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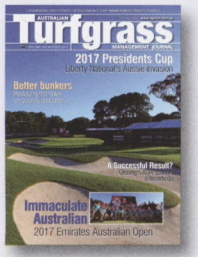

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Editorial
Brett Robinson
Office: (03) 9548 8600
Mobile: 0434 144 779
Email: brett@agcsa.com.au

Advertising
Mark Unwin
Office: (03) 9548 8600
Mobile: 0438 320 919
Email: mark@agcsa.com.au

Art Direction & Design
Jo Corne
Office: (03) 9548 8600
Email: jo@agcsa.com.au

Australian Turfgrass Management Journal

AGCSA

AGCSA
Suite 1, Monash Corporate Centre
752 Blackburn Road, Clayton, VIC 3168
P: (03) 9548 8600 F: (03) 9548 8622
E: admin@agcsa.com.au
W: www.agcsa.com.au

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President: Brett Balloch
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Stephen Lewis

Chief Executive Officer
Mark Unwin
E: mark@agcsa.com.au

Events and Education Manager
Simone Staples
E: simone@agcsa.com.au

Membership Coordinator
Allison Jenkins
E: admin@agcsa.com.au

Accounts
Philip Horsburgh
E: philip@agcsa.com.au

AGCSATech
Bruce Macphee (Environmental Agronomist)
E: bruce@agcsa.com.au
Tim Fankhauser (Agronomist)
E: tim@agcsa.com.au

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Optus Stadium: Perth's slick new 60,000-seat arena Optus Stadium in the lead-up to its first ODI between Australia and England in late January. **Photo:** Brett Robinson.

LEAD STORY: Arena spectacular – Optus Stadium, Perth 6

After a number of years in the making, this summer saw the official opening of Optus Stadium in Perth. The Western Australian capital now boasts one of the most technologically advanced entertainment arenas in the world and at its heart is the playing surface constructed and maintained by HG Sports Turf. Erik Kinlon looks back at the development of one of the country's most talked-about bits of turf and some of the challenges that are set to face the arena management team as they ready for a hectic opening year.

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Foster's fight

It was one of those instances in my career as a scribbler when you just shut up and don't interrupt. I'm sitting in the boardroom of the AGCSA office and on the other end of the phone, speaking from his bed at the Royal Brisbane and Women's Hospital, is Townsville Golf Club superintendent Jason Foster. For 30 minutes he recounts in chilling detail the life-changing events of Thursday 11 January, 2018. As I said, you just shut up, listen and shake your head in disbelief.

I'm sure all in the industry would have reeled in shock when news broke two weeks into the New Year that one of their own had been badly injured while in the line of duty. The 43-year-old father of two was undertaking his daily routine maintenance inspection of the golf club's onsite sewage treatment plant when what is believed to be a build-up of methane gas ignited and exploded. Jason was literally blown off his feet, suffering severe burns to a third of his body.

Treated at the clubhouse by paramedics, Jason was transferred to Townsville Hospital where he was placed in an induced coma and then flown that night to the specialised burns unit in Brisbane. Over the following days he underwent three extensive skin graft operations. While his arms, legs, hands, chest, stomach and back required significant grafts, burns specialists worked around the clock and did an incredible job to save the skin on his face. After eight days he was brought out of the induced coma and with it the reality set in of the very long road to recovery he and his loving family now face.

Those who know Jason will tell you he is one indomitable character. I certainly garnered that from our 30 minute conversation and it was remarkable to hear how he is taking all that has happened to him in his stride. He fully admits that the gravity of what has transpired is probably yet to hit home, but for the time being he is doing everything he can to recover as quickly as possible. Whether that's putting up with the unbearable pain during daily physio sessions or doing extra reps to stretch the new skin on his hands, Jason's resilience and determination is nothing short of impressive. And true to his nature, he can even crack a joke or two about what's happened – "I look like a different person! It's like I've had an extreme facial! I look 20 years younger… the nurses are very jealous."

We often hear of the support that superintendents and turf managers get when they have suffered the trials and tribulations of natural disasters. During those times the industry always does its bit to assist. But when personal tragedy befalls one of our own, it takes on a different dimension. You only have to look at the likes of Simon Bourne and Jason Seis and the way their respective plights were taken to heart by an industry that naturally rallies around those during a time of need.

Jason too has been overwhelmed by the outpouring of support by his industry colleagues, with more than 2000 calls and messages of support from here in Australia and around the world providing him with a tremendous boost mentally. Jason's club has also been extremely supportive and it was standing room only in the Townsville clubhouse for a fundraiser in Jason's honour a few weeks after the incident.

In the fullness of time the events that led to this horrific freak incident will come out as authorities continue their investigations. ATM will also, when Jason is ready, tell his remarkable story. Until then I am sure I speak for everyone in the industry that we send Jason, his wife Cas and their two boys Jacob and Ollie our heartfelt best wishes for the days, weeks, months and years ahead. It's sure to be a challenging road, but you won't be doing it alone. Enjoy the read…

Brett Robinson, Editor

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MARK UNWIN, AGCSA CHIEF EXECUTIVE

Member training and education a key AGCSA focus in 2018

AGCSA

AUSTRALASIAN TURFGRASS CONFERENCE & TRADE EXHIBITION WELLINGTON 2018

Welcome to the first issue of ATM for 2018! I hope you all managed to spend at least a little time relaxing over the Christmas-New Year period – as much as possible at least given some of the extreme weather we are seeing across the country.

The final few weeks of 2017 leading into Christmas were quite a busy period for the AGCSA. We welcomed the newest member of our team, **Tim Fankhauser**, who joined the AGCSA as an agronomist. Tim arrives at the AGCSA after more than 10 years as assistant superintendent at one of the Mornington Peninsula's top golf courses – The Dunes – and will work alongside senior agronomist **Bruce Macphee** to help deliver AGCSATech's expanding range of diagnostic, analytical and consultancy services.

We have completed registrations and judging for the **2018 AGCSA Future Turf Managers' Initiative,** presented in conjunction with AGCSA Gold Partner Jacobsen, A Textron Golf Brand. In a departure from the past two events, this year's FTMI has been taken out of the conference and will be held in Melbourne from 25-27 March with an intensive schedule of seminars, presentations and workshops. Take a look at our FTMI write up on page 20 to see who were successful in gaining a spot on this highly sought after, world-class turf management initiative.

With registrations now open, the AGCSA team has been busy with planning, logistics and coordination for the inaugural Australasian Turfgrass Conference and Trade Exhibition in Wellington (25-29 June, 2018). We have confirmed an impressive range of speakers, topics and workshops for the event, including **Professor Scott McElroy** (Auburn University, USA) and **Craig Haldane** (director of golf course maintenance at Dubai Golf, UAE).

Both Craig and Scott will kick the conference off with day-long workshops on the Monday (25 June), with Haldane drawing upon two decades of experience to present on what drives superintendents and their course management practices. McElroy will examine an issue close to the heart of many superintendents – the problem of herbicide-resistant weeds in turf and manipulating fertility regimes to control *Poa annua*.

Other conference topics include facilitated sessions on management and personal development, hands-on workshops as well as a diverse range of turf management sessions from Australian, New Zealand and international industry experts. If you haven't yet registered, head to the conference website – www.atc2018.com – for more information on the complete conference, education, trade exhibition, tours and partners programmes.

EDUCATION, AWARDS AMENDMENTS

December saw the AGCSA attend the **National Turf Education Working Group** meeting in Brisbane. The efforts of this group have for some time centred on monitoring the educational pathways within the turf industry and making recommendations on all issues affecting training, education, content and delivery.

With challenges on the level and type of education faced by all sectors of the turfgrass industry, this committee has produced a number of resources for students, as well as Delivery and Assessment Guides to aid in the delivery of turf apprenticeships to a minimum standard nationally which is endorsed by national and state associations and industry across Australia. While significant advancements have been made to date, it's widely understood that there is much more to do, and

remains a topic to which the AGCSA is committed to further development.

2018 is certainly shaping up to be a busy year ahead. In addition to the New Zealand conference, the AGCSA is working with other key bodies within the golf industry to share resources and knowledge to better serve our members in all facets of their professional lives. Continuing to deliver member training and education is a key feature of this year's activities, through a range of seminars and workshops delivered in conjunction with state associations, partners and industry bodies. Topics include staff education, professional services, HR and management development. More information on these activities will be updated on these once timing and venues are confirmed.

Finally, an update on an important topic that a number of superintendents have reached out to the AGCSA to discuss. During 2017, a proposal was put forward by parties representing licensed and registered clubs to the Fair Work Commission pursuing an amendment to various industry employment Awards.

While no changes are possible to any Awards until a final determination has been made by the Commission, initial submissions have called for changes to some employment Awards, including the Restaurants and Licensed Clubs Award and the Hospitality Award. These two Awards form the basis of employment for many golf course maintenance staff, turf managers and their teams and, if successful, could result in changed conditions for those employed under these Awards, including merging of conditions and a reduction in some penalty rates.

This is an important issue for our members, and indeed the wider turfgrass industry, and as such the AGCSA has spent considerable time reviewing motions submitted to the Commission. It has also represented national and state association members at a number of Commission hearings on the proposal.

While a significant amount of work is still to be undertaken in compiling our response representing superintendents and maintenance staff before a presentation to the full bench of the Commission hearing (scheduled for July), not surprisingly we have taken calls from a number of superintendents looking to understand the potential changes and the impacts these may have on their teams.

We will continue to keep you updated as much as possible, including providing an overview brief for members and the potential to undertake further activities to support our position. One such potential action we may look to undertake in coming months is a member survey to determine your thoughts and quantify potential impacts to our industry if we believe this is the best course of action for our members. In the interim, please feel free to reach out to the team at the AGCSA if further information is needed.

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The Optus Stadium playing surface comprises HG Sports Turf's Eclipse Stabilised Turf system. It is Wintergreen couchgrass and will be oversown with ryegrass during the winter months

After a number of years in the making, this summer saw the official opening of Optus Stadium in Perth. HG Sports Turf's Erik Kinlon looks back at the development of one of the country's most talked-about bits of turf and the hectic first year schedule set to face the arena management team.

Perth in Western Australia now boasts one of the most technologically advanced entertainment arenas in the world following the official opening of Optus Stadium in January. Throughout 2017, leading stadia sports turf contractor HG Sports Turf was tasked with the construction and surfacing of the new stadium, its second major scale sportsfield project in the WA state capital after the successful redevelopment of NIB Stadium in 2013.

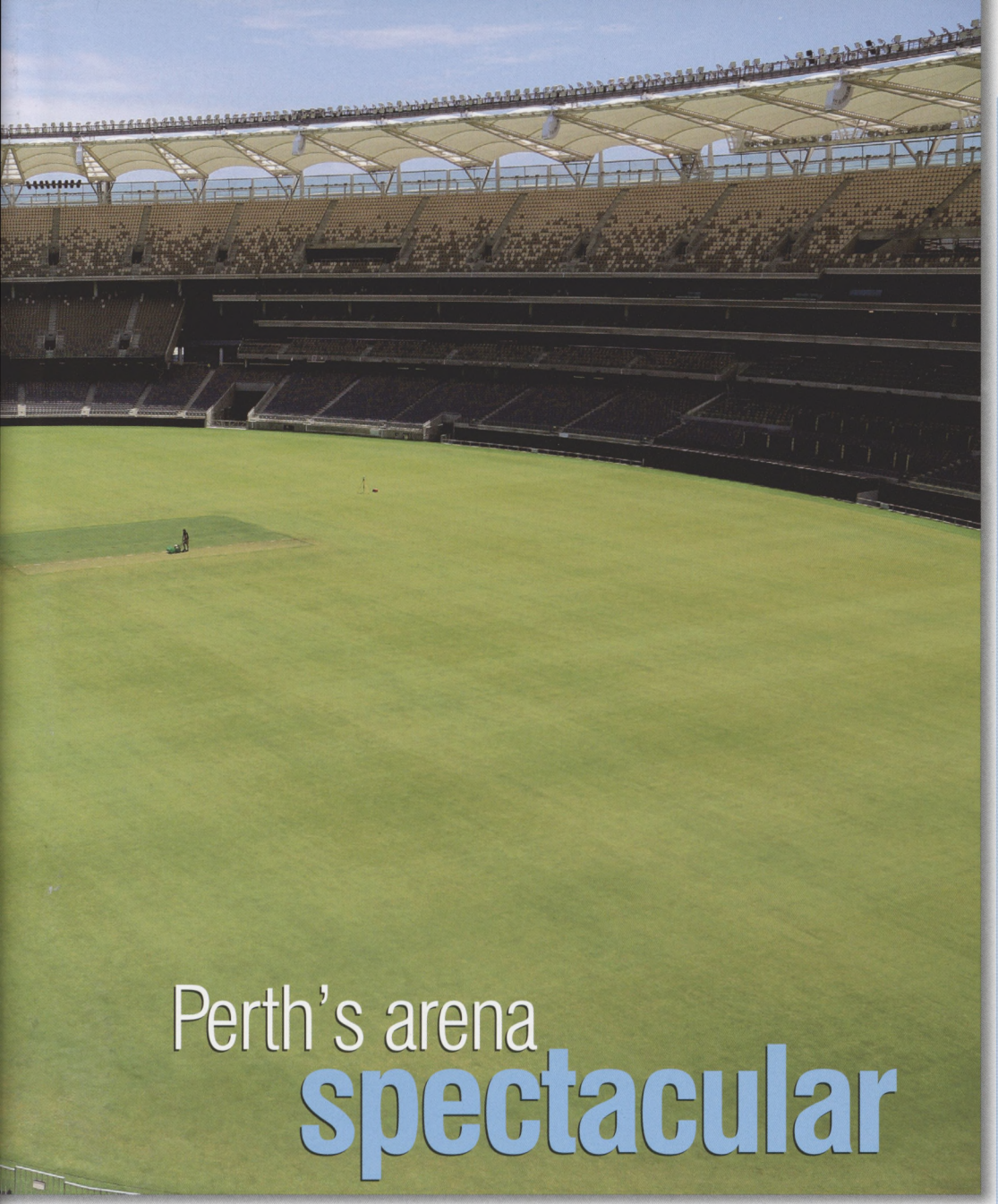
A commitment by the Western Australia Government to deliver a 'fans first' stadium has resulted in an innovative design ensuring an exceptional event atmosphere and home ground advantage that can only be experienced by being there. The design itself acknowledges Western Australia's unique sporting, cultural and Aboriginal heritage and the stadium's prominent location on the Burswood peninsula provides a spectacular vista across the Swan River to the Perth CBD.

Optus Stadium had its origins back in 2003 when the State Government of the time commissioned a review of major sporting infrastructure in Western Australia. The subsequent report recommended the construction of a new 60,000-seat stadium. The original proposal was for the development of the existing Subiaco Stadium site or an East Perth location. However, in 2009 under the Colin Barnett-led government the idea was scrapped and an announcement made two years later that the new stadium would be built on government-owned land on the northern section of the Burswood Park Golf Course (see aerial photos page 8 and 9).

Planning and consortium tendering for the project started in 2013 with construction beginning in December 2014. Multiplex were chosen as the winning contractor for the stadium construction with HG Sports Turf as their field of play construction partner using its Eclipse Stabilised Turf as used in many of Australia's leading stadia.

The site development has seen approximately 2000 concrete piles driven into the ground to a depth of up to 35m and the equivalent of over 21 Olympic-sized swimming pools of concrete to build the stadium. Over 5800 workers were employed

Perth's arena spectacular



Inside and outside, Optus Stadium makes an impression

Affectionately dubbed 'the craypot' by Perth locals due to its unique external cladding, Optus Stadium seats 60,000 and is one of the most technologically advanced arenas in the world

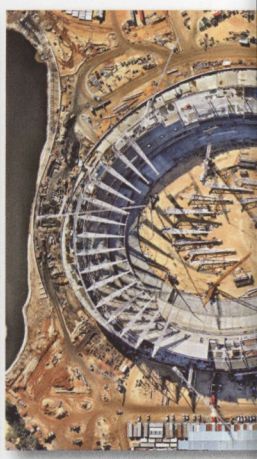
during the 36 month construction period. The stadium development has been in line with the timeframes set out, with completion being late 2017 and official opening event being the Gillette Series One Day International between Australia and England on 28 January 2018.

SURFACE CONSTRUCTION

In 2012, HG Sports Turf was chosen to be part of the Multiplex consortium and, with the successful award of the contract, in 2014 set about putting the wheels in motion. The new Optus Stadium is without doubt the most state-of-the-art arena in the country and the most significant new stadium development in Australia since Stadium Australia for the 2000 Olympic Games.

HG Sports Turf has a significant track record with some of Australasia's major stadia, including the Melbourne Cricket Ground (MCG), ANZ Stadium and Eden Park (Auckland, NZ) and major games events including the 2000 Olympics, 2006 Commonwealth Games and the 2015 South East Asian Games. The development of the new Optus Stadium ranks as one of the company's most high-profile projects.

With a stadium cost reported at $1.6 billion dollars, multiple stakeholders and being owned by the State Government, the levels of expectation and



From public access golf course to 60,000-seat multipurpose arena. The new Perth Stadium is built on the site of the old Burswood Park Golf Course. The aerial image of the course is from May 2012 with subsequent site development aerials taken in December 2013, July 2016, April 2017 and December 2017

During cricket season, five drop-in wickets will be used with their preparation overseen by the WACA curating team

With two 340m² video screens, spectators have no excuse for missing any of the on-field action at Optus Stadium

pressure during every aspect of the build, including the playing surface, were very high. In addition to being contracted for the full development and construction of the playing surface elements, HG Sports Turf was also subsequently awarded the term maintenance contract following on from the six month maintenance defects liability period.

The construction of the playing surface started in June 2017 and was overseen by HG Sports Turf's managing director Hamish Sutherland. In order to support him, HG Sports Turf went through an exhaustive search to find an internationally renowned arena manager that would also act as an assistant project manager during construction.

Tony Hemming was appointed to this role and brought a vast experience of managing international stadia, field construction and world's best cricket wicket knowledge. Hemming, who has amassed more than 30 years in the turf industry in a variety of roles, relocated to Perth at the start of 2017. Prior to this he spent 10 years working as head curator at the International Cricket Council's impressive Academy facility in Dubai Sports City, UAE.

Hemming was on site from the start of the playing surface construction and helped oversee the stadium surface construction as well as the meticulous preparation of the Eclipse Stabilised Turf which was specially grown at a turf farm in Serpentine. The construction process included:

- The preparation of the subgrade over more than 18,000 square metres;
- Installation of a geotextile membrane and lay-flat Megaflo drainage system;
- Installation of a fully automated Rain Bird irrigation system; and
- 3600 ton gravel layer and 9360 tons of amended sand profile in preparation for the new turf.

Although the finished surface levels are flat, the subgrade was shaped to de-risk the site during construction. A variable gravel layer was then placed to a flat finished reduced level and the 240mm lower and upper sand profile layer then added and consolidated.

