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VOLUME 21.3 MAY-JUN 2019

MANAGEMENT JOURNAL

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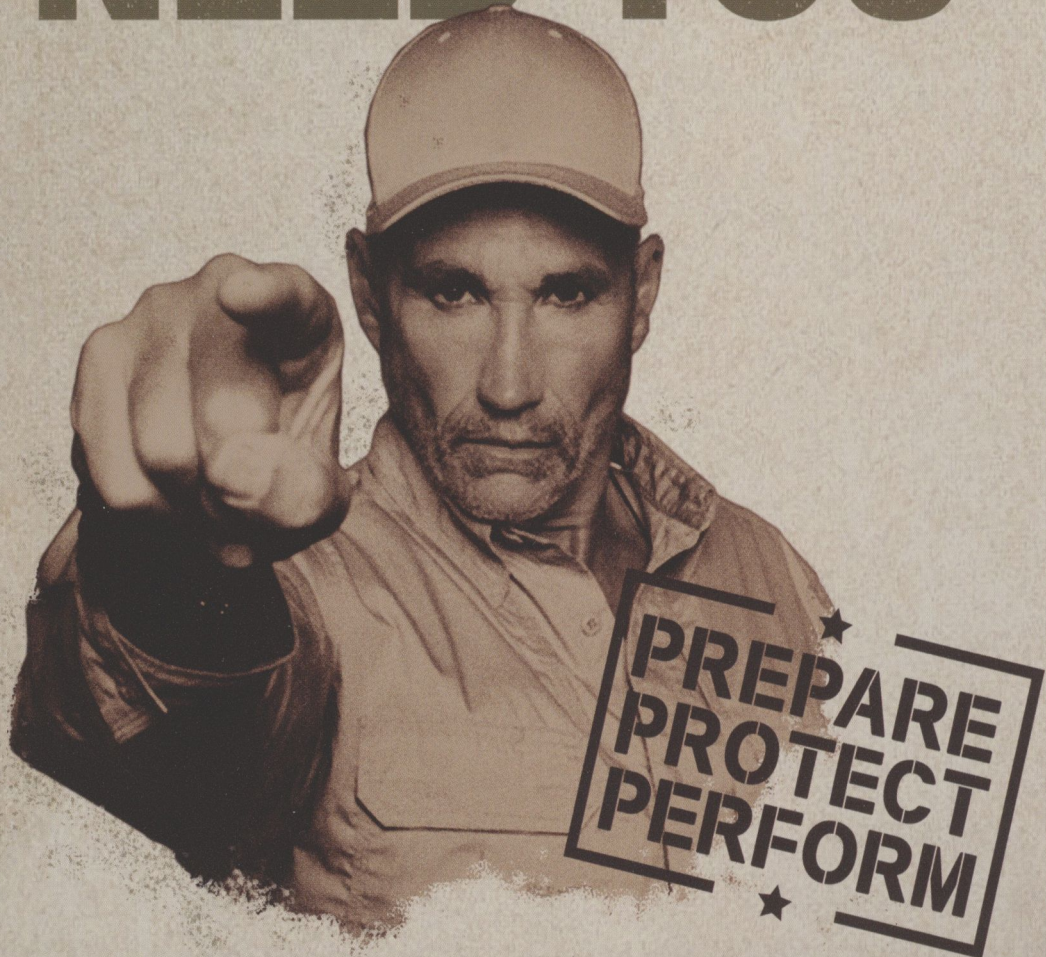
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The Sydney sporting infrastructure landscape is undergoing some dramatic transformation at present, with new stadia being completed and others in the process of being redeveloped. In April, the new 30,000-seat BankWest Stadium opened in Sydney's western suburbs, the long-awaited new home ground for one of the NRL's most famous clubs – the Parramatta Eels – and young A-League club the Western Sydney Wanderers. A true multi-purpose stadium, it boasts a number of technological advances when it comes to sports turf management. In this edition's cover story, Erik Kinlon from HG Sports Turf takes an indepth look at its development and state-of-the-art surface.

Cover photo: Bankwest Stadium during the Round 8 NRL clash between Parramatta and St George Illawarra. **Photo:** NRL Photos.



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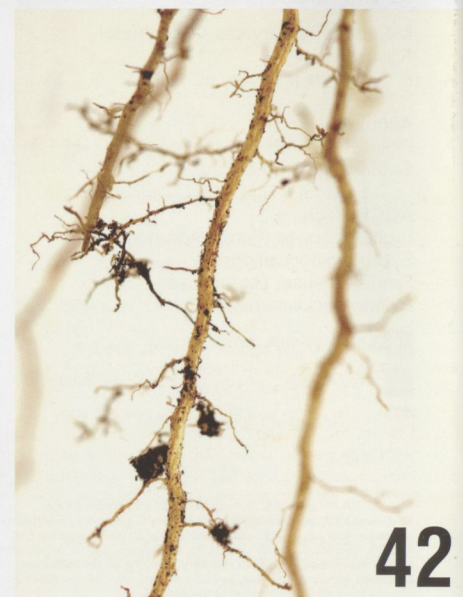
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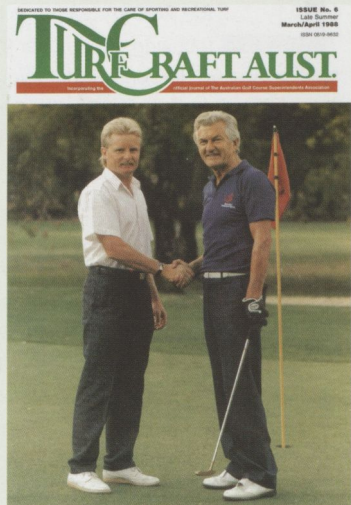
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Distinguished member

Regardless of what side of the political spectrum you reside, it was indeed the end of an era when news broke on the eve of the recent election that Bob Hawke had died. One of Australia's great political characters, the former Labour leader and third-longest-serving Australian Prime Minister had many claims to fame (and infamy) during his time in office, even managing to get himself on the front cover of an Australian turf management journal!

Yes, as the photo right shows, Hawke graced the cover of the March-April 1988 edition of TurfCraft International. Hawke is pictured shaking hands with then Royal Canberra Golf Club superintendent Michael Rose. As the cheeky caption on the inside page reads, "Mr Michael Rose, Course Superintendent, Royal Canberra Golf Club, and a well-known club member."



At the time, Royal Canberra, of which Hawke was a member, was hosting the new ESP Open. The tournament had attracted the likes of a young Greg Norman as well as 'West German' Bernhard Langer (this was before the Berlin Wall had fallen don't forget). As it transpired, Norman went on to destroy the field, winning by seven shots from Langer. Hawke played in the Pro-Am alongside Norman and his quote to legendary Age golf journalist Brendan Moloney afterwards proved prophetic... "There were three of us out there playing golf and this fella playing another game – he will murder this course!"

Reading further into that edition, it also transpired that in the days after the Open Hawke scored his first hole-in-one at Royal Canberra. Never one to let a good opportunity go begging, then TurfCraft International editor Ted Drinkwater added a bit of mayo when describing the cover photo: "Distinguished member of the Royal Canberra Golf Club, the Right Honourable the Prime Minister of Australia, Mr Bob Hawke, and the distinguished Course Superintendent, Mr Michael Rose, congratulate each other for notable achievements. The PM recognised the job that Michael Rose had done in preparing the course for the ESP Open Tournament and the latter shared Mr Hawke's elation at getting his first hole-in-one a few days after the event".

But the real story of that tournament wasn't Hawke playing the Pro-Am or Norman's barnstorming 10-under opening round 62. The NSWGCSA report in that edition, eloquently penned by Royal Sydney great John Odell, relays the horrendous acts of vandalism that Rose had to contend with in the lead-up to the tournament. Here's a snippet of Odell's report...

"In the month before the tournament a bunch of idiots (and that's being polite) calling themselves The Forest Liberation Organisation decided to protest over some development work on Royal Canberra's practice fairway. [Ten trees] had to be removed and the (conservation?) group showed their displeasure by poisoning 200m² of the 1st, 300m² of the 17th, 450m² of the 18th greens and 250m² of the 18th tee. The mindless marauders left a note stating that if any further trees were removed, the remaining greens would also be killed..."

After explaining the repair lengths Rose went to, Odell continued... "End of story? The end of the torment of Michael and his staff? No sir – those valiant protectors of environmental beauty, "The Forest Liberation" people came again, wiped out the newly repaired 17th and 18th greens and left another threatening note repeating the message that if further trees were removed the remaining greens would be ravaged... So to those of you who watched the ESP at Canberra and marvelled at the condition of the course, now you have cause to marvel even more."

I wonder what words Hawke would have chosen to describe those so-called 'valiant protectors of environmental beauty'... Enjoy the read.



Brett Robinson, Editor

Sunshine State all set to welcome sports turf professionals

Entering June, the largest turf event in Australia and New Zealand is almost upon us and the AGCSA team has been focusing efforts over the past few months on delivering what should be a sensational **2019 Asia Pacific Turfgrass Conference and Trade Exhibition** (24-27 June, Brisbane Convention and Exhibition Centre).

The conference programme we have put together this year has been developed from member feedback and responses to conference surveys from last year. We have brought together a comprehensive line-up of leading international turf professionals, researchers and agronomists to complement an impressive list of local speakers presenting on a varied range of topics.

The event kicks off on Sunday with the AGCSA Golf Championships to be held at Brisbane Golf Club, presented by Platinum Partner Toro. The Monday workshops, presented by Gold Partner Jacobsen, feature an expanded session this year with the addition of a sustainability seminar presented by **Steve Isaac**, director of sustainability for The R&A. This complements the existing agronomy and leadership and development workshops which will be conducted by fellow international guests **Dr John Kaminski** (Penn State University, USA) and **Craig Haldane** (Gleneagles, UK).

Monday night sees the Syngenta-sponsored National Awards Gala Dinner, an event that continues to grow in significance within the industry. Looking ahead to the education sessions, alongside presentations from local researchers, superintendents, sports turf managers and a host of industry professionals, the line-up also includes a number of other international experts including **Dr Rob Golembiewski** (Bayer, USA), **Jonathan Smith** (GEO Foundation, Scotland) and **Andrew Johnston** (Sentosa Golf Club, Singapore) who makes a welcome return after headlining in Wellington last year.

In this issue of ATM, we've given you a quick look at some of the highlights of the conference, including an expanded sportsfield and grounds education session featuring presentations from Sport Australia, the AFL, state Departments of Sport and Recreation, Football NSW and other industry leaders.

This edition also outlines a range of exciting product and service releases from the sold-out trade exhibition (26-27 June).



For those unable to attend the education sessions, I encourage you to get along to the trade exhibition – entry is free – to see some of these new product releases first-hand and support the organisations that support your association.

HISTORIC CHAPTER AGREEMENT

Outside the conference, it has been a busy few months for the AGCSA with a number of developments starting to take shape. Primarily among these was the recent announcement of the signing of an historic Affiliated Chapter Agreement which deepens the collaboration and cooperation between the AGCSA and all state golf course superintendent associations.

The sanctioning of such an agreement between national and state bodies is significant, as it is the first time that all associations have established a co-operative agreement to play a unified role in the Australian sporting industry, particularly in the areas of advocacy, education and research.

This agreement will see each of the state superintendent associations formally align under the AGCSA as national body and enables joint policy development, advocacy efforts, training and representation at state and national levels. Further, it creates a platform to implement and support local and

national education programmes that build environmental and sustainable practices, enabling improved outcomes for sports and recreation facilities. It also allows for increased advocacy activities between national and state bodies to ensure superintendents and sports turf management professionals are recognised and represented.

I would like to thank each of the state association presidents and committees for their support in this strategy and more so acknowledge their joint aspiration in working together to develop a more unified and professional turf industry.

'THANK A SUPER'

May also saw the delivery of the second 'Thank a Superintendent Week' campaign, an initiative designed to drive awareness and recognition of the great contributions that course management teams make to the game of golf in Australia. We were thrilled with the coverage this initiative received from golf media and industry bodies, with information appearing in print, websites, social media and radio.

PITCHING IN

Finally, in a significant piece of work for the whole of Golf, the AGCSA has been working with the Australian Golf Industry Council (AGIC) in putting together an advocacy campaign. The AGIC incorporates representatives from the eight leading bodies in golf within Australia and during the early part of the year put together an advocacy campaign leading into the Federal election. The programme, entitled 'Pitch In: Grow Community Golf', called on Federal MPs and candidates to get behind golf during the Federal election campaign, to support the great places and people in the sport.

The AGIC has engaged in a number of meetings with MPs and advocated for further investment into golf facilities to improve the capability and sustainability of golf clubs around the nation. The campaign received a tremendous amount of support, resulting in various radio interviews, social media and media coverage in local and national newspapers and golfing magazines.

Further updates on this campaign, and a host of other activities that the AGCSA has planned over the next 12-18 months, will be featured at the upcoming conference and I look forward to sharing these with you all there. See you in Brisbane. 🌿



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ARENAS

Parramatta tackles St George Illawarra in their Round 8 NRL clash at new home Bankwest Stadium



PHOTO: NRL PHOTOS

Western Sydney wonder

The Sydney sporting infrastructure landscape is undergoing some dramatic transformation at present, with new stadia being constructed and others in the midst of redevelopment. In April, the 30,000-seat Bankwest Stadium opened in Sydney's western suburbs, the long-awaited new home of the Parramatta Eels and Western Sydney Wanderers. A true multi-purpose stadium, as HG Sports Turf's Erik Kinlon writes it boasts a number of technological advances to aid in managing the state-of-the-art playing surface.





AgriDark couchgrass was chosen for the Bankwest Stadium surface based on its strong and rapid recovery from wear, its increased winter activity and shade tolerance

Western Sydney Stadium, commercially known as Bankwest Stadium, is Australia's newest multi-purpose rectangular stadium. It replaces the now-demolished Parramatta Stadium on the same site footprint that also included the removal of the adjacent Parramatta War Memorial Pool, with a replacement pool being built at an alternative site.

Following a two-year construction period, Bankwest Stadium opened in April 2019. It is classified as a Tier 2 stadium that has a 30,000 maximum seating capacity. The stadium is owned by the NSW Government and operated by Venues Live which also operates ANZ Stadium (Sydney) and Optus Stadium (Perth). It was awarded to the winning design and build consortium, with the design by Populous Architects and construction by Lendlease. The total build cost \$360 million.

Leading stadia sports pitch contractor HG Sports Turf was responsible for the full pitch design and construct contract that included some cutting-edge technology never seen before on Australian shores. Bankwest Stadium adds another significant milestone project to HG's portfolio that already includes the likes of the Melbourne Cricket Ground, ANZ Stadium, AAMI Park, Optus Stadium and Metcon Stadium.

The primary uses of the new stadium are for rugby league, soccer, rugby union

as well as concerts and special events. The foundation teams are National Rugby League (NRL) club the Parramatta Eels and A-League soccer club the Western Sydney Wanderers. Other tenants include NRL teams the Wests Tigers and Canterbury-Bankstown Bulldogs, plus Super Rugby team the New South Wales Waratahs. Some of those clubs are relocating games on a temporary basis while the knock-down rebuild of the Sydney Football Stadium and redevelopment of Stadium Australia goes ahead.

The stadium was opened to huge levels of excitement in western Sydney by NSW Premier Gladys Berejiklian at a Community Open Day on 14 April 2019. The first sporting event at the stadium saw the Parramatta Eels take on the Wests Tigers in Round 6 of the 2019 NRL Telstra Premiership in front of a record attendance of just short of 30,000. The Eels christened their new home in style by winning 51-6, five-eighth Mitchell Moses scoring the very first try at the venue and collecting a total of 19 points for the match.

HAIR-RAZING HISTORY

The site on which Bankwest Stadium resides is steeped in history. Going back as early as 1788, the area was used for leisure and horse racing in the British colony at Parramatta that was founded along with the harbour settlement of Sydney.

Governor Charles Fitzroy approved the creation of a racecourse on the site in 1847, with a cricket field grown within the racetrack.

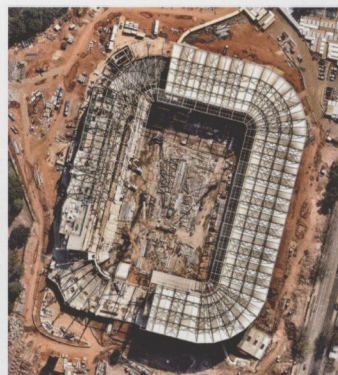
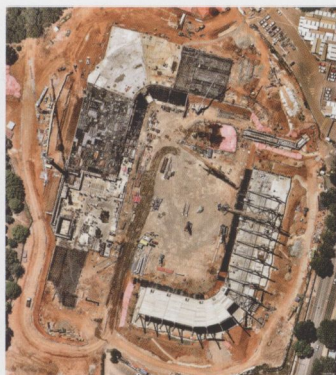
It opened in 1863. After numerous name changes, the local cricket club settled on the name Central Cumberland Cricket Club and from there the site gained the Cumberland Oval name.

Cumberland Oval was used variously for horse racing, cricket, athletics, rugby union, rugby league and motor sports. When in use for motor sports the site was named the Parramatta Speedway, holding events from 1930 through to 1959.

When the Parramatta District Rugby League Club was admitted into the NSWRL Premiership in 1947, Cumberland Oval became the club's home ground. In 1981, Parramatta, coached by the legendary Jack Gibson, secured its inaugural premiership by beating Newtown Jets 20-11 at the Sydney Cricket Ground, but it is what transpired afterwards that will be remembered most.

Some 10,000 Parramatta fans packed into Cumberland Oval to celebrate the win and things quickly turned to pandemonium. Rugby league journalist Neil Cadigan, in an article on the Eels club website, describes the events of that fateful day...

"Cumberland had one old wooden grandstand, built in the 1930s. The ground had certainly had its day... and the Eels had been campaigning since 1977 to have it bulldozed and replaced by a new American-style 'superdome' at a cost of \$6 million. Four years later, the cost had crept up to \$10 million and opposition from a group called Friends of Parramatta Park had

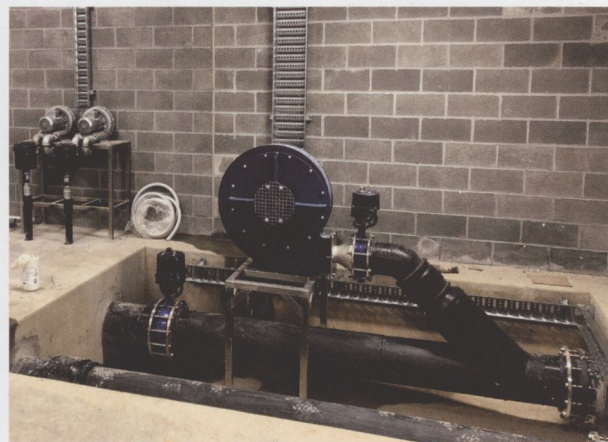


Aerial shots courtesy of Nearmap showing construction progress of the two-year Bankwest Stadium build. The last game at the old Parramatta Stadium (top left) was held in late September 2016 with demolition beginning in early 2017. Stadium construction finished in April 2019 with the first game played there the Round 6 NRL clash between Parramatta Eels and Wests Tigers on 22 April





Bankwest Stadium is the first in Australia to use the AirPat vacuum-ventilation system which can force air into the profile and draw moisture out of it. The system comprises a series of feeder and collector pipes on top of a water and air tight rubber liner that covers the entire surface



delayed progress. A full-time consultant was employed in 1979 as residents, National Trust, traffic police and other opponents stalled development. It was a political hot-potato.

"The night of September 27 it become hotter than hot ... it was torched down to cinders! Fuelled by alcohol, exhilaration and a well-meaning gesture by radio 2KY's iconic broadcasting figure Ron Casey, a wild, destructive party developed at the ground. 'Case' ventured to Cumberland to honour a bet that he would celebrate with fans if the Eels won the first title. Word quickly spread, and hundreds had converged and suddenly fence palings were being gathered for a bonfire.

"The crowd swelled into the thousands and while fans looted the dressing rooms and kiosk shelves, fire broke out above them

and some escaped the smoke-filled stand's bowels just in time to see the old stand become a furnace with flames bursting from the floor to the roof."

Long after the smoke had cleared, a decision was made to build a modern stadium. Parramatta Stadium was designed in 1984, constructed in 1985 and opened by Queen Elizabeth II on 5 March 1986. It was converted into an all-seater stadium in 2002 with a reduced capacity of 21,000.

In 2012, with the success of the newly formed Western Sydney Wanderers A-League club (which included hosting a sell-out crowd for the 2014 AFC Champions League Final) and the ongoing desire of the Parramatta Eels to replace the nearly 30-year-old stadium, the NSW Government canvassed expansion options, including an increase to capacity in

the north and south ends and a successive rebuild of all grandstands. In September 2015 the decision was made for a knock-down rebuild of the entire stadium.

DESIGN FEATURES AND INTENT

Built with the design intent of being a 'fans first' stadium, Bankwest boasts the steepest stands in Australia which brings fans closer to the action and promises to increase the match day atmosphere and fan experience. The use of exposed steel on the exterior of the stadium, as well as the precast concrete units, create the distinctive horizontal patterned façade which are an unapologetic nod to western Sydney's industrial roots.

The key features of the stadium are a 10,000 increase in capacity from the old stadium, a major increase in corporate

Anthracnose
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graminicola),

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Pythium Root Rot,
Seedling Damping Off
(*Pythium* spp),

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(*Fusarium nivale*,
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Take-All Patch
(*Gaeumannomyces*
graminis var. *avenae*),

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Ectotrophic Root
Infecting Fungi (ERI)
[Autumn strategy]

Spring Dead Spot
(*Ophiosphaerella*
narmani),

Take-all Patch
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graminis var. *avenae*)

Ectotrophic Root
Infecting Fungi (ERI)
[Spring and Summer
strategy]

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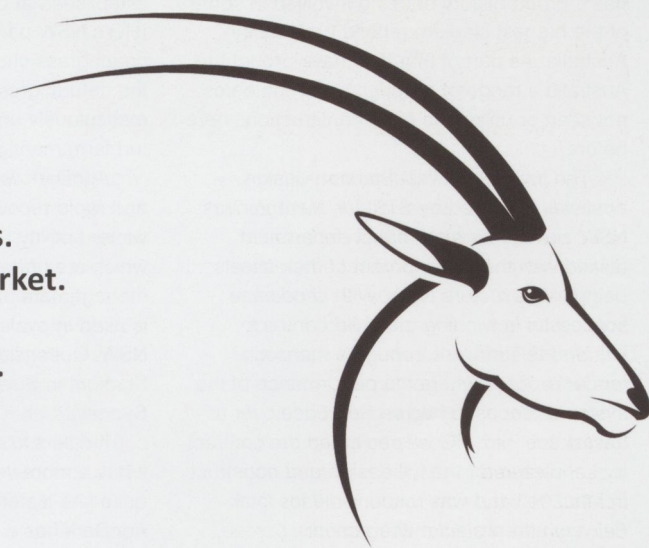
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facilities, steep grandstands, integrated pedestrian and transport links, local landscaping, a premium field level members club and the highest quality audio and visual technology.

Bankwest also features the first major installation of modern safe standing areas in Australia. Three bays, totalling a capacity of 1000 in the 'Red & Black Bloc' active supporters area, can be turned into a standing area using an interchange system. Regular seating installed during the winter rugby code season can be swapped out during the A-League season which runs October to May. Bankwest is also designed to have an LEED Gold Energy rating.

PLAYING THE FIELD

When it comes to the design and construction of stadia playing surfaces, HG Sports Turf has a proud history of being involved in some of the biggest stadium rebuild projects in Australia. As part of that they have brought to Australia a range of proprietary technologies not seen or utilised in pitch constructions here before.

The initial Bankwest Stadium design brief was prepared by STRI for client Venues NSW and the division of that department tasked with the development of their assets being Infrastructure NSW. With Lendlease successful in winning the build contract, HG Sports Turf went through a thorough tender process where the performance of the systems proposed had a preference over a lowest cost bid. HG was awarded the contract by Lendlease for the full design and construct in late 2017 and was responsible for total delivery and project management.

A number of different options were proposed, however, the final decision was to opt for an Australian first with the installation of an in-ground vacuum-ventilation system. HG had such a system at its disposal through long-term US partner The Motz Group.

Post-awarding of the contract, the first task for HG was to manufacture, mobilise and plant 12,000m² of its proprietary Eclipse Stabilised Turf. The turf system was chosen based on its ability to satisfy the criteria of the design brief and to be truly 'ready to play' post-installation. Eclipse Stabilised Turf has long been the go-to product for stadia across Australasia and has been installed previously at the likes of Optus Stadium, the MCG, AAMI Park, ANZ Stadium and Metricon Stadium as part of the 2018 Commonwealth Games project.

Eclipse Stabilised Turf combines natural grass and synthetic grass in the turf roll. The synthetic fibres are tufted into an open weave backing and once ready for harvest guarantee stability, consistency and a very even playing surface immediately after installation.

In February 2018, the product was established at Greenlife Turf in Windsor (HG's NSW partner turf farm) with AgriDark couchgrass chosen as the variety for the natural grass. The turf was grown meticulously under the watchful eye of HG's turf farm manager Mark Patterson-Hill.

AgriDark was chosen based on its strong and rapid recovery from wear, its increased winter activity and shade tolerance, all of which are hugely important factors in the management of any stadium turf surface. It is used in ovals and sports fields in Victoria, NSW, Queensland and by ANZ National Stadium in Suva (Fiji) and ANZ Stadium in Sydney.

It differs from other couchgrasses in that it has a more vertical growth pattern and is quite fine-leaved which is preferred for soccer. AgriDark has a deep rhizome network and produces a dark green leaf that stripes up well, is aesthetically pleasing and looks good on TV.

In the months that followed, HG worked continuously with Lendlease and their partners in The Motz Group and SportEng to

finalise the designs for the pitch construction and respective systems that were to be included. In late October 2018 HG staff mobilised to site, working once again with civil and earthworks contractors Daracon Construction, establishing themselves on site which would become home for the following 16 weeks.

The build programme was going to be tight given that other works on site had shifted and there needed to be a lot of concurrent operations and contractors using the same access and playing surface area to complete their works. HG's first task on site was to assess, check, test and approve any of the early works that had been done on site by others.

With the 'field of play' area being 140m x 80m and built to a completely flat grade, the pitch construction included the following systems and partner suppliers;

- AirPat vacuum-ventilation drainage and aeration system, supplied by The Motz Group;
- Butyl rubber liner supplied and installed by Waterlogic;
- A fully automated and controlled Rain Bird irrigation system with IQ Control and 8005 Series sprinklers supplied and installed by Gosford Water and Irrigation Services;
- 150mm drainage gravel layer and 260mm sand profile blended with five per cent coir fibre (Benedict Sand and Gravel);
- Eclipse Stabilised Turf surface;
- Goal posts for rugby league, rugby union, soccer and AFL-X supplied and installed by Abel;
- Polytan Liga Turf synthetic perimeter to meet international standards.

Much like any construction site, one of the first priorities for HG and Daracon was the installation of the stormwater drainage network, including the mains collectors and connection to the stormwater outlet. With this infrastructure, along with the spoon drain and grate channel installed, it helps to de-risk the site from potential flooding and dewatering.

AIRPAT – THE HIDDEN SECRET

AirPat is the most advanced natural grass rootzone management system in the world. Built in-ground, the system has two distinct modes of operation. In 'vacuum mode' a suction pump draws moisture out of the sand profile, while in 'ventilation mode' a fan unit blows forced air into the sand profile for aeration. The system's intention is to give the turf manager a tool that helps to keep the surface at or as near to the optimum condition all year round.

The AirPat system comprises a series of feeder and collector pipes, much like a conventional drainage system on top of a water and air tight rubber liner (see photos page 10). The feeder/collector pipes are connected to a series of AdvantEdge flat pipes that are custom made with fittings to suit the AirPat connections. When the system is neither in vacuum or ventilation modes it acts as a standard gravity drainage system.

The system can be customised to particular venues to allow for continuous rootzone monitoring and management and can be a fully automated and remotely operated while also having a manual mode. In addition, functions such as water conservation and water recycling, as well as conditioning of the rootzone using warmed and chilled air, can be added.

Along with the AirPat system sensors, the field can be monitored by a series of in-ground sensors that feed back to a 'Green Brain' computer programme. A weather station was also supplied and installed on the roof of the stadium and another mobile weather station is utilised down at pitch level.

The AirPat system was developed by The Motz Group in the US and has been installed at a number of venues, including the Atlanta Braves Ball Park. With the ever-increasing demands being put on stadia turf managers

here in Australia with multiple tenants, sports codes and non-sports events like concerts and monster trucks, management tools like AirPat will be invaluable and certainly the way of the future.

WATER AND SAND

With the complex installation of the AirPat System completed and managed by HG's project manager David Birch, with the assistance of Mark Heinlein from The Motz Group and Daracon Construction, normal service resumed.

A fully automated Rain Bird irrigation system was installed by Gosford Water and Irrigation Services including controller, all pipe infrastructure, wiring, valves, 8005 Series sprinkler heads and pumps to achieve the required flow rate and pressure. Once installed, the system was pressure checked and tested to ensure the CU and DU met the design criteria.

Following a very thorough search with various suppliers, HG sourced the profile sand through Benedict Sand and Gravel from its Menangle production facility in NSW. Working closely with Benedict's professional soil scientist Murray Fraser, HG was able to find the correct blend of sand to ensure it met the required criteria and fitted the parameters required in the specification.

With sand, particularly the correct sand for sports field constructions, becoming an increasingly rare commodity, it was a great result for HG and Benedict Sand and Gravel who now produce this under the brand name 'Smart Mix'.

The profile rootzone was built in one consistent layer and was ameliorated with five per cent coir fibre. The production stockpile was tested frequently at the quarry source and then again once it had been delivered to the stadium. The results proved the following;

- All 10 in-situ samples conformed to the particle size specification;
- Hydraulic conductivity and bulk density of all samples was acceptable;
- Aeration porosity was within or above the acceptable limits;
- Volumetric water content of all samples was acceptable;
- pH was slightly acidic to neutral but can be adjusted;
- Salinity was variable and generally above accepted levels, however, this will reduce with leaching over time.

The importance of the rootzone profile should not be underestimated and is one of the most critical components of any sports field project. The physical properties of the sand need to be within specification and consistent for the full supply of 6000 tons.



It took HG staff four days to install the 11,400m² of Eclipse Stabilised Turf which had been growing at Greenlife Turf in Windsor for more than a year



GREEN CARPET

On 25 February 2019, with the pitch surface completed up to the finished surface level of the sand, the last part of the construction puzzle was to install the Eclipse Stabilised Turf which had by this stage been growing on the farm for over a year. Under the constant gaze and management of Mark Paterson-Hill, the turf was treated like his baby and was 100 per cent ready months in advance.

With a fleet of specialist equipment for the harvesting and installation of the turf and a crack squad of personnel, HG then set about harvesting the 11,400m² to be installed. A harvest crew of six and an installation crew of 12 set about installing the 38 loads of turf which would make the short journey from Windsor to Parramatta.

With each roll measuring 10m long, 1m in width and weighing 800kg, the installation moved at a pretty rapid pace, with 3000m² being installed per day. In order to ensure the surface stayed on grade and within the very fine tolerances HG set, a Lawless laser grade box worked ahead of the turf installation, prior to the rolls being installed.

