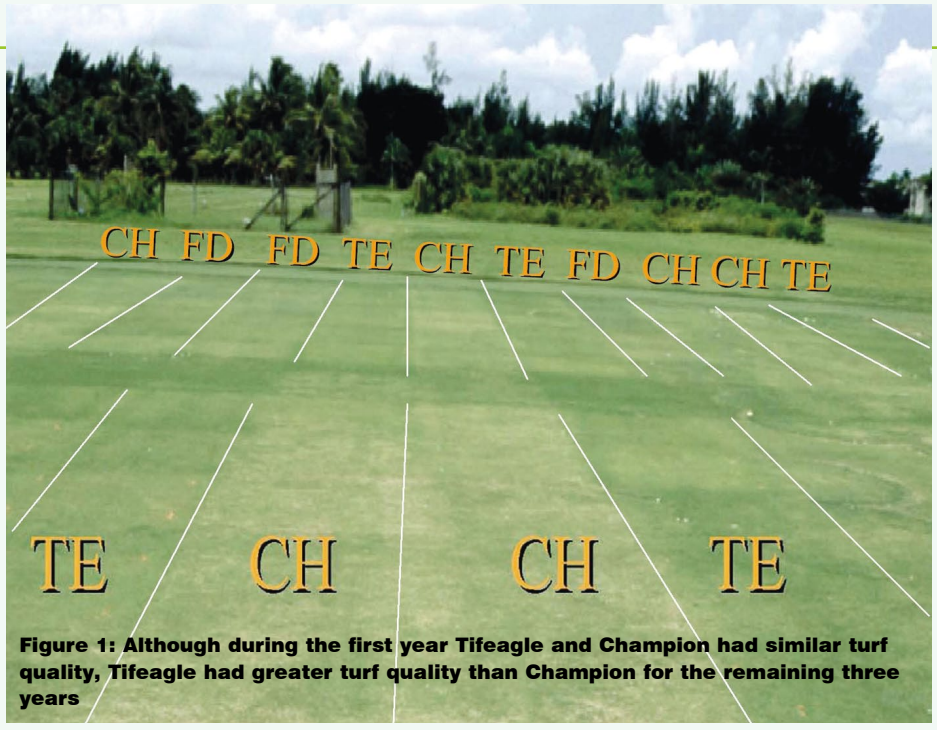


Figure 1: Although during the first year Tifeagle and Champion had similar turf quality, Tifeagle had greater turf quality than Champion for the remaining three years

rate of 4.5kgN/93m^2 would provide for good quality ultradwarf turf regardless of variety. O'Brien and Hartwiger (2001) suggested annual nitrogen rates of 2.7-5.4kgN/93m^2 for ultradwarf bermudagrasses in the south east United States.

The National Turfgrass Evaluation Program (NTEP), in cooperation with the United States Golf Association and Golf Course Superintendents' Association of America (GCSAA), initiated the first on-site golf course ultradwarf variety trial in the late 1990's. The on-site variety trial was limited in scope and did not include cultural management factors such as fertilisation, topdressing or verticutting as study objectives.

Moreover, at the initiation of our study there was little comparative research information on ultradwarfs from which to base sound cultural management recommendations for golf course superintendents in subtropical south Florida. South Florida's climate provides favorable growing conditions for bermudagrass year-round.

To address select questions on cultural management in late September 1999 an ultradwarf putting green research trial was established in south Florida at the Ft. Lauderdale Research and Education Center. This project was designed to identify the optimal cultural practices for best performance of three popular ultradwarf bermudagrasses and thus, form the basis for management recommendations of these grasses under south Florida conditions.

METHODS

The grasses were selected based upon their usage at the time of experimental initiation in Florida. Thus the grasses chosen were Champion, Tifeagle, and Floradwarf. Evaluations were based upon cumulative annual average visual turfgrass quality ratings of the turfgrasses. The effect of grass type and fertiliser nitrogen rate is discussed in this article.