Hanson Quarries provided all of the sand and gravel materials and HG Sports Turf had contracted with West Coast Civil as its civil and earthworks partner for the construction and placement of materials. Horizon West Irrigation was selected for the supply and the installation of the Rain Bird irrigation system. HG Sports Turf had previously worked with both West Coast Civil and Horizon West on the redevelopment of the NIB Stadium which occurred between August and October 2013.

Other notable pieces of the construction puzzle included the footings for the drop-in cricket wickets, a synthetic perimeter around the ground and the outside cricket wicket practice area.

DROP-INS

Drop-in cricket wickets have been used in Australia stadia since 1996 and are currently in place at the MCG, Spotless Stadium (Sydney), Etihad Stadium (Melbourne) and the Adelaide Oval. Since August 2014, Optus Stadium has been working with representatives from the WACA, Cricket Australia and stadium construction contractor Multiplex on the design of the drop-in wickets.

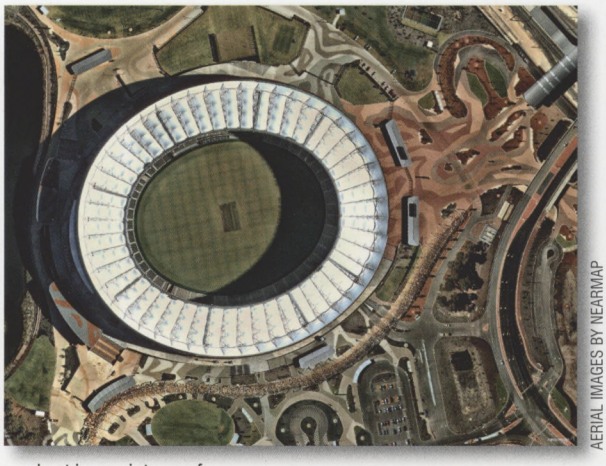
A prototype drop-in tray and wicket was developed with the same soil profile and grass as the current WACA wicket. The prototype was then tested in game simulation conditions by state cricket players and monitored by curators and consultants from Cricket Australia and the WACA.

Following the successful completion of the testing phase, five further drop-in wickets were built to the same specifications. The first official event for the new wickets was the One Day International between Australia and England on 28 January.

When not installed in the stadium during the cricket season, the wickets will be housed in a purpose-built nursery adjacent to the outdoor practice wicket area on the northern side of the stadium. Both the drop-in wickets and the outdoor practice wicket area will be curated under contract by WACA staff.

ROLLING OUT

HG Sports Turf's patented proprietary Eclipse Stabilised Turf system was selected as the surfacing solution for Optus Stadium. In order to deliver such a high profile project, HG Sports Turf once again partnered with leading WA turf producer Greenacres Turf Group to grow the Eclipse Stabilised Turf. It was an easy choice for HG, with Greenacres



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having previously grown the Eclipse turf for the NIB Stadium project. Their understanding of the system along with their internal systems and procedures and attention to detail would further ensure that all quality assurances were exceeded.

Greenacres Turf Group is based in Serpentine, about an hour from the stadium and had the capacity to set aside a 20,000m^2 pad for the turf establishment. The Eclipse Stabilised Turf backing was manufactured and shipped to WA with the planting on the farm starting in February 2016. As with all the company's projects, HG Sports Turf sent across a crew of skilled installers led by turf farms manager Brad Kidd and supported by elite stadiums manager Nathan Humphreys and construction manager Marty Cupples.

The Eclipse Stabilised Turf product is a mixture of artificial fibres stitched into an open-weave backing, but with a completely natural grass surface. The product was laid out on the prepared base and infilled to a depth of 40mm with the same sand used for the pitch profile construction.

The natural grass component is 100 per cent Wintergreen couchgrass. Greenacres Turf Group was responsible for the maintenance of the turf while at the farm and supported with monthly maintenance programmes from HG Sports Turf. Monthly reports and testing were carried out as part of the quality assurance process.

The establishment period, whilst expected to be 12 months, pushed out with some flexibility in the main construction contractor's build programme.

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Not long after the playing surface was laid, it was hit hard with the Koro field topmaker in late October

The Eclipse Stabilised Turf will be over sown with ryegrass during the winter months.

With the profile complete, in September 2017 the HG Sports Turf crew set about installing the 18,000m² turf playing surface. The turf was prepared and harvested by an HG crew of six people with support from Greenacres Turf Group and transported to the stadium. Approximately 60 trucks delivered 300m² of turf per load and up to 3000m² per day.

The turf was received and installed at the stadium by HG Sports Turf's installation crew of 14 people, with each 10 metre x 1 metre roll of turf being placed with precision using WMI tracked turf layers. The turf was installed and abutted into position and with all debris cleared was consolidated using a 2m wide Mentay roller. The installation process took eight days and after each day the turf was handed over to Hemming and his maintenance team. In late October, the surface was ripped into with a Koro field topmaker before being brought back in time for the opening ODI.

To support the needs of the stadium, additional Eclipse Stabilised Turf will be grown at the Greenacres turf farm and be on standby at all times. The ability for the product to be installed and 'ready to play' immediately gives the operators of the stadium incredible flexibility in securing a variety of local and international content.

BUSY YEAR

Hemming leads a team of three that includes the recent addition of Tom Smith as assistant arena manager. Smith, formerly a golf course superintendent at Melbourne's Waterford Valley Golf Course, arrived at Optus Stadium in early February after a 17-month stint in Singapore. There he worked for HG Sports Turf as turf manager at Singapore National Stadium.

Hemming's team also includes experienced former Subiaco Oval head groundsman Gary Lugg and former Metropolitan Golf Club apprentice Jake Anderson. Like Smith, Anderson has recently arrived back in Australia after spending two years working in the UK, with stints at Royal Wimbledon Golf Club and London's Olympic Stadium.

Together the quartet will navigate the Optus Stadium surface through what is set to be a hectic first year. Already the stadium has a full schedule of events ranging from ODI and Big Bash cricket, AFL, concerts and other niche/one-off events. As this edition of ATM goes to print, the stadium hosted the Perth Scorchers' Big Bash|07 semi-final against the Hobart Hurricanes (1 February) in front of a partisan home crowd of 55,000. The drop-in pitches were then removed (7 February) in time for the ground's first official AFL match, an AFLW round two clash between Fremantle and Collingwood on 10 February.

The first real test for Hemming and his crew comes at the start of March. The arena hosts two Ed Sheeran concerts on 2 and 3 March and the following weekend will be the scene of an historic NRL opening round double header. Optus Stadium will host back-to-back NRL matches on 10 March – the Rabbitohs v Warriors at 4pm and Canterbury v Storm at 6pm.

Hemming has undertaken many ground turnarounds during his career but this will be the venue's first major test of a large scale stage build and bump out, not to mention the covering of the arena surface.

The AFL season then kicks off on Sunday 25 March with the West Coast Eagles hosting the first official 2018 Premiership match at its new home against the Sydney Swans, the first of 23 regular season games the stadium will host in 2018. Then there's Nitro Circus which will land on 22 April, English Premier League side Chelsea have a visit planned in late July/early August, while Taylor Swift will conduct the Perth leg of her Australian tour there on 19 October.

2017 was a very busy year for HG Sports Turf, having rebuilt and resurfaced Westpac Stadium (Wellington, NZ) and AAMI Park (Melbourne) prior to starting in Perth. Being involved in one of the most iconic stadium developments in Australia brings a great sense of pride and achievement for the whole HG Sports Turf team. To see Optus Stadium at full capacity, whether it's for cricket, AFL, NRL or concerts, is going to be a sight to behold.

FACT FILE – OPTUS STADIUM, PERTH

- Optus Stadium is a 60,000 seat multi-purpose stadium primarily accommodating AFL, cricket and entertainment events such as concerts. The stadium is adaptable with drop-in seats to host rugby league, rugby union and soccer but also has the capability to hold other major events consistent with the requirements for Commonwealth Games and international athletics. It has been designed to increase seating capacity within the existing structure, adding up to 10,000 extra seats.
- The stadium is constructed over five levels at a height of 42m.
- Two giant video screens, measuring 340m² each, are located at the eastern and western ends of the ground. In addition there are over 1000 television screens located throughout the stadium.
- The stadium roof is made of a light weight ETFE fabric and covers 85 per cent of the seats (the most coverage of any open air stadium in Australia) and responds to Perth's climatic conditions. The roof creates a glowing halo effect at night with the incorporation of LED lights.
- The unique bronze façade reflects WA's unique geology by day and by night can be transformed using state-of-the-art LED lighting technology to create a home team environment and experience.
- The façade is also the canvas for a unique poem, created by Curtin University Professor Kim Scott in collaboration with members of the Whadjuk Working Party, representing the traditional landowners. The poem named 'Kaya', meaning 'Hello' or 'Yes', inter-weaves 11 verses of Indigenous Noongar prose with six verses of English text, etched into 68 pre-cast concrete panels that circle the podium level of the stadium (pictured below).
- The pitch is built in an East-West orientation and is 177m x 141m, similar in dimension to the MCG.
- Finally, and most importantly… cup holders are included in every seat!

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Nixon Park was one of two high-use sportsfields in the Auckland Council region to have installed a hybrid playing surface at the start of 2017

Hybrid hype

Australian-based HG Sports Turf recently completed the construction of two state of the art 'hybrid' grass pitches for Auckland Council, an Australasian first at community level.

In between a hectic schedule of stadium contracts that has seen HG Sports Turf complete Westpac Stadium (Wellington, NZ), AAMI Park (Melbourne) and the new Optus Stadium in Perth, WA, the company also completed the construction of two unique hybrid pitches at Nixon Park and Gribblehirst Park for Auckland Council in New Zealand.

A first in Australasia at community level, Auckland Council has embraced the technology to help fill a gap in its sports field portfolio. Auckland is a city with a population of 1.5 million people and accounts for a third of the New Zealand population. It is rapidly expanding and is expected to grow by more than one million people in the next 20 years.

To be able to cater for this growth and development, Auckland City has a 30-year master plan that balances social, economic, environmental and cultural goals. Within this master plan is a sub-plan for Sports Field Capacity Development. Following an extensive supply and demand study, Auckland Council realised that within 10 years it would have a 3000 hour per week shortfall in the provision of sports fields for sporting activity.

Auckland Council has recognised that investment is required to bridge the gap in this provision. The Sports Field Capacity Development Programme will see upgrades or reconstruction of 106 sand sports pitches, 115 training lights and 21 synthetic or hybrid grass fields over the life of the programme.

Nixon Park (in the Auckland inner suburb of Kingsland) and Gribblehirst Park (Sandringham) were the first recipients to benefit from the programme, with HG Sports Turf installing its Xtragrass Hybrid system on both grounds in the first quarter of 2017.

Both sites are centrally located in character suburbs with very high participation rates. Gribblehirst Park is a single-field sports park and is the home to the Eden Rugby Club. It is a dedicated rugby venue servicing the Eden Rugby Club's 500-plus members. The upgrades to the pitch saw the addition of new drainage, irrigation, sand carpet and lights before the Xtragrass Hybrid system was rolled out on top, infilled with sand and the natural grass established and grown in.

Nixon Park is a multiuse sportsfield with a primary focus on rugby and lacrosse. The ground is extensively used and is a primary training base for Auckland Rugby. Like Gribblehirst Park, the upgrades have seen the addition of new drainage, irrigation, sand carpet and lights, again with the Xtragrass Hybrid system laid on top.

Gribblehirst Park, home to Auckland's Eden Rugby Club, before (right) and during (below) the installation of the HG Sports Turf Xtragrass system

"The upgrades to hybrid technology will see an uplift in capacity of usage from the previous natural turf fields by approximately 70 per cent," says HG Sports Turf general manager of business development Erik Kinlon. "This increased usage, and fields that maintain consistency, safety and are perfectly playable all year round, is a win-win for the community and the local authority. The fact that neither sports field has suffered any lost games or training sessions due to pitch or weather conditions in 2017, in what has been one of the wettest winters on record for Auckland, is a testament to the success of the product."

Xtragrass is a natural grass surface reinforced with artificial fibres, providing the benefits of natural grass playability and a surface that is durable and far more resistant to wear. Developed and refined over the last 12 years, Xtragrass is a patented turf reinforcement hybrid system which provides the flexibility to adapt to the unique differences that exist at every location.

Hybrid grass is becoming a more popular solution for clubs, councils and local authorities that find it difficult to maintain natural turf playing surfaces all year round where high usage and weather can have a major impact.

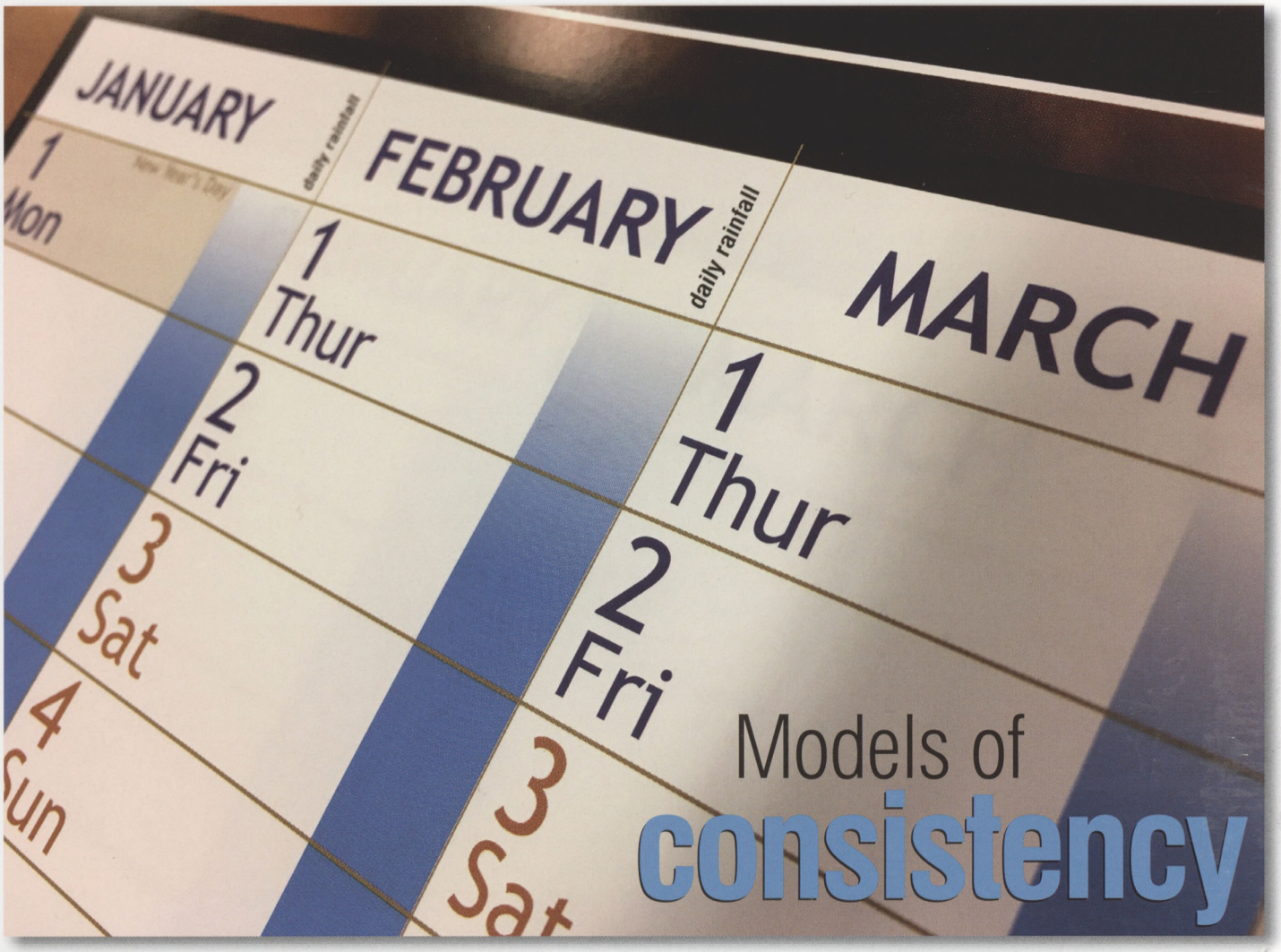
Mark Bowater, head of Auckland Council's Parks Services – Parks, Sport & Recreation, commented: "The installation of hybrid pitches at Nixon Park and Gribblehirst Park in central Auckland has been part of a wider Sports Field Capacity Development Programme run by Auckland Council. The aim of the programme is to increase the playing capacity of the sports field network to enable higher levels of participation and active recreation in response to the needs of a rapidly growing city and region.

"Both Nixon Park and Gribblehirst Park are single-field central city sports parks, in areas of high sports field demand and constrained supply. Hybrid pitch technology was chosen as the preferred method of increasing field playing capacity for a number of reasons:

- As smaller single-field sports parks in older heritage neighbourhoods, synthetic pitches would have had an adverse impact on the character of the park landscapes and their range of active and passive recreational uses;
- The hybrid pitch came at half the cost for two thirds the playing capacity increase of a full synthetic pitch; and
- The hybrid pitch looks like natural grass, and does not require a perimeter fencing.

"Both hybrid pitches were opened for use early in 2017 and have been primarily used during the winter season for rugby union. Both pitches performed very well in terms of drainage, firmness, stability, availability and wear tolerance. Feedback from the resident rugby club and user groups has been positive and encouraging, and there has been a high level of support from the Local Board."

"Hybrid grass is becoming a more popular solution for clubs, councils and local authorities that find it difficult to maintain natural turf playing surfaces all year round where high usage and weather can have a major impact."



Models of consistency

The concept of using Growing Degree Day modelling in Australia continues to gain traction. Over the next two articles ATM looks at the ways superintendents are utilising GDDs to maximise the efficacy of their chemical applications and the improvements they are witnessing in the presentation and health of their playing surfaces.

Lifecycles are an important aspect of turfgrass management whether it is to do with pests, weeds, diseases or the turfgrass itself. Lifecycles are driven by the biological and chemical processes which occur within these organisms. The processes themselves are driven by many factors with temperature being one of the most important.

This correlation with temperature can be used to model and predict the development of certain stages of the lifecycle. In turfgrass management these can help determine the timing of certain chemical applications like plant growth regulators, pre-emergent herbicides or preventative fungicides and insecticides.

Growing Degree Day (GDD) is the term used to describe the method by which the accumulation of temperature can be calculated. The formula for calculating GDD is:

GDD = ((max temperature °C + min temperature °C) ÷ 2) - base temperature °C

This calculation is made daily and the daily values accumulate until a particular target value is reached. In the calculation, the base temperature is normally either -5.6, 0 or 10°C, but varies based on the model. Table 1 below shows an example of GDD calculations based on a 0°C base.

On the first day the daily maximum temperature is 27.2°C and minimum nightly temperature is 14.4°C. The calculation for this day becomes (27.2 + 14.4) ÷ 2 – 0 which equals 20.8. On the second day, the daily maximum is 22.2°C and the minimum is 10°C. The calculation for this day becomes (22.2 + 10) ÷ 2 – 0 which equals 16.1. We add the daily GDD together to get the accumulated GDD total, so after two days the total is 36.9.