As with all of HG's projects, the turf was installed with WMI tracked turf installers as well as the use of a new special weapon 'The Side Kick' which is a hydraulic skid mounted on a 30hp John Deere tractor. As the turf is installed, the Side Kick follows and pushes the turf neatly and tightly into position, ensuring no gaps in the seams of the turf. This method of pushing the turf ensures there is no damage, limited compression and neat straight laying lines. HG loves the machine so much it has invested in three of them and is now the distributor for the region.

It took four days for all the turf to be installed with maintenance operations

starting immediately after. HG was contracted to maintain the new playing surface for the first six weeks after the installation before handover to Venues Live and their turf management team headed by highly respected curator Graeme Logan.

THE CHALLENGES

It is pretty safe to say that a project of this scale and size was always going to have some construction challenges. Working within such tight confines with so many other contractors and trades all trying to complete their works in line with their programs always poses a challenge.

There were a few minor construction issues as well, one being the AirPat system's pipes to and from the under-stadium pump room being cast in the concrete wall at the wrong elevation. This meant there had to be some modifications to ensure the system operated correctly. Overall, however, the project went very smoothly and was completed on time and to budget.

POST-TURF INSTALLATION

In the weeks after the installation and during the time that HG was tasked with the maintenance of the surface, testing of all the surfaces and systems was completed. This saw Keith McAuliffe from Labosport Australia complete the ScorePlay testing on the new Eclipse Stabilised Turf playing surface. McAuliffe commented that it was one of the best completed playing surfaces he had seen anywhere in Australia, if not the world, and had an exceptionally high score of 95 per cent.

The synthetic surface was also tested to ensure it met the standards and criteria for the respective sports codes as set by their

Built with the intent of being a 'fans first' stadium, Bankwest boasts the steepest stands in Australia which brings fans closer to the on-field action

governing bodies. The AirPat System test was also completed out in the field after the turf had been installed and proved to be working exactly as designed, much to the relief of everyone.

Shortly after the turf was installed, a minor renovation was conducted to transition the field to ryegrass for the winter months and prior to handover to the Venues Live boys Joel Toogood and Stephen Bailey.

BANKING A WINNER

At the time of writing Bankwest Stadium has hosted eight NRL and Super Rugby games with the surface performing as expected. The ground will continue to have a steady diet of rugby league and union in the coming months, while on 20 July it will host an exhibition game between the Wanderers and touring English football club Leeds United. It will also host the Wallabies v Manu Samoa rugby international in early September, while in October it will host the Sydney leg of the Downer Rugby League World Cup 9s over two days.

For HG, the most pleasing part of any project is seeing the quality of the finished product. Bankwest Stadium is not just a 'fans first' stadium but it is also a 'groundsman's first' stadium. The commitment from the NSW Government and Venues NSW to demolish and rebuild the stadium has been repaid with a venue that is on par with any other worldwide.

"It gives us great pride and a sense of achievement to have been involved in the construction of Bankwest Stadium," says Hamish Sutherland, HG Sports Turf company principal. "It was great working for a great partner in Lendlease Construction and in turn for a great client in Venues NSW.

"We are extremely lucky to have such a great team at HG Sports Turf and a range of innovative products and technologies that lead the way in the sports turf market. We would like to thank all of our partners and suppliers for their support in helping us deliver another exceptional stadium project here in Australia."

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Kingarrock Hickory Golf near St Andrews Links in Scotland, steadfastly champions the principles of golf course management dating back nearly a century

Just 10 miles down the road from the famed St Andrews Links resides an equally unique piece of golfing real estate. Nestled between the centuries-old villages of Ceres and Craigrothie, resides Hill of Tarvit, a property managed by the National Trust for Scotland. The mansion home and gardens are just one of many stunning historical properties dotted throughout the Scotland countryside, but this one has something that sets it apart from most others – a golf course.

The course – Kingarrock – was originally laid out in the early 1900s by then-Hill of Tarvit owner Frederick Sharp, a wealthy financier and jute manufacturer from nearby Dundee. Both Frederick and his son Hugh were particularly keen golfers and both were members of The Royal & Ancient Golf Club, also serving on the Rules Committee.

The area of parkland in front of the mansion house was chosen and, having been formally planted as a designed landscape with fewer than 40 trees, was perfectly suited for golf. It was renamed Golf Park and good use was made of the established trees such as sessile oak, ash, beech, sycamore, lime and horse chestnut. Locals were allowed on for free after 2pm and the course was often used for practice by competitors at St Andrews, including an Open champion.

Unfortunately, like many courses of its time, it was commandeered for farming use to support the war effort during World War II and not resurrected until an approach was made to the current owners, the National Trust for Scotland (NTS), in 2004. This came about after NTS staff discovered a map of the original course dating back to 1924 as well as a set of Sharp's hickory golf clubs.

Enthused by the discovery, a planning application was submitted and a new design was drawn up. While the original map showed two holes sharing the same green (holes 1 and 6 and 2 and 8), when the course was redesigned by former Walker Cup player Peter McEvoy the shared greens and cross-over holes were replaced with nine individual holes stretching over 2022 yards. And so was born Kingarrock Hickory Golf.



PHOTOS: OWEN BROWNE AND KINGAROCK HICKORY GOLF

The course was eventually reopened in 2008 and it is believed to be the sole hickory-only golf course in Europe. No modern clubs are allowed and all players are furnished with a set of hickory clubs for their round. This throwback to golf of yesteryear also carries over into the maintenance of the course and to this day it is intended that the course be maintained following the greenkeeping methods used and materials available in the 1920s.

A NEW HOME

My journey to Scotland – and ultimately Kingarrock – was one I never envisaged taking when I first left Melbourne in the mid-1990s. I initially headed to St Andrews expecting to stay a year or so, never for one moment thinking that 25 years later I'd still be here. My wife Sandra is born and bred in St Andrews and together we manage Fairways

Guest House, the closest guest house to the Old Course. The Home of Golf has become our home and as a greenkeeper and someone who has a passion for golf course management, I could think of no place better to reside.

It is definitely a world away from where I grew up in the northern Melbourne suburb of Oak Park. I initially undertook an apprenticeship in horticulture (gardening) with the City of Coburg, but with an interest in sport, especially cricket and golf, I joined the staff at Northcote Municipal Golf Course. I ended up taking on the role of 'employee-in-charge' (superintendent), spending five years there during which time I completed an Advanced Certificate in Parks Management and undertook an Advanced Certificate in Sports Turf Management.

A turning point for me came when attending an interview for the assistant



Former Melburnian Owen Browne is sole custodian of Kingarrock Hickory Golf, along with faithful companion 'Harley'



Scotland is Mecca for any self-respecting greenkeeper and for Melburnian Owen Browne its lure proved irresistible back in the mid-90s. As he writes, 25 years later he is still ensconced and finds himself custodian of a very unique golfing establishment.

A blast from the past

superintendent role at Murray Downs under Richard Forsyth. Realising I was way out of my depth and too inexperienced to progress (and with no-one to learn from at Northcote), I took a step back and joined the staff at Kingston Heath. I learned more in the first five weeks under superintendent Graeme Grant than I had learnt in the previous five years.

While there I volunteered to rake bunkers for the 1993 Australian Open at Metropolitan Golf Club where a chance conversation with then AGCSA president Doug Robinson led to a role on the construction crew at The Duke's Course in St Andrews. Doug was turf consultant for the Thompson Wolveridge Perrett layout.

Starting off as a stone-picker in mid-April snow and sleet and thinking 'What am I doing here?', led to a role overseeing the implementation of the landscaping and then the role of head greenkeeper for the

grow-in. After the hand-over to the owners (The Old Course Hotel), I was successful in my application for the position of course manager.

Despite being the first course in St Andrews to obtain GEO Certification and hosting a number of successful tournaments, after almost 10 years my position was made redundant (I'm not a 'yes man' so my face didn't fit). The Australian-based maintenance contractor chosen to replace me lasted only briefly and ended in inevitable failure.

From that I started my own environmental consultancy and contracting business but missed working on a golf course. Never afraid to take a step back, I decided to join the staff at Gleneagles Hotel as a greenkeeper. I spent seven years there progressing to the role of assistant greenkeeper/environmental coordinator in preparation for the 2014 Ryder Cup tournament.

It was around that time that I heard the position at Kingarrock had become available. I was attracted to it due to the unique sustainability and environmental challenges it offered. I do like a challenge – it must be the Irish in me – and have always had an affinity for the environment ever since my days as an apprentice. That, along with an interest in sustainable course management, was further honed during my stints at The Duke's and Gleneagles, to the point now where at Kingarrock, which has been home for the past five years, these form the cornerstone of all our maintenance philosophies.

OLD SCHOOL

When the new Kingarrock course was constructed, minimal soil was moved with the main focus on using the existing landscape to create a course which was fun to play, while retaining views of the mansion house and gardens, the designed landscape and the surrounding areas. No trees were removed but many have fallen since due to age.

Greens averaging just 170 square metres were constructed using the existing free-draining soil which was screened on site. Bunkering was kept to a minimum to reduce player difficulty (and also with an eye on maintenance costs), with just three shallow, sand-filled bunkers and three grassy hollows.

A stone-lined drain, known in Scotland as a 'cundy', was discovered during construction and, with the top stone removed, features on two holes. The result is a typical parkland course routed among ancient trees, highlighting both natural and man-made features among large areas of open grassland.

Similar to the days of the Sharp family, the course is open from March to October when ground conditions are considered more favourable for golf. Following 1920s greenkeeping practices, there are no herbicides, graminicides, fungicides,



Kingarrock's 8th green with the mansion house and Hill of Tarvit in the background

insecticides or wetting agents applied anywhere on the site. Fertiliser inputs are minimal and applied to greens and collars only. No topdressing is applied and there is no irrigation system.

The rebuilt greens were sown with a fescue/bentgrass mix and despite the usual ingress of *Poa annua* provide a suitable putting surface. Pedestrian mowers are used on greens at a height of 8mm and collars at 10mm, with a cutting frequency of 2-3 times per week. No coring or verti-draining is undertaken and thatch control is limited to regular, light scarifying. End of season aeration is undertaken on a weekly basis using a tractor-mounted slitter, to replicate forking, until ground conditions become unsuitable.

Weed control on greens is undertaken using a hole-changer for rosette-type weeds such as daisies (*Bellis perennis*), a core sampler for tap-rooted weeds such as dandelion (*Taraxacum officinale*), while species unlikely to affect ball roll, such as pearlwort (*Sagina procumbens*), are tolerated. Moss continues to be the greatest issue, with twice yearly applications of Lawn Sand (5-0-0 +2Fe) and scarifying required to keep it in check. Disease incidence is at its highest during winter (when the course is closed) and is accepted as inevitable, but recovery is swift when the growing season starts.

A set of Ransomes 7-knife gang mowers is used to maintain tees and fairways, with an additional 5-knife set for semi-roughs. Both are towed behind a compact tractor.

Relying on natural rainfall to keep turf surfaces alive is the greatest challenge. 2018 was particularly difficult and after several months of dry weather the greens resembled the fairways of a links course – firm and fast but not particularly attractive. Recovery has been slow and with a dry start to 2019 things are looking just as difficult.

THE ROUGH CHALLENGE

Since the course reopened in 2008, large areas of semi-rough were mown regularly with some extending well beyond the area of play. While this might have been considered a replication of 1920s golf, it was not sustainable and since 2014, with staff reduced to one full-time greenkeeper (me), these areas have been left uncut. However, having been regularly mown for the previous six years, the returned clippings had added to an already nutrient-rich profile which now generated significant growth.

Generally, they were only 4-6 metres in width, but any golf balls straying offline were lost almost immediately. Most areas were dominated by dense stands of bent and fescue, with some ryegrass (*Lolium sp.*) and Yorkshire fog (*Holcus lanatus*). Wetter areas had transitioned to creeping buttercup (*Ranunculus repens*) and there was a distinct lack of biodiversity.

View from Kingarrock's 9th tee. Following 1920s greenkeeping practices, there are no herbicides, graminicides, fungicides, insecticides or wetting agents applied anywhere on the site. Fertiliser inputs are minimal and applied to greens and collars only.





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A stone-lined drain, known in Scotland as a 'cundy', was discovered during construction and, with the top stone removed, features on two holes

Tussocky grasses such as Timothy (*Phleum pratense*), cocksfoot (*Dactylis glomerata*) and tufted hair-grass (*Deschampsia cespitosa*) were also beginning to colonise certain areas, while pockets of dock (*Rumex obtusifolius*), spear thistle (*Cirsium vulgare*), creeping thistle (*Cirsium arvense*) and rosebay willowherb (*Chamerion angustifolium*) were establishing and adding to the issue of lost balls.

Alternative management methods were required and a combination of methods were introduced involving grazing, cutting and collecting, introducing hemi-parasitic species, hand-weeding and establishing wildflowers.



The grassland areas, some formerly mown as semi-rough, are now grazed from April to September with around 30 Hebridean sheep

Grazing: The grassland areas, some formerly mown as semi-rough, are now grazed from April to September with around 30 Hebridean sheep, an ancient breed of medium-sized black sheep, which came from the islands off the west coast of Scotland and were domesticated by Iron Age farmers. In the 20th century they were brought back from the brink of extinction and now they are widely used by conservation organisations.

They can tolerate harsh weather and survive well on a mixed diet of plants that some modern breeds of sheep find unpalatable. Their scissor-type chewing action protects the lower vegetative parts, allowing regeneration after grazing. Other breeds of sheep have a pulling action resulting in plant loss.

The sheep at Kingarrock are confined to an area of 2500 square metres using a solar powered electric fence. As a rough guide, 30 sheep will chew through this area in around 10-15 days, depending on how cold it is, before being moved to the next area. I only know of two other courses in the UK using Hebridean sheep to manage roughs, but think more could.

Cutting and collecting: After grazing, a Wessex STC180 flail/sweeper, powered by a small compact tractor, is used to cut and collect any trampled vegetation. If conditions are suitable, some sheep droppings are also collected during this operation, further reducing the amount of returned nutrients. The collected material is then stored on site for use by a neighbouring farmer. After composting it is spread on nearby fields.

Prior to golf returning to the site, the field was used for sheep and cattle farming

and heavily fertilised with the emphasis on producing as much grass (feed) as possible. As a result, the soil is still nutrient-rich, requiring particularly vigorous or dense areas of grass to be cut and collected during the growing season. As a general rule, grazing reduces the amount of vegetative material by around 75 per cent resulting in considerable savings in fuel and labour.

Introducing hemi-parasitic species:

After 3-4 years, some areas have thinned sufficiently to allow the sowing of yellow rattle (*Rhinanthus minor*) which is an annual meadow plant 8-25cm high. It is a hemi-parasite (partially parasitic), photosynthesising for itself, but it also parasitises the roots of some plants, especially grasses and clovers.

As it steals nutrients from these species, they grow much less vigorously and the sward is opened up allowing other, less competitive wildflowers to grow. It must be sown in the autumn as it needs prolonged chilling through the winter to trigger its germination the following spring (late February to early March).

Hand-weeding: The tussocky grasses, already weakened by grazing or cutting and collecting, are easily dug out manually with a fork or mattock and despite being very labour intensive this is still the best method of control. Spear thistle and dock are also more easily removed using the same method.

Browne regularly entertains turf industry members wanting to gain an insight into the unique management practices employed at Kingarrock

The density and vigour of creeping thistle and Rosebay willowherb has been significantly reduced with the introduction of both yellow rattle and grazing and makes removal by hand far more effective.

Establishing wildflowers: Wildflowers favour nutrient-poor soils and minimal competition from grass species, so establishing them at Kingarrock obviously poses a considerable challenge. As its host plants reduce in vigour, yellow rattle itself becomes much weaker and the open patches are then either colonised naturally by other wildflowers, sown with wildflower seed (collected on site the previous year) or plug planted using plugs harvested from a small wildflower area established after the course was constructed (an old hole-changer does the trick!).

Rosette-type species, such as meadow buttercup (*Ranunculus acris*), cat's ear (*Hypochaeris radicata*), sorrel (*Rumex acetosa*), yarrow (*Achillea millefolium*) and ribwort (*Plantago lanceolata*) are favoured in areas adjoining the semi-rough as this reduces the likelihood of lost balls due to their more open habit of growth.

Larger or more sprawling species such as greater knapweed (*Centaurea nigra*), ox-eye daisy (*Leucanthemum vulgare*), lady's bedstraw (*Galium verum*) and meadow vetchling (*Lathyrus pratensis*) are more suited to out-of-play areas. Both these areas, formerly known as grassland areas, are now treated as wildflower meadows and grazing commences on completion of flowering in late September.

IMPROVED PLAYABILITY

Despite these four new methods of management being introduced only relatively



A set of Ransomes 7-knife gang mowers is used to maintain tees and fairways, with an additional 5-knife set for semi-roughs. Both are towed behind a tractor

recently, there is evidence of significant improvement already. Most impressive has been the transformation of the grassland area between holes 5 and 6. Four years ago this area was a tangled mass of creeping buttercup, creeping thistle, dock and dense grasses, with just a scattering of yellow rattle plants and one solitary marsh orchid (*Dactylorhiza purpurella*). It was also a haven for lost balls.

Over the last three winters it has been grazed, cut and collected and hand-weeded. As a result, less moisture is being retained in the profile and, consequently, creeping buttercup is less dominant. The sward is now dominated by yellow rattle which has been spread via the feet of grazing sheep and the area currently boasts a population of more than 20 marsh orchids.

Additional thinning of the sward is needed and will occur naturally as the yellow rattle



spreads, but there are already some 'golfer-friendly' sections. Replicating this throughout the course is the ultimate aim, particularly in areas close to play, but as not all areas will transform as readily due to different species composition (rye and Yorkshire fog), it is another significant challenge.

Yellow rattle will also parasitise many wildflower flower species, not just grasses, and in the absence of graminicides at Kingarrock this plant has been vital in developing a wispy rough conducive to the spread of smaller wildflowers, greatly

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The rebuilt greens were sown with a fescue/bentgrass mix and are cut with pedestrian mowers at a height of 8mm

improving biodiversity and significantly reducing the number of lost golf balls. Sowing of yellow rattle has also been extended to the margins of stone-lined drains and bunker faces. The result is a naturalised look and significantly reduced maintenance.

INCREASED BIODIVERSITY

The out-of-play areas, previously maintained as semi-rough, are now becoming more wildflower dominant and are a particularly attractive habitat for insects, especially bumblebees (*Bombus* sp.). The flower-rich meadows are a vital source of nectar and pollen for foraging bees, offering both quantity and diversity, with plants such as Devil's-bit scabious (*Succisa pratensis*), selfheal (*Prunella vulgaris*), yellow rattle and greater knapweed being particularly sought after. Additionally, the seeds of greater knapweed provide a food source for the large flocks of goldfinch (*Carduelis carduelis*) now attracted to Kingarock each autumn.

Although considered invasive and unsuitable in areas close to play, tussocky grass species still have considerable wildlife value and are protected from grazing where possible. Existing areas of Timothy and cocksfoot are retained where they do not affect play and tufted hair-grass is divided and replanted to provide a valuable habitat for field voles (*Microtus agrestis*). The tunnels created by field voles through the tussocky growth provide nesting sites for bumblebees. In turn, raptors, particularly buzzards (*Buteo buteo*), use these areas as feeding sites.

ENVIRONMENTAL INITIATIVES

As well as wildflower establishment, 15 32mm-hole birdboxes were constructed and placed in groups of three on trees around the course's small pond and have attracted tree sparrows (*Passer montanus*) to use the area as a feeding site for their young.

Being very communal birds they prefer to nest in groups but the boxes have also been used by both blue tits (*Cyanistes caeruleus*) and great tits (*Parus major*). Additionally, three 32mm-hole birdboxes were placed on trees on the edge of a small copse of Scots pine (*Pinus sylvestris*) as tree bumblebees (*Bombus hypnorum*) are known for 'adopting' birdbox nests.

Two hedgehog houses were constructed and placed on the course for use during winter and are particularly useful given the lack of leaf litter on the course. Additional areas of knapweed have also been developed as feeding sites for goldfinch and have attracted larger charms (flocks) for longer periods.

A tree replacement programme has started with the aim of establishing suitable replacements for the existing trees as they start to decline. The original species list has



been retained but more emphasis has been placed on the use of sessile oak, as oaks are known to support more wildlife than any other native tree.

As these near-200-year-old trees decline they will continue to provide a habitat well beyond their death, as dead wood piles or 'bug hotels' are constructed in the out of play areas. Despite their less than ideal full-sun position, they provide a valuable habitat for mosses, lichen and fungi as well as numerous insects.

Kingarock now has a strong environmental theme and was rewarded with a runner-up position in the Conservation Greenkeeper of the Year category of the 2016 Golf Environment Awards. A submission for the 2020 awards is currently being compiled.

ST ANDREWS 'LINKS'

Kingarock's association with St Andrews and The R&A, originally started by the Sharp family close to a century ago, continues to be strong today. Steve Isaac, The R&A's director of sustainability, and Gordon Moir, former director of greenkeeping at St Andrews, both serve as Kingarock trustees.

Together with Gordon's newly appointed successor Sandy Reid and Dr Paul Miller from nearby Elmwood College (the UK's leading greenkeeping college), the group meet yearly for a course walk. Discussion focuses mainly on sustainability and the results of some of the initiatives undertaken and rarely on turf quality. Creating and retaining the course's early 1900s character to provide visiting golfers with a genuine hickory golf experience is the main aim.

This association with St Andrews was extended further last year with visits from Dave Hurst (Cromer Golf Club, Sydney) and Liam Scott (Keysborough Golf Club, Melbourne) as part of Toro's Assistant Superintendent St Andrews Internship. It is hoped that future award winners will also visit Kingarock to experience what is a very different and unique approach to golf course management.

Editor's Note: Owen Browne welcomes contact from members of the turf industry to arrange a visit or play. Owen can be contacted by email obrowne@nts.org.uk or stay@fairwaysofstandrews.co.uk. You can also connect with him on Twitter @owenmbrowne. For more information on Kingarock Hickory Golf, visit www.nts.org.uk/Kingarock-Hickory-Golf or check out the Twitter account @KingarockGolf. 🌱

Yellow rattle is a hemi-parasite (partially parasitic) meadow plant that photosynthesises for itself but also parasitises the roots of some plants, especially grasses and clovers

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'Magic'

weekend

PHOTOS: NRL PHOTOS



Six-hundred-and-forty minutes of footy, 366 points, 66 tries, 16 teams, eight games, four action-packed days, one venue. The NRL's inaugural Magic Round in early May was certainly one out of the box for Suncorp Stadium grounds manager Malcom Caddies and his dedicated arena crew.

Magic Round at Suncorp Stadium proved a huge success, with close to 135,000 fans attending eight games over a four day period. Pictured is the Melbourne-Parramatta game on Saturday

ARENAS

Suncorp Stadium grounds manager Mal Caddies planned his nutrition programme months in advance so that the Legend couchgrass surface could be as strong as possible for the NRL's Magic Round onslaught

On both a personal and professional level, the three week period from late April to early May was quite literally a 'magic' one for Suncorp Stadium grounds manager Mal Caddies. It started with some fantastic news regarding his health and culminated with the NRL's inaugural Magic Round, which saw all 16 teams play their Round 9 matches at Suncorp.

On 26 April 2019, some five years since he was first diagnosed with melanoma, Caddies made his well-worn pilgrimage to Princess Alexandra Hospital in Brisbane to undergo scans. Having fought through some dark days shortly after being diagnosed and his subsequent operation in 2014, Caddies' primary goal in the aftermath of it all was to reach the five-year mark cancer-free. These latest scans revealed he had.

The very next day he and wife Lorraine were celebrating eldest son Aiden's 22nd birthday, while seven days later it was

Caddies' turn, notching up the big '50'. Then nine days after that it was the turn of young Jackson Caddies who officially became a teenager on 12 May.

In between all these wonderful personal and family milestones, Caddies also had one of the busiest and most rewarding four-day periods of his professional career since joining Suncorp Stadium following its 2003 redevelopment.

Last June, it was announced that Suncorp would be host of the NRL's inaugural Magic Round which would feature all 16 teams (eight games) across four days at the one venue. No stranger to double-headers in the past, this was a significant scheduling step up for the NRL (and Suncorp Stadium for that matter) and was earmarked as one of several innovations it was looking at to take the game of rugby league to the next level.

And so it proved. Kicking off on Thursday 9 May with a clash between the Gold Coast Titans and Cronulla Sharks and concluding on Sunday 12 May with South Sydney taking

on North Queensland, a total of 134,677 fans packed into Suncorp over the four days. The eight games produced 66 tries and a total of 366 points, Melbourne Storm notching the biggest margin of the round with an 11-try, 64-10 rout of Parramatta on Saturday night.

It was a carnival-like atmosphere both inside and outside the stadium. Stages were erected in the grandstands where bands and DJs played, while outside on the stadium plaza there were a multitude of fan activities, marquees and 'The Bubble', the makeshift transparent home of league personalities Bryan Fletcher and Nathan Hindmarsh for the round. About a quarter of all ticketholders came from interstate, while ticket purchasers came from 10 countries outside of Australia and New Zealand.

After the opening Thursday night game, Suncorp's Legend couchgrass surface withstood a further two Friday night games, three on Saturday and two on Sunday. Despite some corners of the media questioning whether the surface would hold up to such punishment, it did so admirably and will do so again in 2020.

"It was a really good weekend," says Caddies. "The crew pulled some long hours and I reckon I got about 12 hours sleep from the Thursday morning to Sunday night. We really didn't know what to expect with eight games in four days, but the surface performed really well."

"We have hosted multiple events over a week before, so when it (Magic Round) was first announced we were fairly confident that we wouldn't have too many issues with recovery. We were blessed with some perfect autumn weather in the week leading up to the round – 10 hours of sunshine each day and temperatures in the mid-high 20s. The only bit of rain we had (8mm) came during the Friday night game which caused a little more damage than what I would have hoped for, but it was nothing significant."



Despite eight games and some pretty big cattle running around over the four days, the Suncorp Stadium surface held up remarkably well. Magic Round will return to Suncorp Stadium in 2020

GOING IN STRONG

Magic Round topped off what was a busy first half of the year for the Suncorp crew. With a steady diet of A-League soccer since last October, the ground also hosted a Phil Collins concert in mid-January as well as Nitro Circus on 22 February. The Queensland Reds kicked off their Super Rugby home matches on 2 March, before the NRL season began in earnest with the Broncos hosting the Cowboys in Round 2 on 22 March.

All roads, however, led to Magic Round and Caddies made sure his cultural and nutrition programmes all lined up so that the ground was in peak condition for the eight-game onslaught.

"We planned our nutrition programme from about October/November last year with the aim to be as strong as we could possibly be for Magic Round," explains Caddies. "We went onto Living Turf's MP range and did multiple applications of different products either leading into or recovering from events."

"We put out products with higher N and K than I have probably ever done here before and a lot more silica applications. We certainly increased our liquid nutrient input quite significantly and we saw a much stronger plant as a result and is something that we will look to continue going forward."

Once Magic Round was underway, Caddies and his crew of eight would go out at half-time and in between games to walk the field and stamp down any divots. At the end of each day a collection mower was used to pick up debris before staff divotted the field. The following morning staff came back in to do a presentation cut and re-mark the lines and logos if required.

No sooner had the Rabbitohs and Cowboys finished Sunday evening, the Suncorp crew were on deck tidying up and then overseeding the surface with Striker Gold ryegrass at 3kg/100m². After the ground was given a good drenching on Sunday night and again on Monday, Suncorp's artificial light rigs were deployed on the northern end and for the rest of the week it was left to recover.

Three liquid fertiliser treatments were put out as well – a recovery feed on Monday morning, another on Wednesday and one for colour on the Thursday – before the ground hosted an NRL-Super Rugby double header on the Friday and Saturday. The ground then had a two week break before a Super Rugby game on 1 June and then the State of Origin opener on 5 June.


"Overall it as a great experience and be part of something a little different," says Caddies. "Everyone thinks it must be great to

work at a major stadium like Suncorp, but it can become a bit of a grind sometimes week in, week out. But on the Saturday night of Magic Round I had a moment which I haven't had here for a very long time.

"As part of the festivities they had built stages up in the stands and the Stafford Brothers were on and played 'The Horses' by Daryl Braithwaite. I just happened to be walking across the field by myself at half-time of the Melbourne-Parramatta game going back to my office when it started.

"Everyone turned their phone lights on and started singing and I just stood in the middle of the field for about 20 seconds taking it all in and thinking, 'Yeah, this is pretty cool'. I haven't had that sort of feeling for quite some time and it sunk home then and there that we were doing something pretty good for sport in Queensland and for rugby league in general.

"All of it couldn't have happened without the tremendous crew here, including assistant grounds manager Rob Saxby, groundsman Alex Jensen, casuals Shane Biddle, Callum Marsh, Max Corte and the divot staff. We've got a great group of guys who never question anything that has to be done or the long hours needed. I really can't thank them enough for all their hard work."



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Success can take many forms, whether its cutting your first bullet, taking your first superintendent posting or preparing your course for a major international tournament

Are you successful?

The role of a course superintendent can be all-encompassing at times. Lee Strutt, course manager at The Royal Automobile Club in the UK and past presenter at the Australian Turfgrass Conference, reminds us all of the importance of balance in our lives in order to achieve a level of success.

For a while now I have considered what success really is and whether I have achieved it? This led to several discussions with a good friend of mine, Matthew Wharton from Carolina Golf Club in the USA, which eventually morphed into us compiling a presentation that was given at this year's BIGGA Turf Management Exhibition and Golf Industry Show.

The idea came about after Matt and I had been discussing the pressures of being a superintendent and how we were achieving our goals and whether we were being successful? We were both aware of the growing acknowledgement of mental health and wellbeing and thought that there was a clear connection between working towards success and the effects it was having on people in our industry.

We both felt that even though we could not claim to be experts in the field of psychology and behaviour, we believed our experience and knowledge could be shared

with our peers and help assist the younger generation of turf managers coming through the ranks.

Our conversation about success continued backwards and forwards over 18 months as we explored what success really is. During that time, these discussions revived numerous memories of some of the highs and lows we had experienced in search of success, which led us to asking further questions, including;

- Had we achieved success?
- Were we successful?
- How do you define what is success? and
- If we had achieved a certain level of success, what price had we paid for this?

WHAT IS SUCCESS?

Open the pages of The Oxford Dictionary and the word 'success' is defined as;

- The accomplishment of an aim or purpose;
- A person or thing that achieves desired aims or attains fame, wealth, etc....;

- Someone or something that is successful: a person or thing that succeeds.

For us as turf professionals, success can be made up of small and large elements. When we work through our careers we set milestone achievements – maybe it's the first time we mow our first bullet, being responsible for leading a project or team, or promotion to that coveted first superintendent role. All these are signs of success.

Success for some may focus on developing perfect turf surfaces, a pure mono-stand grass species, constructing and maintaining the largest maintenance facility or many significant projects that take you out of your comfort zone. For some it's hosting an event, whether local, regional, national or international like a World Cup or President's Cup. We could also judge success by achieving the status of superintendent at one of the world's most prominent golf clubs, like St Andrews Links or Royal Melbourne.

Gaining qualifications is something very close to my heart. I'm not alone in admitting

One of the great aspects of the turf industry is the camaraderie among its members and the lifelong friendships that are formed

that I left school with very little in the way of academic qualifications. Being labelled as stupid or being categorised that you wouldn't achieve very much wasn't uncommon. Possibly the drive for success and recognition inspired many to achieve higher qualifications, degrees, masters and even PhD's.