The grasses were sprigged into an existing USGA greens specification mixture. The field site was approximately 930m^2 (10,000ft^2) in area. Mowing, irrigation management, supplemental fertilisation in addition to nitrogen and potassium fertilisation treatments discussed below, and overall management were provided by the Florida Golf Course Superintendents' Association research committee. The research Committee also provided guidance on the experimental parameters for the study.

The three ultradwarf bermudagrasses (Champion, Tifeagle, and Floradwarf) were mowed daily at 3.1mm-3.4 mm with a walk-behind greens mower. Cultural management practices evaluated in the first year included fertiliser at two N rates (30g and 60g/m^2) and potassium applied at either a 1:1, 2:1, or 1:2 ratio. The low nitrogen rate was judged to be insufficient for growing ultradwarf bermudagrass in subtropical Florida. Thus, in years two through four, three N rates which translated to 60g, 90g, and 120g/m^2 was applied and potassium was applied at either a 1:1 or 2:1 ratio.

The changes to plots for N rate and N:K ratio were as follows:

2000		2001
N:K	changed to	N:K
-----(kg N:kg K/93m^2/ year)-------		
2.7:1.4		5.4:2.7
2.7:2.7		8.2:4.1
2.7:5.4		8.2:8.2
5.4:2.7		10.9:5.4
5.4:5.4		5.4:5.4
5.4:10.9		10.9:10.9

Nitrogen fertiliser was applied weekly as a liquid formulation of ammonium nitrate or urea to each plot. Potassium chloride (0.0.60) was the K source and was applied as a liquid. The daily mowing height ranged from 3.0mm-3.4mm during periods of high disease stress. The experiment included two verticut frequency treatments (main plots), three grass varieties, two topdressing frequency treatments, and six N:K fertiliser ratios designed as a factorial with four replications of each treatment for a total of 288 plots.

Verticutting frequency was either weekly or biweekly and was accomplished using a walk-behind grooming mower set at the shallowest cutting depth. Topdressing frequency was either weekly or biweekly, which resulted in an annual 8mm or 4mm depth of topdressing, respectively for the two topdressing frequency treatments.

Visual observations of turfgrass quality were made using a 1-10 scale with 10 = dark green turf, 6 = minimally acceptable turf, and 1 = dead or brown turf. Average annual turfgrass quality ratings for the three ultradwarfs are provided for the entire four year period. Average annual turfgrass quality ratings are provided for years two-four representing the change in nitrogen and potassium fertiliser applications after year one. Statistical analysis was conducted on the summed data over each year for all treatments using ANOVA procedures and significant means were identified (SAS, 1989). The Duncan's Procedure for multiple comparisons was used to identify differences in grass cultivars and N rates.

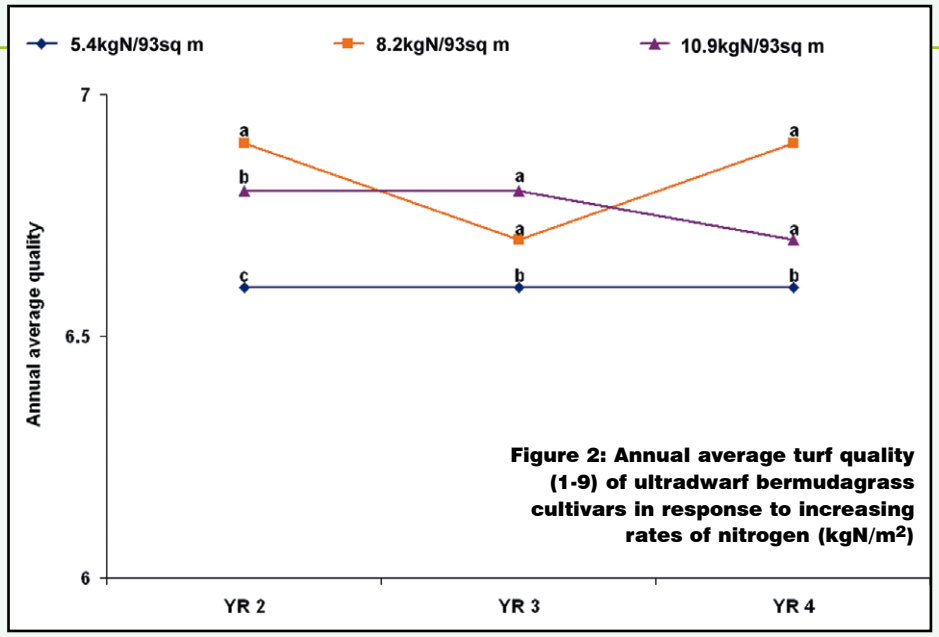


Figure 2: Annual average turf quality (1-9) of ultradwarf bermudagrass cultivars in response to increasing rates of nitrogen (kgN/m²)