TABLE 1. GROWING DEGREE DAYS ACCUMULATED WITH A BASE TEMPERATURE OF 0OC

Date	Temp: High/Low		Daily GDD	YTD GDD
Day 1	27.2°C	14.4°C	20.8	20.8
Day 2	22.2°C	10°C	16.1	36.9
Day 3	22.2°C	7.2°C	14.7	51.6
Day 4	23.3°C	9.4°C	16.35	67.95
Day 5	25.6°C	6.7°C	16.15	84.1

In this example the base temperature is zero, but if the base had been 10°C then our first day calculation would have resulted in a figure of 10.8 (20.8 – 10 = 10.8). Sometimes the calculation will produce a negative value. In GDD calculations there can be no negative numbers and these are treated as zero. So a negative number has no impact on the cumulative total.

GDD calculations are made very easy with the use of computers and spreadsheets. The base numbers are set by the people who have developed the models, with a number of USA universities such as Cornell, Nebraska and Michigan State having developed models for a range of turf management practices. Among the most common areas where GDD modelling has proved to be very effective is in the application of plant growth regulators such as trinexapac-ethyl and paclobutrazol.

To illustrate how a GDD programme would work in practise, take the model for growth regulator application for bentgrass greens as an example. The model has a GDD target of 200 and after the PGR is applied the model starts running. When the GDD accumulation reaches 200 it is time for the next PGR application and after that the model is reset to zero. This means that at higher temperatures the 200GDD target is reached faster and applications are closer together (e.g.: three applications per month), whereas in the cooler months GDD accumulation would be slower and applications further apart (e.g.: two applications per month).

Since weather patterns can vary seasonally and from year to year, GDD can allow turf management professionals to monitor heat accumulation in their area, which translates to the development of the turf. By tracking GDD days, turf managers are able to refine product application timing based on actual weather patterns in their area rather than a pre-determined calendar-based schedule.

GDD models are an excellent tool for maintaining growth regulation in the most efficient way as they remove the guess work out of choosing the optimal time for re-application. It is simple to operate and can be tracked from readily available weather data from onsite weather stations or local weather stations.

MAXX-IMISING EFFICACY

Trinexapac-ethyl (Primo Maxx), an A-class regulator that supresses cell elongation, allows managers to regulate turfgrass growth for 4-6 weeks. In addition, trials have indicated that Primo Maxx increases the quality of surfaces by improving plant density, enhancing colour and assisting in the development of stronger roots.

Modelling of PGRs has shown there is a suppression phase which is followed by a rebound phase. During the rebound phase clipping yields increase above untreated turf clipping yield (see Figure 1). By using GDD turf managers can make applications at timings that maximise the positive effects of Primo Maxx.

The base temperature most often used in calculations for turf is 10°C for warm-season turf and 0°C for cool-season turf. Trial work for threshold limits has been conducted mainly on bentgrass greens with both 100GDD and 200GDD effective as cumulative thresholds (Kreuser, 2015).

With the majority of work to establish thresholds undertaken on bentgrass, other grasses that are more sensitive to trinexapac-ethyl, like hybrid couch greens, will require a different threshold. The 200GDD is a common starting threshold for introducing the GDD model for Primo application. Calibrated thresholds can be achieved through tracking clipping yields.

Research is underway to understand which GDD threshold and base temperature is most appropriate

Far left: By tracking Growing Degree Days, turf managers are able to refine product application timing based on actual weather patterns in their area rather than a pre-determined calendar-based schedule

Above: GDD models are simple to use and can be tracked from readily available weather data from onsite weather stations or local weather stations

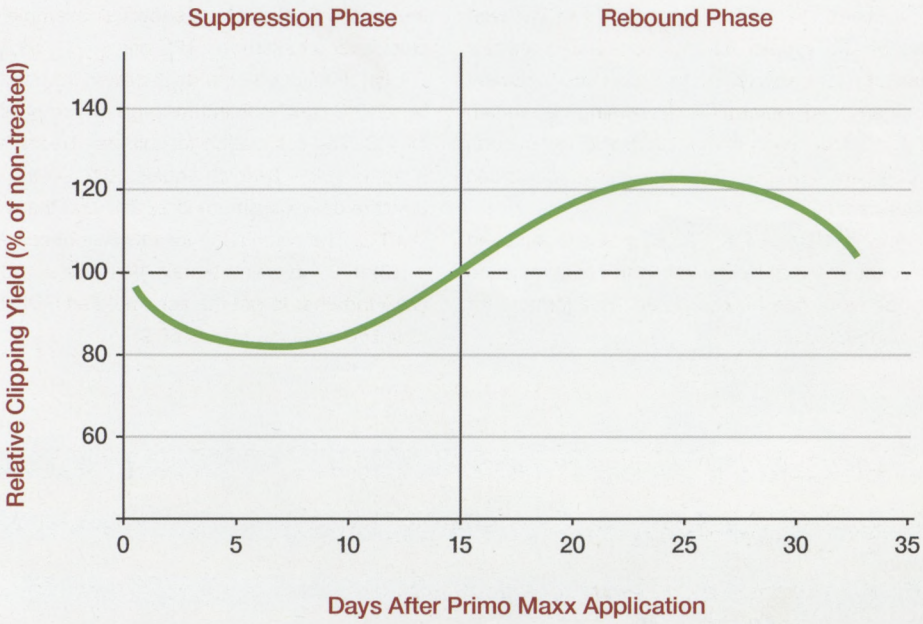
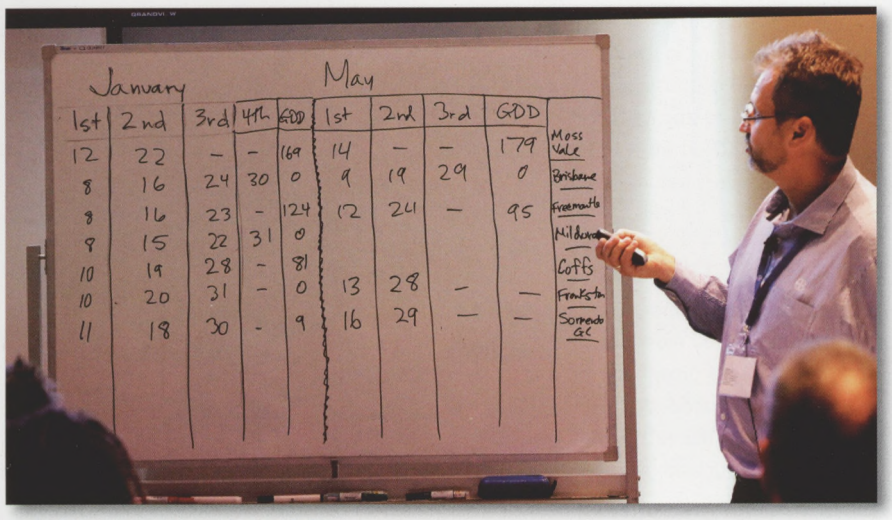


Figure 1. Clipping yield response from Primo Maxx PGR application (modified from Kreuser, 2015)



◀ Jyri Kaapro conducted a workshop on Growing Degree Days at the 2016 Australian Turfgrass Conference in Melbourne

for other grasses including warm-season grasses like couch. Continued development will ensure the most appropriate models are quantified for different turfgrass species to ensure the prevention of over or under application of PGR.

When it comes to GDD models, it is important to remember that although they serve as useful guides, they don't replace scouting techniques or the observations of the turf manager. It is also important to note that for the most accurate GDD data, it's recommended turf managers utilise an on-site weather station. That said, models such as this do serve as a guide to help turf managers compare month over month and year over year. In support of GDD usage, measuring and monitoring clipping yields is an excellent tool to calibrate the use of GDD to each situation. This can be done with the use of an indicator green.

AGRONOMIC STAPLE

For Elanora Country Club superintendent Dan Cook, the concept of applying Primo Maxx using GDD modelling started back in 2009 after speaking to Dr Micah Woods (Asian Turfgrass Centre) while they were both volunteering at the Masters at Augusta National. Cook explains how after monitoring results and finetuning his approach, it has since become a key component of his agronomic programme at the Sydney course…

"Since 2005 I have had several interesting agronomic discussions with Dr Micah Woods in regards to the management of bentgrass in Sydney. These conversations usually revolve around reducing stress on the plant during the summer months. I recall talking to him about the amount of nitrogen required by bentgrass in Sydney which quickly led to a conversation about Primo Maxx and its use.

He had explained to me that there had been much research done in regard to how quickly Primo Maxx is used by the plant depending on air temperature. I had explained that I had always looked at my clipping yield daily and applied Primo at varying rates as required on a 14-day calendar. He asked how I accounted for the hot and cold days or, more to the point, how did I know what or how much Primo was left in the plant, or if the plant ever came out of growth regulation.

After a pimento cheese sandwich and a Masters club during a lunch break at the 2009 US Masters where we were volunteering that year, he explained to me Primo Maxx applications can be calculated using Growing Degree Days. This pricked my ears up as the question I had posed to my staff about clipping yield is usually 'Good morning, how much did you cut off your greens run today?' which was usually answered with either 'The same as yesterday', 'Not much' or 'Heaps!' This proved quite difficult to schedule my Primo rate as the answers were not very definitive.

Dan Cook has successfully employed GDD modelling for Primo applications on his greens at Elanora Country Club over a number of years

Micah had explained using GDD would not let the plant get out of its regulation allowing the effect of the Primo Maxx to be consistent, balancing out the clipping yield while not over-applying and contributing to further summer stress. Simply getting a high clipping yield (not enough Primo) or very little clipping (too much Primo) at any point is not desired.

His very simple explanation was to add the low temperature of the day to the high and divide by two to get the average. Add the average of the days together and when the total gets to a pre-set number reapply Primo. This was a quite simple way to schedule the application of Primo Maxx and I soon adopted this method.

After various trials, it was evident to see that for Elanora's greens (A1 bentgrass) with the fertility that we run (1.2 to 1.6kg N/100m^2/yr) that our 'sweet spot' was 250GDD. This was applying 400ml of Primo Maxx every 250GDD. In summer that can be as few as nine days between applications and in the shoulder seasons it can be as many as 18 days. This proved to be a much more reliable method for scheduling applications and having the desired results in controlling clipping yield to maximise the putting greens performance.

With this method, the Primo Maxx rate stays the same and the time between applications varies. This means the application timing now accounts for cool and warm air temperature variations and is applied just prior to the plant using up or metabolising all of the Primo. Following this we also collect clippings to gain a better understanding of daily yield and track this yield, measuring them in litres.

It would be inconceivable for anyone to think that 250GDD and 400ml of Primo Maxx per application will be perfect for their golf course after reading this, but I do think (and research backs it up) that this method of calculating Primo Maxx application timings can be modified to suit individual sites and grass species. It took one full growing season for me to work out our 'sweet spot' and now it is a staple of our agronomic programme. It may be other sites are on 200 to 400 GDD or the Primo Maxx rate may vary from 200 to 1000ml/ha.

In support of GDD modelling, measuring and monitoring clipping yields is an excellent tool to calibrate the use of GDD to each situation

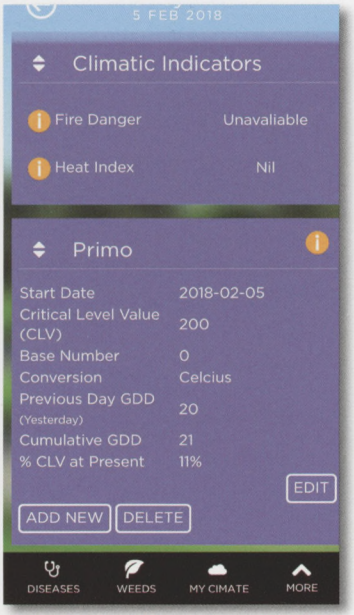
My annual conversations with Micah are always very interesting and in recent years have merged from GDD to Minimum Level for Sustainable Nutrition (MLSN), growth potential (GP) and now topdressing/dusting relative to organic matter production (OMP) and thatch control. I thank Micah for taking time out of his days at Augusta each year to have these agronomic discussions as I find his work fascinating and it has definitely improved the surfaces of the greens at Elanora."

HAPPY, HEALTHY GREENS

Dave Worrad, from AGCSA Trade member company Living Turf, has a number of clients in NSW that are actively utilising GDD models for Primo Maxx applications on their bentgrass/*Poa annua* greens. Here he provides some observations from feedback he has received…

"Those superintendent clients of mine who are using GDD for the timing of Primo Maxx applications all work off a 200GDD/0°C base temperature model. For logistical reasons some don't stick to the 200GDD model exactly. In some cases they can only get their sprayer out on particular days (due to a busy golfing schedule or staffing issues), so in these cases they get as close as they can. Others will apply it weekly, throwing it in with whatever they are applying to the foliage that week; these guys reduce the application rate accordingly.

> "GDD models are an excellent tool for maintaining growth regulation in the most efficient way as they remove the guess work out of choosing the optimal time for re-application."
>
> – MIKE DE LUCA, SYNGENTA



As technology improves, so too does the ease of using GDD models. GDD trackers are now available through smartphone apps such as Living Turf's 'My Climate'

What is important to get your head around is matching the application frequency to the application rate to get the ongoing surface quality/clipping yield they are comfortable with. Every one of my clients applies Primo at a different rate and at different timing intervals. They work out the application rate that achieves the turf growth rate they want based on the application interval. The important thing to success is getting as close to 200GDD as they can.

Regarding rate, I am seeing people using anywhere between 300ml to 1.2L/ha at 7-10 day intervals in summer. As a clipping guide, I suggest working to 1-2 triplex bucket loads per hectare, but it's to each their own re: the turf quality they are looking for.

Most of my clients will not count a day when it gets over 36°C. This isn't an exact science as Bill Kreuser said when we asked him about hot days. His words were "Keep applying at 200GDD during heat unless quality were to decline, then I'd go off". Dr Henk Smith (Living Turf) suggests 36°C but will review at the end of the season. Dr Micah Woods also advises caution during very hot conditions.

Again, the bottom line is the principle of staying close to 200GDD, but not to lose sleep if a few days either side. This approach brings better surfaces than application intervals that stretch to over 14 days through summer. Then if the surfaces start heading south for whatever reason, stop applications until recovery.

Some of the benefits and observations my clients have seen using the GDD model include:

- Clipping yield control allows them to not mow on hot days. Having them under constant regulation allows an acceptable surface.
- Some are able to lift cutting heights by 0.5mm (e.g.: 3mm to 3.5mm) while keeping an equivalent surface quality.
- Slowing leaf growth and reducing the cutting frequency impact reduces turf stress hence less prevalence of disease. As one client observed, last summer his greens were far more resilient compared with the previous summer.

In summary, I like something Micah Woods said to us recently. When average temperatures (i.e.: max + min/2) exceed 25°C, bentgrass/*Poa annua* starts to die. By using Primo to slow growth you slow down the rate at which the turf is dying and hence give turf a better chance of getting through summer. Western Sydney is experiencing a significant increase in days over 35°C since 1970, so anything to counter this stress is highly valuable. Every client I have that approaches Primo application using GDDs has healthier, happier greens, especially over summer."

ACKNOWLEDGEMENTS

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A MORE DISCIPLINED APPROACH

2017 AGCSA Claude Crockford Environmental Award winner Peter Watts has been using GDD modelling for the past three years exclusively for applications of trinexapac-ethyl (Primo Maxx) on Muirfield Golf Club's *Poa annua*/bentgrass greens.

"We use a 200GDD model which was first presented to us by Dr Henk Smith and David Worrad from Living Turf. Henk provided certain assurances in regards to maintaining consistent growth regulation as opposed to the cycle of trinexapac-ethyl 'releasing and recharging' and the effect this has on the plant. The benefits we have witnessed at Muirfield include:

- A flat-lining of growth on the greens from week to week;
- A significantly tighter grass sward;
- From morning to afternoon and day to day, the greens are smoother and faster;
- In periods of extreme weather stress (heat or wet), we are able to modify our mowing practices without comment from the membership; and
- With a restricted labour resource, rolling greens without cutting is a viable option.

Some of the challenges and learnt experiences we have noted over the past three years using GDD modelling include:

- Greens with significant areas of different grass types may find differing growth regulation with each species;
- From speaking with other superintendents, rates of application vary from course to course. This matches discussions with Dr Smith who suggests a range of application rates to suit varied sites. He also suggests building from a lower initial rate;
- Superintendents I have spoken to achieve similar results with programmed applications of trinexapac- ethyl. The GDD model provides more of a disciplined or planned approach to application of PGRs;
- A hiatus to the GDD programme around renovation may be necessary. Initiating the post-renovation GDD programme is dependent on the instincts of the superintendent;
- Greens that appear thin or growing in a hostile environment may necessitate adjustments to a GDD programme;
- When the temperature range is high (summer), applications of trinexapac-ethyl roll around every eight or nine days. Conversely in the cooler months, where the temperature range is small, application timing is every two to three weeks."

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GDD game-changer

PHOTO: GARY LISBON

Course manager Andy Wood has been a big proponent of using Growing Degree Days in the management of *Poa annua* at the world-renowned Kauri Cliffs. The success of his work has encouraged others like Neil Graham and David Warwick to implement similar programmes.

Above: Kauri Cliffs in New Zealand has been using Growing Degree Day modelling for paclobutrazol applications on its greens for the past five years with great success

At Kauri Cliffs in the North Island of New Zealand, we stopped controlling *Poa annua* on all playing surfaces in 2004 and for the following four years no controls were in place. During this period, we even considered trying to speed up the ugly transition process to a full *Poa annua* playing surface by spreading the *Poa* seed around during coring times!

However, in 2008 the decision was made to try and control the *Poa* again but by this stage all the playing surfaces had become so invaded they were between 50-60 per cent *Poa annua*. We looked at all the chemical options available to us at the time which included using endothal, Nominee and plant growth regulators (PGRs).

Another option considered was a staggered resurfacing programme of the greens spread over several years. This, however, was deemed to take too long and without having any spare holes it was considered too disruptive for our high-end, green fee generated golf course.

Therefore, the decision was made to use PGRs. They were considered to be relatively safe to use as far as any potential turf loss was concerned and the transition process back to bentgrass would be gradual.

We had done a lot of work with paclobutrazol over the previous 10 years. The recommended method of application back then was to apply 2 litres per hectare every six weeks alongside a very high nitrogen fertility programme. However, on this application schedule we found that the greens were on a rollercoaster ride. They would look great, then very sickly and then great again depending on when the next paclobutrazol application was due. The other major adverse effect from this programme was a noticeable increase in our organic matter content due to the high nutritional inputs.

In 2009 the recommendations for paclobutrazol use was changed to be used in a 'little and often' scheduling. We immediately switched and were now applying 500ml/ha religiously every 14 calendar days. This new regime did seem to be working with less of a rollercoaster effect on the greens. There was a lot less nutritional input and the *Poa* was constantly regulated.

However, any progress we did make in reducing the *Poa* populations in the growing season seemed to be undone through the winter months when we were not on the programme. It felt like we were starting back at square one again each spring with around the same amount of *Poa* we had the previous season.