Sometimes the reference of success is misguided, as it normally refers to your work and career. However, many have struck success outside work. Sports and hobbies range far and wide where you feel you are achieving something that elevates your sense of achievement and makes you feel that you are successful. It may be even that after a long career you are able to retire early and pursue a life free of work and responsibilities and be free to do whatever you want.

But to achieve these ambitions, we must understand that there must be an amount of dedication, skill and determination. This



Some of the solutions on the horizon may well be the use of new technology (in recent times we are starting to see the rise of automated greens and fairway mowers) that allows much more to be done on the

should come with a serious health warning! We work unsociable hours, normally from before first light to way beyond darkness in the evening, and even taking work home. We work in all seasons, from cold and hypothermic conditions to the heat of summer where sunburn and skin cancer are major health risks. Sometimes fuelling an unhealthy lifestyle is poor nutrition, while some may develop addictions to help deal with the stresses of work. In addition to this, in an age of constantly being connected via technology and under pressure to produce constantly, stress is likely to become the number one issue to achieving success.

How many times have we heard that we treat our family as being our number one priority? But for many, including myself, we have failed miserably at it. Unwisely, I choose a path that my career was my success. Without realising it, this cost my relationship with my children who, now in their adulthood,

“Being the ‘go-to’ person brings a great feeling of being wanted, but being the ‘yes’ person at everyone else’s benefit is not a great recipe. Saying ‘no’ sometimes, at the appropriate time and in the right manner, is healthy.”

Lee Strutt

isn't without its issues. Indeed, tomorrow's manager will need to understand a greater range of knowledge and learning. We are already seeing a huge impact surrounding legislation and restrictions with the use of chemicals, with current day turf managers having to find and navigate a route to a solution that meets expectations.

Unfortunately, golfers' expectations are already inflated and I'm afraid are never going to be lowered! Solutions will need to weave deeper into ever-tightening budget controls, ensuring the champagne lifestyle can be met with beer money.

These additional issues are already being felt throughout the industry, especially in relation to labour. Many potential turf managers see these issues and opt for an easier vocation, while attracting new people into the industry to replace them is becoming increasingly difficult. There are already clear indications around the world that golf is struggling to fill positions and I'm sure there will be more than a few discussions between superintendents at the upcoming Brisbane conference on that very topic.

course. No doubt that this will cause ill-feeling between turf professionals and managers, with managers trying to ensure a product is produced. Along with this, there will be the need to keep multinational, gender, race and generational staff happy and motivated.

I have joked many times that this job



Recognition can often be hard to come by, so celebrate your successes with friends, family and colleagues



feel betrayed that a golf course was far more important than they were! At a time when relationships should be strong, they are now fractured and tainted. Who said that the cost of success is paid when you make those sacrifices? Sometimes you pay the cost long after when you thought your dues were paid.

THE RIGHT RECIPE

So, is there a recipe for success without paying a higher price? Your work and golf course will always be there, if you pay attention. Communication on all levels is a key to managing an ever-changing world. Honesty, integrity and trust through good communication is important to our teams, our line managers, members and guests. This may be through good oral communication as well as newsletters, blogs and social media. Try to work with your teams and managers and share your responsibilities as you won't be the only one that, at times, struggles with the needs of the business.

Involvement with your local, state or national association can help, not only on items that refer to the golf course and agronomy but building relationships with other turf professionals that are a fundamental support framework and who can assist when times are difficult. And there will be difficult times.

Don't be ashamed to reach out for support. We all know that one of the great aspects of our industry is the camaraderie between us and many life-long friends have been made along the journey – they will always be there to give you support.

An important lesson I have learnt is don't sweat the small stuff. If you had \$86,400 in your bank account and someone stole \$10 from you, would you be upset and throw

the remaining \$86,390 away in the hopes of getting back at the person that took your \$10? Or move on and live? We have 86,400 seconds in every day, so don't let someone's negative 10 seconds ruin the remaining 86,390.

There is a delightful quote from iconic British actress Dame Helen Mirren who when asked in an interview in 2017 what advice

“Don't sweat the small stuff. We have 86,400 seconds in every day, so don't let someone's negative 10 seconds ruin the remaining 86,390.” **Matthew Wharton**

she would give herself to her younger self, she said it would be to tell people to “F-off” more and stop being “so bloody polite”. I appreciate that this may seem unprofessional, but sometimes saying what needs to be said isn't a bad thing!

Don't always be the last to leave and don't always be the one that feels they have to say 'yes'. Being the 'go-to' person brings a great feeling of being wanted, but being the 'yes' person at everyone else's benefit is not a great recipe. Saying 'no' sometimes, at the appropriate time and in the right manner of course, is healthy as it stops you being used and allows you to prioritise your time.

Above all, however, make your personal life as important as your work life. Remember, there are friends and family that depend on you being there for them. They want you home safe and happy. Fix deadlines for when you need to finish work. There will always be occasions (like tournaments or projects) when you need to work through, but is there really the need to do it every day?

Superintendents work hard to develop a great team; give them responsibility so that you can have a break from time to time.

Make sure you take all your holiday entitlement. You work hard to develop a great team; you groom them, train them, give them responsibility so that you can have a break from time to time! I would hate to think any one of my team felt that they couldn't take a holiday because they needed to be at work.

Create an environment that can support each other and enjoy life away from turf. This is fundamental mental health wellbeing, giving yourself the permission to switch off (hey, I know this is not easy!). Grant yourself the time to enjoy time away from work and partake in things that make you happy and that aren't related to work.

In many ways, superintendents are a lot like airline pilots. You must look after your crew and passengers. These are your family and friends that you take along your shared journey. What's the point of any journey? Getting to your destination safely. That means you need to constantly check the horizon for your direction, ensure that you are aware of any dangers and that you can take evasive action if required as a team.

Lastly, with all levels of success comes an element sacrifice. Imagine an iceberg if you will. The bit sticking out the water is what everyone sees, but underneath are all

the factors that underpin it – the hard work, persistence, late nights, rejection, discipline, criticism, doubts, failures, risk. We don't always see the scars on the people we feel are successful. Sometimes these scars are mental ones that are never seen but felt acutely by the individual.

So, take a look at yourself, think about what is right for you and the people around you. First and foremost, look after yourself, find happiness and a level of success that fits your physical and mental wellbeing.

ACKNOWLEDGEMENTS

ATM wishes to thank both Lee Strutt and Matthew Wharton for allowing publication of this article. You can keep the conversation going by contacting Lee Strutt via email Lee.Strutt@RoyalAutomobileClub.co.uk and through Twitter @leestruttmg. Matthew Wharton can be contacted via email matthewwharton@carolinagolfclub.org, through Twitter @CGCGreenkeeper and at www.carolinagreenkeeper.blogspot.com. 🏌️

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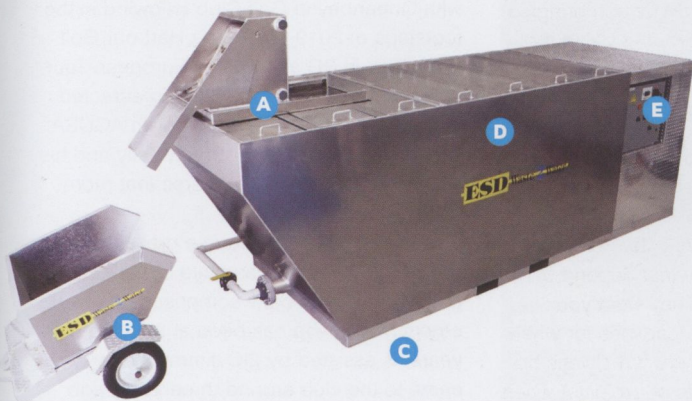
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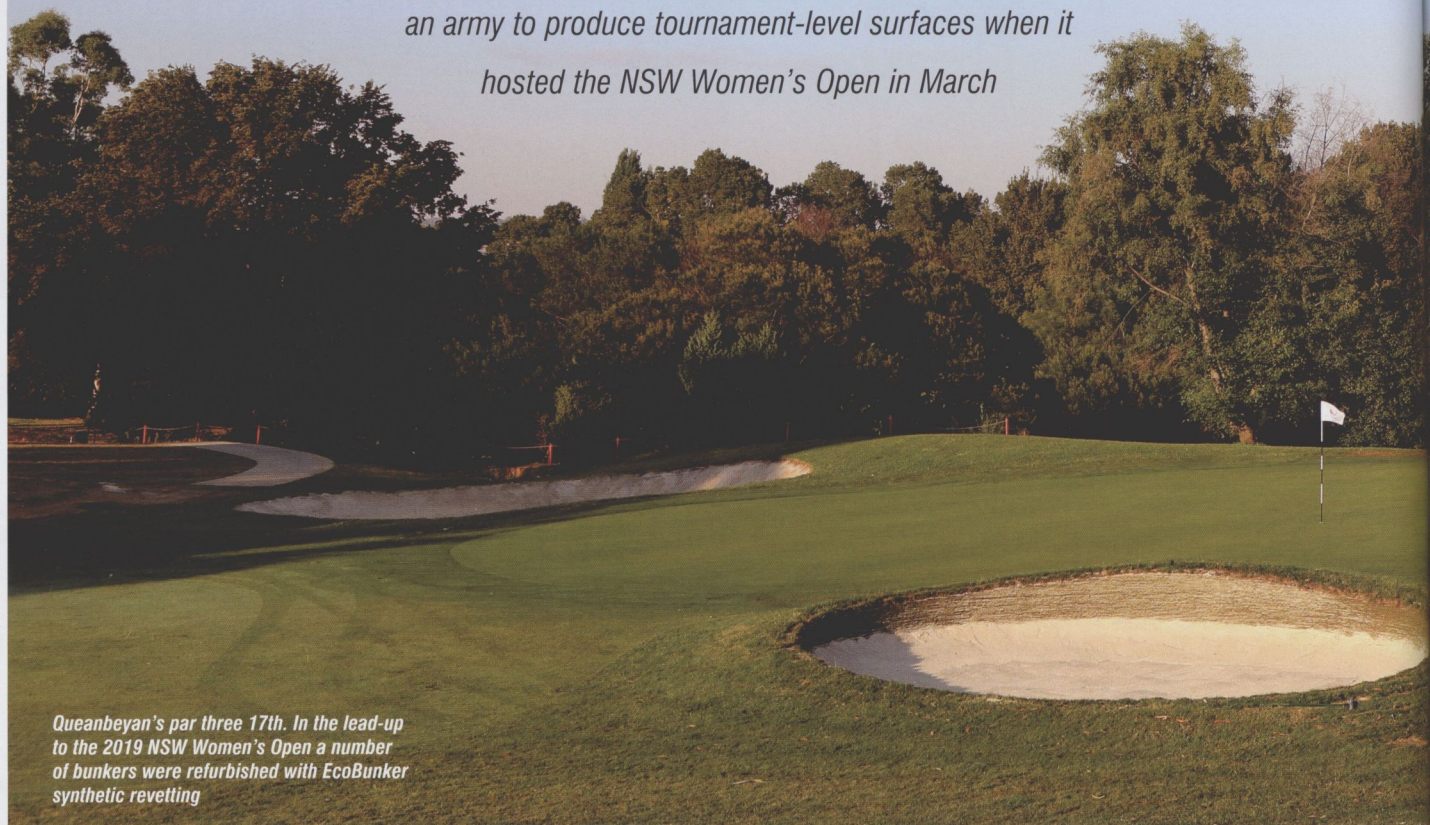
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Kelly's gang

The Queanbeyan Golf Club crew proved you don't need an army to produce tournament-level surfaces when it hosted the NSW Women's Open in March



Queanbeyan's par three 17th. In the lead-up to the 2019 NSW Women's Open a number of bunkers were refurbished with EcoBunker synthetic revetting



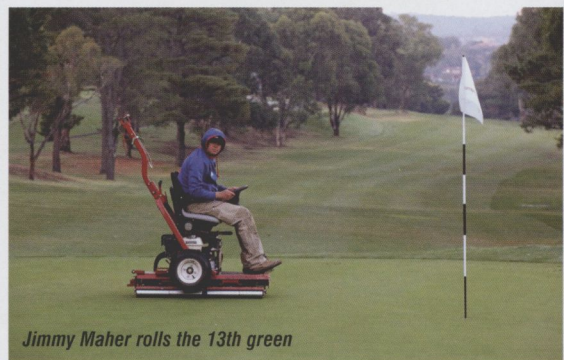
The dedicated Queanbeyan crew comprises (from left) Jamie Green, 2IC Jimmy Maher and superintendent Bryan Kelly

After re-joining the ALPG tournament rota in 2018 following a three-year hiatus, the Worrells NSW Women's Open returned from 7-10 March with Queanbeyan Golf Club following in the footsteps of 2019 host Coffs Harbour Golf Club. The ALPG and Ladies European Tour co-sanctioned tournament again attracted a high class international field with AGCSA superintendent member Bryan Kelly and his small crew serving up a course that more than tested the field.

The quality of the course presented for the \$150,000 event was quite remarkable given that Kelly's crew comprised just two others. Kelly, who has been at the club nine years, is assisted by 2IC Jimmy Maher, who came to the club around three years ago after a tenure at Queanbeyan RSL Bowling Club, and qualified greenkeeper Jamie Green.



Jamie Green triplex cuts the 16th green



Jimmy Maher rolls the 13th green



Queanbeyan's 5th green

Helping out with preparations were a small group of member volunteers who assisted in machine raking bunkers and blowing greens and fairways. Fairways and tees were cut in the afternoons, while the greens were triplex cut ahead of each round.

"I was really excited about what we achieved for the tournament," says 65-year-old Kelly, who in a past life was a member of the Australia Air Force. "It was a lot of hard yakka for Jimmy and Jamie as well as the volunteers, but I was really pleased with how the course presented and the players were very happy. It was great to see how the whole club got behind the event which was the real highlight. A tournament like this is a big deal for the club and everyone played their part to make sure it was a success."

Canberra is well known for its climatic extremes and the weather leading into the tournament did Kelly few favours. For the

month of January the Canberra region clocked 25 days above 30 degrees, including 14 above 35 and five above 40. Ironically on the Wednesday before the tournament, the course copped its first decent rain in over a month when 12mm fell, causing the cancellation of the Pro-am.

The course certainly proved a worthy test for the 142-strong field, with the tight tree-lined fairways and small tricky greens, considered some of the best in the district, causing more than a few headaches for most. The cut was made at +4 and just 30 players finished par or better come Sunday. Despite Iceland's Valdis Jonsdottir dominating the opening two rounds of the tournament – including a career best opening round of 8-under – it was ever-consistent Englishwoman Meghan MacLaren who went on to successfully defend the title she won last year at Coffs Harbour.

In the months leading-up to the tournament there was a flurry of activity both on the golf course and in the clubhouse, with grant money from the NSW Government put to good use. When it was announced that the club was to host the tournament, it came with the news that the club would also receive funding to upgrade its facilities. While the majority of that was spent on improvements to the clubhouse, course works included the construction of a new putting green/chipper, the consolidation and refurbishment of several bunkers using EcoBunker and the addition of cart paths.

ATM congratulates Bryan and his crew on a great effort hosting the tournament. The NSW Women's Open continues its regional tour in 2020 with Dubbo Golf Club set to host, before it heads to the coast with Forster Tuncurry Golf Club's Tuncurry course hosting in 2021. 🏌️

AGRONOMICS

The primary goal for any sand topdressing programme is to dilute organic matter and produce smooth, firm putting surfaces while minimising golfer and mower impact





Little and often

A combination of field observations and recent research sheds new light on the type of sand and quantity of topdressing needed to manage thatch and organic matter accumulation in putting greens.

Sand topdressing is one of the most important practices for producing smooth putting surfaces and diluting thatch and organic matter. Despite this fact, some courses only apply sand during aeration or infrequently during the golf season to avoid disrupting golfers and dulling mower blades and bedknives.

The consequences of an inadequate topdressing programme may not be observed immediately, but eventually there will be significant negative impacts on playability and turf health. This article aims to provide recommendations on sand selection, topdressing rates and application frequency to help ensure that a topdressing programme delivers the best results.

WHAT HAPPENS WHEN YOU DON'T TOPDRESS?

In the absence of adequate sand topdressing, putting greens accumulate excess thatch and organic matter. This results in soft, spongy surfaces that retain elevated levels of soil moisture. Putting surfaces of this nature are also susceptible to mower scalping and disease problems. Footprints, tyre tracks from maintenance equipment and deep ball marks are also problematic on soft greens.

Infrequent sand topdressing also creates distinct layers of sand and organic matter, which restricts water movement, oxygen diffusion and root development.

GOAL OF TOPDRESSING

Everyone agrees that putting greens are the most important playing area of any golf course. Maintaining smooth and firm but receptive and healthy greens with good pace is of paramount importance. A regimented

sand topdressing programme that considers the sand type, application rate and frequency is essential to achieve optimal surfaces.

Creating and maintaining a surface zone comprised of intermingled sand and organic matter is ideal for providing smooth, firm putting surfaces that hold up well to traffic. Additionally, greens that contain a healthy mixture of sand and organic matter will dry more evenly than greens containing excess thatch and organic matter. This means less localised dry spots and hand watering.

ASSESS ROOTZONE PHYSICAL CHARACTERISTICS

Before selecting an appropriate sand for topdressing, it is critical to identify the physical characteristics of the existing rootzone material and evaluate the performance of the greens. There are a variety of questions to answer in this process;

- Is there excess organic matter near the surface?
- Do the greens contain excess fine material, such as silt and clay?
- Do the greens hold too much or too little water?
- Do the greens rut when driving a riding mower or sprayer across the surface?
- Are the greens too firm or too soft?
- Is there an abundance of deep ball marks on greens?

While light and frequent sand topdressing will benefit all courses, some circumstances will require an accelerated programme to improve rootzone conditions and playability. Field observations have revealed that significant improvement in turf performance and playability can be achieved in as little as 12-18 months if adequate sand is applied to dilute thatch and organic matter.



These creeping bentgrass greens were core aerated twice annually but received relatively infrequent topdressing. Organic matter accumulation caused soft conditions and localised dry spot

SAND SELECTION

Selecting the appropriate sand for routine topdressing and aeration begins with identifying the particle size range that will produce the desired outcome. The primary goal for any sand topdressing programme is to dilute organic matter and produce smooth, firm putting surfaces while minimising golfer and mower impact. Additional considerations include sand shape and mineralogy, cost, consistent quality and long-term availability.

Field observations and research demonstrate that two or more sand materials can provide an effective greens topdressing programme. One type of sand can be used for aeration and topdressing when playability is not a priority (e.g., using a coarse sand to topdress greens prior to winter dormancy or during overseeding). Another, less coarse sand could be used for routine topdressing when minimising disruption to playability is important. Concerns with using two different sand materials for topdressing greens will be discussed later in this article.

Aeration sand: Sand used to fill aeration holes should closely match the physical characteristics of the sand used to construct the greens, assuming the greens were built according to USGA recommendations or there is confirmation that the rootzone mix has desirable physical performance characteristics. For native soil greens, it is often recommended to use sand that is coarser than the existing rootzone material to improve aeration porosity and water infiltration.

Routine topdressing sand: Historically, the industry has worked under the notion that the physical characteristics of topdressing sand should closely match sand used to construct



Two growing seasons after initiating a topdressing programme that applied no less than 0.91 cubic meters of sand per 100 square meters annually, organic matter has decreased by 30 per cent

greens. While this philosophy remains sound, research and field observations have revealed that golf courses can use sand with fewer coarse particles without compromising the integrity of the greens.

Courses in the southeastern United States have recognised this and have been using less coarse sand for topdressing for more than 20 years with good success. Until only recently researchers have more closely examined the impact on putting green performance when using sand containing fewer coarse particles than the existing rootzone.

Sand used to routinely topdress putting greens can be less coarse than the sand used to fill holes during aeration. A general guideline is to select a sand that has;

- A minimum of 50 per cent of its particles in the medium-sized fraction (0.25-0.50mm in diameter);
- Between 15-40 per cent in the coarse fraction (0.5-1.0mm in diameter);

- A fine sand fraction (0.15-0.25mm) not exceeding 25 per cent and the very fine fraction (0.05-0.15 mm) not exceeding 5 per cent; and

- Ideally no particles greater than 1.0 mm in diameter given the difficulty in getting these to work down into the turf canopy.

It is recommended to use a material with a coefficient of uniformity (CU) greater than 1.8. If the sand is too narrowly graded, which will produce a low CU, this may result in soft, unstable surfaces. However, the CU is not the only determining factor in stability – sand shape also plays a role, with angular sands being more stable. Utilising a coarser sand during aeration will create more stability.

Fear of layering: Topdressing with sand with few or no particles greater than 1 mm in diameter and only 10 to 40 per cent in the coarse sand fraction (0.5-1.0 mm) is not a concern. Removing this larger sand fraction will not create agronomic problems such as increased moisture retention and reduced infiltration rate. However, topdressing with sand with greater than 25 per cent fine material (0.15-0.25 mm) could potentially lead to increased moisture at the surface. Superintendents are encouraged to collect cores and analyse for physical characteristics every few years to monitor performance.

Mineralogy: While silica sands containing predominantly quartz and feldspars are most desirable due to their high tolerance to weathering, calcareous sands have been used successfully. However, it is recommended to avoid sand containing very high levels of calcium carbonate.

Cost: The cost of quality topdressing sand for greens ranges considerably. While some courses may pay top dollar, the cost is worth it if this material makes the difference between good and great putting surfaces.



Planning to reach a predetermined amount of sand for the season is a good place to start with rate and frequency considerations

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Optimal topdressing rates are most dependent on the length of the growing season and quality of the growing environment. The turfgrass species and cultivar, nitrogen fertilisation programme and traffic intensity also determine how much sand is needed annually

TOPDRESSING WITH TWO SANDS

Will topdressing with two different sand materials cause poor water infiltration or increase soil moisture retention? Researchers at Rutgers University are experimenting with topdressing sand much finer than described in this article to investigate whether there would be any negative impact on a creeping bentgrass green (Murphy et al., 2019).

The finest material used in this study contained 67 per cent fine sand (0.15-0.25 mm) and was referred to as the 'fine-medium' sand in Table 1. The 'medium-fine' sand contained 23 per cent fine particles and 77 per cent medium particles, and the 'medium-coarse' sand contained only 8 per cent fine particles and 58 per cent medium particles.

Although soil moisture content has increased with the fine-medium sand compared to topdressing with coarser materials, plots topdressed with the fine-medium sand have had lower soil moisture content when compared to plots that have never been topdressed. Furthermore, when core aeration is applied to the fine-medium topdressed plots and aeration holes are filled with the medium-coarse sand, the infiltration rate and soil moisture retention have been

similar to that of the plots topdressed with coarser materials and not core aerated.

Therefore, the preliminary results of this research indicate that topdressing with a much finer material than described in this article is better than no topdressing at all. Additionally, any reduction in infiltration rate associated with using the finer sand can be offset by aeration and filling the holes with a coarser material.

This Rutgers study is confirmation for superintendents using two different sand materials for topdressing greens – one for routine topdressing and a coarser material that matches the existing rootzone to fill holes following aeration.

For the management of ultradwarf bermudagrass greens, a current study conducted at Texas A&M University is evaluating the impact of sand topdressing with fewer coarse particles than that used to construct the greens (McInnes et al., 2019). Researchers are using rootzone characteristics such as sand particle size, organic matter content and bulk density from multiple greens on nine golf courses to predict soil moisture content and field-measured infiltration rate.

Modelling efforts are ongoing, but some information can be gleaned from preliminary data. As expected, infiltration rate generally decreases with decreasing particle size and increasing organic matter content, though there are outliers. Even so, the infiltration rate of the majority of sampled greens meets or exceeds the minimum recommendation of six inches per hour and the putting greens are performing well. These preliminary results indicate that desirable infiltration rate and surface moisture content can be maintained with the use of medium-graded topdressing sands.

WHY REMOVE LARGER SAND PARTICLES?

Large sand particles create playability and mower problems. A Rutgers University study on creeping bentgrass putting greens revealed that the particle size of the topdressing sand significantly impacted the size of the sand harvested in mower catchers when mowing the day after topdressing (Murphy et al., 2019).

On average, approximately 60 per cent of the sand in mower catchers fell in the coarse sand fraction (greater than 0.5 mm) when using the medium-coarse sand (the medium-coarse sand contained approximately 34 per cent coarse particles and 58 per cent medium-sized particles) for topdressing. By comparison, less than 10 per cent of the sand found in mower baskets were coarse particles when topdressing with the medium-fine sand (0.1 per cent coarse particles and 77 per cent medium particles). Clearly, the coarser the sand the more sand will be harvested by the mower. The particles picked up will also be the larger-sized particles – those that have the greatest impact on playability and mowing equipment.

Interestingly, the Rutgers study, as well as two recent studies at Michigan State University and the University of Tennessee (Strunk et al., 2018; Dickson et al., 2019), found that mowers collect 1-5 per cent of the sand in a single mowing one or two days after topdressing. More sand will be harvested with subsequent mowing, especially if topdressing

TABLE 1. PARTICLE SIZE DISTRIBUTION, RUTGERS UNIVERSITY STUDY

Topdressing Sand Size	Particle Diameter (mm)/Size Class				
	2.0 - 1.0 Very Coarse	1.0 - 0.5 Coarse	0.5 - 0.25 Medium	0.25 - 0.15 Fine	0.15 - 0.05 Very Fine
	-----% Retained (by weight)-----				
Medium-Coarse	0	33.8	57.7	8.4	0.1
Medium-Fine	0	0.1	76.7	22.7	0.5
Fine-Medium	0	5.7	25.8	66.8	1.7
Mat Layer *	0.2	25.3	56.4	15.4	2.7
Rootzone	7.0	25.8	45.5	17.5	4.2
USGA Spec**	≤ 10	≥ 60	≥ 60	≤ 20	≤ 5
Recommendation					

* Size distribution of sand in 45 core samples of the mat layer collected before the initiation of treatments in May 2018. ** USGA construction recommendations provided for reference. Reproduced from Murphy et al., 2019

concentrations among golf courses. This amount is an average from 104 golf courses in 14 states with diverse turf maintenance programmes. Optimal annual topdressing rates don't directly translate across golf courses, especially across different regions.

Optimal topdressing rates are most dependent on the length of the growing season and quality of the growing environment. The turfgrass species and cultivar, nitrogen fertilisation programme and traffic intensity also determine how much sand is needed annually.

Turfgrass growing in an ideal environment over a long season with plenty of nutrition and few stresses, like shade and traffic, will produce more organic matter and subsequently require more topdressing. However, turfgrass under stress for any reason or grown over a shorter season will require less annual topdressing.

Regarding species, 79 per cent of surveyed superintendents who have converted putting greens from creeping bentgrass to ultradwarf bermudagrass report using more sand with ultradwarf bermudagrass (O'Brien and Hartwiger, 2014). So, an annual rate of 0.62 cubic meters is a starting point and may be sufficient in some situations. However, in other settings, more sand is typically required on an annual basis to mitigate organic matter accumulation.

THE IMPORTANCE OF FREQUENCY

Around the turn of the 21st Century, a standard topdressing strategy was to apply 0.06 to 0.12 cubic meters of sand per 100 square meters every three to four weeks during the growing season (Rieke, 1999). Lower rates and higher frequency were recommended for high-density cultivars or stressed areas.

However, the previously mentioned survey data shows that surveyed golf courses that cultivated at least twice a year and topdressed every 7 to 14 days had lower organic matter concentrations (Schmid, et al. 2014a). Topdressing every 7 to 14 days also is more common in successful ultradwarf bermudagrass putting green management programmes (Lowe, 2013; O'Brien and Hartwiger, 2014). To follow these recommendations, what topdressing rates would be required to reach the annual topdressing guideline of 0.76 to 1 cubic meter of sand per 100 square meters per year?

First, we should account for sand incorporated during aeration. An estimated 0.15 to 0.21 cubic meter of sand per 100 square meters is required for backfilling aeration holes, depending on overall surface disruption. Given this, a course that backfills two aerations annually could apply 0.43 cubic meters of sand per 100 square meters.



A regimented sand topdressing programme that considers sand type, application rate and frequency is essential to achieve optimal playing surfaces

During a 30-week growing season, assuming light topdressing is withheld the weeks immediately before and after aeration, 0.49 more cubic meters of sand per 100 square meters still would be needed over the remaining 24 weeks to reach 0.91 cubic meters per 100 square meters for the season (the middle of the suggested range). If remaining topdressing applications were conducted weekly, only 0.02 cubic meter of sand per 100 square meters would be required each week. The necessary rate would increase to 0.04 cubic meters per 100 square meters with a 14-day schedule.

It's often most manageable to determine a rate and frequency for each topdressing event based on annual goals and stick with that plan unless adjustments are needed to match growth and organic matter accumulation. A rate of 0.015 to 0.045 cubic meters of sand per 100 square meters is generally a good range. Rates will likely be on the higher end during higher growth periods and lower when growth slows, or when turf is stressed. A good rule of thumb is to delay a scheduled topdressing or reduce the rate if significant sand is still visible from the prior application.

In situations where the soil profile is already ideal, some superintendents effectively manage organic matter only with frequent topdressing and no core aeration. In the absence of core aeration, it is critical that the golf courses meet or exceed the annual guideline of 0.76 to 1 cubic meters of sand per 100 square meters.

MINIMISING SAND HARVESTING

Light sand topdressings can be effectively brushed, rolled, or irrigated into the turf canopy. Still, recent research has shown that mowing practices affect sand harvesting even with brushing after topdressing.

Backtrack mowing (i.e., two passes in opposite directions over the same area) at a standard frequency of clip or increasing

the frequency of clip during a single pass, harvested the most sand following topdressing on both creeping bentgrass and ultradwarf bermudagrass putting surfaces (Strunk et al., 2018; Dickson et al., 2019). Cross cutting (i.e., mowing a putting green twice in perpendicular directions) at a standard frequency of clip also collected more sand than a single pass at a standard frequency of clip in the ultradwarf bermudagrass study, but not in the creeping bentgrass study.

As a result, backtrack mowing and increasing the frequency of clip should be avoided following topdressing to reduce sand harvesting and wear on mowers. Additionally, it is helpful to note the amount of sand collected and adjust topdressing rates or incorporation practices if necessary.

CONCLUSION

Sand topdressing is the most important cultural practice for managing organic matter. Recent research confirms the benefits of light and frequent sand topdressing programmes that provide less immediate disruption, better playing conditions and better rootzone characteristics over time.

It is critical to assess putting green performance and the quality of the rootzone to determine if circumstances warrant an accelerated programme for improvement beyond what is possible with light and frequent topdressing. Regardless of the selected programme, silica sand is preferred because of its tolerance to weathering.

Aeration backfill should closely match the physical characteristics of the sand used at construction, but routine topdressing sand can be somewhat less coarse to ease incorporation and reduce wear on mowers. Ongoing research suggests that this will not impede infiltration or cause an overly wet surface. Regardless of the selected topdressing programme, it is wise to assess rootzone physical properties regularly by submitting core samples for testing.

Editor's Note: In the next edition (Volume 21.4 – July-August 2019) ATM will canvass Australian superintendents to gain an insight into their topdressing/dusting practices. Full references for this article can be obtained from the AGCSA.