RESULTS

ANNUAL TURFGRASS QUALITY

Each of the three ultradwarf bermudagrasses had annual average turfgrass judged to exceed minimally-acceptable standards in each of the four years of the study (Table 1). However, annual average turfgrass quality was significantly affected by grass type for all years (Table 1).

Tifeagle generally provided consistently high quality ratings over the four year rating period (Table 1). Floradwarf was statistically equal to Tifeagle on select dates during each year (data not presented) but annual average turfgrass quality was lower each year than Tifeagle (Table 1).

With the exception of year one, annual average turf quality for Floradwarf was statistically equal to Champion (Table 1). Although Champion provided annual average turfgrass quality that was equal to Tifeagle in year one, thereafter Champion had lower annual average turfgrass quality ratings than Tifeagle (Table 1, Figure 1). Champion's annual average turfgrass quality decreased 0.4 points from year one to year two representing the greatest decline in quality over the four year period (Table 1).

TABLE 1. COMPARISON OF ANNUAL AVERAGE QUALITY SCORES FOR THE ULTRADWARF BERMUDAGRASS VARIETIES.

Grass	Year 1	Year 2	Year 3	Year 4
Champion	7.0a	6.6b	6.4c	6.5b
Floradwarf	6.5b	6.7b	6.6b	6.6b
Tifeagle	7.0a	7.0a	7.1a	6.9a
Significance	**	**	**	**

** = P<0.001. Means within the same column followed by the same letter are not significantly different.

Each of the annual nitrogen rate treatments provided annual average turfgrass quality ratings above what is judged minimally acceptable for putting green turf (Figure 2). Nevertheless, increasing N did increase annual average turfgrass quality (Figure 1).

In year one, the annual average turfgrass quality score of 6.5 from grass receiving the 2.7kgN/93m² was significantly lower than the turfgrass quality from grass receiving the 5.4kgN/93m² rate (7.2, P<0.001). Annual average turfgrass quality remained at 6.6 for the remainder of the study (Figure 2 and 3).

"Tifeagle generally provided consistently high quality ratings over the four years"

After year one, the 2.7kgN/93m² rate was replaced by the 8.2kg and 10.9kgN/93m² rates. Increasing the annual nitrogen rate from 5.4-8.2kgN/93m² improved annual turf quality on most rating dates (Figure 2). Increasing the annual nitrogen rate beyond 8.2kgN/93m² did not improve turf quality in any year (Figure 2). Moreover, the 10.9kgN/93m² rate led to a significant decline in turfgrass quality for the first year it was implemented (Year 2, Figure 2).

Based on these results, acceptable annual average turfgrass quality can be achieved with any of the three ultradwarf bermudagrasses in subtropical Florida. The average annual application rates of N appear to be greater than those reported in other regions of the USA (White, et al 2004).

However, this result was not unexpected as south Florida's climate permits year round growth of bermudagrass. Efficient utilisation of nitrogen fertiliser is problematic in regions such as south Florida where shallow-rooted ultradwarfs are grown on highly permeable sand soils that have little ability to retain nutrients or water and which receive intense periodic and appreciable seasonal rainfall.

South Florida's subtropical climate consists of a wet season from May through October and a dry season from November through April. During the wet season, high temperatures persist with frequent, intense rain events. While average daily temperatures are not as high during the dry season, high ET-demand weather is optimal with occasional rainfall. Perhaps it is during the wet season when frequent N fertilisation at lower rates is needed for grass to benefit and to prevent loss of fertiliser to leaching. During the dry season, it is possible that higher N rates may be applied with less frequency as in the wet season.