In 2013 I was fortunate enough to travel to the Golf Industry Show in San Diego and I chose to attend a one-day seminar on PGRs for fine turf run by Dr Shawn Askew and Dr Erik Ervin (both Virginia Tech). Although I was aware of the concept of Growing Degree Days (GDD), I wasn't totally familiar with how it worked in turf and specifically using PGRs.

During this seminar they took us through all the research data and explained the different rates and timing which had been trialled and which rates worked the best. After the seminar, I was inspired with the knowledge I had gained of exactly how to run a successful PGR programme using the GDD model and decided to put this into effect. I came back to New Zealand and converted all the USA application rates back into our available PGR

active ingredients in New Zealand and immediately implemented a 300GDD programme on our greens and tees surfaces.

After changing to this scientific-based application approach, the results were massively evident within two years. We witnessed the larger, coalesced, dinner plate-sized *Poa* areas breaking up into individual plants with creeping bentgrass growing all through the *Poa*. Within three growing seasons we had converted our 50-60 per cent *Poa annua* greens back to under five per cent *Poa annua*. This was all achieved without any risk of ever losing turf or having one single complaint about the playing condition of the greens.

The GDD programme has been the most dramatic positive change in my turf management career to date and I believe the attached photos of our 3rd green (right) will speak for themselves. This simple scientific-based approach programme is completely safe with no risk of turf suffering or turf loss. On a small scale like greens and tees surfaces it is very affordable and achievable even for a smaller club or facility.

The only adverse side effects that I have witnessed through such a programme is that the *Poa* does tend to set seed more often due to the constant pressure that the PGR puts on the *Poa* plant. I believe this is due to the *Poa* always feeling the pressure that it is going to die so in its natural defence it tends to set seed. To combat this issue, we have just groomed and brushed our greens more often through this seedhead period to try and mask the problem.

Another observation I have made is that with constant paclobutrazol applications it can affect some individual bentgrass plants. These individual patches may stand out typically because of a slightly wider leaf blade. Of our 18 greens this has only been particularly evident on two of them and again can be masked over with more grooming, or you could easily turf doctor the patches out.

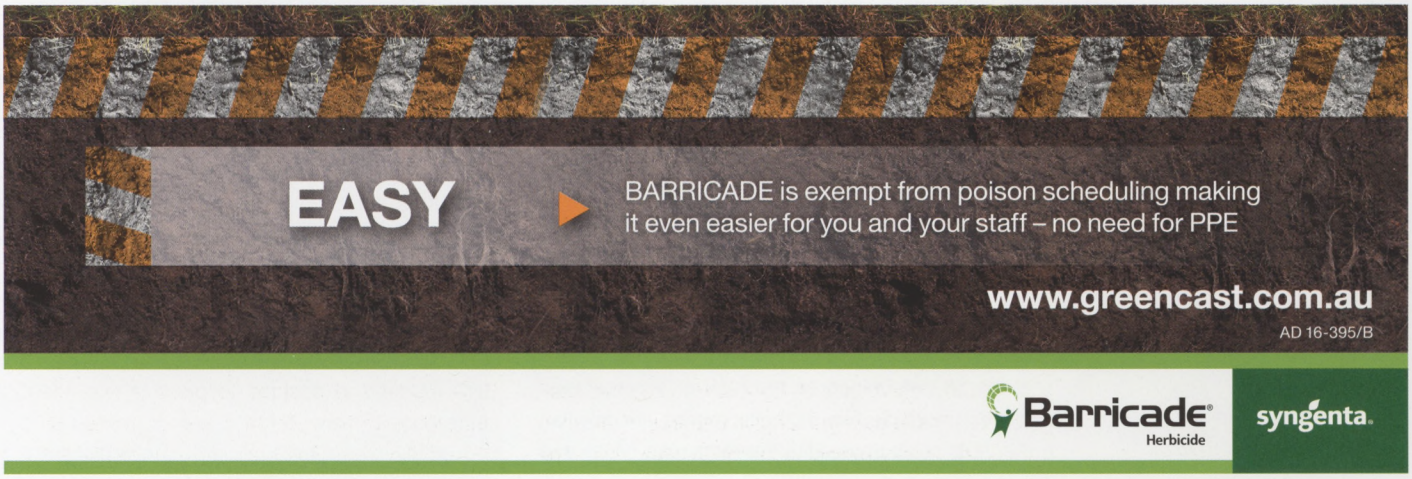
Overall, GDD modelling is an amazing tool that has worked very successfully on our creeping bentgrass greens and tees with very low nitrogen inputs of between 100-120kg/ha/yr. I personally believe this programme would significantly benefit superintendents in the North Island of New Zealand and many parts of Australia such as New South Wales, Victoria, South Australia, Western Australia and Tasmania. My recommendation would be to at least trial a GDD programme using PGRs as the climate in most of these areas is certainly suited to it.

Kauri Cliffs' 3rd green before (top) the implementation of a GDD programme and after (above). Within three growing seasons Wood has seen *Poa annua* populations reduce from 50-60 per cent to under five per cent

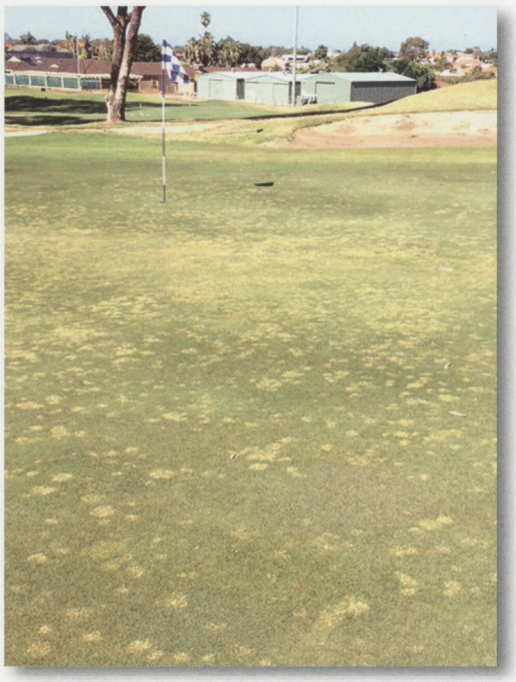
WINNING FORMULA

At Mandurah Country Club south of Perth, WA course superintendent Neil Graham has used GDD modelling for *Poa* control on greens for the last 18 months with excellent results. Here he explains the process:

"The course had minimal *Poa* up until the last eight years when the club started using treated water in a partnership agreement with the Department of Water. A percentage of *Poa* started to transition into the greens and the club were concerned that they may lose the battle to maintain bentgrass greens.



Mandurah CC's *Poa*-infested 9th green in December 2016 at the start of the GDD paclobutrazol applications (right) and as it is today with minimal *Poa* (far right)



> "The GDD programme has been the most dramatic positive change in my turf management career to date."
>
> – ANDY WOOD, KAURI CLIFFS

I started my position as superintendent in January 2016 and was well up for the *Poa* control battle. I started immediately with applications of paclobutrazol at 1L/ha applied at around monthly intervals. While there was suppression I wasn't making any impact on reducing percentages and over winter months the *Poa* was winning the battle.

Some five years ago Andy Wood had mentioned GDD was used by many superintendents but I didn't follow up on any research. However, his recent talk at the 2016 GCSAWA state conference in Margaret River definitely got some interest from local superintendents from his results at Kauri Cliffs.

At the AGCSA conference in June 2016 I attended the GDD workshop conducted by Bayer's Jyri Kaapro. This is one of the best workshops I've attended at a conference and I left with a positive outlook on what I could achieve using GDD. I didn't commence a GDD programme immediately and was using different rates and frequencies depending on what was happening with growth rates.

After greens renovations in September 2016 I implemented a pretty aggressive paclo programme with four applications of Shortstop at 1L/ha over a five-week period. This definitely knocked the *Poa* but was a severe result in terms of the appearance of the surface. After this initial hard hit, I went into the GDD programme using the GDD spreadsheet modelled on a 0°C base. My programme is using 1L/ha every 300GDD days and I'm still using that model with fantastic results.

Over last summer on a number of greens, *Poa* reduced from 50 per cent to around five per cent. In May 2017 we had an agronomy report carried out which included a *Poa* count on some greens on the GDD programme, with the count determined as minimal. We've had three greens of the 18 determined as too high of a percentage to treat in 2017. Two of these greens are now on the GDD programme with the remaining green and putter requiring re-surfacing with bentgrass from our nursery.

In my opinion, GDD modelling gives you a formula to work while still considering the playing surface. As Andy would say, you are after a slow transition and it should be a marathon not a sprint. I think too many of us want to achieve instant results and apply higher rates, get scared and stop applying and apply PGR's with no management plan. We are now using GDD for Primo applications across the course as well and I'm sure we will continue to achieve good results."

ACKNOWLEDGEMENTS

ATM is grateful for the contributions of Neil Graham (Mandurah CC, WA), David Warwick (Avondale GC), and Andy Wood (Kauri Cliffs, NZ) in compiling this article. Andy Wood is happy to be contacted by email andy@kauricliffs.com if readers have any questions or require further clarification as to the GDD programme he uses.

CONSISTENT REGULATION

"I've been using Growing Degree Day modelling at Avondale Golf Club for around 12 months now based on a conversation I had with Andy Wood at the 2016 Australian Turfgrass Conference at Twin Waters. I don't use it for *Poa* control, though I guess I'm getting that by default. It is used for surface preparation in that the paclobutrazol tightens up the bentgrass surface.

I use a 300GDD model and put it out accordingly and have witnessed very consistent growth regulation. I can't say anything regarding *Poa* control as the greens are pure bent. I will continue to use GDD as an ongoing programme based on surface preparation results and the fantastic *Poa* control results observed at other clubs."

- David Warwick

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GROWTH PRODUCTS

Taking the initiative

The third instalment of the AGCSA Future Turf Managers' Initiative, presented in partnership with Textron Golf, will be conducted in late March. ATM profiles the 20 successful Australian and New Zealand candidates who are set to converge on Melbourne.

The opportunity to take the step up from assistant superintendent to superintendent only comes around very rarely, so it's important that when it does you are ready and equipped with the right skills to demonstrate you are capable of making the ultimate move.

For the past two years the AGCSA Future Turf Managers' Initiative, presented in partnership with Gold Partner Textron Golf, has strived to give deserving assistants and senior greenkeeping staff from Australia and New Zealand the tools required to take the exciting, yet daunting, step up the career ladder. The FTMI is set to return for the third time in late March and just as in the previous two years, the calibre of those who have been chosen to attend is simply impressive.

The FTMI kicked off back in 2016 with a total of 13 candidates going through the two-day programme as part of that year's Australian Turfgrass Conference. In 2017 on the Sunshine Coast, the programme was expanded to a total of 20, which included five candidates nominated by the New Zealand Golf Course Superintendents Association (NZGCSA).

Of last year's crop, Tim Hoskinson, formerly assistant superintendent at Paradise Palms Country Club in Cairns, secured the role of course superintendent at Cairns Golf Club shortly afterwards, while two Kiwis also made the big step. Within weeks of attending the Twin Waters conference, Kiel Stechman (Manawatu Golf Club) and George Flynn (Pukekohe Golf Club) were elevated to superintendent roles at their respective clubs.

Twenty candidates, including four nominated by the NZGCSA, will be hoping they emulate their fellow FTMI alumni when they converge on Melbourne from 25-27 March for the 2018 programme. In a change from the first two years, the AGCSA and Textron Golf have decided to take the FTMI outside of the annual conference.

Each candidate was required to submit a detailed application outlining their careers to date, their strengths and weaknesses and why the FTMI would benefit them and their club. Nearly 40 applications were received this year which continues to show just how beneficial initiatives like this are.

This year's successful candidates collectively possess a vast wealth of knowledge and experience. Some have been in the industry for more than two decades, while others have quickly made their way up the ranks. Impressively, six of this year's group have undertaken internships of varying length through The Ohio Program, while a further four have taken a leap of faith and worked overseas at a range of leading facilities, thus broadening their skills across many areas both on and off the course.

One of the endearing aspects of the turf management profession is the willingness of its members to share knowledge, ideas and experiences and it's this aspect that makes the FTMI so rewarding for those chosen. Across an intensive two-day programme, the candidates will not only be immersed in a range of professional development sessions (everything from communication and presentation skills, HR and team management, CV writing and interviewing techniques), they will also be guided by four superintendent mentors. These

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mentors play a key role in the FTMI, providing unique insights from their experiences at the top of their profession and giving the candidates practical advise on how to manage a variety of situations they will likely face.

The AGCSA and Textron Golf is delighted to welcome back mentors Travis Scott (Riversdale Golf Club, Vic) and Leon Hennessy (Cromer Golf Club, NSW) who return for a second year. They will be joined by one of New Zealand's foremost turf managers Leo Barber from Paraparaumu Beach Golf Club. Barber brings the added dimension of having performed the dual role of course superintendent and club general manager at Paraparaumu.

As it does every year ahead of the FTMI, ATM profiles the successful candidates. As you will read, a common denominator among many in this year's group is the willingness over their careers to challenge themselves and take themselves out of their comfort zone. Doing so again in Melbourne will be…

CRAIG ANTHONY

Royal Melbourne GC, Vic

Australia's top ranked golf course isn't a bad place to ply your turf management career and for Craig Anthony he has called sandbelt icon Royal Melbourne home since arriving from Gippsland as an apprentice in 2004. In 2008 he was promoted to spray technician before being elevated to foreman and then assistant superintendent of the East Course in January 2015 where he now oversees a crew of 16 staff.

During his time at Royal Melbourne, Anthony has been involved in a slew of major projects, including the full irrigation system upgrade to both courses and West course resurfacing, as well as playing a key role in preparing the Composite Course for the 2011 Presidents Cup and 2013 World Cup. In 2016, with the support of the club, he travelled to the USA and volunteered for two weeks at US Open host venue Oakmont Country Club. During that trip he also visited other highly regarded golf courses such as Pine Valley, Shinnecock Hills, National Golf Links of America, Merion and Sebonack.

BRADLEY AYRES

The Grange GC, SA

Brad Ayres could not have wished for a better introduction to his career as a turf manager. Starting his apprenticeship at Adelaide Oval in 2003, Ayres learnt off one of the best in the business in Les Burdett. Throughout his employment with SACA, Ayres developed a keen interest in sports turf management and went on to gain a position at Westminster School where he was responsible for the management of their extensive sports turf surfaces.

In 2007 Ayres changed tack and joined the crew of The Grange Golf Club as a qualified greenkeeper. Over the course of the next decade, Ayres' exemplary work ethic and loyalty saw him rise up the ranks to his current role of assistant superintendent. Since this appointment, Ayres has been responsible for assisting with the organisation and implementation of daily work schedules across The Grange's East and West courses for up to 22 staff. The highlight of Ayres' career to date was helping prepare the West course for the 2016 ISPS Handa Women's Australian Open.

JEREMY CLARKE

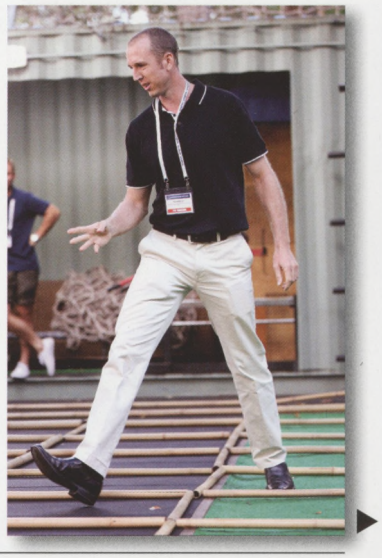
Peninsula Kingswood CGC, Vic

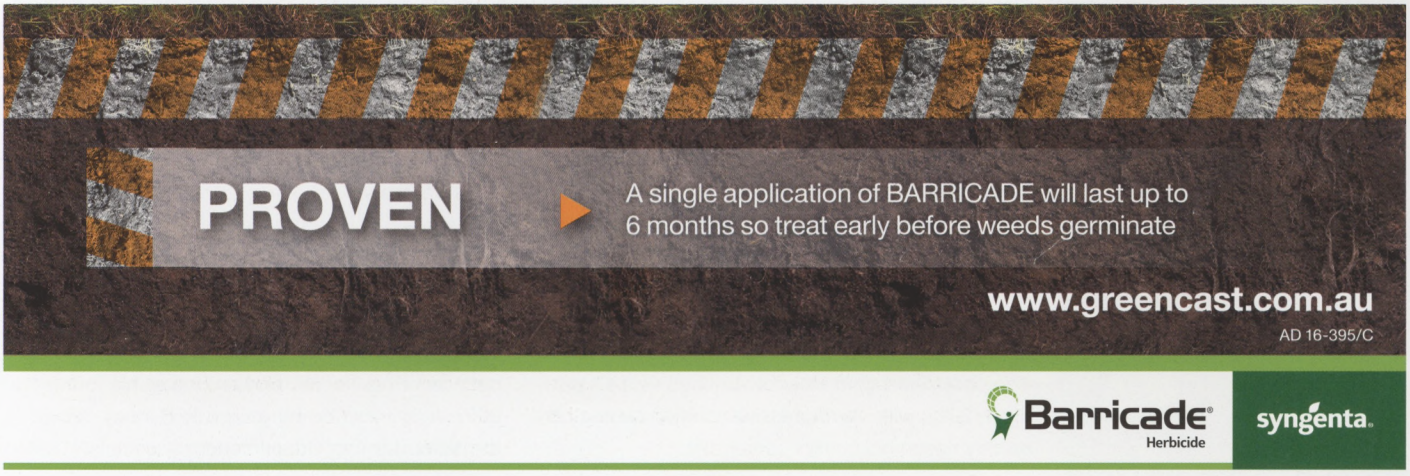
A love for Melbourne's sandbelt courses brought New Zealander Jeremy Clarke across the Tasman in May 2016 to pursue his dream of furthering his turf management career and becoming a course superintendent. Originally from Christchurch, the 28-year-old is a passionate golfer and during his career to date has been involved in three course redevelopments, including the role of grow-in superintendent.

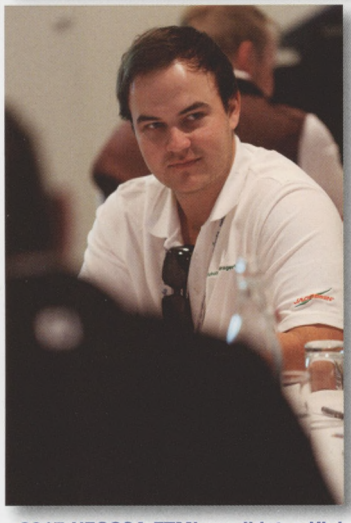
Arriving in Melbourne, Clarke joined the team at Peninsula Kingswood Country Golf Club as a qualified turf tradesperson and quickly established himself in superintendent Glenn Stuart's team. So much so, after eight months he was promoted to the foreman's role of the South course. Clarke has also impressed off the course, receiving the VGCSA's Second Year Scholarship Award for excelling in the

Opposite page: In 2017, the FTMI was expanded to include five NZGCSA candidates, among them Pakuranga Country Club assistant superintendent Lance Morrin. Four NZGCSA candidates are part of the 2018 intake

Shortly after attending the 2017 FTMI, Tim Hoskinson was successful in gaining his first superintendent role at Cairns Golf Club

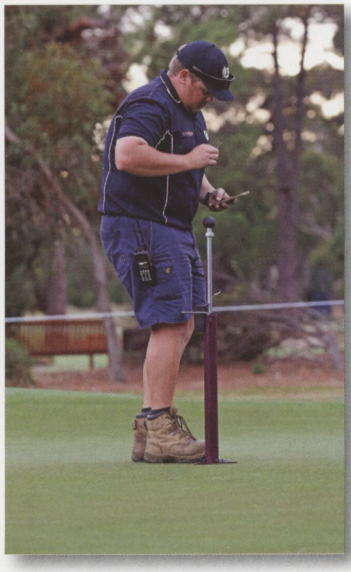






2017 NZGCSA FTMI candidates Kiel Stechman (top, middle) and George Flynn (above) were also elevated from assistant superintendent to superintendent roles at their respective clubs

The Grange's Brad Ayres played a key role in the club's hosting of the 2016 ISPS Handa Women's Australian Open



first year of his Diploma in Sports Turf Management studies. This involved being nominated by his tutors, followed by a presentation to a VGCSA judging panel on the importance of further study and the future of the turf industry.