ACKNOWLEDGEMENTS

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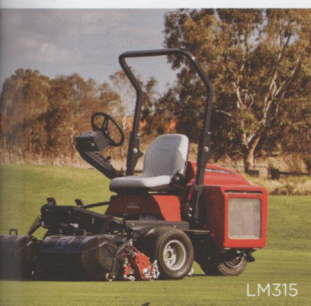
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Spring root dieback

Recently anointed Member of the Order of Australia recipient Peter McMaugh looks back on one of the great pieces of turfgrass research which is still relevant more than 30 years after its findings were released.

In the eulogy article I wrote for Dr Jim Beard in ATM Volume 20.4 (July-August 2018), I mentioned in passing what I considered one of his greatest contributions to turfgrass science, the phenomenon of spring root dieback in warm-season grasses. He first presented this research to the international turfgrass community at the 5th International Turfgrass Research Conference at Avignon, France in 1985.

This was no fly-by-night piece of research. It had been carefully and methodically researched by Jim for over eight years prior to this presentation and continued on for at least another six years. The success of this study was due mainly to the innovative 'rhizotron' construction that Jim was able to build at Texas A&M University (see photo top of page 42). The following description of the rhizotron is taken from the 'Materials and Methods' section of the paper presented in Avignon in the conference proceedings (p.777ff by S.I. Sifers, J.B. Beard and J.M. DiPaola.)

"The Texas A&M Turfgrass Rhizotron consists of a 48 compartment subterranean observation chamber with two rows of 24 glass-faced root observation boxes separated by a work space. Each of the 25cm wide by 75cm deep boxes had a slanted glass face, 0.64cm thick, through which root observations were made. The glass face was kept dark and insulated with 2.5cm thick polyurethane pads during non-observation periods.

"Root extension lengths were recorded daily by tracing new root growth on clear acetate sheets which were pressed against the glass plate. Soil temperatures were continuously monitored within four randomly selected boxes at 10 and 30cm depths (Di Paola et al, 1982). Soil temperatures within the boxes were found to be the same as those in an adjacent undisturbed turf area."

The big advantage of this type of construction is that it allowed the experimenter to see in real time the real life-size root volume of the sward without disturbance of the profile. These windows were used only for periodic viewing and were not permanently open. This was not an original concept but one adapted to turfgrass research from previous studies of the roots of fruit trees.

This is a very important way to study plants because roots do not form or follow their normal patterns of growth in the presence of light. If you are doing any meaningful root studies they have to be done in the dark which is how they grow naturally.

The next thing to note about this study was that it was a long-term one. It is very hard to overestimate the value of long-term studies in turf or, for that matter, agriculture in general. Historically this has been amply illustrated by the long-term pasture plots at Rothamsted Research Station in the U.K. The fame of these is world renowned and their value is incalculable.

In the early days of turf research there were many long-term field lots at the USDA experiment stations and botanic gardens throughout the USA. I was lucky to inherit such a one at the Ryde School of Horticulture when I started in turf research. Today, sadly, they are considered too costly to run and most have disappeared. You simply can't draw long-term implications from short-term studies. Long-term studies have a life of their own and they show up interactions that we often don't expect and certainly can't anticipate.

IMPORTANT FINDINGS

Realising how important this spring root dieback research was and the ground-breaking nature of its message, I urged the





The work by Dr Jim Beard on the phenomenon of spring root dieback in warm-season grasses is one of the most groundbreaking pieces of turfgrass research ever conducted

AGCSA to invite Jim to again visit Australia for the 9th National Turf Conference on the Gold Coast in 1986.

So what was the gist of this message? When warm-season grasses go into dormancy they spend the period prior to full onset sending carbohydrate reserves from the stems into the roots for storage over winter. This is the energy 'piggy bank' that will be re-exported from the roots to create new leaf tissues and stems during spring green-up.

The first very interesting observation that the rhizotron illustrated was that even after the appearance of full dormancy on the sward surface, the tops kept exporting carbohydrate to the roots which kept growing actively for some weeks after the plant apparently had become visibly fully dormant.

There are some very clear messages out of this first observation. The importance of maximising the opportunity for the plant to store carbohydrate in the pre-dormancy period cannot be overstated. Any negative pressure at this period needs to be taken away or minimised. Probably the classic case for stadium venues is the avoidance of scheduling events, such as pop concerts, at this time.

It is also crucial to realise that excessive fertiliser at this period may, especially if you have an 'Indian summer', create the wrong stimulus for excess top growth rather than export of carbohydrate to the roots.

Once fully dormant with the root system quiescent, the plant will happily sit there waiting for the signals for spring green-up. It has to be realised that whatever the seasonal weather conditions may be, that this store of carbohydrate is finite. Once the initiation of growth has begun, then the depletion of that store is set in motion and the rundown cascade is not controlled by a shut off tap. It will continue to run until it is exhausted.

PHOTO: BRETT ROBINSON



This leads to the phenomenon of spring root dieback, because as the roots become exhausted of their carbohydrate reserves they die. Once dead they are of course non-functional and new roots need to be established for the plant to continue to function into the high summer period.

This is why any unexpected setback at this time can have disastrous results. Over the years I have witnessed quite a few of these from spring renovations on couch bowling greens gone wrong or a fairway renovation on a golf course not coming up as expected.

While not in Jim Beard's group of grasses which he put through their paces, kikuyu seems to be one of the grasses most susceptible for damage from this phenomenon. I experienced this very much in the late 1980s when kikuyu harvested in late spring failed to regenerate well several years in a row.

I also experienced this with a race track where the ryegrass oversow was taken out too early and kikuyu failed to fill in for the Melbourne Cup meeting which this club relied on as its major annual fundraiser event.

You are probably still waiting for me to spell out exactly what they did find out. It requires the plant to activate its regrowth and to run out of energy supply almost completely before it establishes its new root system, and then to have a setback which prevents the grass from making enough new energy to build quickly enough to survive. During the first stage of their research this happened in at least 50 per cent of the eight years it ran. If you harvest a grass or defoliate it with a heavy renovation just when it has run out of puff, that is when you invite, and get into, trouble. Another puzzling aspect of this phenomenon was that it did not seem to be as severe in some years as it was in others.

I have also been bemused that the main stream USA literature and reports on turfgrass performance did not seem to refer to this phenomenon in any consistent or prominent way. Indeed, you would almost come to the conclusion that it was ignored or disputed as to how important it is.

Just before he died in May 2018, I had correspondence with Dr Beard, asking him if he had any further information that would shed light on these seemingly out of kilter occurrences. Jim sent me a couple of papers which shed some new light on the previously reported work. One of these was prior to the initial 1985 publication and the other was a 1991 publication after the main story had been told.



Joe DiPaola at the entrance of the original turfgrass 'rhizotron' at Texas A&M University in 1976. (Photo taken from 'Turfgrass History and Literature')

The 1982 paper was especially significant. It was by Joe DiPaola, Jim Beard and H. Brawand and was published in Hort Science 17(5) 829-831, 1982. I think its abstract says it all...

"Root growth of St. Augustinegrass [Stenotaphrum secundatum (Walt.) Kuntze] and bermudagrass [Cynodon dactylon (L.) Pers, x C. transvaalensis Davy] (C-4 plants), show distinct seasonal patterns different from those of the cool-season perennial grasses (C-3 plants). Root growth continued after winter shoot dormancy occurred, and at soil temperatures below 10°C. Severe browning of the entire root system was observed just after spring shoot greenup followed by a delay of about three weeks in new root initiation and replacement, even though significant shoot development was occurring prior to this period of root initiation."

The critical observation here is the delay period of about three weeks between the decay of the old roots and the initiation of the new ones. This is the real danger period. Every commercial turf grower dreads the late spring frost on turf which has been growing actively for a few weeks.

The 1991 paper by Gary R. Forrester was part of a PhD study by that candidate. It involved studies where dormancy was induced gradually or suddenly on grass fertilised at three different nitrogen levels. The carbon dioxide fed to the plants was

radioactive so it could be studied as CHO (carbohydrate) in different areas of the plant.

Grasses slowly chilled down accumulated higher levels of stored carbohydrate than those chilled suddenly – which is no surprise. There was little difference between the low and mid-range N on carbohydrate storage but at the high N rate the storage was much lower. The author suggested that this was because the grass respired at a higher rate (i.e. burnt up more carbohydrate) even though the temperature was dropping. This clearly indicates that using high levels of N going into dormancy is not a good idea.

How does all this apply in Australia? It may seem unlikely that it would have much affect because we don't have the soil freezing conditions that occur in the USA. It may also seem that because the warm-season grass varieties we conspicuously select for use here have later onset of dormancy and earlier green-up that it doesn't have as much relevance to our conditions.

My research in recent years has thrown up some very interesting facts. The stronger the rhizome systems that grasses have, the higher their carbohydrate storage capacity is and the less chance they have of being affected adversely by this phenomenon.

Most of the couchgrasses (Bermuda) used in the USA are interspecific hybrids (C. dactylon x C. transvaalensis). These mostly have very poor rhizome production, while Stenotaphrums have none. Also some of the most popular commercial grasses used in Australia have good root structure but very poor rhizome production. This means that they are much more susceptible to spring root dieback damage than grasses with strong rhizomes.

The good news is these are now here. But that will have to be the subject for another day. Keep a look out!

Editor's Note: The AGCSA has a copy of Dr Beard's 1986 conference paper on file if readers require a copy. Email editor Brett Robinson brett@agcsa.com.au



Beard's spring root dieback studies threw up a host of new questions relating to the timing of spring cultural practices such as renovations



Asia Pacific Turfgrass Conference and Trade Exhibition

Brisbane Convention and Exhibition Centre
24-27 June 2019



Conference Guide





Welcome to Brisbane

For the first time since 2006, the annual conference returns to Brisbane. ATM looks ahead to some of the highlights during the week at the Brisbane Convention and Exhibition Centre.

The AGCSA Board, together with staff and management, welcome all delegates to Brisbane for the **2019 Asia Pacific Turfgrass Conference and Trade**

Exhibition (24-27 June). Featuring over 120 hours of education across a variety of streams, in addition to the industry-leading two-day trade exhibition and famous social functions, the conference is the not-to-be-missed event for all sports turf managers in 2019.

To be held at the outstanding **Brisbane Convention and Exhibition Centre**, this year's conference will bring together a phenomenal line up of speakers, including presentations from major sporting organisations and universities, as well as international agronomic experts to complement our local industry leaders. Delegates will be exposed to a raft of topics ranging from leadership and development, management of sportsfields, grounds and golf courses, as well as the latest in turfgrass research from here and overseas. Some of the speaker and programme highlights across the week include...

Paul Warren: Captain of the Australian Invictus Games team, Paul's opening Plenary session address, titled 'Resilience and an adaptive mindset', is sure to motivate and inspire. Paul demonstrated courageous attitude and extensive determination when he lost one of his legs after an improvised explosive device detonated while he was stationed in Afghanistan. Despite the life-changing events of that moment, Paul's courage, determination and mental strength is something to behold.

Dr John Kaminski (Penn State University, USA): One of the global turf industry's foremost technical experts, John will conduct one of the Monday Jacobsen-sponsored workshops on 'Improved disease control in turf through proper application strategies' as

well as a session on cultural and chemical management of *Poa annua* (Golf Stream, Thursday). John loves nothing more than getting into discussions with local turf managers to see how they manage their facilities and is looking forward to again engaging with the many skilled practitioners Australia is renowned for producing.

Steve Isaac (The R&A, UK): After a hiatus of 10 years presenting to Australian turf managers, The R&A's director of sustainability makes a welcome return to our shores. Steve will present the additional third Monday workshop which looks at the issue of sustainable golf course management practices where he will be joined by a number of special guests. Steve will also present another workshop on Wednesday looking at the principles of low input golf.

Craig Haldane (Gleneagles Golf Club, UK): Craig was all set to present at last year's conference when a switch of jobs from The Emirates Golf Club in Dubai to Gleneagles in Scotland forced his late withdrawal. The AGCSA is delighted to have such a leading



course superintendent on board this year and Craig will present the third Monday workshop on what drives your management practices. He will also present on managing turf with poor quality irrigation water (Golf Stream, Wednesday).

Local experts: While there are a number of international experts set to descend on Brisbane, the conference is also bringing together some of the elite agronomic and technical minds of the Australian sports turf industry. Among those presenting will be;

- **Dr Graham Stirling (Biological Crop Protection):** Graham and wife Marcelle are recognised Australia wide as the foremost experts when it comes to nematology. Graham will speak on the problematic Southern sting nematode and its threat to golf courses, bowling greens, sports fields and recreational turf in Australia.
- **John Neylan (SportEng):** One of Australia's leading agronomists, John will feature during a number of presentations throughout the week on herbicide resistance and trials looking at sand versus soil profiles. John will also play a key role in Thursday's water workshop.
- **Dr Andrew Geering (University of Queensland):** A plant pathologist with more than 30 years' experience, Andrew will look at current research into couch smut and buffalo yellows.
- **Dr Chris Lambrides (University of Queensland):** Another of the Sunshine State's experts in the area of turfgrass genetics and physiology, Chris will discuss salt tolerance in Bermudagrasses.

Wednesday workshops: In addition to the all-day Monday workshops, Wednesday will feature a number of smaller 1-2 hour long workshops on topics as varied as vegetation management (**Kate Torgersen**), Growing Degree Days (**Mike De Luca**) and spray adjuvants (**Jyri Kaapro**). Visiting international guest and zoysiagrass breeder **David Doguet** (Bladerunner Farms) will also feature



Mark Carter

heavily on Wednesday, first up as part of the Construction Projects workshop and then later in a workshop devoted to zoysia and its use on golf courses. The construction workshop will also feature the likes of course superintendent **Ryan Fury** (Killara Golf Club) and golf course architect **Harley Kruse**.

Leadership, management and personal development: This year's conference has a very strong management theme to it, with delegates set to have their minds opened up to a raft of new ideas and concepts relating to how they manage their teams, themselves and their personal circumstances. Among those presenting are;

- **Damien Austin (Brisbane Lions):** The high performance manager at the Brisbane Lions AFL club, Damien will be presenting on the topic of building high performing teams. His presentation will encompass the lessons learnt on the construction of elite sporting environments, which has transferability to any business or organisation.
- **Mark Carter (Glow):** A huge hit during the recent AGCSA National Turf Education Seminar Series, Mark returns to make a number of presentations on leadership and communication and how to build strong, resilient teams. Not to be missed!

- **Jason Cunningham (The Practice):** One of Australia's business growth and finance experts, Jason will impart some strategies for mastering your financial situation.
- **Jacinta Mulholland (ASG Group):** A senior leader with a 20-year career in customer experience and the value of culture in building and leading high performing teams, Jacinta will talk on creating and leading cultural change.
- **Cameron Schwab:** An experienced CEO, leadership coach and organisational specialist, Cameron works with boards, management teams and groups to build leadership capability, particularly as it relates to organisational performance.

Thursday Water Workshop: With Sydney recently hitting Level 1 water restrictions, water management is again in the headlines. Water is a turf manager's most precious resource and this workshop, which brings together course superintendents, agronomists and irrigation consultants and designers, will take a practical look at water management practices that can be employed at your facility. Another not-to-be-missed session!

Some other highlights of the Brisbane education programme include;

- Grounds managers at Australia's elite sporting stadiums share their knowledge and experience in a panel session;
- Understanding turfgrass plant physiology and stress management (**Dr Rob Golembiewski**);
- The construction of Australia's newest venue – Bankwest Stadium (**Erik Kinlon**);
- Cricket wicket management and pitch preparation for curators (**Les Burdett**);
- Turfgrass Talkback session with a team of sports turf managers, researchers and industry experts to kick the conference home in the final session on Thursday.

There is sure to be something for all sectors of the turf industry at this year's conference and the AGCSA hopes everyone takes plenty of ideas back to their places of employment. We look forward to seeing you in Brisbane! 🌱

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SUNDAY

2pm-4pm
Registration Desk Open

11.45am - 8pm
2019 Toro AGCSA Golf Championships and
Presentation Dinner - Brisbane Golf Club

TORO

MONDAY

AGCSA Jacobsen Workshops
10am - 3pm (lunch 12.30pm)

JACOBSEN

GREAT HALL 2

Dr John Kaminski
Improved disease control through
proper application strategies

ROOM M2

Craig Haldane
What drives your management practices

ROOM M7-8

Steve Isaac
The R&A's Sustainable Golf Seminar

10am - 2pm
Partners Morning Tea and River Cruise

6.30pm - 10.30pm
National Awards Gala Dinner

syngenta.

TUESDAY PLENARY

Great Hall 2

8am - 8.30am
Conference opening and welcome

8.30am - 9.15am
Paul Warren
Resilience and an adaptive mindset

9.15am - 10am
Jason Cunningham
Strategies for managing and mastering
your financial situation

10am - 10.30am
Sue McGill
Effective operations of sport infrastructure

10.30am - 11.15am Morning tea

11.15am - 11.45am
Mick de Brenni
Sporting infrastructure and research
in Queensland

11.45am - 12.15pm
Jake Anson
AFL facilities planning and grounds

12.15pm - 1pm
Steve Isaac and David Gallucci
Golf: Towards 2025

1pm - 2pm Lunch

2pm - 3pm
Mark Carter
Leadership and communication

3pm - 4pm
Cameron Schwab
Your brand: From success to significance

4pm - 6pm
VIP Trade Opening (delegates only)

WEDNESDAY

7.30am - 8.30am
2019 AGCSA AGM (M7+8)



GOLF GREAT HALL 2

8.30am - 9.30am
Dr John Kaminski
Practical cultural and chemical control of
ERI fungi

9.30am - 10.30am
Bruce Macphee
Course budget management - How and
where to save on maintenance

10.30am - 11am
Morning tea

11am - 11.40am
Dr Chris Lambrides
Salt tolerance in Bermudagrass

11.40am - 12.20pm
Craig Haldane
Effectively managing fine turf with poor
quality water

12.20pm - 1pm
Dr. Rob Golembiewski
Plant physiology and stress management

1pm - 2pm Lunch and Trade Show

2pm - 3pm
Choice of workshops (see far right)

3pm - 5pm Afternoon tea and Trade Show

THURSDAY

GOLF GREAT HALL 2

8.30am - 9.30am
Dr Peter Boutsalis and John Neylan
Report on ongoing chemical resistance in
turfgrass studies

9.30am - 10.30am
Dr Graham Stirling
Southern sting nematodes: A serious threat
to sports and recreational turf in Australia

10.30am - 11.30am
Morning tea and Trade Show

11.30am - 12pm
Mark O'Sullivan
2018 AGCSA Excellence in GCM Award

12pm - 1pm
Pat Wilson and Chris Burgess
Managing volunteers

1pm - 2pm Lunch and Trade Show

2pm - 4pm
Turfgrass Talkback - Talkback host will
interview, intervene and moderate our team
of experts on audience based questions

6pm - 8pm Farewell Bash

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PARTNERS

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TOPICS WERE CORRECT AT THE TIME
OF ATM GOING TO PUBLICATION.



MAJOR SPONSORS



WEDNESDAY

SPORTSFIELDS

ROOM M1

8.30am - 9.10am

Dr Mick Battam

Turfgrass management strategies for high use sportsfields

9.10am - 9.50am

Dr Andrew Geering

Couch smut and buffalo yellows research

9.50am - 10.30am

John Neylan

Final report on sand vs soil profile performance trial

10.30am - 11am Morning tea

11am - 11.30am

Dr Lukas Van Zwieten

C & N cycling and utilisation of biochars to modify and control sportsturf soil properties

11.30am - 12pm

Dr Sheila Nguyen

Reducing environmental footprint at major sporting events

12pm - 1pm

Around the grounds

Experienced SF&G managers share their experiences based on audience questions

1pm - 2pm Lunch and Trade Show

2pm - 3pm

Choice of workshops (see far right)

3pm - 5pm Afternoon tea and Trade Show

MANAGEMENT

ROOM M2

8.30am - 9.10am

Mark Carter

Building a strong and resilient team

9.10am - 9.50am

Jacinta Mulholland

Creating and leading cultural change

9.50am - 10.30am

Gilly Brooks

Building capabilities and staff development

10.30am - 11am Morning Tea

11.00am - 11.40am

Jay Allen

Understanding and managing negative publicity

11.40am - 12.20pm

Damien Austin

Building high performing teams - Lessons from elite sporting clubs

12.20pm - 1.00pm

Rae Bonney

Mental health

1pm - 2pm Lunch and Trade Show

2pm - 3pm

Choice of workshops (see right)

3pm - 5pm Afternoon tea and Trade Show

WORKSHOPS

ROOM M5+6

8.30am - 10.30am

Ryan Fury, Harley Kruse & David Doguet

Construction projects - Superintendent, architect, grass varieties

10.30am - 11am Morning Tea

11am - 11.40am

Kate Torgersen

Vegetation management

11.40am - 1pm

Steve Isaac Low input golf

1pm - 2pm Lunch and Trade Show

2pm - 3pm **Choice of workshops**

ROOM M1

Jyri Kaapro

Demystifying adjuvants

ROOM M2

Michael De Luca

Growing Degree Days

ROOM M5+6

David Doguet

Zoysia on golf courses - Why use it?

ROOM M7+8

Fred Yelverton

Agronomic programmes for golf/sports fields

3pm - 5pm Afternoon tea and Trade Show

PLEASE NOTE: TIMETABLE SUBJECT TO CHANGE. ALL TIMES AND SPEAKERS/ TOPICS WERE CORRECT AT THE TIME OF ATM GOING TO PUBLICATION.

THURSDAY

SPORTSFIELDS

ROOM M1

8.30am - 9.30am

Dr John Kaminski

Cultural and chemical management of *Poa annua*

9.30am - 10am

Tim Fankhauser

Monitoring and managing wear on sportsfields using NDVI technology

10am - 10.30am

Jas Virdee

FFA facilities auditing

10.30am - 11.30am

Morning tea and Trade Show

11.30am - 12.30pm

Les Burdett

Cricket wicket management seminar

12.30pm - 1pm

Eric Kinlon

Development of Bankwest Stadium

1pm - 2.00pm Lunch and Trade Show

Great Hall 2

2pm - 4pm

Turfgrass Talkback - Talkback host will interview, intervene and moderate our team of experts on audience based questions covering all areas of sportsturf management

6pm - 8pm Farewell Bash

WORKSHOPS

ROOM M2

8.30am - 1pm

Bruce Macphee, Scott Johnstone, Mick Kelly, Simon Grieves, Shane Greenhill, John Neylan and John Geary

Water management workshop.

ROOM M5+6

8.30am - 10am

Spray Workshop

1pm - 2pm Lunch and Trade Show

Great Hall 2

2pm - 4pm **Turfgrass Talkback**

6pm - 8pm Farewell Bash





*One of Queensland's premier
golfing establishments is set to
host the 2019 Toro AGCSA
Golf Championship.*

Brisbane Golf Club, host venue for the past three consecutive Isuzu Queensland Opens, will be the stage for what is set to be a hotly contested 2019 Toro AGCSA Golf Championship on Sunday 23 June. A full field of superintendents and turf managers will descend on the Yeerongpilly course to vie for the Red Jacket, with 2018 champion **Tony McFadyean** (Nedlands Golf Club, WA) returning to defend the title he won for the first time at Royal Wellington Golf Club.

Brisbane Golf Club is home to course superintendent **Mitch Hayes** who is closing in on seven years in charge there. Originally from Grafton, NSW, Hayes has had an interesting turf management journey to date, one that took him to South West Rocks and Townsville golf clubs before heading to the US to undertake an internship through The Ohio Program. Stationed at Quail Hollow for 13 months, it proved to be the experience he needed to set himself up for an eventual return to Australia and the role at Brisbane.

Hayes runs with a crew of 12 that includes assistant superintendent **Peter McNamara** and together they manage perhaps the most unique greens in the Sunshine State. After being devastated by the Brisbane River floods in 2011, between 2013 and 2015 the club converted all greens from 328 to Champion ultradwarf couchgrass, the first and only club to date in Australia to use the variety.



*Brisbane Golf Club is the only course in Australia to
boast Champion ultradwarf couchgrass greens*

In total, six greens were completely rebuilt down to the sub-base, with contouring changes made on almost every green. Champion's tight, dense canopy, its smoothness and ability to generate excellent speed were all characteristics that the club coveted and according to Hayes it has delivered in the years since.

"It was definitely a risk to go with Champion, but it is one that has definitely paid off," says Hayes. "For me, Champion is a much better grass. The canopy is so tight and you can get good speed out of it and smooth ball roll. The members here like fast greens and with this grass you can deliver that expectation in this climate.

"We aim for 4kg of actual N per 100m² per year with the Champion. In summer I spilt that 50/50 with granulars and foliar. This time of year, with the Champion shutting down, we increase foliar inputs of nitrogen, calcium, silica, iron and pigments to maintain colour.

"Winter in Brisbane can be wet at times so we typically run a monthly preventative fungicide programme; nothing elaborate, just basic fungicides to provide broad spectrum control. White helmo and pythium blight are our biggest diseases on Champion during winter."

In addition to converting to Champion, other works at the same time included installing a 1.2m collar of *zoysia matrella* around greens to stop encroachment. A number of fairways, such as the 5th, were also recontoured, extra drainage installed on others and select bunkers also refurbished. The 8th, the last hole to be completed, saw the biggest changes and in addition to the greens conversion the fairway was heavily reshaped and the existing water body extended to the front and side of the green.

Elsewhere around the course, tees and fairways are a mix of green and blue couch. The older fairways have had large patches



Brisbane set for **super** showdown

of blue couch in them for years, with Hayes allowing it to gradually take over. In recent times he has also been trialling TifTuf on several tee surfaces and a few collars with the results to date encouraging.

"We are currently trialling TifTuf on sections of the 19th and nursery collars," explains Hayes. "The idea is to try and find a couchgrass that will not move as quickly laterally to help slow down encroachment. At present we are using zoysia collars on a 'strip and replace' programme, but this is starting to become costly and labour intensive for the club.

"We also are trialling TifTuf in the social 1st, ladies 6th and men's 13th tees. We are interested to see how it handles wear, particularly on the par threes, how it holds colour during winter and its irrigation requirements – it is said to require 30 per cent less water than Nullabor couch. We have noticed it is a little more drought tolerant,

but it is hard to quantify exactly how much. We will keep trialling the grass over the next couple of seasons to see if it will be the right fit for us, but so far it is looking promising."

Brisbane is a busy course with the club pushing through 65,000 rounds a year. During the winter months, a major priority is managing traffic around the course and lifting mowing heights to help mitigate damage. The Champion greens are maintained at 4mm during this time, tees 12mm and fairways 14mm. Rough is cut at 50mm year round.

With the greens conversion occurring only a few years ago, recent times have been quiet on the project front. Aside from rebuilding some bridges around the course (three are still left to do), the club has been in consolidation mode in order to prepare for the next major infrastructure project – a complete irrigation system upgrade. That project is likely to start in October this year and Hayes simply cannot wait for it to kick off.



"I am particularly excited to see this happen as we are still running a hydraulic system with centre line Toro 690s, some of which are older than I am," laughs Hayes. "We are yet to decide which supplier we will go with, but the main features will be a switch from a satellite system to decoder to avoid staff having to remove satellites out of flood zones. We will also be taking the opportunity to relocate the pump controller to higher ground to avoid any risk of damage during flooding."

As it was at Royal Wellington, the 2019 competition is set to be a fierce contest, with McFadyean heading a field of contenders that includes past winners **Michael Dennis** (Royal Perth), **Brett Woodward** (Coral Cove) and **Chris Burgess** (Yarrowonga Mulwala). Fresh from collecting his second Powell Trophy at the VGCSA AGM, Numurkah superintendent **Matt Campbell** could be a smoky, while fellow Victorians **Brett Balloch** (Anglesea Golf Club) and **Adam Lamb** (Barwon Heads) are never too far from the mix.

"The course will largely play the same as our members experience daily," says Hayes when asked what his fellow supers should expect when they tee up at Brisbane. "We try to maintain the same level of conditioning year round, with the ability to tidy up the peripherals when we host a tournament. It'll be a good test for the field and we are looking forward to welcoming everyone on the 23rd."

Buses to Brisbane Golf Club will depart the Brisbane Convention and Exhibition Centre at 10.15am, with a 12.15pm shotgun start for the 2019 AGCSA Golf Championship. 🏌️



2019 AGCSA Graduate of the Year Award finalist Jordan Thompson (Royal Canberra GC) was a course volunteer at the 2018 Emirates Australian Open at The Lakes

After the honours were shared at the Wellington conference last year, ATM profiles the finalists for the AGCSA Graduate of the Year Award and also the STA Sports Turf Graduate of the Year, both of which will be announced during the Brisbane conference.

Last year history was created. Not only was it the first time the Australian Turfgrass Conference had ventured outside of Australia, but when it came to announcing the winner of the AGCSA Graduate of the Year Award, presented in partnership with Platinum Partner Toro Australia, two of the finalists could not be separated.

In one of closest contests in the award's 23-year history, Royal Hobart Golf Club's Bryce Walsh and Morisset Country Club's Daniel Hendrie shared the honour, with Walsh achieving the additional distinction of being the first graduate from Tasmania to collect the prized Dint Golf Solutions-forged trophy.

This year will see 11 state finalists line up in front the judges in Brisbane, six contesting the AGCSA Graduate of the Year and five the STA Sports Turf Graduate of the Year. Winning these prestigious awards can open up a multitude of opportunities and the winners this year will receive trips to the US, courtesy of Toro, to help further their careers and gain valuable insights into the wider turf industry. The AGCSA and STA Australia, together with Toro, congratulate the following finalists...

AGCSA GRADUATE OF THE YEAR AWARD

JACK SCHMIDT



GCSAQ

Cardwell Golf Club

Ironically, this year's home state representative will have to travel just as far as the rest of

his fellow finalists to take his place in front of the AGCSA Graduate of the Year judging panel. Twenty-year-old GCSAQ representative Jack Schmidt hails from the small Far North Queensland town of Cardwell, located halfway between Cairns and Townsville.

Living in the beachside town all his life, Schmidt is assistant greenkeeper at the nine-hole (18-hole composite) Cardwell Golf Club. Finishing school as a 16-year-old, Schmidt took on an apprenticeship at the club and completed his studies through TAFE in Townsville. He completed his Certificate III in Sports Turf Management last November which has given him valuable experience, confidence and skills not only in his chosen profession but life in general as well.

During his time at the club, Schmidt has been involved in a number of significant projects, in particular the design and reconstruction of five tee blocks. He continues to thoroughly enjoy working on and maintaining the beautiful aesthetic features of Cardwell Golf Club, which is surrounded by pine forest and has the Great Dividing Range as a stunning backdrop.

JAX BATTYE



GCSAWA

Meadow Springs G&CC

Representing Western Australia in 2019 is 26-year-old Meadow Springs crew member Jax Battye.

With a background in landscape horticulture and environmental rehabilitation, but having played golf since the age of six, Battye always knew that the turf industry was where his heart resided. After some extensive travels overseas and returning to WA in late 2015, he found himself taking on an apprenticeship at Mandurah-based Meadow Springs.

Battye rates the best part of his job as leaving work every day knowing that he has created, maintained and upheld the

standard that is Meadow Springs. The effort and attention to detail that he and his fellow staff members put into the course every day makes him want to get up each morning and do it all over again.