Future research should examine how N rates and other cultural management practices can be optimised to improve nutrient resource efficiency and reduce potential adverse environmental impacts for seasonal climate changes.

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Machinery for supplying mowing equipment. The authors also appreciate the technical assistance of Ms. Karen Williams, Ms. Eva Green, Mr. Gary Pedersen, Dr. Raymond Snyder, Dr. Lawrence Datnoff, Dr. Robin Giblin-Davis, Mr. John Rowlands, and Mr. Kevin Wise.

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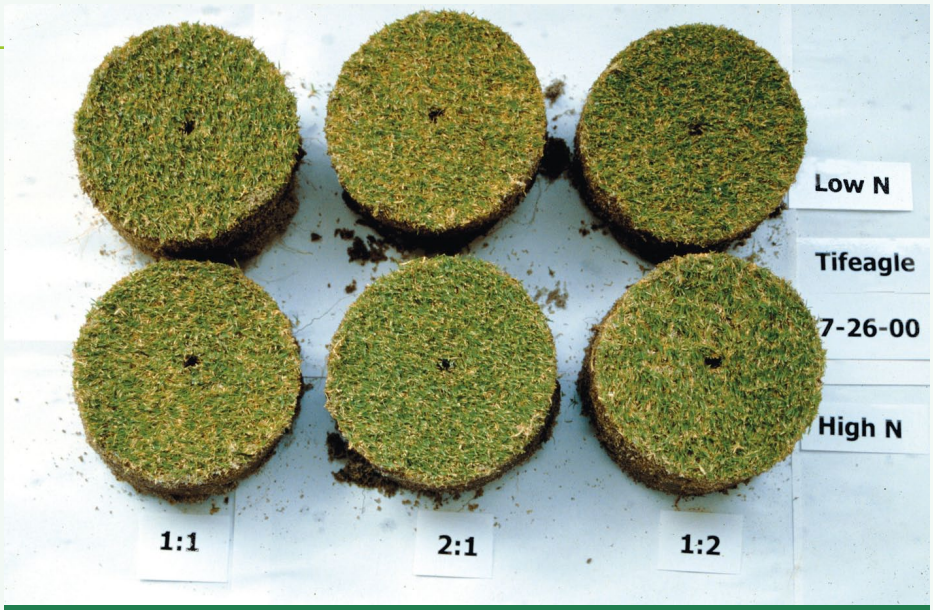

Figure 3: During the first year of the experiment, similar quality was observed for all N:K ratios. However, ratios at the higher rates of nitrogen had greater quality

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AGCSA UNVEILS 2006 DOWN UNDER TURF TOUR

Overseas superintendents will get a unique opportunity to attend next year's national turfgrass conference as well as visit some of Australia's premier golf courses following the unveiling recently of the AGCSA's 2006 Down Under Turf Tour.

Timed to coincide with the 22nd Australian Turfgrass Conference in Brisbane this year, the 12-day tour (10-21 July) is a new initiative designed to highlight the excellent work of Australian superintendents to an international audience as well as give overseas superintendents the opportunity to experience the Southern Hemisphere's largest turf industry gathering.

Delegates on the tour will receive full registration for the conference, which runs from 17-21 July as well as visit 12 of the country's elite courses to see how superintendents manage their courses under Australian conditions.

The tour will take in courses in Melbourne, Sydney and Brisbane including the likes of Royal Melbourne, Kingston Heath, Metropolitan, Moonah Links, New South Wales, Royal Queensland and The Lakes. The tour will also

take in one of Australia's premier turf research facilities, the Redlands Research Station in Queensland.

Leading the tour will be highly respected agronomist and AGCSATech manager John Neylan along with AGCSATech technical officer Andrew Peart. They, along with the respective superintendents at each course visited, will provide a unique insight into what challenges superintendents have to overcome in the day-to-day turf management of Australian golf courses.