ADAM FRY

Kooyonga GC, SA

A love of cricket propelled a young Adam Fry into the world of greenkeeping. With his family heavily involved in the local Adelaide cricket scene, by the age of 13 Fry was already rolling and preparing wickets. From this he moved into golf course management and completed his Certificate II and III while at The Grange Golf Club, during which time he was part of the crew that prepared the course for the 2008 World Amateur Golf Championships. After completing his studies in 2010, Fry broadened his horizons and undertook an internship through The Ohio Program. He was stationed at Harbour Town Golf Links in South Carolina for 12 months and experienced two US PGA Tour events.

Returning to Australia, Fry was quickly snapped up again by The Grange as leading hand and played a major role in the redevelopment of the East Course under the auspices of Greg Norman Golf Design. In 2012 Fry accepted the role of assistant superintendent at another of Adelaide's prestigious clubs Kooyonga, initially under superintendent Steven Newell and now his former boss at The Grange Richard James. This February will see Fry play a significant role as the course hosts the 2018 ISPS Handa Women's Australian Open.

MICHAEL GIAMBOI

Meadow Springs G&CC, WA

Meadow Springs course superintendent Greg Simmonds has been in the industry long enough to recognise talent and in irrigation technician Michael Giamboi he has one of the most capable greenkeepers he has mentored in his 30 years. Having no previous experience working on golf courses or in the turf industry, Giamboi started his apprenticeship at Meadow Springs as a 17-year-old in 2012, with his impressive acumen seeing him quickly rise to his current senior role.

Among his career highlights to date include collecting the 2015 TAFE Apprentice of the Year Award, beating home a strong field of 10 fellow apprentices. In addition to his irrigation tech role, Giamboi has also been involved in Meadow Springs' major course renovations, including reconstructing an entire par three fairway.

BENJAMIN HARDIE

Portland GC, Vic

Benjamin Hardie has greenkeeping in his blood. The 31-year-old grew up on and around golf courses with his dad a greenkeeper for the best part of 25 years. Hardie embarked on his career with an apprenticeship at Sydney's Carnarvon GC before moving to Melbourne and The Heritage Golf & Country Club. Working under the likes of superintendent Sam Myott and assistants Peter Cawsey and Dean Lewis, Hardie credits those gents with helping to shape his turf management skills.

From Heritage, Hardie was then involved with the construction of Ocean Dunes on King Island as part of the McMahons team, one of the biggest highlights of his career to date. With some invaluable construction experience under his belt, in the latter half of 2017 Hardie moved with his young family to Portland, Victoria where he is now enjoying the challenges of his first superintendent posting.

MARK HOLMES

The National GC (Long Island), Vic

A keen sportsman from a young age, Mark Holmes' interest in the turf industry began long before his career actually did. Holmes completed his apprenticeship at The National Golf Club on Victoria's Mornington Peninsula and after six years there moved to Ballarat where he curated the many sporting fields of St. Patrick's College. After five years in that role he moved back to Melbourne, joining the crew at Royal Melbourne for a two year period, during which time he was involved in the 2011 Presidents Cup and 2012 Women's Australian Open.

Wanting a more senior role, Holmes was successful in becoming foreman at Patterson River in 2013 and within 18 months was promoted to assistant. In 2015, he returned to The National and is now foreman at the club's Long Island course. In addition to the career highlight Presidents Cup, Holmes was also a volunteer at the 2013 Australian Open at Royal Sydney and the 2014 Masters at Metropolitan.

IAN HOWELL

The Ridge GC, NSW

Ian Howell has experienced much of what the turf industry can offer in the first decade of his career. Howell began his journey in 2007 at Sylvania Bowling Club in Sydney, receiving the NSW Bowling Greenkeepers Association award

for the highest pass by a lawn bowls greenkeeper. In 2012 he packed his bags for London, landing the assistant ground manger role at Richmond Athletics Association, home to the Championship level London Scottish Rugby Club. A year later he was preparing wickets and rugby and football pitches at the prestigious Latymer Upper School which is used as a training base for many elite rugby teams including the All Blacks, Wallabies, Springboks, British & Irish Lions and the Barbarians.

Returning to Sydney in 2014, Howell started as a greenkeeper at The Ridge Golf Club with Programmed Turnpoint and has since gone on to complete the Certificate IV and Diploma of Sports Turf Management courses. He received distinctions for both and also won the Sports Turf Association's award for the highest pass in the Diploma course. Within a year of starting at The Ridge, Howell progressed to 3IC and another 12 months later was appointed assistant superintendent.

GARETH KELLY

Royal Hobart GC, Tas

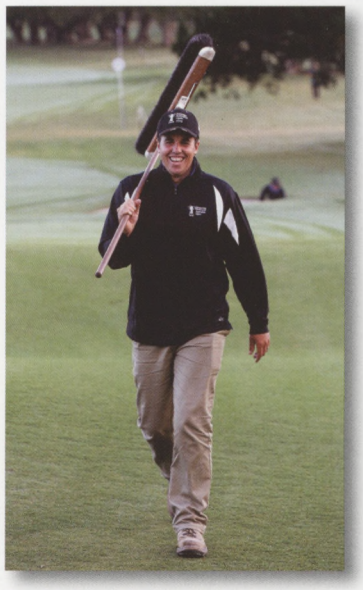
Royal Hobart Golf Club has become a second home for Gareth Kelly over the past 25 years. Kelly started his work life as a panel beater, completing a four year apprenticeship before undertaking some voluntary course work at Royal Hobart Golf Club. He was duly offered a full-time role in 1992 and has been there ever since, rising to the role of assistant superintendent for the past 12 years. Encouraged by superintendent Steve Lewis to broaden his skills, Kelly undertook both the Certificate IV and Diploma of Sports Turf Management courses, the latter of which he completed in 2015.

NATHAN LINDSAY

Hamilton Island GC, Qld

Nathan Lindsay undertook his apprenticeship at St Michael's Golf Club in Sydney, completing his trade certificate as well as the Certificate IV and Diploma in Sports Turf Management courses and Certificate III in Landscape Construction during his eight years there. During his last three years at the club he held the role of 3IC/irrigation and spray technician before deciding to test the waters overseas by taking on an internship through The Ohio Program. While in the US he spent six months each at Kirtland Country Club (Cleveland, Ohio), The Club of Mediterra (Naples, Florida) and The Broadmoor Resort (Colorado Springs, Colorado).

Following his internship he landed in New Zealand as a seasonal greenkeeper for six months at Cape Kidnappers. That was followed by another seasonal greenkeeping position at St Andrews Links in Scotland working on the New and Jubilee courses during the 2015 summer when The Open Championship was hosted on the Old Course.



The National's Mark Holmes was a course volunteer at the 2013 Emirates Australian Open at Royal Sydney

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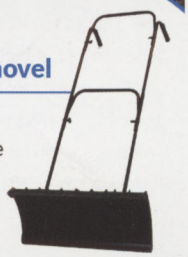

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FTMI candidates are put through an intensive two-day programme of workshops and personal development sessions

Before completing his time at St Andrews, Lindsay was fortunate enough to be appointed assistant superintendent at Hamilton Island Golf Club in Queensland, a position that he has currently held for the past two years. The club recently hosted the PGA Professionals Championship in early November.

BLAINE KNOX

Palm Meadows GC, Qld

Blaine Knox joins the 2018 AGCSA FTMI fresh from having been on the crew at Liberty National Golf Club for the 2017 Presidents Cup. Knox is currently the assistant superintendent at Palm Meadows Golf Course on the Gold Coast and has experienced a lot in just his nine years in the industry. Knox started as a casual groundsman at Ipswich Golf Club and straight away found a passion for the industry. Going on to complete his apprenticeship at Sanctuary Cove Golf & Country Club, Knox then took up an internship at Liberty National through The Ohio Program.

Returning from the US, Knox joined Palm Meadows and took on the role of assistant superintendent in what he rates as his career highlight to date. In addition to that, Knox rates his time spent volunteering at major tournaments, among them the 2014 Emirates Australian Open, the Australian PGA Championship, The Barclays and 2017 Presidents Cup, as memorable highlights.

NZGCSA FTMI CANDIDATES

ANDRE ARTHUR

Kauri Cliffs, NZ

Arthur completed his apprenticeship at Tauranga Golf Club, NZ in 2006 and immediately decided to take his trade overseas. He would end up spending a total of nine years overseas, working in various countries including Australia, Sweden, the UK and The Netherlands. This was an invaluable experience at such an early stage of his turf management career and exposed him to all levels of golf course management, working for clubs with as many as 35 staff and as low as three.

Major highlights while overseas included working at the prestigious Sunningdale Golf Club in the UK during which time he was involved in preparations for the Senior British Open. Another was working at the European Tour's Turkish Open. While overseas, Arthur worked his way up to a deputy head greenkeeper position at Roehampton Golf Club in London which he held for two years before deciding to return to New Zealand. After a number of short-term roles in Auckland, in November 2016 he was appointed as course foreman at Kauri Cliffs.

SAM DAVIS

The Hills GC, NZ

A love for golf since the age of 10 and a promising career as an amateur helped propel Sam Davis into the turf management profession. For a five year period Davis was a member of the Bay of Plenty Interprovincial Men's team, captaining it for three of those years and being a part of the winning team in 2012. It was while playing full-time that Davis took on a summer seasonal role at Omanu Golf Course over a two year period before joining Tauranga Golf Club part-time as an unqualified greenkeeper.

That part-time role turned into an apprenticeship and in 2016 Davis was awarded the Central North Island Turf Managers Association Trainee of the Year Award which afforded him the opportunity to work at the 2016 New Zealand Open at The Hills in Queenstown. Davis made such an impression on general manager and former superintendent Brendan Allen during that tournament that he offered him a job on the last day, with Davis going on to complete his apprenticeship there. Upon finishing his apprenticeship, Davis was selected to participate in the 2017 New Zealand Industry Award Exam and currently holds a team leader position on The Hills crew where he is responsible for managing a weekend crew of seven staff.

PETER MCNAMARA

The Brisbane GC, Qld

Hailing from Grafton in northern NSW, Peter McNamara started his apprenticeship at the Clarence River Jockey Club. In 2010 he headed north of the border and finished the final two years of his studies at Indooroopilly Golf Club. In September 2012 McNamara was successful in gaining an internship through The Ohio Program and was placed in South Carolina where he worked two PGA Tour events at Harbour Town Golf Links and Sea Island Golf Club.

Returning to Australia in 2013, McNamara landed at Brisbane Golf Club where he has risen to be the current assistant superintendent. During his time at Brisbane he has played a major role in the club resurfacing all 21 greens as well as two practice precincts to Champion bermudagrass, the first club in Australia to use the hybrid variety. McNamara has also assisted in preparing the course for the hosting of two Queensland Opens in 2016 and 2017. He also volunteered at the 2015 Australian PGA Championships at RACV Royal Pines Resort.

CHRISTOPHER MITCHELL

Sanctuary Cove G&CC, Qld

Cabarita Beach Bowls Club would be the launching point for Christopher Mitchell's turf management apprenticeship under head greenkeeper Max Whatman. Once completing his trade certificate, Mitchell was fortunate to obtain a greenkeepers position and an introduction to the golf course industry at Lakelands Golf Club under then superintendent Darren Moore. When Moore left Lakelands in 2006, Phil Soegaard was appointed superintendent and he duly promoted Mitchell to the role of course foreman.

Working closely with Soegaard, Mitchell spent the next nine years learning and progressing his knowledge in all aspects of the turf management industry. In 2014 he completed the Diploma of Sports Turf Management through Ryde TAFE, receiving a recognition award for the highest pass mark at distinction level for the year. In 2015, after feeling it was time to further his career and bolster his management experience, Mitchell contacted

Paul McLean at Sanctuary Cove Golf & Country Club. Employed as second golf course assistant superintendent, Mitchell worked under Brock Agnew who was in the inaugural FTMI intake back in 2016. In recent times Mitchell has been appointed assistant superintendent of the Palms course following an internal restructure and was a course volunteer at the 2016 Emirates Australian Open at Royal Sydney Golf Club.

SHAUN PAGE

Southern GC, Vic

An AFL SportsReady Traineeship at Melbourne's prestigious Yarra Yarra Golf Club gave Shaun Page his break into the turf management profession. After being presented with the NMIT AFL SportsReady Trainee of the Year Award, Page continued on with an apprenticeship at Yarra Yarra which he completed in 2008. Page continued to rise through the ranks at Yarra Yarra, progressing to foreman and spray technician and eventually assistant superintendent. He completed his Diploma in Sports Turf Management in 2012 and rates as one of his highlights helping prepare Yarra Yarra for three Masters of the Amateurs tournaments.

After 10 years of service at Yarra Yarra, Page made the move to Southern Golf Club as foreman. Once again this was a great opportunity for him to learn at another golf course as well as being able to take his experiences from Yarra Yarra. Within a year he was promoted to his current role of assistant superintendent.

RHETT PINDER

Club Mandalay, Vic

Rhett Pinder has been involved in the turf industry since he was 16, assisting his brother, an apprentice groundsman at the time, on weekends with the grounds and cricket wickets at Melbourne's Ivanhoe Grammar School. With a passion for sport, particularly cricket and golf from a young age, Pinder could not envisage himself working in any other industry and duly took on an apprenticeship at Ivanhoe Golf Course in January 2007. Quickly realising the opportunities the industry presented to work overseas, Pinder enquired about working in the UK, at Lords and Wimbledon. While Wimbledon was unsuccessful, he had a response from Lords and within a matter of weeks was offered a position on the groundstaff for the English summer starting in March 2013.

During his season at Lords, Pinder helped prepare wickets for the 2013 Ashes Series and the 200th MCC Anniversary game between the Rest of the World team (captained by Shane Warne) and the MCC team (captained by Sachin Tendulkar).

Blaine Knox was among a strong contingent of Australian course volunteers at the 2017 Presidents Cup at Liberty National Golf Club, USA

Cromer Golf Club's Leon Hennessy returns as one of four superintendent mentors for the 2018 FTMI ▶

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Christopher Mitchell, pictured volunteering at the 2016 Emirates Australian Open, has recently taken on the assistant superintendent role of the Palms course at Sanctuary Cove

NZGCSA FTMI CANDIDATES

BENJAMIN FINN

Paraparaumu Beach GC, NZ

Growing up in New Zealand's southernmost city Invercargill, Ben Finn completed a Bachelor of Physical Education degree at the University of Otago before jetting off on a two-year 'overseas experience' to South America. Arriving back home and with nothing to come back to, it was some inspiration for his brother Corey, a greenkeeper himself, who encouraged him to apply for an apprenticeship at the spiritual home of New Zealand golf – Paraparaumu. After a Skype interview from a Wanaka internet café with Leo Barber, Finn was offered the job, swiftly moved north and fell in love with the course.

Upon completing his apprenticeship, Finn successfully gained an 18-month placement at Quail Hollow through The Ohio Program. During that time he experienced major course redevelopment work including re-grassing greens, tees and approaches. All bunkers were renovated and four new holes were designed and constructed. Finn also got the opportunity to work two PGA Tour events and a PGA Championship while there. Just prior to his internship finishing Finn was offered the role of head greenkeeper at Paraparaumu Beach Golf Club.

YANNICK WEBER

Cape Kidnappers, NZ

The last of the four NZGCSA candidates, Yannick Weber can certainly boast one of the more interesting backstories of all this year's FTMI candidates. Born in Zurich, Switzerland to a British father and Swiss mother, Weber grew up in the country's famed alpine region and after a brief stint as a commercial clerk undertook mandatory military service. After fulfilling that requirement Weber, went through three years of education to become a Swiss national snowboard instructor.

In June 2007 Weber was given the chance to work as an assistant greenkeeper at Golfpark Nuolen and from there he was hooked. After two years of work experience he undertook the Scottish Vocational Qualification Level 2 in Sports Turf, Greenkeeping (2009-2011) at SRUC Elmwood College and was awarded Student of the Year two years in a row. Weber followed that up with a Higher National Certificate in Golf Course Management at the same college.

With contacts gained through attending the annual BIGGA conference, in the summer of 2014/2015 Weber journeyed to New Zealand to take on a seasonal role at Cape Kidnappers. Upon returning to Switzerland he was promoted to assistant superintendent at Golfpark Nuolen during which time he attended the Golf Industry Show in San Diego. Having had a taste of working overseas, Weber was drawn back south when the assistant superintendent role at Cape Kidnappers became available, with superintendent Brad Sim snapping up the former seasonal employee in December 2016. Weber says to now be leading the crew of 13 there with Sim to manicure one of the world's best courses is like living a dream.

Pinder's desire to learn and experience different areas of the industry also led him to volunteer at the Fiji International (Natadola Bay) in October 2016 and at the 2017 Emirates Australian Open at The Australian Golf Club.

GREG SMITH

Muirfield GC, NSW

Greg Smith cut his teeth as an apprentice at North Ryde Golf Club, located in Sydney's northern suburbs, and would end up spending seven years there before moving across to Pennant Hills Golf Club under superintendent Richard Kirkby. His next move was overseas, taking up an internship through The Ohio Program, including a 12-month placement at the 36-hole Jack Nicklaus-designed Bear Lakes Country Club in Florida. During his time at Bear Lakes he was part of the crew that prepared the facility for the PGA Tour's 2001 Q-School tournament.

Returning to Australia, Smith continued his career at Camden Lakeside Country Club and Strathfield Golf Club, before securing the assistant superintendent position at Muirfield Golf Club, a position he has held for the past 11 years.