A career highlight to date was being asked to stand in as interim superintendent for three months from October 2018 to January 2019 following the departure of long-time superintendent Greg Simmonds. As Battye comments, it was "such a wild experience and an amazing opportunity and further sealed the deal in my mind as to what I want in life and my career."

JORDAN PHILLIPS



NSWGCSA

Newcastle Golf Club

Jordan Phillips started working at Newcastle Golf Club as a casual in October 2014 which

led to him being offered an apprenticeship which he eagerly took up. During his time at the Australian top 20 course, Phillips has taken on a lot of responsibilities and with his apprenticeship now complete is looking at taking on more of a senior role under superintendent Daniel Wilkinson.

Career highlights to date include volunteering at the 2018 Fiji International (Natadola Bay) and 2018 Emirates Australian Open (The Lakes) and receiving the 2018 Vince Church Graduate of the Year Award at the NSW Golf Industry Awards night.

JORDAN THOMPSON



STA ACT

Royal Canberra Golf Club

Growing up on a small farm in Rockhampton, Jordan Thompson always wanted to pursue a career

in the sporting industry, whether that was through playing sport or working on a field, golf course or racetrack. Shortly after finishing school, he moved to Canberra to play rugby and still pulls on the No.10 jumper for Premier Division club Universities.

In 2014 Thompson joined the crew at Royal Canberra Golf Club, just a few months before the club embarked on the first stage of its redevelopment. Bearing witness to such a major project, which saw the club become the first in Australia to convert its fairways to bentgrass, enabled Thompson to gain a unique insight into construction processes



Morisset CC's Daniel Hendrie continued NSW's strong showing in the AGCSA Graduate of the Year Award last year

and grow-in practices. He formally started his apprenticeship at the club in 2016 through the Canberra Institute of Technology.

In addition to a love of travel – Thompson is hoping to combine his passion for playing rugby union and greenkeeping and do both overseas one day – he is also active on social media and sees it as a great way to promote the industry and the great work being achieved by Australian greenkeepers. To that end he has started an Instagram hashtag "greenkeepingaustralia". Although only in its infancy with about 30 posts to date, Thompson is hoping it will grow and show how desirable an industry it is to work in. Like his Newcastle counterpart above, Thompson was also among the volunteer corp at the 2018 Emirates Australian Open at The Lakes.

THOMAS BURRIDGE



SAGCSA

Kooyonga Golf Club

Thomas Burrige didn't move too far in taking up a traineeship at Kooyonga Golf Club, having

grown up just around the corner from the premier Adelaide establishment. As a young guy who loved looking after the front lawn, work experience and some casual work led to him being employed as a trainee at Kooyonga in 2016, following in the footsteps of older brother Jacob who had also completed his traineeship at the club.

Right from day one, Burrige demonstrated a passion for turf, always seeking to increase his knowledge and ability. He showed great dedication, freely giving his time and happy to be around and involved in whatever was going on, be it routine maintenance, renovations or course reconstruction activities. He was involved in the preparations and presentation of Kooyonga for the 2018 Women's Australian Open, having volunteered at Royal Adelaide the previous year.

His thirst for improvement and knowledge has led him to move interstate to work at Peninsula-Kingswood in Melbourne, somewhat ironically again following the well-worn path of brother Jacob who is now an assistant there. Along with being able to immerse himself in the turf operations at one of the leading clubs on the sandbelt, Burrige has taken the opportunity to commence further education to enhance his knowledge.

NICHOLAS FIDDELAERS



VGCSA

Huntingdale Golf Club

Thirty-two year old golf and sports enthusiast Nicholas

Fiddelaers was a late starter to the turf industry after growing up and working on a dairy farm in country Victoria. He moved to Melbourne to attend university, but after deciding on a change he started a Certificate





Royal Hobart's Bryce Walsh (centre) celebrates becoming Tasmania's first Graduate of the Year winner with boss Steve Lewis (left) and assistant Gareth Kelly at last year's Wellington conference

III in Sports Turf Management at Holmesglen TAFE in 2016 and an apprenticeship at Kew Golf Club in September of that year. In April 2018 he shifted across to Huntingdale Golf Club under long-serving course superintendent Michael Freeman.

In his 18 months at Kew, Fiddelaers was involved in many different aspects of golf course maintenance and construction. Along with regular day-to-day course preparations, he was also involved in major course works which saw nine new bentgrass greens constructed along with fine fescue surrounds, a new Toro irrigation system and a variety of drainage works.

Since moving across to Huntingdale he has had the chance to assist with the mentoring of other apprentices and greatly expand his knowledge of the profession. Fiddelaers says he couldn't be happier with his experiences in the golf turf industry to date and is looking forward to a long and successful career.

STA SPORTS TURF GRADUATE OF THE YEAR AWARD

MITCHELL MCKENZIE



**STA ACT
Canberra Racing Club**

The sole racetrack representative among this year's STA finalists, Mitchell McKenzie works at Canberra's premier racing facility Thoroughbred Park. McKenzie actually began his working life as an apprentice

cabinetmaker before deciding on a career switch and joining the Canberra Racing Club in 2015 as an apprentice greenkeeper. Having successfully completed his studies through Canberra Institute of Technology, McKenzie was promoted to the position of foreman this May.

Among his achievements to date at Thoroughbred Park include the building a synthetic racing surface in September 2016, successfully completing grass and synthetic track renovations yearly and being promoted to a senior role within the Canberra Racing Club track crew. McKenzie most enjoys working outside and being in a team environment and the variety that the turf management profession offers compared to other trades.

JAKE DE MARIGNY



**STA NSW
Sydney University**

Jake de Marigny completed his apprenticeship at the University of Sydney and assists in the preparation of the main oval and first grade wickets. De Marigny has also spent time working at ANZ Stadium and also travelled to the US where he visited Mountain View Seeds and worked at Broward County Stadium, preparing a cricket wicket for American college cricket.

During his studies, de Marigny received the award for best performed student in Certificate III. He enjoys the outdoors aspect of being a turf manager, constantly learning and improving and enjoys seeing the final results of the work he and the team produce.

JACOB MOON



**STA SA
SACA**

Jacob Moon began his traineeship with the South Australian Cricket Association (SACA) in August 2016 under Justin Groves and Jake Pavlich. Working there until the end of March 2017, he then shifted to the City of Unley Council under supervisor Steve Shepherdson for five months before returning to SACA for the 2017/18 cricket season.

At the end of that season he moved onto the City of Holdfast Bay where he worked at Gliderol Stadium during the 2018 SANFL season under head curator Dave Wark. In September of 2018 he returned to SACA to work with Trent Kelly and the team and is still currently there.

Throughout his apprenticeship Moon has been fortunate to work with highly skilled and knowledgeable people who have taught him a great deal about the trade. One of Moon's biggest achievements to date was completing his dual qualifications of Cert III Horticulture and Cert III Sports Turf Management.

NATHAN ANDREWS



**STA VIC
Citywide Service Solutions**

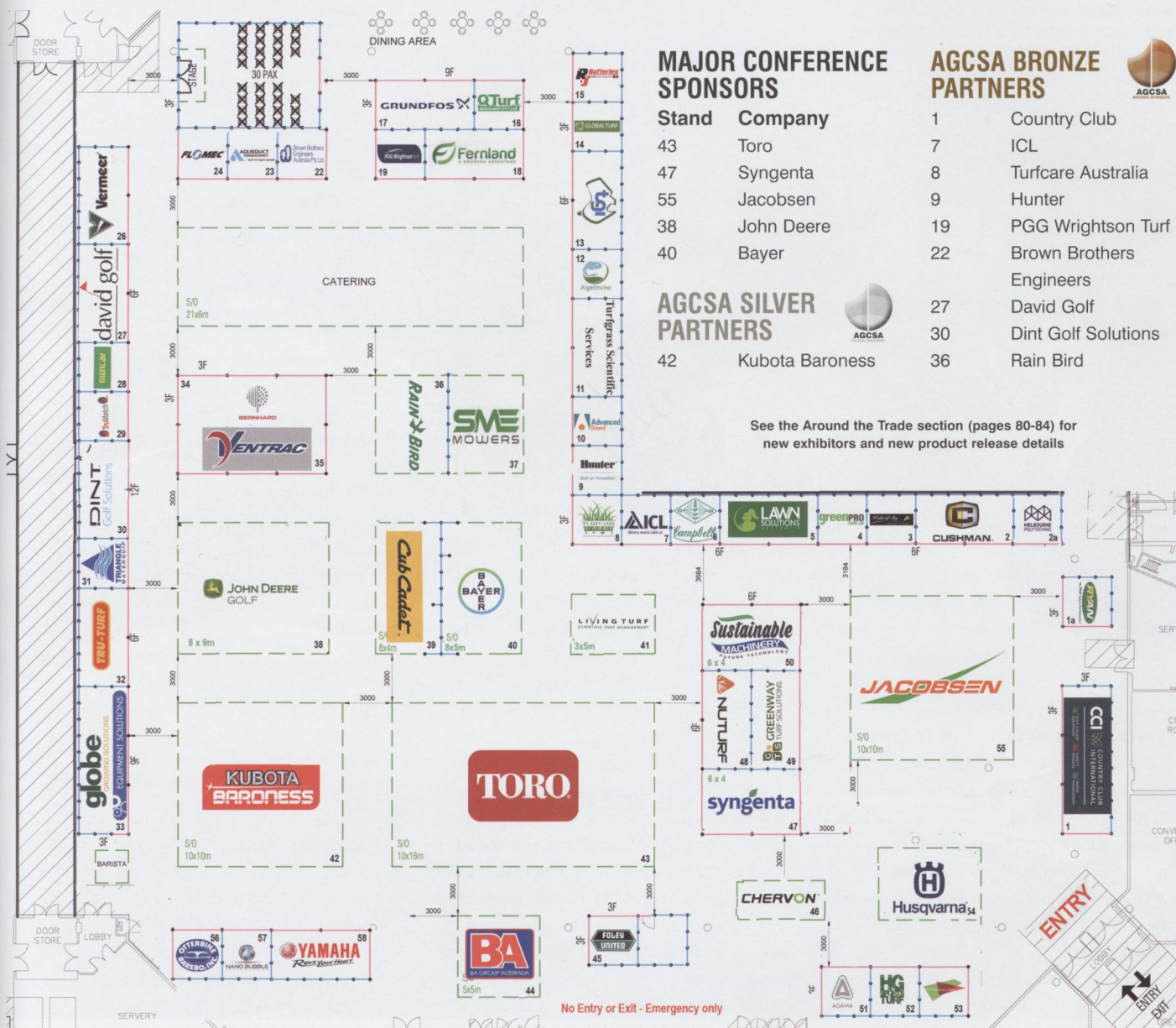
Nathan Andrews has been with Citywide Service Solutions since the start of 2016 and over the course of his apprenticeship was involved in the day-to-day maintenance of 60+ sports fields within the City of Whittlesea and Nillumbik Shire.

Nominated for the award by Melbourne Polytech's Mark Burchell, Andrews was recently promoted to the position of leading turf manager on another Citywide contract in Melton as lead turf manager. In addition to completing his apprenticeship, the role now sees him managing the turf at 25 AFL, cricket and soccer grounds. Andrews, who plays for the Whittlesea Eagles in the Northern Football League, enjoys the attention to detail that turf management requires and the sense of satisfaction after doing a job well.

Editor's Note: Details of the STA Queensland graduate representative had not been finalised at the time of going to print. 🙏



2019 ASIA PACIFIC TURFGRASS CONFERENCE TRADE EXHIBITION – BRISBANE



JOHN DEERE
GOLF



India's Oxford Golf Club is literally an oasis, surrounded on three sides by dry rocky hills on the outskirts of Pune



Indian Oasis

AGCSATech senior agronomist Bruce Macphee looks back on his recent trip to India which afforded him the chance to visit some of the country's unique golfing establishments.

In April I was fortunate to visit both India and China, attending the 2019 India Golf and Turf Expo as a guest speaker before heading to Shanghai to complete a pre-match inspection of Jiangwan Stadium prior to the Round 11 AFL Premiership clash between St Kilda and Port Adelaide.

The Indian conference was hosted by the Golf Industry Association (GIA) and the Golf Course Superintendents and Managers Association of India (GCS&MAI) who organised the seminar at Tyagraj Stadium, New Delhi from 27-28 April. The AGCSA has had a long held relationship with the GCS&MAI which was forged through the efforts of the late Colonel K.D. Bagga, the association's founding president. This has seen several visits over the years by AGCSA Board members and agronomists to present at the annual conference.

This year's conference included a trade show and two days of lectures from both local and international speakers on a wide range of topics, from turf management through to promotion and increasing participation in the game. It was a great opportunity to meet superintendents and see the challenges faced across the industry are universal.

During my time in India I was also given the opportunity to visit several golf courses including top ranked Oxford Golf Resort and The Poona Golf Club in Pune, about a two-hour drive from Mumbai.

Oxford Golf Club is set in a valley surrounded on three sides by rocky hills with the main access road dropping down into the valley. The view of the course as you reach the top of the pass is breathtaking, with the green, striped fairways providing such a contrast to the surrounding rocky hills which appear dry and desolate.



The Pacific Coast Design-designed 18-hole course is laid out over 6420 metres with seashore paspalum on tees, fairways and greens. The course itself has been open since 2009 with construction starting in 2004. During that time an extensive amount of rock was moved to form what is truly a spectacular course in a unique setting.

The course has not been short of challenges in the past years, with difficult-to-manage microclimates, poor water quality and two distinct seasons of weather. The monsoon season brings prolonged periods of wet weather and low light, while the long dry season sees temperatures regularly in the 40s and deteriorating water quality. Agronomist John Neylan has worked with several clubs in India over the last five years and has assisted greatly in setting up Oxford Golf Club's maintenance programmes and to manage its water quality issues.

Towards the end of the dry season, irrigation water can return pH readings above 8.5 which is strongly alkaline. With the high pH comes high concentrations of carbonates and bicarbonates in the water. Bicarbonate and carbonate ions combine with calcium and magnesium which will precipitate (form a solid) as calcium carbonate (CaCO_3) or magnesium carbonate (MgCO_3) as the soil dries. This can cause a slight cementing of the sand particles which can form in layers within the greens profile.

This process causes a decrease in the concentration of calcium and magnesium and results in an increase in the relative proportion of sodium. The impact of the water quality on the soils will be;

- An increase in soil pH which reduces the availability of important nutrients;
- A change in the soil structure resulting in a harder soil that restricts root growth;
- Increase in soil sodium which causes a nutrient imbalance;
- General nutrient imbalances.

The only means by which the water could be improved in this situation was by introducing acid into the supply. Sulphur burners are becoming the preferred method of acidifying water because there are fewer hazards compared to handling acid directly.

A sulphur burner was set up in 2016 at Oxford Golf Club to treat their irrigation reservoir. The unit pumps in water from the reservoir, acidifies it and then returns it to the reservoir. The unit burns granular sulphur (stored in an attached hopper) to form sulphur dioxide (SO_2). The sulphur dioxide is then mixed with the water stream and ultimately forms sulphuric acid.

The acid lowers the pH of the water, which is then returned to the reservoir improving the pH and quality of the water. Regular monitoring of pH levels within the irrigation reservoir has allowed the staff to programme the duration the sulphur burner is required to operate each day throughout the irrigation season.



Oxford course superintendent Sanjay Kulkarni and his three assistants run a highly organised operation with an exceptional level of course presentation

Since the introduction of the sulphur burner there has been significant improvements in water quality, soil conditions and overall turf quality. Soil pH has stabilised and started to reduce, in some instances from 8.4 to 7.9. It is important to note that the pH scale is logarithmic and that a reduction of one unit is actually a 10-fold reduction.

Oxford course superintendent Sanjay Kulkarni and his three assistants run a highly organised operation with an exceptional level of presentation throughout the course. One of the key points I observed was the meticulous monitoring and record-keeping undertaken. This has provided some solid figures that can be used in support of implementing management programmes and equipment purchases.

There are some great contrasts between maintenance practices undertaken in India and Australia, with the significantly lower wage costs in India meaning manual labour is used where mechanical methods would otherwise be the norm.

The AGCSA looks forward to its ongoing involvement with the GCS&MAI and providing assistance to Indian superintendents. As part of that relationship, the GCS&MAI, together with Rain Bird, has afforded one of their superintendents the opportunity to attend the Brisbane conference. Shraboni Das Arora, from Belvedere Golf and Country Club in Ahmedabad, will be a delegate as well as visit a number of courses during her stay. ﷻ

TOPDRESSING AND CONSTRUCTION SANDS

Recently AGCSATech has received a large volume of enquiries in relation to sourcing of topdressing and construction sand. After many years, one of the largest sand suppliers to the Melbourne and surrounding areas has ceased production at its Langwarrin quarry.

While there are other options available, before selecting a new supplier there are a number of points to consider;

- It is important to assess the physical characteristics of your current profiles, so a sand can be selected that best matches your existing conditions;

- The quarry must have a proven track record of being able to produce a consistent product that will continue to be available into the future; and
- Selecting a sand with a higher portion of fines can lead to increased moisture levels in the surface and over time create soft wet putting surfaces.

If you are looking for a new sand supply, AGCSATech can conduct a full range of tests to ensure that the sand meets the required specification. Contact (03) 9548 8600 or email bruce@agcsa.com.au or tim@agcsa.com.au.



Grounds for change

John Neylan and David Nickson continue their look at the final results to emerge from a two-year STA Victoria-funded project to determine the potential hours of use for sports fields of different construction types and maintenance regimes.





Kikuyu damage mid-winter 2018. The field constructed on a heavy soil type deteriorated very quickly when there was rain

wear, weed control, overseeding and fertility. Across the study period there were several observations;

- The turf composition and in particular the warm-season grass base and turf density varied throughout the year (Figures 1-3).
- Where there was a strong warm-season grass base in the late summer/early autumn, the surface held together very well irrespective of the level of wear. In particular, where there was a good couch base, even though losing most of its leaf, the surface remained intact throughout the winter. The stolons and rhizomes provided a strong and resilient surface.
- It was noted that where the warm-season grass base had not completely recovered from the previous winter wear, the damage to the turf was compounded in the following winter. This provided a progressive deterioration of the warm-season grass base.
- In Year 1, the ryegrass oversow on the couch field was not successful. This highlighted the importance of allowing a sufficient establishment period without activity on the field (e.g.; pre-season training) if there is to be a satisfactory ryegrass cover. In Year 2 on the same field it was not overseeded.
- On one of the kikuyu fields a proportion of it was overseeded in Year 2. The goal to goal line to the width of the point posts was overseeded as a means of reducing the deterioration of the field over winter. The overseeding was partially successful in reducing the damage, however, soil moisture was the overriding factor affecting the damage. It was also noted that the overseeding process stimulated germination of *Poa annua* and the overseeded area ended up being 50:50 ryegrass/*Poa annua*.

In April 2017 a research project funded by the Sports Turf Association of Victoria was commenced to study the effects of hours of use on sportsfields of different construction types and levels of maintenance. The results of the first year of the study were published in ATM Volumes 20.3 (May-June 2018) and Volume 20.4 (July-August 2018). The research was completed in December 2018 and the detailed report is available at <https://vicsportsturf.asn.au/>.

This article is the second of a two-part series on the completed study and presents the data collected on the surface quality parameters including turf composition, wear, traction and turf health. The previous edition of ATM (Volume 21.2 – March-April 2019) presented soils data from the near two-year project.

TURF COMPOSITION AND DENSITY

Turf composition of the four fields studied changed throughout the 21 months and depended on the base grass composition,

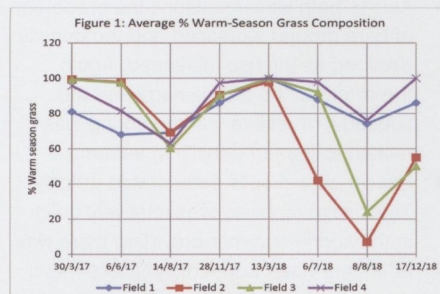


Figure 1. Turf composition and in particular the warm-season grass base varied throughout the year

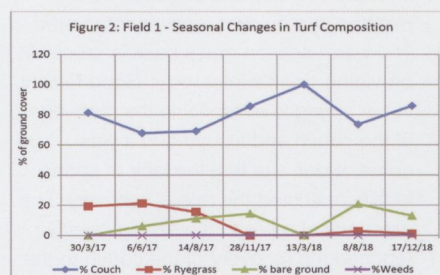


Figure 2. Seasonal variation of turf composition on one of the fields studied

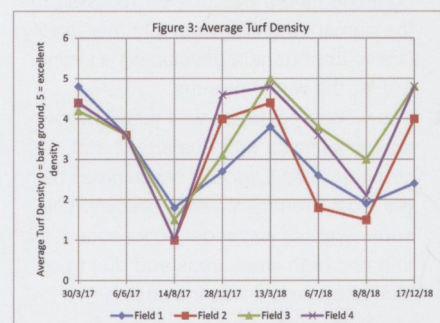


Figure 3. Turf density also varied throughout the year



Recovery from wear in the spring is highly dependent on good fertility, water management and insect control



- Based on the data to date from the winter of 2018, the absence of a ryegrass overseed had no adverse effect on the surface other than a lack of green colour. However, for this strategy to be effective there must be a strong couch cover going into winter.
- Across both winter seasons the proportion of bare ground increased and the density declined as the use increased. Again, the extent of the turf damage and the subsequent recovery in the spring was related to the turf density in autumn.
- Kikuyu on wet soils deteriorated quickly. The kikuyu recovery was relatively quick in the spring/summer providing there was adequate water and fertility. There was a dramatic change in the maintenance of the kikuyu fields comparing the spring of 2017 with 2018. In 2018 there was increased fertility and irrigation that resulted in a quicker recovery of the turf.
- The warm-season grass base is crucial in providing good winter wear. Good fertility in the spring is essential in the recovery of the couch and kikuyu and it was noted at one site that the lack of spring fertility restricted the rate of recovery. The presence of mites in the spring greatly reduced the recovery of the couch to the point where a complete turf cover had not been achieved by late December (see photo below). Where the mites were controlled there was quicker recovery of the damaged areas. Post summer fertility is also important in developing a strong turf for the winter months.
- The weed population was relatively low across all fields with *Poa annua* and summergrass (*Digitaria sanguinalis*) being the most prominent weed species. The summergrass was most noticeable in the thin and high wear areas and due to a lack of treatment was increasing.



- In relation to the *Poa annua*, it was increasing considerably at one of the couch fields due to a lack of effective treatment. On the other couch field there had been a concerted effort to reduce the proportion of *Poa annua* that was showing signs of herbicide resistance.

THATCH DEPTH AND ROOT GROWTH

The thatch depth (Figure 4) did not change substantially over the period of the project and is related to the renovation programme, age of the profile and the high wear on three of the fields. The high wear in particular does reduce the amount of biomass, particularly in the high traffic areas of the field such as goal squares, centre bounce and the goal to goal line.

In addition to the thatch depth there is also the accumulation of organic matter below the thatch layer. The organic matter layer is a function of age of the profile and does influence the infiltration rate and the moisture retention. As a general premise, hollow coring of sportsfields every year would be highly beneficial in thatch and organic matter control and improving the infiltration rate.

At the initial assessment there was a considerable difference in the root depth between the couch and kikuyu fields (Figure 4). The couch fields had an average root depth that was about 10cm deeper than the kikuyu. This greater root depth in the couch in part reflects the better drought tolerance compared to the kikuyu.

At the March 2018 assessment there was a substantial reduction in the average root depth on both couch fields compared to the kikuyu fields where there was no obvious change. The reduction in root depth was due primarily to a low soil moisture content with both couch fields having a below optimum soil moisture content. Field 1 was affected by

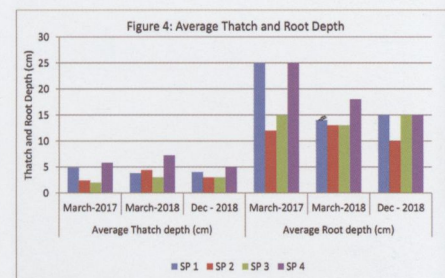


Figure 4. Thatch depth did not change substantially over the period of the project

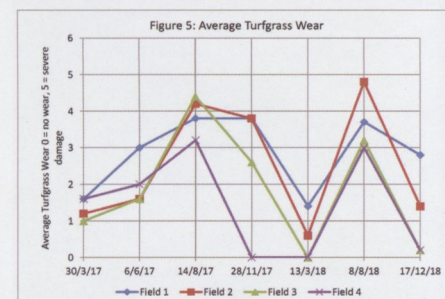


Figure 5. Wear varied across the year with the winter months combined with the football codes creating the greatest damage from wear

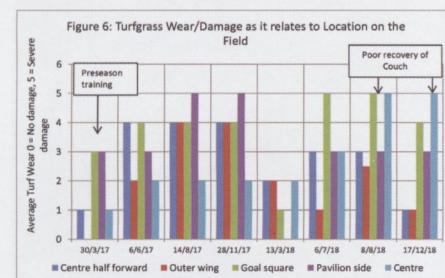


Figure 6. During the winter months, wear was concentrated in particular areas such as the goal squares, centre of the field and on the pavilion side

poor water distribution uniformity and Field 4 was being kept dry as a means of reducing the *Poa annua* population.

At the December 2018 assessment there was very little change in root depth compared to the previous assessment.

TRAFFIC AND WEAR

Wear varied across the year with the winter months combined with the football codes creating the greatest damage from wear (Figure 5). During the winter months the wear tends to be concentrated in particular areas such as the goal squares, centre and on the pavilion side of the field (Figure 6).

This has been a common occurrence over our 35 years involved in turf management. It highlights one of the most damaging aspects of winter sports use – training and the lack of control of where training occurs. There are several key facts noted around surface wear;

- Very high wear at the initial inspections due to pre-season football training and the effects of this wear persisted across the winter sports seasons.

Mite damage in a high wear area impeding recovery

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A strong couch base going into the autumn/winter season provides a high wear resistant surface even when there is very little leaf due to the high traffic.

- Overseeding in this study appears to have very little influence on wear tolerance and this is due to the timing of overseeding and allowing time for the ryegrass to establish. From a general perspective, the overseeding is mainly aesthetic (i.e.; greener surface) rather than contributing to any great improvement in wear tolerance. The removal of the ryegrass in the spring is also critical in restoring the warm-season grass base.
- Most fields had concentrated wear in goal squares and the side of the field adjacent to the pavilion (Figure 6).
- The wear and turf damage increases as the winter season progresses.
- Some high wear areas at the March 2018 inspection was due to a carryover of turf damage from the previous football season and the lack of repair over the summer.
- Where there is a strong couch base and the soils remain well drained and relatively dry there is excellent wear tolerance. While most of the leaf is worn away the strong network of stolons and rhizomes holds the surface together and prevents holes from developing. This aspect emphasises the importance of maximising growth and turf density during the summer months.
- The growth and recovery from the wear in the spring is highly dependent on good fertility, water management and insect control.
- The surface levels on most fields were within acceptable limits with no holes greater than 20mm depth. On the high use soil field (Field 2) the surface levels were highly disturbed once the soils become saturated. The surface levels require repair in the spring (usually by heavy roller).

SURFACE HARDNESS

The surface hardness was within acceptable limits at all of the assessment dates though there was a high variation between and within fields. The fields that had good drainage had a relatively consistent surface firmness. Field 2, which was soil based and had no drainage, varied considerably. During winter the soils were saturated and very soft whereas in summer as the soils dried out the surface was considerably harder.

The most critical period for surface hardness is in the autumn transition from summer to winter sports. If the late summer has been hot and dry, the surface is generally quite hard and will persist through until the autumn/winter rains occur. Surface hardness in the autumn can be corrected through deep tine aeration and increasing soil moisture through irrigation.

TRACTION

As a general overview, the traction was within acceptable limits throughout the study period

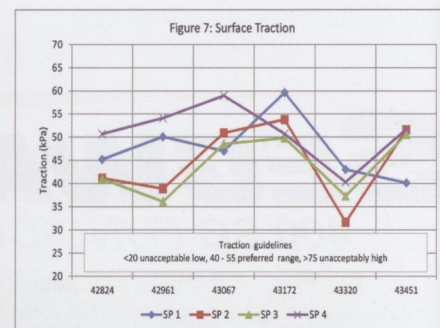


Figure 7. Traction was within acceptable limits providing the soils were relatively dry

providing the soils were relatively dry (Figure 7). On Field 2 where the soils were saturated, the traction was very low and the surface was boggy and slippery.

One of the interesting observations was the increase in traction as the couch became dormant and there was a loss of leaf. What appears to be happening is that in the late summer there is a lot of leaf and a buffer between the traction device (or potentially a boot) and the layer of stolons. As the leaf is abraded and exposes the stolon layer there is increased grip.

Surface traction and the overall playability of the surface are strongly related to grass type and soil moisture content. A strong couch base on well drained soils is going to provide the highest level of playability.

HOURS OF USE

Sports field use data was compiled for the winter months and are presented in Tables 1 and 2. The data was collected from council booking schedules and information from user groups.

It should be noted that the recording of hours of use is an area that councils could standardise and improve on so that more accurate and comparable figures can be obtained. By having more accurate figures around actual hours of use and the number of participants, it would greatly assist

TABLE 1: HOURS OF USE WINTER 2017

Location	Winter 2017					
	Hours/week			Total hrs/winter season		
	Training	Games	Total/week	Training	Games	Total/season
Sportsfield 1	13.5	17	30.5	351	442	793
Sportsfield 2	13	3.6	16.6	416	71	487
Sportsfield 3	2.5	2.5	5	60	60	120
Sportsfield 4	18	7	25	468	182	650

TABLE 2: HOURS OF USE WINTER 2018

Location	Winter 2018					
	Hours/week			Total hrs/winter season		
	Training	Games	Total/week	Training	Games	Total/season
Sportsfield 1	23	2	25	598	52	650
Sportsfield 2	13	3.6	18	416	80	496
Sportsfield 3	2.5	2.5	5	60	60	120
Sportsfield 4	17	6	23	442	156	598

in developing appropriate maintenance standards and deciding on the level of investment in new sportsfield construction.

The hours of use that can be tolerated before there is significant turf damage is influenced by the construction type, weather (in particular rainfall) and maintenance of the surface. There is little doubt that the investment in a well-drained field with a couch turf provides the highest hours of use. This presumes a level of maintenance that ensures there is a 100 per cent grass cover of high density at the end of summer, leading into the winter sports season. The other confounding factor is the quality of the surface acceptable to the user groups. Where a substantial loss of turf cover and reduction in aesthetics is 'acceptable' the hours of use can be greater.

The ever-present problem with the hours of use is training and the concentration of traffic in a relatively small area. A prime example of this is for Field 1 where there was significant wear on one side of the field due to pre-season football training. The damage to sportsfields and the cost of restoration would be greatly reduced if the user groups were either more aware or more cooperative in spreading the training activities. The user groups need to play a major role in this.

The problem around high use and a low level of expectation for the surface is the end of season repairs that are required to restore the surface and the associated costs. It is apparent in some situations there are minimal repairs and over time the damage is compounded, requiring even more extensive repairs such as returfing damaged areas when the damage is creating a hazard. Irrespective of the level of activity and the standard of field, preventative and targeted maintenance is critical to maintaining a sustainable playing surface.