The tour will cost $5795 incl GST and includes most expenses. For a full rundown of the 2006 AGCSA Down Under Turf Tour including an itinerary, registration form and conditions, visit the AGCSA website. Alternatively, contact AGCSA events manager Fiona McPadden at the AGCSA office on (03) 9548 8600.

FOOTY TIPPING FEVER NUTURF

The AGCSA, in conjunction with Nuturf, will again host the 2006 NRL and AFL footy tipping competitions. Since their inception two years ago, the competitions have been hotly contested with over 1000 turf industry members taking part weekly.

This year's competitions will again see a shed vs shed component as well as a separate state vs state competition. All competitors will need to register anew for the 2006 competition which can be done through the footy tipping link on the AGCSA website www.agcsa.com.au

GCSAQ

Welcome all to 2006 from the GCSAQ committee. I trust that you had a great Christmas and New Year and are glad to be back at work. The weather has certainly been a talking point up here recently and it's almost as though we are back in the days of old with some of the downpours we have experienced.

2005 was another busy year for the GCSAQ with numbers up at most field days. To the members that made the effort to attend these days and make them what they are by supporting the sponsors, thank you. We look forward to seeing more this year.

To those superintendents who are attending, if you can talk to or bring along a member that you know who has not been attending that would be great and I am sure they will enjoy the day. In 2006 we have an exciting program mapped out and a big thank you must go to our sponsors for their ongoing support and commitment to this great industry. We look forward to growing our partnership with you this year.

Our Christmas party was once again held at Wet 'n' Wild. The weather was magnificent and our northern NSW members were extremely well behaved. Must be getting older and wiser boys 'or under the thumb'.

The Queensland Golf Industry Awards were recently held at the Hilton Ballroom where the peak bodies of golf – the PGA, QGU, WGQ, GCSAQ and Secretary Managers Association – recognise individuals and clubs for their efforts. The GCSAQ award winners were Danny Gowing (Laidley Golf Club) who won the Superintendent Achievement Award and Doug Robinson (Pacific Golf Operations) who collected the Superintendent Recognition Award.

AGCSA Claude Crockford Environmental Award winner Ben Marshall (Club Pelican) took home the Superintendent Environment Award, and John Rusanow was named winner of the GCSAQ Turf Apprentice of the Year Award. Congratulations to all winners and other nominees.

Congratulations to all superintendents that hosted tournaments over the last couple of months. As always you have done yourself, staff and the industry proud.

Two important events that have recently taken place included the meeting with the Queensland Training and Employment Council to put our case across as to why we do not want to see a reduction in the time of turf apprenticeships. We were very well received and I believe we got our point of view across.

Special thanks must go to Scott McKay (North Lakes Golf Club), Steve Potts (AGCSA) and Brian Dale (Grovely TAFE) for the time and effort put into this application. Thanks are also extended to other members of the National Turf Education Committee from other states, superintendents from other states and local GCSAQ members for your words of thought and encouragement. We will know the outcome early this year.

A meeting was also held to consider the draft guidelines for National Water Recycling. Waterwise Queensland put out its Queensland Water Recycling Guidelines and manual for the Recycled Water Agreement in Queensland. Scott McKay attended this meeting so anyone wanting information on this subject should contact Scott.

Upcoming events include the Simplot Day at Lakelands Golf Club in February (date TBA). Also on 20 February at Redlands Research Station the DPI will be holding a seminar on healthy soils for great turfgrass. (As an aside, the greens grade turfgrass plots have been planted). On 6 March, the Country Club International Day will be held at Hyatt Coolum.

RODNEY COOK,
PRESIDENT, GCSAQ.

VGA

Sea Isle 2000 seashore paspalum is one of the many grasses to be included in the warm-season grass trials at NMIT. The Victorian Greenkeepers' Association has moved the trial to the next stage with Sea Isle 2000 selected to be grown as a lawn bowls surface on a two-rink bowling green at Coatesville Bowling Club.

Sea Isle 2000 (*Paspalum vaginatum*) is a warm-season grass that has generated a lot of interest because of its tolerance of more saline, low-quality irrigation water. With the continuing reduction in quality irrigation water in some areas, this grass needs to be trialled to discover if it is suitable as a lawn bowls surface in Victoria.