Peter McNamara is the current assistant superintendent at Brisbane Golf Club

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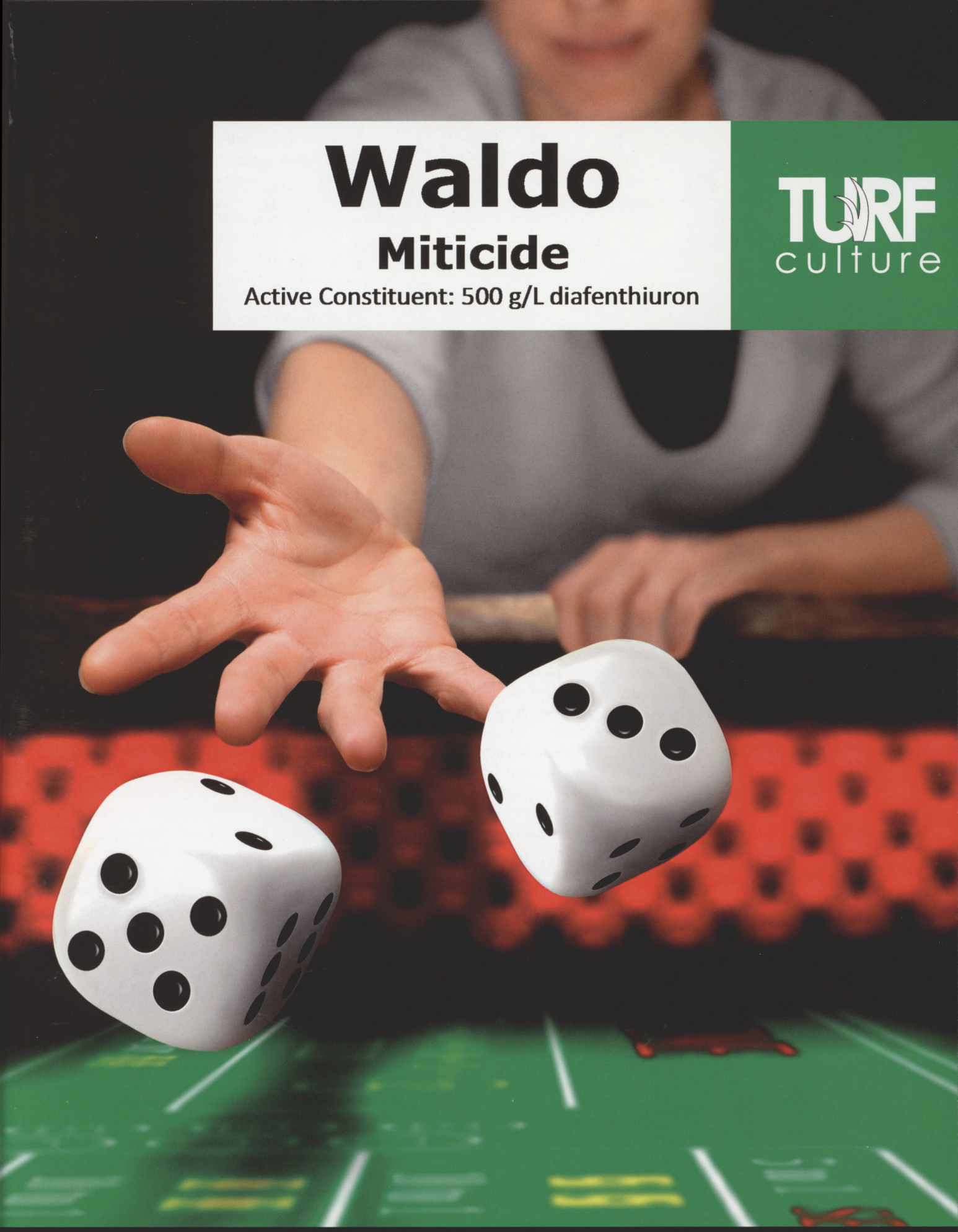

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Take the safe bet, Waldo Miticide

Links foreman Jon-Paul Wood gives the Royal Sydney trial green its first cut 27 days after seeding. The green comprises two different turf varieties, two different rootzones and, in an Australian first, a SubAir Systems unit

PHOTOS COURTESY OF GARY BEEHAG AND ROYAL SYDNEY GOLF CLUB

Royal Sydney gets air

With an impending redevelopment not far off, Gary Beehag writes that Royal Sydney Golf Club has constructed a trial green which includes the installation of the first fully integrated SubAir Systems unit in Australia.

In late 2017, Royal Sydney Golf Club completed the construction of a unique trial golf green as it gets prepared to undergo a major course redevelopment in the coming years. The purposely-specified profile has been designed and constructed to evaluate two bentgrass varieties across two different rootzone profiles, but it is what's beneath the surface that makes this green unlike any other in the country.

In what is a first for Australia, the Royal Sydney trial green has incorporated SubAir Systems' (USA) technology of surface and sub-surface aeration and moisture management. The green represents the first fully integrated SubAir Systems installation to comprise a permanently installed, below-ground blower and vacuum pump and computer unit for a golf green in Australia.

The trial green had its origins not long after Royal Sydney Golf Club announced in August 2016 that it had appointed leading international golf course architect Gil Hanse to oversee changes to the course. Hanse has been charged with revitalising both the Championship course and the nine-hole Centenary course in what will be one of the most significant overhauls the club has witnessed in its long and proud history.

As with any impending redevelopment comes the opportunity to examine new methods of construction, new turf varieties, new profile materials and new management practices, all with the distinct goal of providing the best possible surfaces for the members. With this at the forefront of his mind, then Royal Sydney course superintendent Steve Marsden initiated the design and construction concept of a trial golf green, with the plan to evaluate and then implement the most successful combination of grass, soil and technology across the club's two golf courses.

"The Championship Course putting greens have performed very well, however, we wanted to be able to provide firmer putting surfaces and improve moisture retention," says Marsden, who left the club in late January 2018 to return to his native New Zealand. "Pure Distinction and an A1/A4 blend were the two bentgrass cultivars that we selected to trial."

For this ground-breaking project, Royal Sydney appointed Melbourne-based consulting agronomist John Neylan to document the physical and performance specifications of the rootzone sands and the green's profile following an exhaustive investigation and evaluation process of potential sand types.

"The club has invested considerable research, time and money into this project to maximise the knowledge and performance outcome," says Marsden. "The original intention was to construct this trial green with a University of California profile because of the natural sand throughout the

The formed sub-base, partially installed drainage aggregate, central main drainage pipe and lateral pipe spacing connectors

course. However, wanting to utilise SubAir Systems technology with its perforated, internal pipework required sourcing, testing and installation of a clean gravel over the entire sub-base and an envelope around all internal pipework."

Golf Shapes (NSW) was appointed to construct the trial green, manage the production and quality control processes as well as to procure the associated internal (perforated) and external pipework and fittings required for the installation of the SubAir Systems unit. The club imported the SubAir Systems main pump and blower unit direct from the US manufacturer, with Royal Sydney's Turf Care team installing the internal and external drainage pipework and external irrigation pipes, fittings and sprinklers.

The internal pipework to facilitate the SubAir Systems consists of a large-diameter perforated pipe enveloped in gravel through the centre of the trial green

PROFILE DESIGN

The trial green is oval-shaped in area and measures approximately 600 square metres. Planning for the green began in early 2017. The site chosen by Marsden was one of club's two practice chipping greens positioned on elevated ground east of the majestic clubhouse. The profile design of the green is based on the proven perched water table (PWT) concept of rootzone sand above a gravel layer.

The trial green was constructed atop a compacted sandy loam base. The internal pipework to facilitate the SubAir Systems consists of a large-diameter perforated pipe enveloped in gravel through the centre of the green. The trial green is divided into two zones, using a plastic vertical barrier physically separating the two rootzone sands.

A total of 22 possible sand types were sourced by Neylan and Marsden from sand quarries located around the Greater Sydney, Newcastle and Canberra regions. Following initial laboratory testing conducted by Melbourne-based company Ground Science, Marsden and Neylan decided to further evaluate just two sand types for the trial green. Concurrent to sand testing, four potential basalt gravels sourced by Golf Shapes from several gravel quarries around Greater Sydney were also tested by Ground Science.

Spreading of one of the imported sands onto one half of the green's drainage layer

Laboratory analyses conducted on all tested sands included particle size distribution and associated hydrological properties, including their comparative abilities to transmit and retain moisture. In addition to the laboratory analyses, a series of small scale test profiles were established in large 50-litre containers so that the moisture retention characteristics and surface hardness could be evaluated during the wetting and drying cycle. Once all of this information was reviewed and assessed, two different physical and performance specifications were documented by Neylan for two rootzone sand types from two different sand quarries.

SAND AND GRAVEL QUALITY MANAGEMENT

Quality assurance and control for the rootzone sands and drainage gravel was the responsibility of Golf Shapes. Pilot and production stockpiles at the two respective sand quarries were produced for sample testing by Ground Science and final approval by Marsden and Neylan. Considerable internal testing by the respective sand quarries in conjunction with external testing resulted in compliance to the technical specifications.

Potential gravels sourced by Golf Shapes from a number of gravel quarries were likewise tested by Ground Science for final approval by Marsden and Neylan. One of the technical challenges was to obtain one gravel type with a particle grading that proved compatible with both rootzone sands, based on their respective grading.

The entire process of quality planning, assurance and control was controlled by a detailed Quality Management Plan (QMP) documented by Golf Shapes that included an Inspection and Test Plan (ITP) approved by Marsden.

TRIAL GREEN CONSTRUCTION

Construction of the trial green began in August 2017. Royal Sydney groundstaff located then disconnected all existing irrigation pipework and control valves and removed all existing sprinklers. All electrical 240-volt cables and associated wiring was disconnected by a qualified electrician. The entire area encompassing the trial green and surrounds was defined and all existing turfgrass was removed then discarded.

The entire site for the trial green and surrounds was re-shaped by excavating then stockpiling sand from the old green and sandy loam beneath the apron. The sandy loam varied in colour from off-white to light-grey because of varying organic content, typical of coastal sands in Sydney's eastern suburbs. Natural coastal sands can prove problematic for putting green construction because of their propensity to be water repellent.

Design of the trial green's profile necessitated 'shelling-out' its shape to a nominated depth below the formed apron to allow for the combined depths of drainage gravel and each rootzone sand above the compacted, sandy loam sub-base.

Installation of internal drainage pipework commenced with mechanical excavation of the centrally-located, main trench to facilitate a 150mm diameter, perforated, sewer-grade PVC smooth-bore drainage pipe. Extensions of this main pipe at both ends beneath the formed apron subsequently formed the drainage outlet pipe (low side) and air-suction pipe (high side) for the SubAir Systems unit.

A herringbone system of lateral drainage trenches was subsequently excavated at four metre centres to facilitate installation of the 100mm diameter perforated polypropylene drainage pipes. Special connectors joined the centre main to all lateral pipes. In addition, a sub-base trench encircling the entire green was carefully excavated by course groundstaff to facilitate an additional 100mm perforated polypropylene perimeter pipe. Installation and connection of the perimeter drainage pipe was crucial to facilitate efficient movement thus equalisation of air under pressure throughout the entire drainage-air pipe system.

A tested and approved crushed, drainage aggregate sourced from a basalt rock quarry was carefully placed to envelope the main and lateral drainage-air pipe system. Installation, spreading and levelling of the drainage aggregate and each rootzone sand to its nominated depth either side of the vertical barrier was achieved using Golf

The vertical barrier separating each sand type and around the entire trial green site

Shapes' unique Komatsu 360° tracked dumpster. Consistency of depth of the levelled drainage gravel and each rootzone sand was checked to ensure adherence to the nominated specification. Completion of construction of the green was achieved in late September.

A key feature of this trial green is the different depths of each rootzone sand, as nominated by Neylan, based on their documented specification of particle size, hydrological properties and their theoretical depth as determined by plotting of their moisture characteristic curves.

SUBAIR SYSTEMS INFRASTRUCTURE

At the heart of the SubAir Systems technology is a 240-volt electric, combination blower and vacuum pump unit. The unit has a 7.5hp (USA) pump with an air flow capacity of 1200 cubic feet (approximately 34 cubic meters) per minute.

The combination pump unit can be programmed to either force atmospheric air from an externally-located intake port upward into the rootzone sand (pressure mode) or extract rootzone gases and excess water downward from the rootzone (vacuum mode) utilising internal and external pipework. Sensors to automatically monitor moisture, salinity and even temperature of the two sands have been incorporated into the profile.

Brian Key, director of sales for SubAir Systems comments: "For golf course putting greens we stipulate a 150mm diameter perforated main drainage pipe, 100mm diameter perforated lateral drainage pipes all interconnected to a 100mm diameter perforated perimeter drainage pipe beneath the green. Correct location and elevation of the electrically-operated blower, air intake and exhaust pipe, air separator, dual valve assemblies and water outlets, in relation to the height of the putting surface, are all critical to ensure maximum efficiency of air movement and displacement throughout the entire pipework system."

The SubAir Systems combination blower and vacuum pump unit and its associated devices within the pipe network to control vacuum and pressure levels of the air whilst allowing removal of

Placement of the SubAir Systems combination pump and blower unit in the rough adjacent to the trial green prior to final landscaping

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TORO

Former Royal Sydney superintendent Steve Marsden presses in the seed on the new trial green. New bentgrass variety Pure Distinction and an A1/A4 blend were selected to trial

drainage water, are located external to the green. Installation of these components and their fittings was conducted during the latter phases of the trial green's construction. The external pipework required three separate trenches in the surrounds.

One trench was excavated around the lower side of the green to facilitate installation of the primary drainage pipe to an existing pit. A solid 150mm diameter, sewer-grade PVC pipe connected the green's outlet pipe to the drainage pit. At a specified point along this outlet pipe, one of two dual valve assembly apparatus was connected. The dual valve assembly at this point functions to ensure that vacuum and pressure levels generated by the electrically-operated blower unit are isolated from atmospheric pressure.

Two separate trenches, one through sandstone rock, were excavated on the high side and front of the green. One trench facilitated installation of a 150mm diameter PVC inlet pipe, down and around the front of the green, again finishing at the existing drainage pit on the low side. Immediately adjacent the green's edge a cleanout port junction was securely installed to allow for periodic inspections of the pipe system's functioning.

Again, at two specified points along this pipe, the second of the two dual valve assemblies and the air/water separator apparatus were installed. The air/water separator functions to ensure only air and not any water enters the pipe connecting the blower unit.

The last trench facilitated installation of another 150mm diameter PVC pipe connecting the air separator unit ending in an area of rough on the high side of the green. At the end of this trench deeper mechanical excavation was required to allow for the installation of the combination blower and vacuum pump unit (see photo page 31), its associated inspection portal and 240-volt electrical cabling and electrical wiring. Specialised wiring was further installed to facilitate connection of the in-built computerised controller unit to the soil sensors. Installation of the combination blower and vacuum pump unit was completed in November to allow commissioning of the entire system.

Critical to the efficient functioning of the SubAir Systems unit is the correct location and the respective elevation of the combination blower and vacuum pump unit in relation to the location and elevation of the two dual valve assemblies in the external pipe system.

Of the pipework requirements for the SubAir Systems, Golf Shapes director Darby Muller states: "We did have some initial difficulty in procuring some of the specified pipe connectors to fit the diameter of the American-sized pipework, plus to accurately define the design locations and heights to allow for the air/water separator apparatus and blower unit. We consulted the SubAir Systems installation guide and had the opportunity to consult Brian during his two visits to the club."

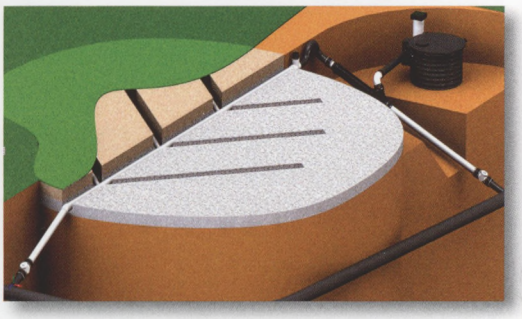
ESTABLISHMENT AND GROW-IN

Initial levelling of the two imported rootzone sands was followed by surface incorporation of Basamid which releases during decomposition the breakdown compounds isothiocynates. In November, the green was seeded to Pure Distinction and an A1/A4 blend and surrounds grassed to couchgrass. Over the next couple of years, the playing surface performance of the two bentgrasses and the respective abilities of each rootzone sand to remove and retain water will be carefully monitored.

Editor's Note: Adam Marchant is now the superintendent at Royal Sydney Golf Club following Marsden's departure in late January 2018. The club also recently announced the appointment of former Riverside Oaks superintendent Thomas Jones as its new assistant superintendent.

Below: The SubAir Systems controller with air intake grate located top left

Below right: A diagrammatic of how the SubAir System looks beneath a typical green



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High praise for Royal Pines

WORDS AND PHOTOS: BRETT ROBINSON

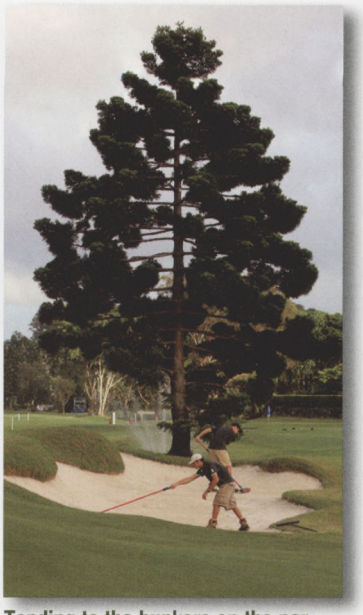
RACV Royal Pines Resort was lauded for its conditioning during the 2017 Australian PGA Championship. Pictured is the 4th

If you want it to rain on the Gold Coast, just hold a golf tournament. For many years that has been the running joke among the golf course superintendent community there and true to form pretty much every time that RACV Royal Pines has hosted a major event the weather has conspired.

RACV Royal Pines course superintendent Lincoln Coombes is well accustomed to the fickle weather that often prevails for such events and normal service seemingly resumed in the lead-up to last December's 2017 Australian PGA Championship. After 30mm during the lead-in week, a further 23mm fell during Thursday's opening round which meant the surfaces were at field capacity. That affected the players out early on the opening day, including tournament drawcard and current Masters champion Sergio Garcia, and for Coombes it meant having crew members on standby to squeegee water off some of the greens.

Come the weekend, however, all the focus was on Sunday. With the Bureau of Meteorology predicting rain and storms to arrive after lunchtime, tournament organisers brought the start time forward by three hours to negate any chance of the weather ruining the finish. That meant a two-tee start at 6am, with the leaders starting their final rounds at 8am.