The high quality couch surface on one of the fields demonstrating excellent spring recovery

SPORTSFIELD MAINTENANCE

Maintenance information was collected for each field and it has been summarised in Table 3. Information for other sportsfields was also collected to provide a broader base of information as it relates to construction type, hours of use and maintenance inputs. It is noted that the type of construction and hours of use are not necessarily reflected in the intensity of the maintenance regime.

Field 1 hosts a high standard of amateur football and a local suburban turf wicket cricket competition. It also has to cope with the highest winter training load of the four fields monitored. This field has a moderate intensity of maintenance and does not quite match the wear from the hours of use. The key aspects are;

- Mowing frequency – adequate and copes with the level of growth;
- Compaction control – minimal and would benefit from more frequent deep tine aeration;

- *Poa annua* control – minimal;
- Fertility – given the use, additional fertiliser would be warranted; and
- Post-winter sports renovation – moderate programme, needs to be more intensive to restore field playability.

Field 2 hosts junior football and cricket and has to cope with a moderate to high winter training load and games. This field has a minimalist level of maintenance that has increased over the 21-month monitoring period. The key aspects are;

- Mowing frequency – adequate and copes with the level of growth;
- Compaction control – minimal and would benefit from more frequent deep tine aeration;
- Fertility – given the use, additional fertiliser would be warranted; and
- Post-winter sports renovation – intensive programme restores field playability.

Field 3 hosts senior soccer and has a low winter training load and games. This field

TABLE 3: MAINTENANCE INFORMATION FOR THE FIELDS UNDER ASSESSMENT

Activity	Sportsfield 1	Sportsfield 2	Sportsfield 3	Sportsfield 4
Category*	A	C/D	B	A – A+
Mowing (cuts/year)	39	48	48	90 – 100 (with rolling in winter as a substitute for mowing)
Topdressing	60m ³	60m ³	Nil	As required
Compaction relief	1 solid tine	1 – 2 solid tines	1 solid tine	2 – 3 solid tines (vertidrain)
Hollow coring	1 hollow core	Nil	Nil	1 hollow core
Scarifying	Nil	1 over 2 years	1 over 2 years	Depends on thatch levels
Insect control	2	Nil	Nil	1 over 2 years (as required)
Disease control	Nil	Nil	Nil	Nil
Wetting agent	Nil	Nil	Nil	Nil
Pre-emergent herbicide	1	Nil	Nil	4
Post-emergent herbicide	2 for <i>Poa annua</i> control	Nil	Nil	2 for <i>Poa annua</i> control
Broadleaf herbicide	Nil	Nil	Nil	1
Nitrogen fertility (kg/100m ² /yr)	1.9	0.99 – 1.5	0.99	1.9
Fertiliser applications	3	2 – 3	2	4

*The category is arbitrary and varies between municipalities but provides some level of hierarchy. The category often reflects the standard of facilities rather than just the standard of the playing surface. For this project the fields have been provided with a ranking based around the condition of the field, standard of competition and quality of the winter playing surface. It has also utilised the information detailed in Table 2.

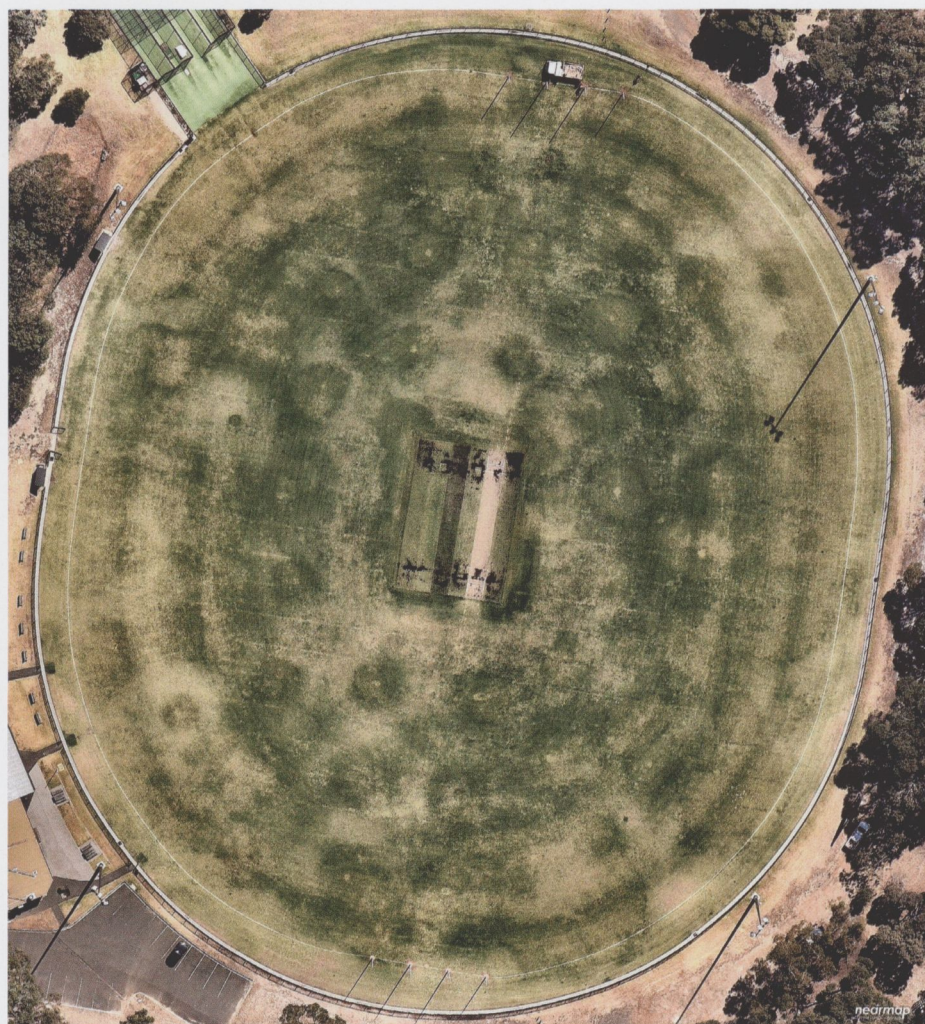


PHOTO: NEARMAP

Irrigation is a critical component to achieving a high wearing surface in winter

has an adequate level of maintenance that has increased over the 21-month monitoring period. The key aspects are;

- Mowing frequency – adequate and copes with the level of growth;
- Compaction control – minimal and would benefit from more deep tine aeration;
- Fertility – adequate;
- Post-winter sports renovation – intensive programme restores field playability.

Field 4 hosts the highest level of cricket (Victorian Premier League) and the highest level of local football. It also has to cope with a heavy winter training load. This field has the greatest intensity of maintenance and is consistent with the standard of sport and the hours of use. The key aspects are;

- Mowing frequency – high;
- Compaction control – high;
- *Poa annua* control – high;
- Fertility – given the use, additional fertiliser would be warranted;
- Post-winter sports renovation – intensive programme restores field playability.

MAINTENANCE BUDGETS

It was difficult to obtain budget details, particularly where contract maintenance was involved. Data was collected from

several sources so as to provide indicative maintenance costs for different categories of fields (Table 4).

CONCLUSIONS

After 21 months of monitoring and assessing the four fields in this project, there are several conclusions;

- The dry winter of 2017 assisted in the fields coping with the traffic and this was again reflected during the winter of 2018 which was even drier.
- The field constructed on a heavy soil type deteriorated very quickly when there was rain. The precarious nature of soil-based fields further highlights the importance of a well-drained profile.

TABLE 4: INDICATIVE MAINTENANCE BUDGETS

Field category	Budget (\$/ha)*
A+	\$15,000 - \$25,000**
A	\$10,000 - \$20,000
B	\$5000 - \$10,000
C	\$3000 - \$8000
D	\$2500 - \$5000

*Includes; mowing, fertilising, aeration/compaction control, pest and weed control and topdressing

**Highest cost occurs where liquid fertilisers are used

- A sand profile that has some subsoil drainage substantially improves the ability of the surface to cope with high traffic loads.
- A strong couch base going into the autumn/winter season provides a high wear resistant surface even when there is very little leaf due to the high traffic.
- The spring transition is most important to restoring the warm-season grass base and is dependent on soil aeration, high fertility and mite control.
- Any soil decompaction programme needs to be monitored as to its effectiveness.
- *Poa annua* was the most prominent weed species during the winter and all fields had a relatively high *Poa annua* content. Where there was poor recovery of the warm-season turf, this provided areas for the *Poa annua* to germinate.
- The hours of use data indicates that on a well-drained couch field, with a moderate level of maintenance, 30 hours of use per week over a 26-week autumn/winter period is sustainable. With a moderate increase in fertiliser and soil aeration it is expected that this could be increased. The timing of maintenance practices is also an essential element in improving the hours of use.
- The spring recovery of the warm-season grass cover is important in maintaining the integrity of the warm-season grass cover and density. Where there is poor spring/summer recovery there is a gradual deterioration of the warm-season grass that can require replacement.
- Poor water distribution at some sites was affecting the overall turf health, turf recovery, turf density and root growth.

ACKNOWLEDGEMENTS

Authors John Neylan (SportEng) and David Nickson (Grand Prix Turf) wish to thank the STA Victoria for their support and funding of this project and the Frankston City Council, Bayside Council and the Mornington Peninsula Shire for allowing access to the sports fields under test. 🌱





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It is imperative that future environmental conditions be incorporated into golf course landscape planning to prevent problems arising down the track

Hybrid landscapes

Riversdale Golf Club is unique among Melbourne's metropolitan golf clubs. It is unique in its mixture of exotic and native tree species, and its myriad gardens, both of which play essential roles in the Riversdale golfing experience.

Riversdale comprises roughly 50 per cent exotic tree species and 50 per cent Australian native tree species, of which around 80 per cent are classified as non-local natives (i.e.; natives that do not grow naturally within Melbourne).

For the purposes of this article, therefore, I will refer to Riversdale as a hybrid landscape; hybrid in that it incorporates both traditional parkland aesthetics and areas recently re-vegetated with local native species. Like many of Melbourne's metropolitan parks and

Riversdale Golf Club's Dominic Bowd kicks off an ongoing series of articles on the work being achieved by golf club horticultural staff by looking at the ongoing management of Riversdale's hybrid landscape.

gardens, which display an array of species from around the world, Riversdale Golf Club showcases trees from a variety of places including;

- North America (*Quercus palustris* – pin oak);

- Chile and Argentina (*Araucaria araucana* – monkey puzzle tree);
- Scotland (*Ulmus glabra* 'Camperdownii' – wych elm);
- China (*Metasequoia glyptostroboides* – dawn redwood); and
- Brazil (*Jacaranda mimosifolia* – jacaranda).

It also exhibits many non-local Australian native trees, such as red-flowering ironbark (*Eucalyptus sideroxylon rosea*), spotted gum (*Corymbia maculata*), bull kauri (*Agathis microstachya*), hoop pine (*Araucaria cunninghamii*) and Huon pine (*Lagarostrobos franklinii*), and local natives including yellow box (*Eucalyptus melliodora*), silver-leaf stringybark (*Eucalyptus cephalocarpa*) and the majestic river red gum (*Eucalyptus camaldulensis*).

The gardens at Riversdale are also very diverse, with the clubhouse and immediate surrounds featuring exotics such as purple torch (*Bartlettia sordida*), which hails from the cloud forests of Mexico, and a plethora of colourful camellias (*Camellia* sp.), of east Asian origin, among other species.

With such a diversity of species, the challenge going forward will be to ensure that both maintaining and enhancing this hybrid landscape can be achieved within environmental limits. Due to changes in climate and an increase in the unpredictability of weather systems resulting in excess heat and a decrease in winter rainfall, it is imperative that future environmental conditions be incorporated into landscape planning now to prevent problems arising down the track.

TRADITION, VISION AND ENVIRONMENTAL LIMITS

Presenting a vision for the future that also honours tradition can be challenging and divisive. As one of Melbourne's oldest golf clubs, Riversdale is a place steeped in tradition. Some members see the re-introduction of locally native species – notably sedges, rushes and grasses – as undermining the traditional parkland idyll of the course.

However, in a future where water use will be more constrained and the weather hotter, more humid and more volatile, strict adherence to that traditional landscape idyll is simply impractical and potentially be costly for the golf club. Put bluntly, an agreement between the club management, the club president, board members and the maintenance department with respect to a robust holistic and sustainable landscape plan is necessary.



Proper planning will not only ensure an enduring landscape aesthetic, but also reduce costs associated with the eventual removal and replacement of poorly selected species

For many years, shrubs and tree species had been planted at Riversdale without adherence to a plan. This has resulted in;

- A tree density that was impacting the health of playing surfaces;
- Disorderly and visually confusing vistas throughout the course with no clear themes; and
- Unsuitable species being planted in unsuitable soil and on unsuitable aspects.

In recent times, a landscape enhancement plan has been employed as a guide to assist the club in managing the planting of shrubs and trees. This has been drawn up chiefly by landscape architect Paul Mogford (Crafter + Mogford Golf Strategies) with my assistance and the support of Riversdale course superintendent Travis Scott.

This plan has introduced thematic continuity into the course, whereby the dominant theme on a hole/in a non-play area is further enhanced by selecting visually and/or taxonomically compatible species that will be able to withstand current and future environmental limits. Some of the recent

plantings have adhered to this plan and include;

- The right hand side of the 18th fairway where we have planted pin oak (*Quercus palustris*) and hoop pine (*Araucaria cunninghamii*), species which enhance a pre-existing theme, are very hardy and well suited to current and projected conditions.
- A non-play area between the 12th fairway and 16th green which has been turned into an exotic conifer grove. We removed all other species (mainly straggly acacias and weedy pittosporums) and enhanced the conifer theme by planting Albertiana spruce (*Picea glauca*), Himalayan cedar (*Cedrus deodara*), Italian stone pine (*Pinus pinea*) and Atlantic cedar (*Cedrus atlantica*) among others.
- Local indigenous plants such as common tussock (*Poa labillardieri*) and yellow buttons (*Chrysocephalum apiculatum*) which feature as an attractive mass-planting adjacent to the 14th green (see photo above).

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- A non-play area, between the 11th and 17th tee complexes (see main photo page 68), previously dominated by dwarf peppermint (*Agonis flexuosa* 'Nana'), diosma (*Coleonema pulchellum*) and woody and herbaceous weeds, that now features an array of native grasses and small shrubs. We did this to enhance both thematic continuity – creating a native understorey beneath the existing yellow box (*Eucalyptus melliodora*) – and to improve the local ecology by providing habitat for lizards, insects and birds.

In addition to the plantings, I have also been propagating locally indigenous species from seed and cuttings in a greenhouse in order to restore the native ecology in dilapidated non-play areas of the course. These include wallaby grasses, tall sedge, knobby club-rush, silver banksia, yellow buttons, common tussock and gold dust wattle.

KNOW YOUR LANDSCAPE

Incorporating future environmental limits into golf course landscape planning is now an essential component of landscape design. Proper planning will not only ensure an enduring landscape aesthetic, but also reduce costs associated with the eventual removal and replacement of poorly selected species.

While the landscape enhancement plan conceived by Paul Mogford and I is an important over-arching guide, it is not exhaustive and does not cover all non-play areas of the course. Visionary and creative thinking combined with an aesthetic and scientific understanding of the landscape by course staff is also integral to any successful long-term plan.



Visionary and creative thinking combined with an aesthetic and scientific understanding of the landscape by golf course staff is also integral to any successful long-term plan



Choosing and planting species adapted to shifting environmental limits is crucial

Topography and aspect: Lack of access to groundwater significantly limits the ability of many plants to flourish, particularly when the soil lacks the capacity to retain water. The undulating nature of the landscape and often poor soil conditions at Riversdale make choosing suitable sites for planting crucial.

Currently, I am manually watering a host of trees throughout summer – including dogwoods, crepe myrtles, ornamental pears, birches and ginkgoes – that were planted in hydrophobic soils at drought-prone elevated points in the landscape. Ideally, these trees should be replaced by species more suited to the conditions.

Aspect is also critical when choosing species for specific locations, with the exposure of north and west-facing slopes to the aggressive summer sun acting as a significant limiting factor for many species.

Soil: The soil at Riversdale is mostly comprised of grey sand on a medium-to-heavy mottled clay, with alluvial silts, sands and gravels present along the creek line. The grey sand is typically nutrient-poor and hydrophobic, while the clay layer is somewhat more fertile and water retentive. However, roots can find it difficult to penetrate the clay, meaning that employing an excavator to break apart the clay prior to planting is a must. Also, because much of the natural soil profile has been altered, analysing it and improving it with additives such as compost and gypsum is crucial.

In the past, many of the trees have been planted in unimproved nutrient-poor hydrophobic grey sand or heavy clay predisposed to waterlogging. This has resulted in poor drought resilience and leaf desiccation, leaf chlorosis, restricted growth and ultimately death. The importance of soil when planting cannot be understated.

Future conditions: Evidence from peer-reviewed climatology data strongly suggests a warming of south-eastern Australia with an associated reduction in winter rainfall events, with effects to be acutely felt in urban environments. Therefore, choosing species adapted to these shifting environmental limits is crucial.

What surprised me last summer was observing both juvenile and mature maples struggling in the heat. With days exceeding 40 degrees set to increase, maples may not be a viable option, particularly in drier locations.

To ensure juvenile and mature trees and shrubs do not perish en-masse in the future, topography and aspect, soil and planning for future conditions must be considered when choosing species. An awareness of future environmental limits is critical. 🌱

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COMPLIANCE



In the arena

Terry Muir goes into bat for those turf managers having a go, those that work hard every day to produce their best, those who put their reputation on the line yet still cop a whack...

There is only one guarantee if you are a course superintendent or sports turf manager... there will always be critics.

Every day professional sports turf managers put themselves and their work out there in their own personal arenas for everyone to see. I think Brene Brown's statement is very relevant: "I want to be in the arena. I want to be brave with my life. And when I make the choice to dare greatly, I sign up to get my ass kicked."

The main thing to remember is that we're talking about unfair criticism here rather than constructive feedback. Sometimes the criticism is unfair because it's simply incorrect. And on other occasions, it's unfair because it's about something that has no bearing on how you do your job.

Yes, it is reasonable to expect that a superintendent or sports turf manager takes responsibility for the quality of their work, the presentation of their facility, is accountable for their staff and makes every effort to manage safety and environment protection. However, when something untoward happens, or things go wrong, nothing makes it acceptable for the critics to line up, unless they have stood in the turf manager's arena.

As 26th president of the United States Theodore Roosevelt once famously said: "*It is not the critic who counts; not the man who points out how the strong man stumbles, or where the doer of deeds could have done them better. The credit belongs to the man who is actually in the arena, whose face is marred by dust and sweat and blood; who strives valiantly; who errs, who comes short again and again, because there is no effort without error and shortcoming; but who does actually strive to do the deeds; who knows great enthusiasms, the great devotions; who spends himself in a worthy cause; who at the best knows in the end the triumph of high achievement, and who at the worst, if he fails, at least fails while daring greatly, so that his*

place shall never be with those cold and timid souls who neither know victory nor defeat."

Roosevelt's speech is about giving credit to someone who continues to work hard to improve themselves and not minding their critics. It's also about striving to do good deeds to make a difference and not just remain as a person who has not contributed to a great cause. It certainly inspired NBA legend LeBron James who etched the words 'Man in the Arena' into his basketball shoes.

So, the next time something goes wrong in your workplace – an incident involving turf damage or disease, worker injury or pollution – someone will be pointing the finger at you. Remind them that every time you point your finger at someone, there are three fingers pointing right back at you. Try it out. It is impossible to point the finger of blame at someone or something without simultaneously pointing a finger back at oneself.

Too often I have seen people point the finger of blame at others without considering that they may be partially (or even wholly) responsible for the situation or outcome. Brene Brown, in her well-known TED presentation 'The Power of Vulnerability', said that "if you are not in my arena and also getting your butt kicked, then I am not interested in your criticism. If you're in the cheap seats talking about how I could do my job better, I'm not interested in your criticism."

If you have critics or enemies – good. That means you've stood up for something (Winston Churchill). The critics will always be there in the turf management arena so you might as well invite them in. Explain your craft, demonstrate your commitment to turf excellence, to employee safety and environment protection and sustainability. Let them know that you are the man or woman in the arena and constructive feedback is always welcome.

Remember though, certain critics can't be pleased. And in the grand scheme of

things they shouldn't be the ones you're trying to impress anyway. Critics are by nature observers and not participants.

This article is about something more than critics. It is about acknowledging the person who is having a go, those that work hard every day in this industry putting their reputation on the line.

The person we should celebrate is the one in the arena, not the critic. If you're the turf manager who builds something first and then talks about it, if you see a problem and solve it, or present it to management and get support, then this is the person that should be celebrated. It's easy to support these people in success and the response to the AGCSA's recent 'Thank a Superintendent Week' initiative was a terrific celebration.

But, how are turf managers treated when things don't always go right? Recent issues associated with a harsh summer and serious safety incidents with significant injuries do show there are failings. Yes, maybe some failed or maybe they were wrong, but at least they tried. If we refer to Roosevelt's statement – "there is no effort without error and shortcoming".

Failure or error is inevitable. If you don't want to fail or be criticised, don't do anything; though you'll probably then be criticised for not doing anything, or for doing nothing. So, how do we treat turf managers in failure? Turf managers are the ones in the arena, seeing something that others don't or a way forward that others aren't taking. If this isn't you, at the very least don't be the critic.

Critics are judging turf managers on whether they perform perfectly or not. Success is viewed as an all-or-nothing phenomenon and if the turf manager performs flawlessly, they are considered a success, but anything less than 100 per cent perfection is considered to be a failure. I think we can all agree that even those turf managers that might be running slowly are lapping everyone sitting and watching from the sideline. 🏌️



Contractor or employee?

Workplace relations legal expert Paul O'Halloran looks at the important difference between being classified as an employee or an independent contractor.

It is important to carefully review contractual documents when entering into professional employment or engagement opportunities in the industry, to ensure the nature of the working arrangement is lawfully characterised.

When individuals are incorrectly classified as independent contractors, as opposed to employees, they can lose out on employment entitlements such as annual leave, personal leave, overtime, penalty rates, superannuation guarantee contributions and other benefits.

So what is the difference? There is currently no single legal definition in Australia for whether a worker is a contractor or an employee. Instead, if the true nature of a working arrangement is challenged by a worker, the courts or a tribunal will consider a 'multi-factor' test.

The test is based on the fundamental fact that when services are being provided by the independent contractor to another business, an independent contractor provides those services whilst working in and for his/her own business. By contrast an employee provides personal services whilst working in and for the employer's business.

There are six key factors you can consider to determine if what is being offered is an employment or contractor arrangement;

- **Control:** The more your work is subject to direction as to how and when it is to be done, the more likely you will be seen to be an employee.
- **Delegation:** No capacity (or limited capacity) to delegate your work to others tends to be a strong indicator of an employment relationship.
- **Advertising:** If you are represented and portrayed to the public as carrying out the activities of the business that engages you, by way of uniforms, logos etc, this will be a strong indicator of an employment relationship.
- **Payment:** A regular stream of income that is the same or similar each week is usually inconsistent with a person being an independent contractor. Contractors are often required to provide a fixed quote for a specified outcome, rather than receive hourly pay.
- **Single source of income:** If you are receiving a substantial percentage of your income from only one source (such as a golf club), it is far more likely you will be considered an employee of the club rather than an independent contractor.
- **Incorporation:** Most true independent contractors provide their services through an incorporated entity.

Although the totality of the relationship needs to be considered, the bottom line is that if you answer 'no' to the following two questions, you are unlikely to be an independent contractor:

- Are you performing the work as an entrepreneur who owns and operates your own business?
- In performing the work, are you working in and for your own business as a representative of that business and not of the business receiving the work?

If the answer to both is 'yes', you are likely to be an independent contractor. If 'no', then you are likely to be an employee.


Organisations misrepresenting an employment relationship as an independent contracting arrangement are subject to prosecution and penalties under the Fair Work Act 2009 (Cth) for 'sham contracting'. A sham arrangement may exist if the contractor's company has no assets, is effectively run by one person, that person performs all the work for one hirer, and the relationship with the hirer is ongoing. Members who have concerns about the nature of their work should seek specialist advice.

Editor's Note: Paul O'Halloran is partner and accredited specialist (workplace relations) at Colin Biggers & Paisley. 🌱

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Just another idyllic start to the day at Blackheath Golf Club in the NSW Blue Mountains...



Blackheath Golf Club, NSW

It doesn't get more picturesque than the NSW Blue Mountains region which boasts a number of golf's hidden gems. Among them is Blackheath Golf Club, home to superintendent Luke Skinner.

Superintendent: Luke Skinner (37).

Family: Wife Ingrid, kids Hamish (10) and Elke (5).

Social media: Instagram @present_tense8.

Period as a superintendent: 7.5 years.

Association involvement: AGCSA and NSWGCSA.

Turf management career: Half Moon Bay GC, Qld (apprentice, four years); St Michaels GC, NSW (four years); Massey Park GC (assistant, one year); Blackheath GC (superintendent 7.5 years).

Qualifications: Certificate IV and Diploma in Horticulture (Turf) from Ryde TAFE.

Major hobbies/past-times: Still putting the old body through 90 minutes of football every week. Golf and trail running.

Where in Australia is Blackheath GC?

Blackheath is one of the highest points in the

Blue Mountains, NSW at 1065m above sea level. We are about 120km west of Sydney and 10km west of Katoomba. Blackheath is surrounded by the Blue Mountains National Park and is home to some of the best lookouts and bushwalks in the country. A small tourist town, it fills up during the spring months for the flowering rhododendrons and in the autumn the changing colours of the trees attracts the affectionately named 'Leafers'.

Tell us a bit about your background and how you came to be a superintendent.

I have played golf since I was able to pick up a club and have always had an interest in beautiful golf courses. It wasn't until moving to Cairns for what was meant to be a six-month working holiday that my journey into the world of turf began. I saw and applied for

a job as the apprentice at Half Moon Bay Golf Club, under then superintendent Mark Davis, where I was to spend the next four years loving every minute of it.

The call of family eventually pulled us back to NSW where I was able to secure a job at St Michael's under Darren Jones. I have always loved links golf more than all others and I was super excited to be able to spend the next four years growing there. It was while at St Michael's that I completed both the Certificate IV and Diploma and this was followed by a short but sweet stint at Massey Park under Aaron Fluke.

Who were some of your early mentors?

Mark Davis (now at Darwin Golf Club) definitely had a major influence on my outlook on the industry. We were working with a small crew and limited budget and many of the

ways of using that situation to your advantage instead of seeing it as a hindrance, which I now use, came from Mark and his teachings. All these years later I still very much see Mark as a good mate.

The move down to St Michael's allowed me to see things from the other side of the fence and my time there with Darren Jones was most productive. Watching and learning how to deal with larger workforces and budgets, while a distant dream now, was very beneficial.

How did the job at Blackheath GC come about and what do you like most about the role there? During my short time at Massey Park I became aware of the supers job at Blackheath being open. Although a bit hesitant about my own abilities, the possibility of landing a supers job closer to where I grew up was too good to pass up. The summer climate is definitely a positive, although I'm still never far away during those months. The lifestyle up here is perfect for bringing up a family; we are far enough away from Sydney that everything is just so much more relaxed, but close enough that you don't feel too disconnected.

Give us an overview of the Blackheath GC course. The diversity of flora on our golf course makes it a photographer's dream at different times of the year. We have numerous and large azalea and rhododendron gardens that, while they can be a pain to maintain, provide spectacular colour during their flowering season. The autumn colour here is pretty special as well, with the vast array of maples dotted around the course creating an incredible backdrop for golf, although the leaf clean up feels like it never stops!

Due to the climate here, our fairways are a mix of warm- and cool-season grasses. While we certainly don't get as hot as Sydney's western suburbs, we can still get long stretches of 30+ days which makes keeping the ryegrass happy a battle. The other side of that is that we get some very heavy frosts that can hang around on some sections of the course for the entire day. A few years ago we went from getting nearly 10 inches of snow late in October to hand-watering hot spots only a few weeks later! It's never boring up here.

Is it an easy/hard facility to manage? I'm tempted to say easy, but I feel like I'm only

One of the big changes Skinner has implemented during his tenure is altering greens renovations practices. The results speak for themselves



The Blackheath crew and volunteers led by course superintendent Luke Skinner (far left)

saying that because after the few years I've been here I now feel comfortable about the course and my understanding of how things need to be approached. But then I think of the irrigation system, the age of some of the machines, the limited budget, staff numbers, winter, those Friday afternoons in summer when you don't know how you got it all done, and I don't think it's any easier or harder than any other golf course to manage. You just do the best you possibly can with what you have.

What course management changes have you implemented during your time as superintendent? When I first started here my aim wasn't to make any early sweeping changes. I wanted to get to know both the golf course and the crew over a few months so I could understand the strengths and weaknesses and work from there. The changes we made to renovations have been significant (see more in the 'At a Glance'

breakout page 78), to the point that members now have no idea when we do anything to the greens. The irrigation system has been a major project, not just in upgrading it but the way it was being used. I also pushed early on for a mechanic and Paul, or 'Macgyver' as he is affectionately known, has been an amazing find. The money he has saved the club has been huge and his ability to fix things is really something.

Any special environmental considerations in managing the course? With Blackheath being situated right in the middle of a World Heritage Listed National Park and the actual course sharing one whole side with this park, we are very conscious of our position and possible impact with this environment. I have always tended to be a minimalist when it comes to spraying anyway, so that helps when dealing with this particular environment. We do get really windy up here for pretty



Being located in the Blue Mountains, Blackheath is no stranger to big dumps of snow and heavy frosts

much the entire month of August so that can make life difficult as well.

What are some of the major challenges facing Blackheath GC both from a turf and club management perspective? Even with all the work we have done to upgrade the irrigation system, there are still large sections that are old and will need replacing in the near future. The same goes for some of the machines. Every year since I've been here I can proudly say we have improved the course from the year before. The issue with this is that while the expectations of the members now grows with raising standards, the money and staff numbers does not follow.

I think pretty much every regional golf course would be suffering the same drop in both members and social player numbers. This is an issue that we all need to be creative in attracting not just new players to the game but also attracting the time-poor social golfers that they need to spend their limited golfing time at your course. Blackheath has the long-term plan and objective to become a destination golf course, one that will attract golfers from all around to travel to and play. While the club side of things works on becoming more self-sustaining and viable, there are plans in the works for the course to take the next step towards being the 'must-play' course outside of Sydney.

Outline any major course improvement works recently completed and/or in the pipeline. Blackheath recently enlisted Ross Watson to begin the process of a redesign of the course. So far this has involved several visits from Ross himself with a Course Improvement Committee involved to help articulate the club's vision for the course. I've spent several hours one-on-one with Ross, driving around the course talking about what currently works, what doesn't work and where I can see room for improvement not just from a golf perspective but maintenance as well. Being a golfer I have a thousand ideas on how Blackheath could be improved and to have an architect that was very open to my ideas wasn't actually what I was expecting, so that's been a pleasant surprise. Ross's level of understanding in regards to how certain aspects of design can impact on the maintenance side of things has also been very encouraging.

A master plan has now been submitted to



the board, after a few drafts, and we are now entering the feedback stage from members and trying to figure out where we start and how much we do in each stage. Being a smaller club, it isn't feasible for us to close large sections of the golf course for long periods of time, so anything that is done will be spread out over an extended period of time.