If this grass can cope with the local variety of weather conditions and can develop into a quality bowls surface, it may provide greenkeepers with another alternative to bentgrass and couchgrass. It will also be interesting to see how a blend of this grass and bentgrass will perform.

Sea Isle 2000 sprigs have been planted at Coatesville Bowling Club to trial seashore paspalum as a lawn bowls surface

David Sharp, Andrew Fitzharris and Doug Agnew have combined to get this project set up at Andrew's Coatesville club in the Melbourne suburb of East Bentleigh. The green was sod cut and most of the turf removed with the kind assistance of Gary Thomas and a group of students from NMIT. Andrew scarified and levelled the green, then added the required fertiliser that was kindly donated by Oasis Turf.

Thirty metres of Sea Isle 2000 was purchased from Jimboomba Turf Group in Queensland and shipped down in a refrigerated truck. The turf was laid out across the green and scarified to create the chopped up sprigs which were then mixed into the soil and the surface rolled. We now wait for the roots to establish before the next work can begin.

In other news, I hope all greenkeepers around the state will be able to attend our mini conference at Rich River Bowling Club in Echuca from 8-10 May. For more information on this very informative conference, go to the VGA website www.vicga.com

BILL HAMSHERE,
VGA COMMITTEE.

GCSAWA

Welcome to the first of many state presidents reports for 2006. The end of 2005 wind down for the association was eagerly welcomed, but now it is full speed into what is set to be another challenging year.

Our end of year Christmas party was a great success and thanks to all those who attended. Osborne Park Bowling Club welcomed us nicely and provided a great service. The event was typically very casual and relaxed and enjoyed by all.

The GCSAWA is keenly preparing for the 2006 Margaret River Biennial Conference to be held from 20-23 August. The event will be staged in town utilising the Best Western Colonial Lodge accommodation and corporate facilities as we did previously. The timing of this event has been organised at this time of year to maximise membership participation in both our state conference as well as the 22nd Australian Turfgrass Conference in Brisbane from 17-21 July. Both events look likely to draw excellent numbers so plan now to get along. Early indications are that many WA supers are planning on making the trip to Brisvegas so we are hoping for record numbers.

Our Management Challenge structure for 2006 has also taken on some slight changes, namely the committee's decision to host this event yearly in the Perth metro area. It was a hard decision and one which no doubt may be unsavoury to some members. In reality it is simply a matter of survival. We would love to continue to host this event at the winner's club regardless of location but history dictates poor attendances whenever it leaves Perth.

On an educational note, some members may remember filling out an industry survey in early 2005 regarding the abolishment of either Certificate III turf apprenticeships or Certificate III traineeships. This was initiated by government cost-cutting and industry responded in numbers to preserve the traditional Trade Studies Certificate III.

As of 1 January, 2006 there will be no Trainee Certificate III Turf Management. Traineeships will still be provided in Certificate I and II Turf Management. Certificate I informally takes the role of the original pre-apprenticeship which served industry well and Certificate II Turf Traineeships can be undertaken over one year part-time with the ability to be rolled into Certificate III Turf Apprenticeship upon completion. A student departing their Cert II Turf Traineeship would enter Cert III Trade Studies as a second year apprentice.

Recently the association along with the National Education Advisory Committee has been feverishly working to ward off recent government attempts in WA as well as Queensland to tinker with our current turf management training pathways. Early indications in WA are that our traditional four-year term for training apprentices could be slashed to three years with only two years spent in TAFE training and one on the job.

This reduction in training off-site will dramatically effect the ability to have our apprentices trained to the current national standards and would result in either the delivery of a watered down training package or the requirement for apprentices to attend college for an additional month per year if industry in WA was to endorse the National Standard Training Package. Training to this level which is nationally endorsed must always be our benchmark for long-term industry survival. Any move to restrict or tinker is serious.

It is still early days and this only acts as a heads up to what may happen in the future if industry fails to react in numbers. We will need your voice when the time comes, so have a think about this issue and the likely effects on your operation. I will keep all members informed of outcomes with similar matters in Queensland as well as any further developments here in the West.