Normally the weekend rounds are a little more relaxed for the tournament crew, with generally later one-tee start times. However, there was no such luxury this time and after 3.30am-4am starts all week the RACV Royal Pines crew were back in at 3am to prepare the course for the final round. Just to make



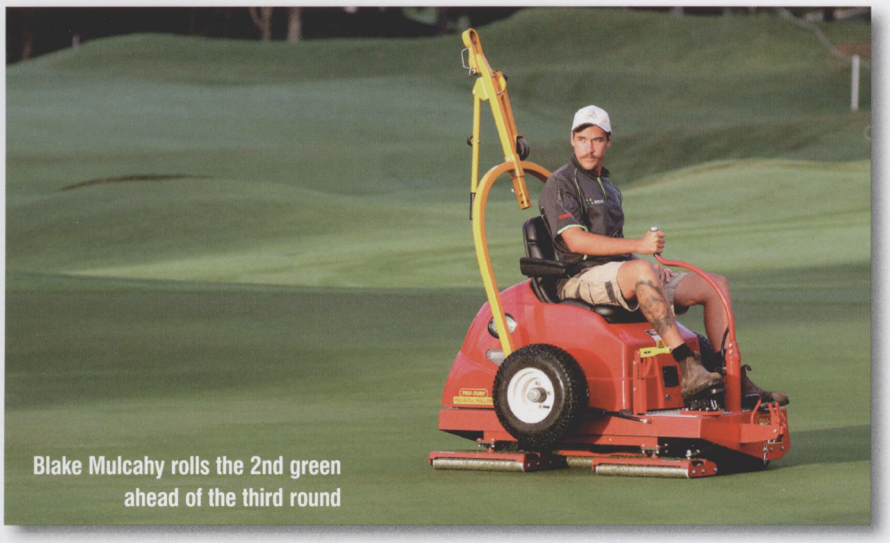
Tending to the bunkers on the par three 14th

The 2017 PGA crew pictured on the 16th green, with superintendent Lincoln Coombes far right

things more difficult, no more than an hour into their work the heavens opened and dumped a further 6mm of rain between 4am and 5am.

While the crew had to battle the elements, by the time the first groups teed off the weather had cleared and remained clear as the tournament concluded in glorious warm and humid Gold Coast conditions. And just to add to Coombes' bemusement, the forecast storms never eventuated!

The 2017 PGA again lived up to its reputation of close finishes, with the Joe Kirkwood Cup decided in yet another playoff. Cameron Smith and Jordan Zunich battled it out for the majority of the final round, finishing tied at 18-under to force the playoff. Playing the 18th twice, it was Queenslander Smith who holed out for a par while Zunich could only



Blake Mulcahy rolls the 2nd green ahead of the third round

Ash Hill cuts the 15th green. The TifEagle greens were triplex cut at 3mm for the tournament

manage bogey after a poor drive. Despite missing out, Zunich will be long remembered for playing the round of the tournament on the Saturday, firing a course-record equalling 64 – and that was after he finished bogey-double bogey!

The earlier-than-normal final round rush aside, Coombes says the 2017 tournament proved to be a lot more seamless than previous years. A combination of lessons learnt from past tournaments and the weather coming to the party post-greens and fairway renovations in September, meant a much smoother lead-in.

"The fifth one felt really good," says Coombes. "The course has settled in a little bit more and each year we learn a bit more. The first couple of years the grass just looked and felt as though it was sitting on top of the profile, whereas now it has become one with it and settled in nicely. We started our preparations a little earlier this time and we were lucky with the weather. It had been dry up until renovations eight weeks out but after that we got some good soaking rains and the course responded.

"Preparations for these events are always fluid and depend on the weather, but the focus was on trying to prepare the surfaces as best we could, with the primary focus the greens. I know they talk a bit about the grain in these greens, but it's getting less and less each year. Certainly the first couple of years there were a lot more dark/light shade patterns through the greens, but I think this time they are starting to soften. It has only really been in the last 12 months that we have been able to get a decent dethatching programme in place and dusting which has helped.

"I don't think there's a great deal of difference between the two nines now, although we did notice it during renovations. We hollow tined greens with 5/8" tines and I wanted to follow that up with a Verti-drain just to try and break up some compaction deep down. The older front nine greens took it well, but on the back nine we started pulling up turf so we had to stop. The greens are still reasonably young and I'm sure next year they'll be even better. But they came together really well and were rolling true. They were very smooth and consistent which I was really happy with."

Greens preparations for the 2017 tournament involved a triplex cut at 3mm followed by a double roll which elicited around 11.5 on the Stimpmeter. Collars were cut at 5mm, tees at 6mm and the Wintergreen fairways at 10mm. With 20 hectares of fairways to cut each day, some of which have pretty severe movement in them, Coombes had to make some special dispensations with his preparations. The majority of fairways were shaved in the afternoon, with any remaining ones completed the following morning. Although not normal practice, Coombes says there were no concerns raised by tournament organisers or the players.

The only slight hiccup came ahead of the final round when, because of the early rain, the PGA was forced to make some last minute changes to

The 18th at RACV Royal Pines again witnessed a playoff, this time between eventual winner Cameron Smith and Jordan Zunic

Mick Burton, Graeme McGrath and Steve Barrington give the 10th fairway an early morning shave

hole locations on 9, 10, 11, 14, 16 and 17 that had been placed in low areas. Course volunteer Luke Allen, who had ventured north from RACV Cape Schanck for the week, also had the ignominy of needing assistance after the tyre on his triplex tees mower punctured ahead of the third round. RACV Royal Pines turf technician Tony Henderson, doing his best F1 pit crew impersonation, quickly had him back on the job.

"It was a great tournament," says Coombes. "I really have to thank all the crew who were in early and back late every day, as well as all those people and companies that supported us. All my suppliers – Turfcare Solutions, Nuturf, Globe, Greenway Turf Solutions – the other RACV resorts and clubs for allowing their guys to come and assist, Paul McLean (Sanctuary Cove) for lending some rollers and a staff member, Toro for the additional fairway units, Peter Kirby (Adama) and Paul Bevan (GTS) for feeding the crew each morning. It was a really enjoyable week."

In the aftermath of the thrilling finish, Coombes and his team were lauded for their efforts in presenting the course. PGA's director of tournaments Andrew Langford-Jones singled out the crew for the perfect conditions they presented.

"The conditioning of the golf course for the 2017 tournament was the best it has been since the Championship moved to RACV Royal Pines Resort," says Langford-Jones. "The players were in very high praise of the presentation and playability of the golf course. Head superintendent Lincoln Coombes and his team should be congratulated on the effort they made. The European Tour players and staff were also extremely complimentary of the golf course and thoroughly enjoyed their week at the venue."

Those sentiments were echoed by the players. 2017 Greg Norman Medallist Marc Leishman said it was the best condition he had seen the course. Speaking after the Pro-Am, Leishman commented: "The whole course is perfect really. I think this is the fourth time I've played it at Royal Pines and it just seems to be getting better every year. The grasses are really coming in and the greens are pretty receptive this year and are so smooth. The course is in the best condition I've seen it."

Despite missing the cut, Adam Scott was also very pleased with the shape of the course: "You can see the greens are starting to receive some shots and it's probably playing more and more like the designer would have hoped. It's really settling in nicely and I think it's going to play a little better each year as we keep going."

Within 24 hours of Cameron Smith hoisting the Joe Kirkwood Cup aloft, the PGA of Australia announced that it had extended the tournament's tenure on the Gold Coast for a further three years. The tournament returns to RACV Royal Pines Resort in 2018 from 29 November to 2 December, with details of the remaining two tournaments in 2019 and 2020 to be announced at a later time.

Ryan Pantic changes holes on the 6th ahead of the final round

Turf technician Tony Henderson channelled an F1 pit crew member to tend to a punctured tyre on a tees triplex mower as third round preparations were underway

All hands to the pump, but not a bunker pump in sight

Underlying problems

It has been another challenging growing season for course superintendents and turf managers. ATM columnist John Neylan looks at some recent issues he has come across and also pays tribute to Alastair Dowie and TurfCraft International which ceased publication late last year.

Above: A compacted profile restricts root growth

As we experience another summer of turbulent weather, the stresses in a range of turfgrass situations continues to provide a challenge to turf managers. Over many years as a turfgrass agronomist, I am often asked about the visual symptoms on the turf. What is the problem? Rarely can they be diagnosed by a visual appraisal. From time to time we do forget that the surface symptoms, whether it is wilt, discolouration or distorted growth, is probably a manifestation of some other problem.

When there is a 'surface problem' we need to take a profile sample from the affected area and examine the soil conditions, thatch and organic matter levels and the condition of the root system. There is a strong likelihood that there are other stresses at play that is producing these surface symptoms.

Here are just a few recent examples which I came across during my travels to various golf courses and sportsfields this past summer…

COMPACTED SURFACE

Problem: A sports field had a patchy turf cover, there was ERI fungi present and a high infestation with mites. The symptoms had been treated with miticide, fungicide and fertiliser with minimal improvement. On examining the profile in both a poor and a good area of the field, the main problem was soil compaction and a very poor root system. The soil compaction had probably occurred during construction.

Control method employed: The sports field was vertidrained, retreated with miticide and fertilised.

HIGH MOISTURE CONTENT

Problem: A golf green had a high infestation of algae and had been treated with an algaecide which had provided only short-term control. On looking at the profile there was a dense thatch layer, restricted water infiltration and black layer (see photos opposite). Checking the soil moisture content using a TDR probe, the moisture content was in excess of 40 per cent v/v. Algae was a manifestation of the restricted drainage and increased soil moisture content. The cause was a lack of adequate thatch control through renovations and sand dusting.

Control method employed: The greens were programmed for a more intensive renovation and sand topdressing and a regular programme of sand dustings.

ORGANIC MATTER BUILD-UP

Problem: A golf green during mid-summer had repetitive outbreaks of disease including pythium and rhizoctonia. The disease had been repeatedly treated with fungicide with only short-term control. The profile sample revealed a root system with no white healthy roots and there was a lack of root density.

In an article by AGCSATech senior agronomist Bruce Macphee in ATM Volume 18.6 **(The root of all things – p34-37)**, he emphasised the importance of having a strong, dense and healthy root system. Where the root function is compromised, the uptake of systemic fungicides will most likely be limited and the control of root diseases such as take-all patch, rhizoctonia and pythium will only be marginally successful.

Control method employed: This situation is not an easy fix and required a more intensive investigation. The green in question was a perched water table construction with good drainage and

a high drainage rate sand. The problem was that the green was about 20 years old and despite an adequate renovation and sand dusting programme over time had built up a considerable amount of organic matter.

The reality was that age had caught up with the green. While some short-term action could be taken through a more intensive renovation programme, it was decided that due to the age of the green and other microclimate effects, that the green should be resurfaced. This involved removing the 100mm of organic matter, replacing the sand and seeding with bentgrass.

SOIL DEFICIENCIES

Problem: A hybrid bermudagrass golf green had a patchy appearance with prominent dark green patches and pale yellow/green patches. What is the problem – disease, nutrition, soil problems or possibly bermudagrass off-types? A soil profile sample on this occasion did not reveal the cause of the problem – there was minimal thatch and a reasonable root system.

The next step was to take some samples of soil and water to see whether that would reveal what was causing the problem. The water supply was treated effluent and the analysis revealed that the water was extremely high in sodium. In an effort to counteract the effects of the sodium, large quantities of calcium in the form of gypsum, was applied.

The result was that there was an excess of calcium and this was reducing the availability of magnesium. Calcium influences the absorption of potassium and magnesium. Magnesium is a central constituent of the chlorophyll molecule which is responsible for the green colour of plants. With a magnesium deficiency the turf typically has a yellow appearance.

Control method employed: Reducing the calcium and increasing magnesium applications. Regular monitoring of the soil chemistry, in particular the sodium, calcium and magnesium levels.

Above are just a few of the examples of where looking beyond the symptoms is an important step in resolving the true problem. As a reminder, when you have a problem and before you treat the symptoms with a magic elixir, the following steps should be taken;

- Take a profile sample from both affected and unaffected areas and examine;
  - Root depth, density and health. Look for stunted roots (could be nematodes) and any black and/or rotting roots.
  - Look for any soil layers and soil compaction.
  - Determine soil moisture content.
  - Measure thatch/organic matter depth.
- Take soil and water samples for nutrient analysis.
- Have samples tested for the presence of both root and leaf fungal pathogens.
- If there are a lot of distorted roots, test for nematodes.

A SAD FAREWELL TO TURFCRAFT INTERNATIONAL

As you get older and having been involved in the turf industry for over 35 years, you tend to reflect on the history of the industry and the events that have shaped its current form. One of these key events was the establishment of TurfCraft International in 1987 and I was saddened to hear late last year that the November-December 2017 edition of TurfCraft, its 177th, was going to be the last of this pioneering publication. The decision by Fairfax Media to give TurfCraft the axe based purely on economics does highlight the turf industry's lack of profile and the relatively small size of the profession.

For the past 30 years we have taken for granted that the turf industry has had one (TurfCraft) and then two (Australian Turfgrass Management Journal) high quality publications covering the Australian turf industry. When I first started with the Turf Research and Advisory Institute in Victoria, there was no national industry magazine. There had been an attempt to start a magazine on several occasions, however, all of them disappeared after a few irregular issues. At that time the Australian Turfgrass Research Institute (ATRI) was the only organisation that was producing a regular, high quality technical publication aimed at the Australian turf manager.

There is no doubt that the quality publications out of the US and the UK have great merit, however, having an Australian publication that relates turf agronomy and maintenance to the Australian climate is critical.

The presence of black layer within the profile and impeded drainage in this example had resulted in excessive moisture retention within the green profile causing an infestation of algae

A poor root system makes disease control difficult

Established by Ted Drinkwater who saw a niche in the market and eventually through a partnership with the AGCSA, TurfCraft was first published in 1987 and filled a critical void. TurfCraft provided a mix of technical articles and real life experiences. It also publicised the profession of turf management and highlighted the achievements of individuals working in the industry.

Through his articles and editorials, Ted had a way of inciting discussion and argument and he loved nothing more than a letter to the editor to be sent in countering an opinion or article. Ted was the first to bring a journalistic styling to producing a turf industry magazine. This meant that you could well be asked for an opinion on the topic of the day and you needed to be careful of your response. Ted and TurfCraft challenged established thinking which didn't always go down well in essentially a conservative industry.

TurfCraft became a vehicle to promote the profession of greenkeeping and was a great promoter of the lower profile sectors of the turf industry. While the golf course superintendents were well acknowledged as industry leaders, TurfCraft promoted all of the greenkeeping professions including bowls, racetracks and sportsfields.

The formation of the Turf Grass Association of Australia (now the Sports Turf Association) to further develop the lot of greenkeepers and turf managers was a project strongly supported by TurfCraft magazine.

TurfCraft and Ted Drinkwater provided an opportunity for people such as myself to put pen to paper and have a crack at writing an article. His editorial expertise and advice was very much appreciated and has enabled me to continue writing for over 30 years. I once questioned him about the content and the way a particular article was written and why he hadn't taken the editorial pen to it. His response was that the author should live or die by what they wrote. Again, he was looking for people to respond to what had been published and he loved nothing more than robust debate amongst industry practitioners.

TurfCraft provided a vehicle for many others involved in the turf industry such as Peter McMaugh, Jack Harris, David Nickson, Rod Riley, Lin Hambleton and David Aldous amongst others. The pioneering research on *Poa annua* undertaken by Dr Mary Lush may not have appeared in popular media if TurfCraft hadn't existed. My hope is that the likes of Peter McMaugh and David Nickson will be able to continue to publish their unique views on turf management in ATM.

When Alastair Dowie took over the TurfCraft reins in 1997 he managed to mend a few broken relationships and was a strong supporter of the AGCSA's activities. There was a great synergism between TurfCraft and ATM (which started publication in 1999) that provided a complete picture of what was happening in the turf industry. ATM, as the sole remaining publication, now has a huge responsibility to expand its list of topics and hopefully use the skills of the contributors to TurfCraft to provide a broader take on the turf industry.

Below right: TurfCraft's November-December 2017 edition was sadly its last after 30 years

Below: Calcium induced magnesium deficiency as a result of trying to counteract the effects of high sodium levels with high levels of gypsum

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Design with maintenance in mind

USGA agronomists Todd Lowe and Jim Skorulski look at some of the key considerations golf course architects and course superintendents need to think through as part of a course construction or renovation project.

Golf course architects are tasked with creating aesthetic layouts that provide an enjoyable experience for golfers. While some features may be more appealing than others, they sometimes can be detrimental to turf health or costly and difficult to maintain. Therefore, it is important to balance the design goals of a construction or renovation project with the long-term goals and budget of the golf course.

This article provides some guidelines that should be considered to help optimise playing conditions and control long-term maintenance costs when building or renovating a golf course.

GENERAL

Size: According to a USGA-funded survey by Gelernter and Stowell of US golf courses in 2015, the median maintained turf acreage for an 18-hole golf course was 95 acres (approx. 38 hectares). In regions where water is scarce, there have been greater limitations on maintained turf acreage in an effort to reduce water use.

All golf course maintenance inputs – including water, labour, fertilisers and plant protectants – can be reduced by decreasing the acreage of intensively maintained turf. For this reason, many golf facilities are converting irrigated turf areas to drought-tolerant turf or naturalised plantings to improve sustainability.

Drainage: Soil moisture – one of the most important factors in golf course maintenance – has been discussed since the inception of the USGA Green Section in 1920. If given the option, sandy soils that drain well are preferred over heavier soils that remain wet. Water can be added to dry turf but removing excess water from a wet area is difficult.

Golf courses with heavy soils or poor surface drainage hold excess water and often require supplemental drainage or sand topdressing to provide quality playing conditions. Poorly draining golf courses may suffer from inferior playability, cart traffic and mowing issues, and increased turf stress.

PUTTING GREENS

Putting greens are the most important playing areas on a golf course. For good reason, putting greens receive the most scrutiny and intensive maintenance. Location, design and construction method have significant impacts on putting green maintenance and performance. Even the most experienced turf managers with almost unlimited resources can struggle to produce quality putting surfaces when these important factors are ignored.

Location: 'Location, location, location' is a common real estate mantra that also pertains to putting green complexes. Place a properly built and well-managed putting green in a poor growing environment and it will struggle or may even fail.

Turfgrass plants maintained at mowing heights at 3mm or less need a lot of sun to produce enough energy to sustain growth and recover from traffic. Shaded turf plants have weaker roots, produce more succulent tissue and are less competitive than shade-tolerant weeds. Shaded surfaces also remain wet longer than areas in full sun, increasing the risk of disease activity. Ideally, putting greens should be located in areas that receive a minimum of 10 hours

Above: Putting greens that have areas without positive surface drainage are more prone to a variety of issues, including winter injury and traffic damage

of direct, non-filtered sunlight per day throughout the growing season. Northern and north-eastern exposures will receive more morning sunlight, which is most critical for turfgrass. If a putting green is located in an area shaded by trees for much of the day, selective pruning or tree removal will be necessary to improve the growing environment.

Like most golfers, turfgrass appreciates a light breeze during the heat of summer. A breeze of 3-5 kilometres per hour provides a cooling effect that can reduce heat stress, lower soil temperatures and help dry plant surfaces, thereby reducing the likelihood of disease. Keep in mind that trees create natural windbreaks capable of impacting wind velocity for a distance of 2-5 times the height of dense tree plantings on the windward side and up to 30 times the height of dense tree plantings on the downwind side. Dense stands of vegetation can be thinned out to allow for more air movement.

Drainage: Many design factors impact putting green performance, but perhaps none is as important as drainage. Putting greens that shed surface water and internally drain well will be the most successful and easiest to maintain. When it comes to surface drainage, keep these important points in mind:

- Putting greens should have several outfalls to disperse water off putting surfaces.
- Avoid designs that concentrate surface water at primary access points.
- Putting surfaces should never have water-holding depressions.
- Ensure that surface water from surrounding areas does not flow onto a putting green.