How is Blackheath GC faring in the water management stakes? When I first started here I was told that as long as you start December with full dams then you won't run out over summer. Despite a couple of drier than average summers, this advice has rung true. We are lucky that it only really takes a storm or two and our dams will be full again and there is a spring that feeds the creek that never appears to slow down and fills the creek at a rate that would have you believe

someone has left a tap on full! All that being said, we really try and be smart with the water we have and I have changed watering practices dramatically since being here.

How has Mother Nature treated the course in recent times? It really is hard for me to sit here and complain about the summers we get because I know when we have a week of straight mid-30's, there are guys not too far away battling far worse conditions than me. However, our winters really can make up for that!

The frosts can make our course look like we have received a couple inches of snow overnight and you'll still have golfers on the tee at 7am (with carts) ready to play which can get frustrating. We do also average a couple of days' worth of snow every year which can make life interesting. Thermals are worn as often as sunscreen up here!

The one product I couldn't manage my course without is... Everyone seems to say Primo here and I certainly use that and love it. But I reckon I'd be more lost without a good wetter like Tri-Cure. If we have a hot weekend coming up, it's my 'go-to' product to put out on a Friday as it gives me that extra peace of mind that I know everything will be good come Monday. It doesn't stop me coming in a few times over the weekend, but that's more down to my OCD than the product...

What are some pros and cons of being a regional superintendent? I probably tend to look at a lot of things having both. I think being outside and away from Sydney you can feel like you are a bit out of the loop and disconnected from other courses, but this can also be seen as an advantage as you can focus on your own backyard a bit more and not feel so compared to your next door neighbour. I do like that we regularly surprise people from the city with the condition of our course. I think there can be a misconception within golfers that country courses aren't going to be as good as those in the city and this is so often not the case.

Are expectations of course presentation and conditioning any less than that placed on your metropolitan counterparts? There is no doubt that at the bigger courses in the cities, when you are paying decent money for memberships and green fees, that there is a certain level of expectation on course condition. In saying that, the members of all regional golf courses are a very proud group of people and they all believe they have the best course around. While resources are less available to regional courses, their members still expect the course to be presented to the highest level. I am also sure that I am not the only regional super that aims for and expects



Blackheath has recently enlisted architect Ross Watson to begin the process of a course redesign

their course to be presented as best as it possibly can every day of the year.

Do you have to be more resourceful as a regional superintendent? You definitely have to be able to think outside the box being a regional super and be open to ideas. Everyone would love a shed full of new machines and crew of a 20 switched-on workers, but that's never going to be the case. I am fortunate that I found a mechanic who I really can't praise enough. Nothing is ever dead with Paul. He can literally fix anything and is also able to create any crazy idea I have with little fuss and at a fraction of the cost it would be to get it new. Adam (assistant) and Chris (groundsman) are also really good at seeing a problem and coming up with their own ways of dealing with it before I've even noticed it.

How important are volunteers to a course like yours? I am fortunate here that we have

a few very dedicated members who love to help out on the course. With a crew the size of ours there is no way that we would be able to get everything done to the standards that we set during summer without their help. Mick Loneragan seems to spend more time on a rough mower during summer than he does at home. Barry Simpson can be often found wandering the fairways with his brush cutter or chainsaw tidying things up. Between the two of them they handle quite a lot of the smaller jobs that we just never seem to have the time for. We have another two members, Steve and Gordon, who have taken it upon themselves to control noxious weeds, which is very important given our proximity to the national park.

If you could change one thing about your job as a regional superintendent what would it be and why? It would purely be the money side of things for me. It can get quiet frustrating at times when you have



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ideas and concepts on how to change things or improvements and genuinely the only thing standing in your way is a lack of funds. Seeing the potential that a place like this has, I'd just really like to be able to help fulfil it.

What have you got in your shed and what's next on the wishlist? Toro 3250 (greens), Toro 3150 (grooming), Toro 3100 (surrounds), Toro 3150 (tees), Toro 5510 (fairways), Toro 3500 (rough), Iseki SF310, Cushman run around, Tru-Turf roller, in-house customised spray unit, Toro bunker bike, Bobcat, topdresser, VertiDrain 7316, Ditch Witch and John Deere 1750 tractor.

Favourite piece of machinery has to be the Ditch Witch. This magnificent old girl was just sitting behind the shed rusting away until Paul got his hands on it. He was somehow

able to bring it back to life and while I'm not afraid of a bit of hard work, when you can have a machine like this available you damn well use it! The next major purchase will be a new spray unit. While ours does the job, it is heading towards the back end of its career.

Any interesting pieces of machinery in the shed? Aside from the Ditch Witch, we have a drag system for our VertiDrain and a sweeper system that were both fully designed and built in-house after some crazy conversations between MacGyver and myself. I float an idea/wish and then it all just snowballs and we end up with something that works better than anything you could buy!

Favourite spot on your course? I do love the 9th green – it is one of the highest points

on the course and the view is pretty good, especially early in the morning as the sun is just rising. I have a soft spot for the 2nd tee as well – every time I cut it or move markers I spend a few seconds reliving my hole-in-one from a couple of years ago!

Best advice you have received about being a superintendent. During my time at St Michael's, Darren Jones told me that you need to take photos, lots and lots of photos. He said if you can keep a good catalogue of photos, not just for your own collection but as a good documentation of works and improvements, it is amazing how quickly said photos will not just show how far you've taken the course, but also help as evidence when you want to make arguments for future progression.

AT A GLANCE – BLACKHEATH GOLF CLUB, NSW

Course specs: Short par 69 course, measuring 5350m. Greens and surrounds bentgrass/Poa mix, tees and fairways kikuyu/ryegrass.

Members/rounds: 350/22,000.

Major tournaments: Legends Tour Pro-Am, trainee pro tournaments, various interclub tournaments.

Annual course budget: \$100K.

Staff: Luke Skinner (superintendent), Adam Gronlund (assistant), Chris Baker (groundsman), Paul 'Macgyver' Greig (mechanic) and long-time volunteers Mick Lonergan and Barry Simpson.

Climate: Blackheath falls into the subtropical highland climate bracket. In summer our average maximum temperatures are around 26°C, but we can get days/weeks that get well into the mid-30s. Average maximum temperature in winter is around 9-10°C, although plenty of days struggle to get above 5-6°C. Average rainfall is around 1000mm.

Soil types: The majority of our top 100-200mm is of a loam/sandy loam makeup and below that things are more clay-based. We have large deposits of ironstone throughout the course which can cause problems.

Water/irrigation: The top two dams are supplied via stormwater harvesting and a hanging swamp. The bottom dam is feed via a creek that runs from stormwater and a spring that flows 365 days a year.

Blackheath can lay claim to some of the highest incidents of lightning strikes in NSW due to all the ironstone within the mountains,



which has caused havoc with the irrigation system for years. Before I started, the decision was made to reduce the amount of wiring in the ground and take the control system back to being hydraulically driven. To say that I felt like I'd stepped out of a time machine is an understatement, but one decent storm and a few hundred metres of trenching to get five greens back online later and the reasons behind the change became evident.

We have to remind ourselves sometimes how bad and inadequate the irrigation system was, but after a lot of trenches and hours on the shovels, we currently have a fully automated and as good as full coverage irrigation system that, when it feels like it, works really well.

Cutting heights/regimes: Greens 3mm, surrounds 12mm, tees 10mm, fairways 16mm and rough 60mm.

Renovations: Renovation practices have changed quite a lot since I started at Blackheath. When I first arrived, they were coring and heavy topdressing twice a year in

spring and autumn and that was about it. My desire had long been to take things in the direction of a 'less more often' approach and due to the pressures of the golfing schedule the windows for renovations have become smaller and smaller. We now go in two out of every three springs with half-inch hollows, going in with solids on the off years, with a topdress and amendments.

There is now no longer any major autumn renovation. This has been replaced with smaller, less intrusive mini renovations throughout summer and autumn. Once a month we will needle tine the greens and then dust with a good quality sand. We also groom the greens at least once every two weeks and follow our planned nutrition programme.

Disease pressures: The beauty of the Blue Mountains climate is that since I've taken the job I haven't had to deal with that dirty 'P' word for which I am eternally grateful for. Our biggest problem diseases are dollar spot and winter fusarium, which we have had great success in reducing through our cultural practices and improved irrigation techniques, coupled with a regular spray programme.

Nutrition: The only overfeeding that I tend to indulge in is at smoko! When it comes to the greens I am more on the minimalist side of the fence, much to the dismay of my sales reps. Greens will get some form of foliar feed with most fungicide applications and amendments will be applied at spring renovations depending on soil test results.

It is amazing how short some members' memories can be, but when you are able to show them photos from a few months ago or even a few years ago, they can be very quick to come back around to your side of things.

What do you think is the most challenging aspect of a superintendent's role today?

For me it's providing the most bang for your buck. Not just in golf courses but in life in general, people really want to make sure they are getting the most value out of their dollar. Making sure that I spend every cent as wisely as possible while still providing the best playing surface I possibly can provides me with my greatest challenge in this job.

What have you worked on personally in recent years to improve your skills as a superintendent? I do try and attend any trade/info days that come up when time allows me and I do have a pretty keen interest in golf course architecture so I am always reading and researching that. I have found though that the times where I have picked up the best bits of knowledge has been purely from speaking to other people from within the



The diversity of flora at Blackheath makes the golf course a photographer's dream at different times of the year

industry. When you hear them talking about an issue they have and how they solved it, that's when I go back to work and see how I

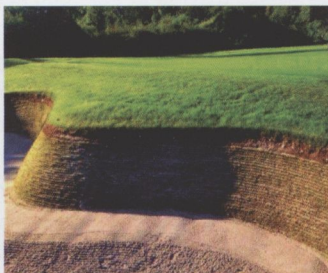
could possibly implement those practices to make myself or the course better.

What gives you the most job satisfaction?

A Friday afternoon, especially during the middle of summer, when we all get back to the shed and you know that the course is looking absolute mint, but you kind of shake your head and wonder how on earth you got it all done! Like many superintendents, I am never entirely happy and always think I could have done more, but you do have to catch yourself at times and be satisfied that what you're presenting is good.

Most pleasing/rewarding moment during your time as Blackheath GC superintendent?

When you have members who have been at Blackheath for 40-50 years come tell you that this is the best they have ever seen the course makes you appreciate that maybe you are doing something right. You can get lost sometimes in all the smaller imperfections that really very few people see, so when golfers who have been around for that long are saying that then you have to be pleased. 🏌️





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Toro's new Z Master 7500-D combines the speed and manoeuvrability of a traditional zero-turn mower with the power and productivity of a large-scale commercial mower

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"This new model combines the speed and manoeuvrability of a traditional zero-turn mower with the power and productivity of a large-scale commercial mower," says equipment product manager at Toro, Brian Goodridge.

"This new mower also delivers the quality of cut that is expected of Toro products and the large 96" cutting deck will improve productivity versus smaller decks."

For more information about the Z Master 7500-D, which comes backed by an industry-leading five-year, 2000-hour warranty, visit www.toro.com.au or contact your local Toro rep.

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For more information on XTron 700WG, head to the product page on the Nuturf website www.nuturf.com.au.



TORO CELEBRATES 100 YEAR ANNIVERSARY IN GOLF

The Toro Company has reached the 100-year mark in serving the golf industry. In 1919, Toro developed the industry's first motorised fairway mower, the Toro Standard Golf Machine, for The Minikahda Club, in Minneapolis, Minnesota. By mounting five individual reel mowers onto the front of a farm tractor, Toro helped courses increase productivity by replacing the labour and time intensive use of horse-drawn equipment.

Toro credits its longevity in the industry to four key factors;

- Listening closely to its customers;
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- Long-standing customer relationships; and
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This formula has led to revolutionary product launches and an ever expanding breadth of product offerings over the last century. Well-known brands such as Greensmaster, Reelmaster, Groundsmaster, Workman, ProCore, MultiPro, SandPro and others have become synonymous with quality, durability and value.

A few historic examples of innovations for the golf course industry include the

first flexible frame fairway mower in 1921, the first golf utility vehicle – the Toro Knockabout – in 1930, new valve-in-head sprinklers in 1964, the versatile Toro Sand Pro series in 1972, the first contour-following Flex head greensmowers in 1986 and the first lithium-ion powered greens mower – the Greensmaster eFlex – in 2012.

Toro's people are also largely responsible for the longevity of the company. Topping the long list of influential Toro employees over the past century is the company's first president and co-founder, John Samuel Clapper, who personally held several patents for golf course equipment, including the first electric-powered (corded) greensmower in 1928.

Also on that list is Dr James 'Doc' Watson, who joined Toro in 1952 and is revered as a pioneer in agronomics, a teacher to customers and Toro employees alike and a legend in the golf industry.

The Toro Company was founded on 10 July 1914 and for the first five years focused primarily on providing engines for the Bull Tractor Company and other tractor and truck companies, and developing the first Toro-designed piece of farm equipment – the power cultivator – before shifting focus to mowing products.

CARMEN JOINS LIVING TURF

Living Turf has welcomed the addition of another member to its team of sales representatives, with **Shane Carmen** joining the company in February. Carman grew up on a farm on the Adelaide plains and joined the turf industry as an irrigation specialist and obtained his plumbers license before becoming a certified Rain Bird central

control installer. Over the past three years Shane has serviced the South Australia and Northern Territory markets as a turf product specialist and simultaneously completed his Certificate III in Sports Turf Management. Carman is supporting Daryl Sellar in providing technical support and product supply to Living Turf's SA and NT clients.

2019 ASIA PACIFIC TURFGRASS CONFERENCE TRADE EXHIBITION –

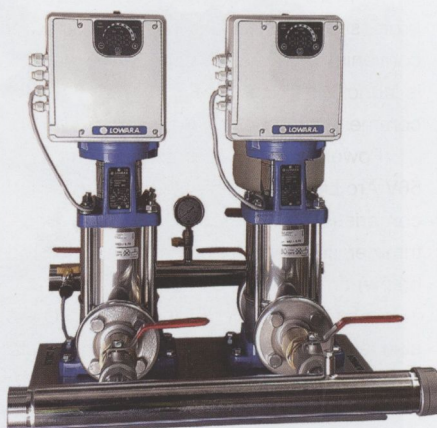
The 2019 Asia Pacific Turfgrass Conference Trade Exhibition is a must-attend event on the turf industry calendar and enables turf managers from all areas of the industry to meet with numerous industry suppliers under the one roof, plus showcases the latest in industry products, machinery, innovations and services. This year's trade exhibition is a sell out with around 80 of the country's leading product and service providers set to attend.

The trade exhibition forms an integral component of the annual conference and will be held at the Brisbane Convention and Exhibition Centre from 9am on Wednesday 26 June to 3pm on Thursday 27 June. The exhibition is open to everyone and is free of charge, with registration required at the door. ATM takes a look at some of the new companies exhibiting this year as well as some of the new products set to be featured.

ADVANCED SEED STAND 10

Advanced Seed (www.adseed.com.au) will be showcasing a number of new bentgrass, fescue and ryegrass varieties during the Brisbane show. Among them are;

- **Flagstick bentgrass:** Flagstick is the result of 20 years' continual research, first at Michigan State and then by Seed Research of Oregon (SRO). This long-term development ensures Flagstick will provide superior performance in putting green use. Screened for superior dollar spot resistance, high density and fine leaf texture, Flagstick blends extremely well with other SRO varieties including 007, 777 and SR1150 which make up the popular Dominant Xtreme blend.



- **777 bentgrass:** Bred by some of the most world renowned turfgrass breeders, Dr Richard Hurley, Dr Leah Brilman and Dr Stacey Bono, 777 features fine leaf texture with attractive green colour and higher turf density for better putting quality and *Poa annua* resistance.
- **Ruddy creeping red fescue:** Ruddy is a new generation, strong creeping red fescue and replaces SR5250. It has been selected for its exceptional wear tolerance at all mowing heights, making it an essential in all golf blends for surrounds, tees and fairways.
- **4 Turf:** A new generation of tetraploid perennial ryegrass for turf. Developed for quick establishment particularly in cooler climates, strong deep rooting and overall stress capabilities.

ALGAENVIRO STAND 12

AlgaEnviro is a Queensland-based company that has been operating across Australia and New Zealand for over five years. It offers an innovative approach to making water



management easy without adding poisons and algacides. Cost effective and no weed removal or potentially toxic algae blooms. AlgaEnviro believes in taking a proactive approach to maintaining water health in large and small water bodies such as lagoons, dams, rivers, reservoirs, ponds and lakes. algaenviro.com.au

BA GROUP AUSTRALIA STAND 44

BA Group Australia will be featuring its new pedestrian Greens Keeper sprayer (pictured below left) on its stand in Brisbane. Looking after sensitive turf areas can be significantly easier with the market-leading 75L pedestrian Greens Keeper which has been specifically designed to make spraying greens, collars, tees and bowling greens an easy task.

It's packed with features such as smooth tread pneumatic tyres, low boom height with TeeJet air induction nozzles to reduce chemical drift, handlebar control station including a digital speedometer, pump operation, boom operation, a pressure regulator with pressure gauge and control of the optional Spot-On foam marker kit.

Other features include a 1.5m or 2m folding boom including individual nozzle shut off, fully draining tank sump and agitator, a 13.6L/m 12-volt Shurflo pump (plenty of flow for high water rates) and excellent tank agitation. www.bagrouppaustralia.com.au

BROWN BROTHERS ENGINEERS STAND 22

Brown Brothers Engineers is distributor for some of the world's leading brand pumps including Lowara. The recently released Lowara Smart Pump range is designed to 'plug and play' and is all about the right combination of motor, variable speed drive



WHAT TO WATCH OUT FOR IN BRISBANE (26-27 JUNE)



and pump. It features an integrated intelligent pumping system with an electronically driven, permanent magnet motor.

The Smart Pump Range (pictured left) already meets the 2020 performance standards expected to be implemented by the EU with its 'ultra-premium' IE5 motor and a power drive system of IES2 (highest efficiency class). This equates to up to a 50 per cent savings in operating cost when compared to a similar standard non-VSD pump. It is easy to install and commission in both new and retrofit applications. The new series is flexible, precise and more compact than ever, with a reduced footprint of up to 14 per cent.

It has the capacity to handle extreme environmental temperatures from as low as -20°C and up to 50°C. The embedded e-SM electronic drive can operate up to three pumps at once with no need for an external control panel. It features state-of-the-art technology to optimise performance, communicate with other building systems, reduce energy usage and dramatically decrease operational costs.

www.brownbros.com.au

CHERVON STAND 46

New exhibitor Chervon will be featuring the innovative EGO Power+ cordless system on its stand in Brisbane. Imagined and brought to life by a global organisation with a 25-year history of delivering professional quality and breakthrough technology, EGO Power+ delivers petrol-matching power without the noise, fuss or fumes.



To meet the needs of ground care professionals in terms of power, performance, convenience and wellbeing, EGO Power+ is launching its first dedicated range of commercial cordless garden tools.

Powered by the patented design of the 56V Arc Lithium battery system, the range comprises four high-spec tools – a hedge trimmer, line trimmer, brush cutter (pictured below) and blower.

In addition to these four tools, EGO will also launch a new backpack battery which takes cordless performance to a whole new level. With an IP rating of 56, this new battery is suitable for all weather conditions. There's no need to stop and place a plastic cover over the top because its 1500-watt hour capacity will keep on working.

www.egopowerplus.com.au

DAVID GOLF STAND 27

Long-standing AGCSA Bronze Partner David Golf (www.davidgolf.com.au) will be featuring a number of new and improved products on its Brisbane stand;

- **Tournament Ready wetting agent:**

USA's fastest-growing premium penetrant soil surfactant by Underhill is back and exclusive to David Golf. Backed by its 'Smart Surfactant Technology', Tournament Ready works to three vital components – quick wetting penetration of soils, moves excess water out of saturated soils continuously and holds water in the right place. Available in three pack sizes, (10L, 208L and 1003L)



- **David Golf M18 ball washer:** Ever since its first model was released, the 'David' has become an icon of the golf industry and the latest M18 ball washer (pictured above) is the result of more than 60 years of evolution. Manufactured from high grade cast aluminium alloy, the M18 has a completely enclosed rubber track to eliminate leaking. An 'in cast' overflow pipe ensures no overflow. The M18 ball washer has been completely updated, streamlined and modernised without losing its authentic look. Available in black or green with custom powder coat colours also an option.

- **No.1 shovel:** Super lightweight and easy to use, the new No.1 shovel by David Golf is set to be a real hit with customers who need a shovel that lasts. Weighing less than 1kg, the No.1 shovel boasts an ash timber handle and a D-grip for comfort. The 2mm thick blade is gusset strengthened to withstand the transferring of materials such as mulch, sand, cores and scarifyings.

GREENPRO STAND 4

Australian made and owned, greenPRO is a division of Quik Corp, a company with over 30 years' experience in the manufacture of premium equipment for agricultural, industrial and emergency services applications. The greenPRO range was designed from a requirement for heavy duty ATV/UTV towable machinery for landscaping contractors, golf clubs, sports clubs, schools, lifestyle farmers and council parks and gardens maintenance. This includes the unique solar-powered travelling irrigator range, powered remote controlled green watering hose reels for golf courses and ATV towable steam trailer for organic weed control. Built for Australia's

extreme conditions, all greenPRO implements are constructed with the highest-quality materials, ensuring maximum durability. www.greenpro.com.au

GREENWAY TURF SOLUTIONS STAND 49



Greenway Turf Solutions (GTS) will be celebrating its expanding presence in the market at this year's Brisbane conference. From the company's outset, the vision of GTS directors Chris Chapman and Paul Spencer has been to develop a business that services the needs of professional turf managers right across Australia.

The first step towards the realisation of this vision came in November 2015, when Chris and Paul expanded GTS by stepping into the operational footprint left in the wake of Simplot Partners' departure from the state of Queensland. GTS re-employed all the former Simplot Queensland staff and have successfully grown the business to one of the most recognised turf product and service brands in the state. The Queensland expansion was to be soon followed by opening in South Australia in 2016 and NSW in 2018. GTS then acquired Turfcare Solutions late in 2018 and in early 2019 relocated their national headquarters to larger premises in Yatala (pictured above) to cater for the growing business which now employs 20 staff across three states.

www.greenwayturfsolutions.com

OTTERBINE STAND 56

Otterbine has provided water quality solutions for ponds and lakes for over 50 years. Independently tested and proven to deliver the highest oxygen transfer and pumping rates, customers can expect results from both surface and sub-surface aeration systems. By effectively transferring oxygen into the water column, Otterbine systems promote natural aerobic digestion of organics, run-off and algae that can plague water features.

Offering dam aeration systems from 0.5HP to 5HP, Otterbine aerators discourage algae and aquatic weed growth, odours, fish kills and discoloration, as well as

deter insects. Not only do aerators and fountains improve water quality, they can offer decorative enhancement with a variety of spray patterns to select from. Additional products offered by Otterbine include diffused air systems, industrial aerators, giant fountains and fountain lighting.

www.otterbine.com

R&J BATTERIES STAND 15

Australia's fastest-growing battery company, R&J Batteries has 20 company-owned outlets across Australia and New Zealand as well as a footprint of more than 7000 distributors and resellers. Established more than 20 years ago and employing more than 150, R&J Batteries offer a growing range of specialist golf car products including US Batteries, RELiON Lithium Batteries, Lester Battery Chargers and Flow-Rite Single Point Water Kits. R&J Batteries stock a growing range of accessories including battery chargers and testers, jump packs, cables, battery terminals and are Australia's leading retailer of Fuchs oils and lubricants. R&J Batteries are the sole importers for US Batteries into Australia and New Zealand. www.rjbatt.com.au

SME MOWERS STAND 37

SME Mowers will be exhibiting Steiner tractors and BOB-CAT zero turn mowers at the Brisbane trade exhibition. The Steiner is a versatile turf tractor with multiple attachments suited to anyone that has large amounts of turf to maintain. Its oscillating and articulating frame and 4WD design can work on slopes of up to 30 degrees. The BOB-CAT is a

commercial zero turn mower built rough and tough with deck sizes ranging from 36" to 72" wide. Also on the stand will be a Turflynx representative promoting the new 100 per cent electric, autonomous Turflynx fairway mower (pictured below).

www.smemowers.com.au



VERMEER EQUIPMENT STAND 26

Vermeer will be featuring its range of irrigation installation solutions that can help boost productivity and profit. Among them are Vermeer's small utility trenchers available in both walk-behind and ride-on configurations, offering fast and effective installation of irrigation lines and other utilities. Vermeer's tracked stand-on mini-loaders (pictured below) are easily manoeuvred around tough worksites and are compatible with a variety of attachments, including harley rakes and spreader bars. Vermeer vacuum excavators allow operators to excavate around sensitive utilities without risk of potentially dangerous – and expensive – harm to these assets. In addition, Vermeer's Verifier locators are an affordable solution to identify the exact location of existing underground utilities.

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It was a good day all round for Huntingdale Golf Club with Nicholas Fiddelaers winning the VGCSA Apprentice of the Year Award alongside boss Michael Freeman receiving VGCSA life membership

What a season we have had here in Victoria! And no doubt a hard few months for many of us all across the country. Like most, I'm glad it's over and we can only hope that next summer is a little kinder. It was an extremely tough period for superintendents across Victoria and I commend our members who reached out and openly discussed their course issues as we all tried to deal with varying problems brought on by the climatic conditions.

A big thank you to the NSWGCSA in granting us valuable resource information which the VGCSA adapted to accommodate members' needs and issues of the day. A message from the VGCSA committee was sent out to superintendents in late March. Its purpose was to offer support to superintendents who needed to open communication with their Boards and members.



Matt McLeod (left) and John Neylan were honoured with VGCSA Recognition Awards at the association's 2019 AGM

I spoke with plenty of supers out there who had simply depleted all available resources, whether water and/or budget related. They basically had to make do or were resigned to be very selective in their management, carrying out what chemical applications they could until the weather provided some relief.

On a lighter note, it was a great autumn day for golf at the Commonwealth Golf Club as part of the 92nd VGCSA Annual General Meeting in early May. The lunch presentations included the announcement of the 2019 VGCSA Awards, with **Matt McLeod** (Cobram Barooga GC) receiving the Superintendent Recognition Award and **John Neylan**

(SportEng) receiving the Trade Recognition Award.

Matt began his career at Coomealla Golf Club near Mildura in 1992. After a stint working at Carnoustie in Scotland, he returned to Australia in 1996 and secured the 2IC role at Murray Downs the following year. After a short stint in Hong Kong, he returned in 2001 to pick up his first superintendent role at Millicent Golf Club in South Australia.

In 2003 he headed back to the Murray and became superintendent at the 36-hole Tocumwal Golf Club, during which time he served a number of years on the VGCSA committee. After 12 years at Tocumwal, in 2015 Matt moved up the river to take over

HUNTINGDALE'S MASTER BESTOWED VGCSA LIFE MEMBERSHIP

Long-serving Huntingdale Golf Club superintendent **Michael Freeman** was honoured with life membership of the Victorian Golf Course Superintendents Association (VGCSA) at its AGM in early May at Commonwealth Golf Club. Freeman, a past VGCSA president and committee member, was recognised in front of more than 100 VGCSA members and industry representatives for his incredible 37 years at the former home of the Australian Masters.

Freeman's rise to the peak of his profession comes as little surprise considering his background. His formative years revolved in and around some of Melbourne's elite sandbelt clubs as his father Lawrence was course superintendent at Yarra Yarra Golf Club for 23 years. A young Freeman would caddy for members and

also spent a lot of time with his father after school and on weekends changing holes, hand watering and tree planting. He chipped in and helped out during tournaments – his first as a seven-year-old picking up sticks at the 1972 Dunlop International – and also helped out alongside his father at other sandbelt courses when they had events. On one occasion, although he can't recall when, Freeman was introduced by his father to Royal Melbourne superintendent and industry icon Claude Crockford.

Instilled with his father's work ethic and passion for the industry, after leaving school Freeman sought an apprenticeship and was duly taken on by John Spencer at Huntingdale Golf Club as a 17-year-old in 1982. By 1990 he had worked his way up to assistant superintendent, a position he

would hold for 12 years before taking over from Spencer in 2002. Still in charge today, during his 37 years at the club Freeman was involved in 27 of the 31 Australian Masters held there and in charge of preparations for eight.

"Michael is one of the most giving, caring and inspirational individuals you'll ever meet in this industry," says current VGCSA president Barry Proctor, who worked under Freeman for a number of years as Huntingdale assistant. "He has been a stalwart of the Victorian industry for many years and thoroughly deserves his place alongside some of the great superintendents this state has produced."

Australian Turfgrass Management Journal congratulates Michael on his VGCSA life membership.



Newly anointed VGCSA life member Michael Freeman (centre) with fellow association life members John Geary (Cape Wickham, left) and Richard Forsyth (Royal Melbourne, right)

at Cobram Barooga Golf Club and has since gone on to also complete his teaching qualifications.

John Neylan needs little introduction and adds the VGCSA award to the AGCSA Distinguished Service Award which he received at the 2014 Australian Turfgrass Conference. John's storied career, spanning nearly four decades, has seen him play a major role not only in Victoria but Australia-wide and includes the setting up of AGCSATech, the technical division of the AGCSA.

Following his tenure at the AGCSA, John started up a very successful turfgrass consulting and research business and in recent months has joined the team at SportEng as an agronomist.

Another special announcement on the day was the bestowing of life membership of the VGCSA for Huntingdale Golf Club superintendent **Michael Freeman**. As part of the presentation, an overview of Michael's career and personal milestones were highlighted in an entertaining 'This is your life' interview hosted by former VGCSA committee

member and 13th Beach superintendent **Steven Hewitt** (who likes to refer to himself as Graham Norton these days).

Other awards handed out at the AGM included VGCSA Apprentice of the Year which went the way of **Nicholas Fiddelaers** from Huntingdale Golf Club. A mature age student who transitioned into turf management from an ag and farming background, Nicholas will now go on to represent the VGCSA in the final of the AGCSA Graduate of the Year Award to be judged at the upcoming 2019 Asia Pacific Turfgrass Conference in Brisbane. The VGCSA Diploma Scholarship, which affords the winner \$2500 towards their tuition fees, went to Kingston Heath's **Tim Hamilton**.

Earlier in the day, **Mat Campbell** from Numurkah Golf and Bowls Club swept all before him in the VGCSA Golf Championship held on a superbly presented Commonwealth GC layout (host superintendent **John Mann**). Campbell shot a 76 to finish four shots ahead of runner-up **Mark Findlay** (Sanctuary Lakes GC) and also collected the Toro Cup for best stableford score (38 points) from **Shaun Page** (Southern GC).

Mark Dougherty (Globe Growing Solutions) posted 38 points to collect his fifth Presidents Shield, nearest the pins went to **Peter McAlicee** (Yarra Valley CC), **Rod Ferry** (Nuturf) and Findlay, while **Scott McKinnon** (Woodlands GC) smashed the longest drive.

The VGCSA thanks all members who attended the AGM as well as guest speaker Sam Groth who entertained us during the lunch with stories from his time as a professional tennis player. Sam, who holds the record for the world's fastest serve (263kph), has recently taken up the game of golf and in the space of 12 months at Commonwealth has gone from an 18 handicap down to 2.8!

At the time of this edition going to print the VGCSA was busy preparing for the 2IC/3IC/groundstaff meeting at Club Mandalay. Among the topics for the day were working abroad, the principles of social media in the workplace and interview processes.