I look forward to catching up with as many members as possible over the coming year.

BRAD SOFIELD,
PRESIDENT, GCSAWA.

VGCSA

A warm welcome to 2006. A busy 2005 finished off with the turf research day at Sanctuary Lakes in late November followed by the end-of-year meeting at Sandhurst.

Numbers at the turf research golf day continue to grow and this year we had 70 teeing up, but numbers at Sandhurst were down due to the weather and time of year. Thanks to superintendents Peter Jans and Chris Grumelart for getting their courses in top condition for these events. The end-of-year meeting date for 2006 has already been moved to November (at Box Hill Golf Club) in an effort to increase numbers.

The next VGCSA meeting will be held at Sorrento Golf Club on 20 February. It would be great to see everyone at Sorrento for our first meeting of the year and we have put together an exciting panel made up of superintendents Paul Holmes (Yarra Yarra) and Jim Porter (Royal Melbourne) as well as John Neylan (AGCSATech), Phil Ford (NMIT) and Terry Woodcock (Sportsturf Consultants).

Not long after the VGCSA will be travelling to Barnbougle Dunes in Tasmania. Requested by popular demand from our members we have organised to have this meeting which will be sponsored by Globe Australia. A registration form has been mailed to all members with the last newsletter.

The trip will begin on Sunday, 26 March and return late the following day. The format includes afternoon golf at the stunning Barnbougle Dunes followed by dinner (pay as you go) on Sunday, while on Monday the VGCSA meeting will be held along with a course inspection. A full package which includes airfares, accommodation, golf and meeting costs $330. We hope to see you there.

MARK PROSSER,
PRESIDENT, VGCSA.

TGAA VIC

Welcome back to the start of another exciting year. A new year creates an opportunity to undertake those things you have been talking about doing for years, whether it be study, taking on a new project or just challenging yourself with something new.

One good way to improve your knowledge and skills and at the same time meet new colleagues and friends is to become a member of TGAA Victoria and come along to the various seminars and functions that we provide throughout the year.

2005 was a very successful year for the TGAA, with many new members joining up and some very positive feedback about the functions that were provided throughout the year. In 2006 we look to improve on that and already have some new ideas in place. If you have any ideas for a day throughout the year, please let one of the committee members know.

The final function for 2005 was a huge success with over 70 people in attendance. For many it was their first look at a full-scale turf farm. Geelong Anco manager Bruce Stephens and his staff did a wonderful job explaining the procedures they go through to get the turf ready for sale.

As well as that, Bruce described how some of their new turf lines were going, how they had responded during establishment and what we should expect from them after purchase. For me it was great to see the turf in a farm environment which showed the conditions they are grown in and how they manage pest and disease problems. We thank Bruce and his team for allowing us to tour their farm and for their insight into the turf they are growing.

From there we travelled to the Geelong Botanical Gardens (GBG) where Jayne Salmon from the Friends of the GBG guided us around and told us about the history of the gardens and how they were developed. It was fantastic to see the 21st Century garden which takes up nearly one third of the total area, but uses less than 1 per cent of their water. We can all learn a lot from their design.

We were also lucky enough to view the planting of a very rare tree called the Wollemi Pine (*Wollemia nobilis*). Once believed to be extinct, this pine tree is one of the oldest known living plants in the world. Discovered by a bush walker in the Blue Mountains only 10 years ago this species still only has approximately 100 living plants. For me to see a tree of this stature being planted was a great honour. Thanks go to Jayne, John Arnott and the Geelong Botanical Gardens for allowing us this wonderful tour.

Our next stop was at Geelong Grammar School where we dined for lunch in the historical Dining Hall. I think we all agreed that the best way to describe it was like something out of a Harry Potter movie. After lunch we viewed the demonstration of a new line planter from sponsors Turfcare who use the machine in conjunction with Anco.

From there we went on a tour of the Geelong Grammar grounds. The school is celebrating its 150th year and was packed full of history. We also viewed a field recently sown down with La Prima seeded couch that was throwing out long runners even after four weeks. Thanks to all at Geelong Grammar for their hospitality. It really is a beautiful school.

Our first function for 2006 will be held at Haileybury College on 12 February where we will play a six-a-side round robin cricket match. It is aimed at being a family day, with both playgrounds and a swimming pool beside the ovals. Make up a team of your own or have us organise one for you. But just bring along your family and picnic for a day of fun and laughter.

MATT HANRAHAN,
TGAA VIC COMMITTEE.

NSWGCSA

Summer has hit NSW with a vengeance. High 30's and low 40 degree temperatures are cooking the state with severe bushfires taking several houses and many livestock. Some light rainfall and cooler temperatures have temporarily delayed the threat in the last few days as I write this report.

The wonderful cover of turf achieved after excellent spring rains has been burnt by the heat. After syringing greens on New Years Day I took a reading of the surface temperature – it was 43 degrees after watering! Hopefully some rain will eventuate soon but until then I wish everyone the best of luck surviving the rest of summer.

While superintendents have been dealing with excessive temperatures, the industry was also struck with the sad news of the deaths of Grant King and Bob Ashley. Grant was the past superintendent at Queanbeyan Golf Club and played a big part in the early days of the TGAA in the ACT. Grant passed away while at work at Gold Creek Country Club from a heart attack.

Scott Riley (Penrith Golf Club), Chris Blagg (Maxwell and Kemp) and Justin Treweek (Dint) enjoying the cruise

Bob Ashley, who started Hydrotechnics, installed and repaired irrigation systems and pumps in NSW for many years and there were many times when Bob saved superintendents with pump problems in difficult times. Bob contracted cancer only five months before he passed away just before Christmas. Our thoughts go out to the families and friends of these two gentlemen.

Yet another NSWGCSA board member hung up the boots in December. Wayne Hawley from Bexley Park Golf Club assisted on the treasury portfolio for two years. The board and members thank Wayne for his time.

2005 was ushered out with a very successful Christmas harbour cruise on Sydney Harbour. On a day of 39 degrees, 92 superintendents, assistants and industry folk sought relief on the harbour with a cold drink or three. Fortunately 4mm of rain the previous night relieved some of the tension for those supers wondering how their greens were surviving or trying to contact their apprentice to get in and check them.

A great day was had by all and thanks go to board member Scott Riley (Penrith Golf Club) for organising the event along with sponsors Dad and Dave Turf Supplies, Bayer, Globe, Maxwell and Kemp and Environmental Business Solutions (EBS).

MICHAEL BRADBERY,
PRESIDENT, NSWGCSA.

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LOWARA

At StrathAyrs 400 acre turf nursery we were looking for a pump system that could meet all of our irrigation requirements from running a 3" set line with sprinklers to up to five travelling irrigators. We chose the Lowara/ Hydrovar pump system because of its flexibility, and potential cost savings.

We are entirely satisfied with the system which is so easy to use. The service from Brown Brothers was a major factor in purchasing the pumpset and " I would recommend them to anyone"

Jason O'Brien
Farm Manager
StrathAyr Turf Nursery

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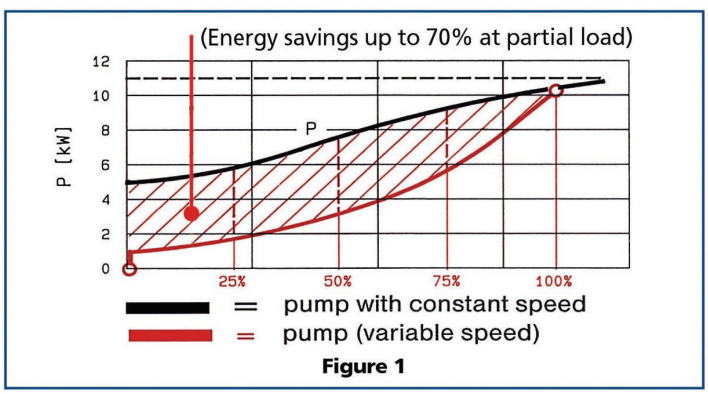

Figure 1

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