Later in July will be our annual Country Meeting at Yarrowonga Mulwala Golf Club Resort. Our main focus this year will be directed towards management, HR, PR, along with the usual agronomy topics and discussions. This two-day meeting is always very well attended due to the educational content and is a great opportunity for industry networking and exchange of ideas.

As announced at the AGM, the VGCSA has now joined the other state superintendent associations to form the first formalised affiliate agreement between national and state associations. The VGCSA looks forward to a closer alliance between all states and the AGCSA in working productively together for the benefit of all members.

BARRY PROCTOR
PRESIDENT, VGCSA



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As I put pen to paper it is mid-May here in New Zealand, yet looking outside it could easily be two months earlier! Temperatures are still hovering around the 20 degree mark, which for us in New Zealand is warm for this time of year, and around most of the country there has been a distinct lack of rainfall with many courses still applying irrigation to keep things ticking along. Much of the Auckland region is 'year to date' half a metre down on last year (albeit with a very wet summer/autumn last year), with less than 200mm received so far.

For those that have been blessed with a bit of precipitation, it has often been far too much over a couple of days, resulting in much of it running off and not penetrating through the surface and down into the roots. At my own track – Westown Golf Club in the Taranaki – rainfall totals indicate that we should be very wet with 680mm to the end of April, but we are still dry. Last month saw 171mm fall over a day and a bit, while in previous months probably 80 per cent of monthly totals haven't fallen over 3-4 days.

I guess this keeps us all on our toes as one year can be a complete contrast from the previous. No longer can we turn the calendar page over in March and say that autumn has arrived or in June and say winter has arrived. Certainly the seasons are changing, with one often merging into the other without any real announcement of change. And with climate change, we too must adapt and react to the conditions that we have got at the time and not what we should have.

FINE TURF SEMINAR

It's hard to believe that it is almost a year since we had the Australasian Turfgrass Conference in Wellington. It was a fantastic week where we had a great mix of minds from both sides of the Tasman converging for the first time in joint format. Aussies and Kiwis joined together as one and freely discussed ideas, products and methods and then enjoyed each other's company over a beer or two. Lasting friendships, great stories and fantastic feedback resulted from it and long may it continue.

June this year will see a Fine Turf Seminar held in Taupo hosted by the Central North Island Turf Managers. Much planning has gone into a well-structured programme with speakers including Royal Melbourne's own **Richard Forsyth** whom always captivates the floor with his presentations.



Properly managed and organised volunteers are an invaluable resource to any golf club. Pictured is the chainsaw gang at Westown GC in New Zealand

Fine Turf Seminars are a great way for local associations to flourish and grow as they put their collective heads together to come up with programme content and speakers they think appropriate. They know that a lot of effort and hard work is required to achieve this and are often put out of their comfort zones, but in doing so come out the other end as more confident and knowledgeable. Local associations are always looking for people and ideas for their committees, so if you think you have what it takes, please let them know.

ROAD TO RECOVERY

Members will recall in an earlier report this year I advised of the tragic accident that involved two greenkeepers from Remuera Golf Club that sadly took the life of **Jarryd Davidson** and left **Josh Presland** hospitalised in a very serious condition with a multitude of broken bones. I'm very pleased to say that Josh has made fantastic progress and returned to work on 6 May and is doing very well so far.

Throughout his rehabilitation Josh stayed in touch with all his work mates both when they visited him in hospital and when he was mobile and became a regular in the smoko room. His mates at Remuera are as thrilled to have Josh back at work as Josh is himself to be able to get back to work. We as a collective in the turf industry offer Josh our support and all the best going forward and for continued positive outcomes for him.

VOLUNTEERS

The NZGCSA was very pleased to announce the John Deere TPC Sawgrass Volunteer Program earlier in May in which one of our lucky members will, in conjunction with three members from the AGCSA, travel to

Florida, USA in March 2020. Together with the management team at TPC Sawgrass, they will help prepare the Stadium Course for golf's unofficial '5th Major' – The Players Championship. This will be a fantastic opportunity not only in terms of continuing knowledge but also in potential career development. There will be a rigorous process to go through for all the applicants before the winner is announced in November. We thank John Deere for introducing this initiative and for making the impossible happen for one of our members.

On the subject of volunteers, at the Wellington conference last year I spoke on the important role they play at many golf clubs. It is opportune then that I take this moment to give thanks again to all the volunteers throughout New Zealand that regularly give their time to golf courses.

Without their valuable contribution, whether it is doing the big jobs of chainsawing trees or weed spraying the gardens, much of the work around our golf courses simply wouldn't get done. With most courses having budget and staffing levels heading south, our survival may well depend upon embracing volunteers to help us all with our maintenance requirements.

Properly managed and organised, volunteers are an invaluable resource to any golf club, while at the same time the golf club is providing an outlet to volunteers for them to utilise their lifetime of skills for them to feel they are still contributing to society and, in particular, giving something back to the club that they dearly belong to.

Until next time stay safe, enjoy life and keep up the good work.

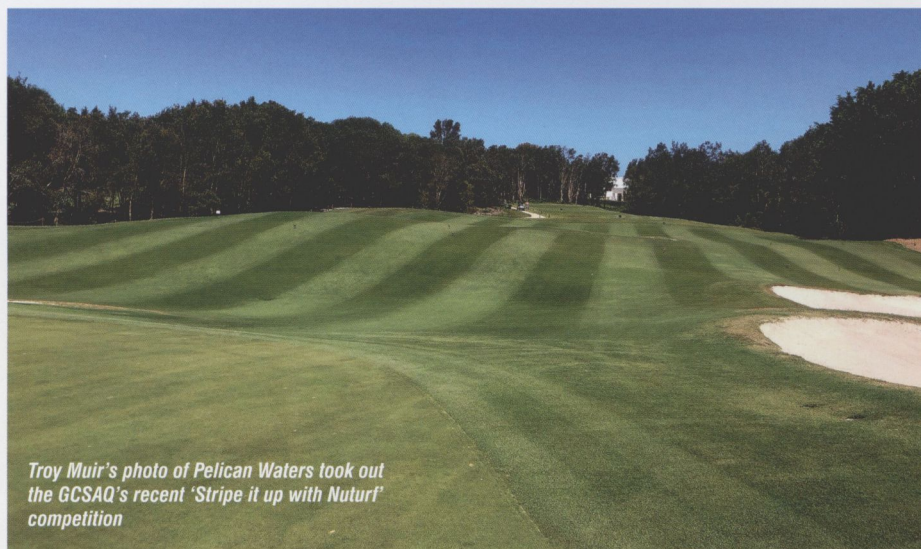
STEVE HODSON
PRESIDENT, NZGCSA

Activity within the GCSAQ has not slowed despite the cooling of the weather this autumn. The 2019 Industry Turf Day was held at Lakelands Golf Club on 12 April with 100 players converging for lunch followed by a noon tee-off. Light showers fell early before the sky cleared and delivered perfect golfing conditions.

This event was a huge success, with guests playing the short course which made it a fun-filled event with more time for guests and sponsors on each hole. Host superintendent and GCSAQ committee member **Phil Soegaard** and his team did a fantastic job presenting the golf course. Thank you to all players and sponsors who supported the day.

Byron Bay Golf Club also hosted a GCSAQ members' golf day on 31 May, sponsored by Nuturf, Toro and Syngenta. Members enjoyed 18 holes of golf courtesy of Nuturf and Toro followed by dinner and drinks at Tuk Tuk Thai at Byron Bay Golf Club courtesy of Syngenta.

Thank you to everyone who entered the GCSAQ's 'Stripe it up with Nuturf'



Troy Muir's photo of Pelican Waters took out the GCSAQ's recent 'Stripe it up with Nuturf' competition

competition. The competition was a huge success with over 25 GCSAQ members emailing their entries in for their chance to win a \$100 Dan Murphy's voucher. In addition to entries from members, we received entries from far and wide including an entry from Education City Golf Club, Qatar as well as some amazing shots of fantastic work that greenkeepers are doing in their own backyards. Congratulations goes to **Troy Muir** from Pelican Waters on winning the competition with his shot of the 11th hole (pictured above).

The 2019 GCSAQ Annual General Meeting will be held in September at City Golf Club in Toowoomba (superintendent **John Halter**). Keep an eye on the new GCSAQ website and social media channels for further information. Our new website – gcsaq.com.au – is getting lots of traffic and we encourage anyone to send us stories that they would like to share to info@gcsaq.com.au.

PAUL MCLEAN
PRESIDENT, GCSAQ

TURF QLD Turf Queensland Grow Green

Turf producers continue to receive good natural rainfall which is assisting the restocking of water catchments on farms. Turf shortages are still in place in some areas as it takes up to six months to grow saleable quality turfgrass. Turf growers in Central Queensland are still under water shortage pressure, but it is pleasing to note that the Ross River Dam in Townsville remains well above the 90 per cent mark.

Workplace health and safety has been highlighted recently with a few incidents which provide a timely reminder for everyone to update their WH&S plans and activities with employees and staff. Everyone has a responsibility to ensure the safety of all employees.

On that theme, on 14 May Turf Queensland organised an important cross-industry WHS workshop which brought together members from Turf Queensland, STA Queensland and the GCSAQ at the Alexandra Hills Hotel Conference Centre. This was a milestone as it was the first time these three associations have come together to promote issues to the turf industry at large. More cross industry initiatives such as this will occur in the future as a result of this successful day.

More than 50 attended and listened to presentations on machinery and chemical safety, returning to work, mental health issues as well as an update on the issue of fire ant control. The event was filmed and will be uploaded to the Turf Queensland website.

A meeting was also held recently with a number of Turf Queensland representatives and the new general manager of the Red Imported Fire Ant (RIFA) organisation under Bio-Security Queensland and the Department of Agriculture and Fisheries. Turf Queensland met with five departmental representatives to promote the position of the natural turfgrass production industry. They advised that there are a number of changes coming for the control of fire ants which involves the change from chlorpyrifos to bifenthrin.

As this edition was going to print, turf producers from across the country were gearing up for the Turf Australia national conference in Sydney (30 May to 1 June). This all-inclusive event offers turf growers, staff and families the opportunity to come together as a united industry for both information and social experiences. The conference focussed on farm operational issues with topics including changes to

loading and heavy vehicle regulations, updates on turf levy projects, water security and new technologies.

A number of research projects are underway covering issues such as couch smut, couch mites and a research project on 'buffalo yellows'. This project is a result of samples being undertaken from farms in NSW last year after widespread reports of distinct yellowing, poor growth and poor yields from some buffalo paddocks. A number of Turf Queensland members have come back positive and the same number negative which has been passed on to Turf NSW.

Irrigation Australia has also contacted Turf Queensland regarding comments on water use efficiency utilising different types of turfgrass. For background and information, a number of our members have responded and this has been passed on to Irrigation Australia accordingly who are developing a draft for the 'Revised Guidelines for Water Conservation and Efficient Irrigation' in conjunction with the Queensland Department of Natural Resources and Mines.

JIM VAUGHAN
EO, TURF QUEENSLAND

NSWGCSA



On 6 May the NSWGCSA held its Annual Ambrose Event and Trade Exhibition at Oaks Cypress Lakes Resort in the Hunter Valley (superintendent **Craig Molloy**). The event was supported by major sponsors PJC Sports Turf, Vermont Sands/Eulonga Quarries and Turfcare Australia.

This year representatives from 13 companies showcased their products on individual tees around the course. The event was sold out, with 124 golfers in total and 136 for dinner and festivities. This is the first time in over seven years that the NSWGCSA has visited Cypress Lakes Resort, with the course in outstanding condition thanks to Craig and his team.

The entire experience was brilliant, with around 30 people coming up on the Sunday night (enjoying dinner and a couple of quite drinks) before teeing off at 11am on Monday. A special shout out goes to the guys who travelled from places like Canberra (5.5 hours), Coffs Harbour (4), Mudgee and Gunnedah.

In the end it was the Turfcare Australia team, led by their (short) captain (and owner) **Shane Summerhayes** with **Scott Armstrong**,



Oaks Cypress Lakes Resort hosted the NSWGCSA's popular Annual Ambrose Golf Day in early May

Daniel Metcalf and **Nathan Vanderlans** (pictured top), that took out the day. It was back-to-back wins for Turfcare. The scratch winners were the guys from Canberra (pictured above right) also led by their short captain **Scott Fogg** with guns **Ben Grylewicz**, **Simon Sneddon** and **Bryan Kelly** shooting a very impressive 14-under off the stick. NTPs went to **Lee Sutherland** (St Michael's Golf Club), **John McCafferty** (Country Club International), **Barry Sullivan** (Hurstville Golf Club) and Shane Summerhayes.

As this edition was going to print, the NSWGCSA was gearing up for its first Walk 'n' Talk day of the year, sponsored by Globe Growing Solutions, to be held at Brighton Lakes Recreation and Golf Club (superintendent **Rob Green**). A second Walk 'n' Talk Day is scheduled for 13 August at Bayview Golf Club (superintendent **David Stone**).



Finally, the NSWGCSA would like to say a major thank you to **Russell Fletcher** (St Michael's Golf Club) for his role on the Board of Directors as treasurer. Russell has recently resigned his position as superintendent at St Michael's and also from the Board of the NSWGCSA. Russell did a fantastic job in the treasurer's role and will be missed by the entire board as well as NSWGCSA admin manager **Alison Jones**. All the best for your future endeavours Rusty.

**NATHAN BRADBURY,
PRESIDENT, NSWGCSA**

TURF NSW



The ongoing drought conditions have continued throughout much of NSW. At the time of writing, over 99 per cent of the state is currently in drought, with the outlook for neutral to moderate El Nino conditions forecast over the coming months.

Dam levels in the Greater Sydney Metropolitan area are dropping at 0.5 per cent a week and inflows into Warragamba Dam, Sydney's main water supply, are at historic lows. This means that when combined dam storage levels reach 50 per cent, Level 1 water restrictions will be introduced.

Sydney Water has been in close consultation with Turf NSW and Turf Australia about possible water restrictions and the potential impact this has on turf production businesses. Turf NSW has discussed possible exemptions for the turf production industry, in particular for newly laid or established turf in residential areas.

Water efficient practices are important to follow and Turf NSW encourages all members to educate their customers about efficient watering practices, including;

- Watering before 10am and after 4pm (in the morning ideally);
- Preparing soil with a minimum of 150mm (ideally 180mm) of sandy loam base before turf is laid;
- Using hand-held hoses with a trigger nozzle;
- Fixing leaky taps, pipes and fittings;
- Recommend deep watering less often to develop strong root systems where possible;
- Watering with timers and automating irrigation systems; and
- Use of wetting agents is encouraged, particularly on sandy soils.

Turf NSW has also represented our members in regional areas where, in some instances, watering of lawns is proposed to be banned all together. It is important that sensible exemptions are negotiated to minimise the financial impact on turf producers.

Irrigation Australia, the peak body for the irrigation industry, is also running a landscape irrigation conference and exhibition in June

on the Gold Coast. This promises to be an exciting event and for further details please visit www.landscapeirrigation.com.au or phone 1300 949 891. Irrigation Australia also has a variety of training courses that are tailored to meet individual and group needs. For the full list of courses, please visit www.irrigationaustralia.com.au.

If members and their customers are designing or installing irrigation systems it is important to also engage a certified contractor, irrigation agronomist or designer who has met certain industry best practice standards. These certified professionals can also be found on the Irrigation Australia website.

For further information, please contact Matthew Plunkett on 0434 147 988 or info@turfnsw.com.au.

**MATTHEW PLUNKETT
IDO, TURF NSW**

STA VIC



The annual STA Victoria Sports Turf Seminar will be held on Wednesday 10 July at the MCG. This information-packed event will be jointly sponsored by Bayer Crop Science and Toro. The 2019 programme has a diverse and engaging series of subjects for all, not to mention a session we are planning on making a regular yearly event – Turf Corner – which consists of a panel of city council, private school and stadium personnel.

We look forward to welcoming our special guest MC **Jason Hodges**, Better Homes and Gardens' resident landscaper. No doubt Jason will keep the day moving in a fun and progressive way. Jason is brought to you with the compliments of Lilydale Instant Lawn.

This year's Sports Turf Seminar will feature 'Preparing for Premier Cricket at Casey Fields'. Casey Fields' supervisor **Daniel Schwarze** has been taking a visual record for all to enjoy and we look forward to his presentation. Early Bird registrations are now available via the STA Victoria website

and Facebook page, with the full programme to be sent out shortly.

In addition to the annual seminar, STA Victoria continues to plan for other events, including the Pitch Preparation Day in September and Irrigation Seminar in October – stay tuned for more information on these days!

As part of STA Victoria's commitment to providing its members with current information, professionalism, education and research, we are seeking your feedback and ideas for our next research project. We need your input for relevant industry research projects to undertake. Based on the topics received, we will be running a live poll at the upcoming annual seminar to decide. Please send your research topic suggestions to vic@sportsturf.asn.au or post your suggestions on the STA Victoria Facebook page - www.facebook.com/sportsturfassociationvic.

The STA Victoria Annual General Meeting will be held at 8am prior to the opening of the Sports Turf Seminar on 10 July. At this

meeting office bearers will also be elected for the executive and general committee. There are two general committee vacancies and we would like to hear from you if you are interested in putting forward a nomination. Please contact vic@sportsturf.asn.au for a nomination form or if you have any questions; alternatively all the information regarding the AGM will be posted on the website and sent out via Facebook shortly.

And finally, STA Victoria wishes all the candidates nominated for the STA Toro Graduate of the Year Award the best of luck, not only in the judging of the award but in their future careers. The final interviews, which will feature STA Victoria representative **Nathan Andrews**, will be held in Brisbane on Sunday 23 June ahead of the 2019 Asia Pacific Turfgrass Conference. The interview process will be managed by STA Australia and the AGCSA with a Toro representative present.

COMMITTEE, STA VICTORIA

SAGCSA



As of the start of May we have received some long overdue rain! The wet stuff has been hard to come by over the past six months with some courses only receiving 14mm since the middle of December through to the start of May. It is safe to say that it has been a long, tough summer for some.

Big congratulations must go out to **Rowan Daymond** and his staff who presented The Grange Golf Club in superb condition for the 2019 ISPS Handa Women's Australian Open back in February. It was Rowan's first televised tournament as a superintendent and he took it all in his stride. He and his staff faced a terrible tragedy leading up to the event, as outlined in the last edition of Australian Turfgrass Management Journal, but were able to work through it and showcased the golf course in world class condition.

Since the last report, **Simon Work** has taken on the superintendent's position at North Adelaide Golf Links. Simon left his role as assistant superintendent at Mount Osmond Golf Club working under **Barry Bryant**. During April we held a 'walk 'n' talk' day at North Adelaide with around 35 attending.

Simon talked us through some proposed redevelopments possibly happening over the



North Adelaide Golf Links hosted a SAGCSA walk 'n' talk day in April

next few years. North Adelaide Golf Links is a council-run course that consists of an 18-hole championship course, an 18-hole beginner course and an 18-hole par three course. With limited staff numbers Simon and his team are

doing an amazing job. North Adelaide Golf Links is set in a convenient location, adjacent to the Adelaide Oval and over the river from the city, and the possibilities for the future are very exciting.

As this edition was going to print the SAGCSA was gearing up for its Country Meeting to be held in the Adelaide Hills and surrounds on 27-28 May. The AGM will this year be held at Glenelg Golf Club (superintendent **Tim Warren**) on 11 July and we have a combined education day with STA SA on 30 July at the Adelaide Oval. I look forward to seeing all members at these upcoming events.

NATHAN BENNETT PRESIDENT, SAGCSA

ON THE MOVE...

SCOTT CAMERON: Appointed new superintendent Springwood CC, NSW.

RUSSELL FLETCHER: From superintendent St Michael's Golf Club, NSW to superintendent The Ridge Golf Club, NSW.

MARTY FORMOSA: Departed as superintendent Dunheved Golf Club, NSW.

CHARLIE GIFFARD: Departed as

superintendent Indooroopilly Golf Club, Qld.

CHAD GILMOUR: From superintendent Gladstone Golf Club, Qld to superintendent Chalambar Golf and Bowls Club, Vic.

MARK SPRAGGS: From superintendent Club Taree, NSW to superintendent Tuncurry Golf Club, NSW.

TONY SMITH: Retired as superintendent Launceston Golf Club, Tas.

TGCSA

Since the last report there has been quite a bit of activity here in Tasmania with a range of days being held for all associated with the turf industry.

The AGCSA Autumn Seminar Series journeyed to Blundstone Arena in Hobart, with 30 attending what was a very informative and interactive day. The quality of presentations, including that of host curator **Marcus Pamplin** about his management of the arena, ensured that everyone would have had some take home messages or ideas to implement in their own workplace.

The engagement by all attending was fantastic to see, as everyone in the room was involved at one point during the day. Thanks to the AGCSA and all speakers for holding this seminar in Tasmania – we look forward to more in the future.

The most recent industry education day was a Nuturf-sponsored roving 'walk 'n' talk' seminar to the North West Coast which took in the newly developed Penguin Dial Park twin oval community development which opened in 2018.

Turf manager **Kane McDonald** walked us through the precinct and explained the pros and cons of the construction and maintenance he has to deal with given the amount of football and cricket matches (and practice) as well as school activity that the facility receives and the pressure to maintain turf quality. The ovals we inspected were in impeccable condition and the whole development is a credit to Kane and his crew.

Back on the bus, the next stop was Ulverstone Golf Club (superintendent **Isaac Jones**) to inspect the dam extension which has bolstered the club's water storage capacity by another 20 megalitres to give them security throughout the summer months. Isaac was on leave, so host for the visit was course chairman **Craig 'Tangles' Walker**. We did not have a course inspection, but from afar it did look outstanding and the great work has carried on from the recent Tasmanian Open.



Ulverstone Golf Club has recently extended its dam storage capacity by 20ML



Kane McDonald (third from left) leads an inspection of the new Dial Park twin ovals in Penguin during the recent TGCSA education day

After a beautiful lunch and product presentation by Nuturf reps **Gavin Hegan** and **Andy Byard** at Ulverstone, we ventured to Devonport Golf Club to view the \$14 million venture which incorporates golf, bowls and croquet. Three brand new bentgrass bowling greens have been constructed as well as a new croquet lawn in addition to a complete upgrade of the irrigation and control system.

Craig again hosted us as he is the superintendent at this multi-purpose facility which will also have an indoor bowling rink. Craig has a very exciting time ahead as the club has embarked on a master plan to restore the course back to the previous Morcom design done many years ago.

The consultancy and construction works are being carried out by **Graham Grant** and judging by the just completed 10th hole it is definitely going to be a place we visit again in the near future. From all the 20 attendees, thank you to Nuturf for sponsoring this most informative day.

Down the southern end of the state, Royal Hobart (superintendent **Steve Lewis**) and Tasmania Golf Club (**Danny Gilligan**) have just presented their courses for the Australian Men's and Women's Interstate Series. Well

done to both Steve, Danny and their crews as the feedback from both venues was nothing short of excellent.

Elsewhere around the Tassie traps...

- Works on the proposed Mogford-designed golf development at Arm End (Opossum Bay) are believed to be starting at the end of 2019.
- As mentioned above, Craig Walker has been appointed as superintendent at the new Devonport Sporting Complex. Craig cut his teeth in the industry under **Chris Hay** when at Kingston Beach.
- Planning is well underway for the TGCSA Conference at Tamar Valley Resort on 13-14 August. A high quality list of keynote speakers will be presenting from all areas of turf management; and
- Planning is well under way for another nine holes to be developed alongside Barnboughle Lost Farm. Architects Coore Crenshaw will be visiting on site in August to work on a course routing. Irrigation and all aspects of the construction will allow for continuation to 18 holes in the future.

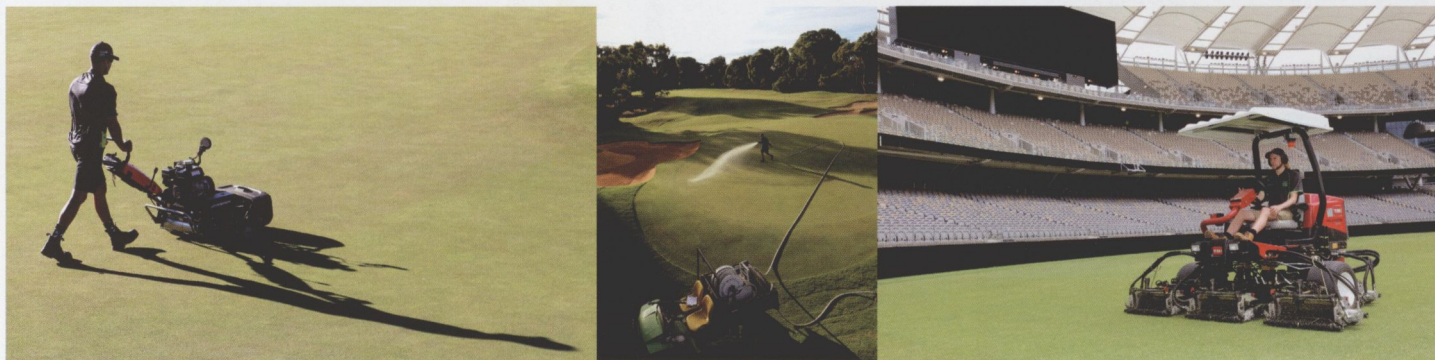
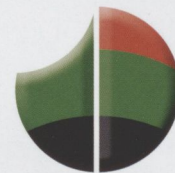
PHIL HILL
PRESIDENT, TGCSA



The new 10th green at Devonport Golf Club



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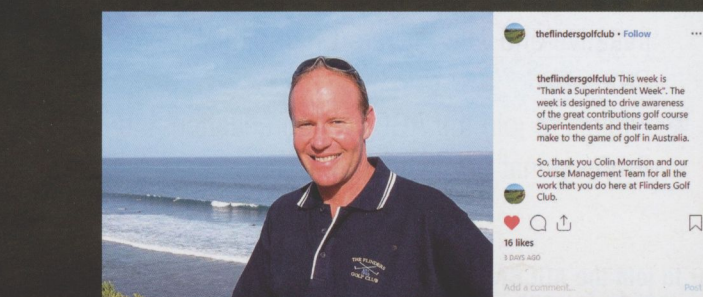
- Discount registration to the Asia Pacific Turfgrass Conference and Trade Exhibition
- Annual subscription to Australian Turfgrass Management Journal
- Free HR and legal assistance, advice and consultation service
- Access to over 40 operational and turf management templates
- Member rates on AGCSATech services.
- Superintendent and sports turf manager members receive a FREE disease diagnosis for their organisation valued at \$99!
- Discount registration for all National Turf Education & Environmental Seminars
- Free access to the Michigan State University's Turfgrass Information Centre
- Access to AGCSA and Redeem Members Benefits Program
- Free access to sports turf research and management resources
- Member rates on sports turf books and merchandise
- Member rates on AGCSA employment services and advertising
- Free access to selected Australian golf tournaments
- Free access to AGCSA Water and Environmental Initiatives
- Eligible to enter the AGCSA Golf Championships
- Eligible to nominate for the Future Turf Managers' Initiative and The Players Championship Volunteer Program
- Eligible to join the AGCSA Accreditation and Professional Certification Programme

To find out more details on the advantages of becoming a member or to join the AGCSA, head to www.agcsa.com.au or contact AGCSA membership services coordinator Allison Jenkins on (03) 9548 8600 or email admin@agcsa.com.au

#ThankASuperAUS



The AGCSA ran a second highly successful 'Thank a Superintendent Week' from 13-19 May. Across various social media platforms, the golfing industry gave due recognition to course superintendents and their maintenance crews for the sterling work they undertake to present Australia's golf courses day in, day out. Here are some of the fantastic posts that featured throughout the week...





cranbournegolf • Follow
Cranbourne Golf Club

cranbournegolf This is the hardworking team responsible for providing our Members with such an amazing course, day after day across the year.

Front row from left- Matt, James (Super), James (2IC), John (Foreman) and Apprentice Josh. Back row from left - Apprentice Tom, Michael, Chris (Mechanic) and Shaun.

THANK YOU ALL 🙏🙏🙏

25 likes
3 DAYS AGO

Add a comment... Post

Warren Smith
@WarrenSmithOX

Following

It's #ThankASuperAUS Week, so here's a shoutout to the very hardworking greens staff at @bonniedoongc - I know the members appreciate the way the course looks and plays every week.

You guys rock! #golf #Sydney #Australia

3:51 PM - 14 May 2019

David Mason
@Moosetash1

Following

If it wasn't for these guys #winningteam, my job would be so much more difficult. These are the ones who deserve to be thanked for their continuous hard work and commitment. #MetropolitanGC #ThankASuperAUS #AGCSA2

kingston_golf_club • Follow

kingston_golf_club Thank a Superintendent Week, May 13 to 20 #ThankASuperAUS #AGCSA Mark Angel has been our Superintendent for 22 years. Over that time the whole course has been redigged to make it the great course it is now. Kingston SE is now talked about in the region as the course to play. With Mark being our only greenkeeper he is doing a busy making the course a joy to play all year round. Thank You to Mark.

16 likes
1 DAY AGO

Add a comment... Post

killaragolfclub • Following
Killarag Golf Club

killaragolfclub To finish off Thank a Superintendent week, the Club would like to especially thank our Grounds Manager Ryan Fary and our Assistant Grounds Manager Dean Herdman - these two men are a big reason why our golf course is presented the way it is day in and day out. I hope all our members were able to thank one of our grounds staff to show them how much we appreciate their efforts. #AGCSA #ThankASuperAUS #Killaragolfclub

5 likes
1 DAY AGO

Add a comment... Post

murrayjohnson Great job to Ryan and all the boys! Well done!

1 like
1 DAY AGO

Add a comment... Post

ISPS HANDA • Follow
#WomensAusOpen

Following

For #ThankASuperAUS week we would like to express our sincere gratitude to the course team behind the @ISPSHanda #WomensAusOpen at @GrangeGolf. Course superintendent Rowan Daymond and his team worked tirelessly to present the course in terrific condition for the championship

3:04 PM - 15 May 2019

2 Retweets 14 Likes

dunthyllegunorange • Follow

dunthyllegunorange Thank you to Dunthyllegunorange Superintendent Grant Barrett, 13 years at the helm. The course is in awesome condition - despite very challenging conditions over summer. Read more about Grant and his team by clicking the image below. #ThankASuperAUS #OurAGCSA #ThankYou

16 likes
3 DAYS AGO

Add a comment... Post

grangegolfclub • Follow
The Grange Golf Club

grangegolfclub Daymond and his team who work tirelessly to manage the largest and most valuable asset of our Club - the Course.

Our Course Managers and their staff continuously strive to keep the game's turf and surrounds healthy and attractive, while considering the environmental as a primary focus. Our dedicated Grange team deliver hundreds of thousands of rounds of golf every year and our golfers continue to experience playing on world-class facilities.

A big thank you to Rowan, Chris, Dan, Jeff, James and Aidan and their teams.

#ThankASuperAUS #OurAGCSA

5 likes
1 DAY AGO

Add a comment... Post



kalgoorliegolfcourse • Follow
Kalgoorlie Golf Course

kalgoorliegolfcourse Thank A Superintendent Week 13th - 20th May

Our maintenance team do an amazing job of maintaining our world class golf course! Join us in thanking our Superintendents and Course maintenance staff by sharing your photos and messages of support.

#ThankASuperAUS #OurAGCSA

5d

19 likes
5 DAYS AGO

Add a comment... Post

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