New putting greens should be built with well-drained soils and an internal drainage system to remove excess water from the rootzone. The USGA Recommendations for a Method of Putting Green Construction provides science-based recommendations for selecting a successful rootzone mix based on soil porosity, saturated hydraulic conductivity and other important characteristics. These recommendations also stipulate the installation of a gravel layer and internal drainage system to remove excess water and help maintain optimal rootzone moisture.

In the event that complete renovation is implausible in the short term, sand channel drainage and other systems have been successfully used to improve the drainage of soil-based putting greens with limited drainage capacity. No matter the construction method used, a well-drained rootzone along with a properly designed drainage system will help ensure long-term putting green performance and success.

Design: Design and construction principles for putting greens have evolved from the classical era of golf course architecture. Modern putting greens tend to be larger in size and less-severely contoured than their earlier counterparts. This makes sense considering increased traffic and expectations for faster green speeds.

Architects are continuously challenged to design putting greens that offer the ideal balance of practicality and interest. The following are some general design guidelines that should be considered when rebuilding putting greens or building new putting green complexes:

- Large putting greens permit wider distribution of traffic and should experience less turf stress. Modern putting greens are usually designed to provide at least 550m^2 of surface area and should be larger when putting surfaces are more heavily contoured. Small putting greens should have limited contouring to provide adequate hole locations and sufficient access to the putting green.
- A general recommendation is to make at least 40 per cent of a putting surface available for hole locations. This will make it easier to spread golfer foot traffic. Generally, areas for hole locations should not exceed slopes of 4 to 5 per cent. Keep in mind that the appropriate slope for a hole location largely depends on the desired green speed. Slopes of 3 per cent or less are more practical when fast green speeds are expected.
- Be aware that steep or abrupt putting green contours will reduce the area available for hole locations and can be difficult and costly to maintain, especially at low heights of cut. The process of floating the final putting green surface can help soften overly abrupt contours, but it is important to evaluate all putting green contours during subgrade construction when the architect has the greatest flexibility to make modifications. A good golf course architect will seek input from the golf course superintendent when creating putting surface features.
- Provide several large access points to a putting green. These areas should be wide and contoured to accommodate golfers and maintenance equipment. Confining traffic to a single, narrow access point will create turf

Do not plant trees with shallow surface roots near maintained turf, cart paths or any areas that receive regular play

It is important to balance the design goals of a construction or renovation project with the long-term goals and budget of the golf course

PHOTO: NEARMAP

◀ Turfgrass plants maintained at 3mm or less need a lot of sun to produce enough energy to sustain growth and recover from traffic. Shaded turf plants have weaker roots, produce more succulent tissue and are less competitive than shade-tolerant weeds

stress on and around a putting green and make it much more difficult to maintain high-quality playing conditions. Carefully consider traffic patterns when planning the size and placement of features such as bunkers or landscape plantings and avoid funnelling golfer traffic into confined areas.

- A putting green and its surrounds must provide adequate space for operating mowers, rollers, sprayers and other maintenance equipment. Large aprons and collars and moderately sloped putting green surrounds can improve staff safety and efficiency. Designs should also take into account the type of equipment that will be used to maintain a putting green complex. Large putting greens with ample turning areas are helpful for facilities contemplating triplex mowing programmes.

TEES

Teeing grounds are focal points on a golf course. As the starting point for each hole they experience heavy traffic and some require constant divot repair. Tee alignment towards the landing area is an important design feature but has little impact on sustainability.

A good golf course architect will seek input from the golf course superintendent when creating putting surface features

Other factors that should be considered include size, shape, location, drainage and maintenance in surrounding areas.

Size: A general rule of thumb is to provide at least 10m^2 of teeing area per 1000 rounds played from a particular tee. Tees that experience particularly heavy traffic – e.g., holes 1 and 10 – and par three tees should be even larger to disperse traffic and improve divot recovery.

Shape: Rectangular tees provide a classic look but are more difficult to mow. Designing tees with soft corners can allow for triplex mowing. Triplex mowing is often preferred at some facilities because it can increase efficiency.

Location: Sun exposure and air movement are equally important for maintaining healthy turfgrass on tee surfaces. Trees that are too close to tees can create difficult growing environments and interfere with play by limiting useable surface area. Before planting new trees, consider their impact on nearby tees. Also consider pruning or removing existing trees that are causing turf issues. If pruning or removing problem trees is not possible, it may become necessary to relocate the affected tee complex.

Drainage: Build tees with at least six inches of well-draining rootzone mix. Tee surfaces should have a slope of at least 0.5 to 1 per cent to maintain adequate surface drainage while still providing a level playing surface. Whenever possible, avoid draining surface water toward entry and exit points. For more information on building tees read the USGA Green Section Record article 'Guidelines for Building Great Tees'.

Tee surrounds: Avoid steep banks – i.e., anything greater than 18 degrees or a 3-to-1 slope – around tees to allow ease of access for golfers and simplified maintenance. Establishing tee surrounds with drought-tolerant grasses or naturalised plantings can help reduce costs and improve sustainability.

FAIRWAYS AND ROUGHS

It is important to provide sufficiently wide fairways while recognising that fairways require more resources to maintain than roughs. As a reference point, the average 18-hole golf course has around 11ha of fairways (Gelernter and Stowell, 2017). Superintendents and golf course architects should work together to create fairways that meet the intended design criteria while keeping maintenance costs under control.

Intermediate rough: Maintaining a strip of intermediate rough between fairways and primary roughs is popular at some facilities. Keep in mind that this feature requires a separate mower and additional labour that diverts resources away from other playing surfaces. The USGA article 'A Waste of Time and Resources' provides more information on this subject.

Turf selection: It goes without saying that selecting the appropriate turf variety suited to the climate

is paramount for ensuring optimum playing conditions. Trying to maintain a turfgrass species outside of its adapted range can be a challenge and usually requires additional maintenance inputs. Consult trial data undertaken and also canvass other superintendents and clubs in the area to see what successes (or otherwise) they have had with particular varieties to help select a grass that will perform best at your site.

Graduated rough system: Primary rough areas – i.e., those immediately adjacent fairways – often receive more water, fertilisers, plant protectants and mowing than other types of roughs. Designs that allow for secondary roughs or naturalised roughs in out-of-play areas can help reduce the resources devoted to rough maintenance.

It is important to consider pace of play when implementing a graduated rough system. Secondary and naturalised roughs are best suited for low-play areas. Mowing secondary roughs or naturalised areas may only occur occasionally, so communicate to golfers the seasonal differences in playability and aesthetics in these areas. The USGA Green Section Record article 'Beyond the Primary' further discusses graduated roughs.

BUNKERS

Bunkers can require intensive maintenance including frequent raking, edging and hand trimming. There is no doubt that bunkers can be appealing design features, but their associated maintenance costs are high. Superintendents and architects should work together to create bunkers that are appropriate for the facility's golfers, design goals and maintenance budget. Designs that allow for mechanical maintenance in and around bunkers will help improve efficiency.

Flashed faces: Flashed sand faces can be quite costly to maintain because they are prone to washouts during heavy rainfall. Sand faces with slopes less than 25 per cent are less vulnerable to washouts and can be easier to maintain. Also,

Teeing grounds that are too small for the amount of play they receive will struggle to recover from peak use and can become an eyesore

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The number, size and severity of bunkers can have a significant impact on golf course maintenance costs. Steep slopes and narrow capes make bunkers more difficult and costly to maintain

liners can be installed on bunker faces to help hold sand in place, reducing washouts and sand contamination. Installing liners is an additional cost, but they can greatly reduce long-term maintenance costs and improve golfer satisfaction.

Grass banks: Steep grass banks around bunkers can be very expensive to maintain. They often require hand mowing and edging, which can be time consuming. Water management on steep grass faces can also be extremely challenging. Avoiding narrow capes and steep slopes in grass bunker faces will facilitate maintenance and improve entry and exit for golfers.

Drainage: Avoid allowing surface drainage from surrounding areas to enter bunkers by using berms, swales and interceptor drains to deflect or capture water. This helps limit washouts and sand contamination. Also, avoid directing subsurface drainage into bunkers. Subsurface drain lines should be included in bunkers to prevent standing water from accumulating, reduce washouts and maintain desirable sand moisture.

TREES AND LANDSCAPING

When planting new trees, utilise native species that are adapted for the site and climate. Always consider a tree's mature size and form during the selection process. Avoid tree species that are prone to storm damage, have inherent pest problems or are prolific rooters. Trees that produce significant amounts of debris – e.g., sticks, fruits, nuts, bark and other debris – are best used away from in-play areas.

Size and location: Avoid tree plantings that create morning shade on playing surfaces or block air movement; they can weaken turf and increase the likelihood of disease. Tree roots can also extend well beyond a tree's dripline and impact playing areas. Competition from tree roots increases the need for irrigation and fertiliser to maintain healthy turf.

Surface roots can also damage maintenance equipment, cart paths and create playability issues. Therefore, it is best to avoid planting potentially large trees any closer than 20-25 metres from putting greens or teeing grounds. Tree canopies should also never impact sightlines from a tee to a fairway or putting green.

Limit tree planting in high-traffic areas. The combination of traffic, shade and root competition can cause considerable turf thinning. Trees can also funnel traffic into small areas, causing further problems.

Aesthetics: Ornamental plantings, when used effectively, can enhance golf course aesthetics. However, they are costly to maintain properly and for that reason their use should be limited. Make sure to consider the cost per square metre for maintenance when planning ornamental plantings to avoid diverting excessive resources away from playing areas.

A graduated rough system can help save resources while also creating a visually appealing landscape. Incorporating non-irrigated ornamental grasses in out-of-play areas is one way to reduce water use without slowing down pace of play

SUMMARY

A well-designed golf course with prominent features can be a beautiful thing. However, if the resources necessary for maintaining its features are lacking, even a well-designed golf course can end up a far cry from its original intent.

With ever-increasing scrutiny on resource management, the factors listed in this article should be considered when building or renovating a golf course. The golf course architect and superintendent should work closely together throughout any construction or renovation project. Communication and collaboration are key to ensuring that facility goals are met and that the architect's design can be maintained with available resources.

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ACKNOWLEDGEMENTS

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This aerial view showing Latrobe, Green Acres, Kew and Ivanhoe golf clubs in Melbourne shows the vital role golf courses play in acting as wildlife corridors in built up urban areas

PHOTO: NEARMAP

Making a difference

This edition of ATM sees the start of a regular column dedicated to environmental management issues. In this and future editions, passionate environmental manager Kate Torgersen will look at the many ways golf clubs can enhance their environmental management credentials.

Environmental polluters! That's what someone said to me about golf courses when I began my career in the turf industry back in the early 2000s.

While raking a bunker, I was admiring all the native trees, heathland shrubs, wildflowers and many native animals using the course as a home and thought how could people say that golf courses were such a negative impact on the environment. Understandably chemicals can be used on a daily basis, large amounts of water are required to sustain turf and a lot of machinery is employed to prepare turf surfaces, but outside that golf courses have huge advantages that many people overlook.

If managed well, golf courses can provide many benefits such as;

- Providing large green spaces in built up urban areas;
- Native wildlife corridors;
- Reducing contaminants and nutrients in stormwater runoff;
- Protecting remnant vegetation;
- Providing refuge for endangered flora and fauna;
- Storing large amounts of carbon; and
- Promoting physical health and mental well-being.

As an industry these days more people are becoming aware of the importance of environmental management practices and are implementing their own plan. Environmental organisations specialising in golf courses are becoming more prevalent, golf courses are hiring staff to specifically manage native areas, while studies and research is being conducted by major universities and organisations (e.g.: biodiversity on golf courses, carbon storage). In addition, leading industry groups are working together to assist golf courses and working with stakeholders on promoting environmental management and the importance of adhering to industry best practice.

All this is helping to educate course/general managers, committee members, staff, golfers and most of all it is promoting and showing the general public that golf courses provide a huge contribution to the environment and well-being of everyone.

A LITTLE GOES A LONG WAY

Each year golf course managers are expected to present the course to a higher standard on a tighter budget. Many may have deteriorating irrigation systems, rebuilding playing surfaces to keep up with the advancement of the game and upgrading tired old machinery. All of this is often carried out with decreasing staff numbers and increased pressure from committees.

Now add a focus on the environment and sustainability and you may be asking where am I going to get the money to institute such works? The best thing about environmental management is that it can cost as little or as much as you like, but even the smallest of adjustments to your maintenance programmes and you are managing your course in a more environmentally positive way.

Some examples may be to reduce mowing rough in selected areas (you never know what natives may appear as a result), collecting or composting your grass clippings instead of spreading it in rough areas and adding more nutrients (equals more weeds) and adding habitat logs in out-of-play areas instead of mulching or stockpiling adding to costs. These are just a few examples to get you started and something we will explore in more depth in future editions of ATM.

Positive environmental management practices can be implemented right throughout a golf club, from on the course to the clubhouse kitchen. Here are a few examples:

- Maintenance facility – installing water management systems, solar panels;

Programmes such as drumMUSTER provide an effective way of disposing of used chemical containers

- On course – preservation and enhancement of native flora and fauna and updating aging irrigation infrastructure to use water more efficiently;
- Clubhouse – waste management, energy efficient lighting;
- Kitchen/bar – source locally, create your own herb/vegetable garden;
- Pro Shop – utilising sustainable suppliers, instituting recycling procedures;
- Tournaments – recycling, protecting out of play areas with designated paths; and
- Golf course architects – environmental awareness during the design phase, sustainable water design

So here's a task to get you started. We all recycle at home so why not at work? All clubs will likely have a recycling bin (it may be at your maintenance facility or clubhouse). While emptying all the bins on course, separate the recyclables and the waste into separate bins.

Managers these days are preparing more and more reports. Why not set up a paper recycling station in your office? Some local councils provide paper recycling services for local businesses. If this is not available in your area, there are numerous commercial recyclers in Australia that provide a collection service.

Clubs use chemicals on a regular basis, so what to do with the empty containers? drumMUSTER is the national programme that has been set up for the collection and recycling of cleaned, eligible chemical containers. In addition to this programme a number of commercial operators may accept chemical drums for recycling – check with your local operator for this.

Mown areas transformed to native vegetation areas not only enhance the aesthetics of a golf course but help to reduce maintenance inputs

We all know the key asset of any golf club is the course. To ensure this asset is protected for future generations as an industry, we need to manage them in an environmentally and sustainable manner. I hope through this regular column and the ongoing assistance now available through the industry we can help you ensure your club's future.

Editor's Note: With environmental management an ever-present issue, ATM encourages readers to send in any questions they may have for Kate or any topics that they would like her to address in this column. Send your questions/ideas to ATM editor Brett Robinson via email brett@agcsa.com.au or call (03) 9548 8600.

> "The best thing about environmental management is that it can cost as little or as much as you would like – the smallest of adjustments to your maintenance programmes and you are managing your course in a more positive way to the environment."
>
> – KATE TORGERSEN

INTRODUCING KATE TORGERSEN

ATM is delighted to introduce **Kate Torgersen** who from this edition onwards will be providing a regular column for readers. The hope of this column is to build a greater awareness and appreciation of golf course environmental management issues and provide advice on some of the best ways to institute projects around your course.

Kate started her career as an apprentice greenkeeper at Peninsula Country Golf Club in southeast Melbourne and this was where her passion for golf and the environment would begin. Over the course of the next 14 years, Kate has enjoyed stints working at some of the top golf courses in Victoria and is currently head horticulturist at Commonwealth Golf Club.

Kate also travelled to Scotland in 2012 to discuss golf and the environment with the likes of The R&A, the Golf Environment Organisation and the Scottish Golf Environment Group. From these meetings she decided to come back and start a business (Environmental Golf Solutions) to help golf courses with environmental management and to spread the word, not only within the industry but also the wider community, about how valuable golf courses are to the community and the environment.

To broaden her knowledge, Kate decided she needed to explore other avenues and began a job as a natural reserves ranger with a local council, gaining valuable bushland management skills and techniques that she now uses on golf courses to manage their out of play areas. She then decided to go back to school to study conservation land management.

Not long after starting her studies, she found herself back on familiar ground working at a golf club, implementing their vegetation management plan. This was a new and exciting chapter for Kate as it wasn't just implementing the plan on the ground, but also selling the concept to the club's committee and members – a real challenge as any superintendent will attest.

Through all these experiences both on and off the course, Kate now finds herself assisting golf course architects, creating and implementing environmental management plans for golf clubs and assisting them through the process.

Getting the recruitment process right will ensure your club employs staff who will become an asset rather than a liability

Hiring?
Here's how...

ATM's HR expert Vicki Crowe provides some sage advice for course superintendents and turf managers to heed when hiring new staff.

Employing new staff can be an extremely stressful process and the risk of getting it wrong can have long-running ramifications not only for you as a manager but for your team and organisation as a whole.

It is important to take an holistic approach and that begins even before you place the position vacant ad. It is critical from the start to have the right foundations in place. These lay the groundwork for the recruitment, selection, induction and ongoing performance management of the employee – or what those in HR call the employee life cycle.

The foundations firstly include the position description (PD). Whether it's for a course superintendent, qualified groundsman, territory manager or an apprentice greenkeeper, the position description should have between four and five accountability areas with key performance indicators (KPIs) aligned to each area of accountability. These allow you to measure performance and may even play a role in termination if not achieved.

When you are creating your KPIs, ask yourself;

- What is the desired outcome?
- How are you going to measure it?
- How will you know the employee has achieved the outcome?

Too many KPIs are not measurable or specific enough. If you can measure the KPI with a percentage or number (i.e.: zero accidents, attendances) then do so.

With a solid and specific PD in place, then comes time to place your position vacant ad. Job ads are a sales pitch to attract candidates to the position and the club and are vital in getting the right people applying. In your ad tell potential candidates;

- Why it's so great to work at your organisation;
- What facilities or benefits the club/organisation offers; and
- How or where the job fits into the business and with the team culture. In other words, humanise the ad.

Having taken a look at some of the job ads currently on the AGCSA website, there are a number of ads which only provide the bare minimum of detail about the role being advertised. In this day and age when attracting new staff is becoming harder and more competitive, you are effectively shooting yourself in the foot by taking such an approach. Making sure you sell your club/organisation in the best possible light will go a long way to attracting quality candidates.

THE SCREENING PROCESS

With a well worded job ad out in the market, hopefully it has had the desired result and you have received a wad of quality applications. The challenge now becomes how to single out the suitable candidates from the unsuitable.

It's a good idea to create a 'key selection criteria' checklist to assist with screening applications. Create a simple template of approximately five mandatory must have's from the accountabilities in the PD that the candidate requires to successfully carry out their main tasks. These might include;

- Previous experience using a certain machine;
- Level of education or qualifications;
- Knowledge of certain chemicals; or
- WHS experience.

Also identify three or four personal attributes (behaviours) that you feel are important for them to fit in and work amicably with the team. For example – excellent people skills to engage with the members, good team player, flexible, shows initiative, positive attitude, ability to multi-task or work under pressure.

Once you have screened the resumes using the criteria checklist, ideally you will have five candidates short-listed for verbal telephone screening. I usually create a verbal screening questionnaire

of five technical or task-related questions that cover the accountability must have's. Besides the accountability areas, I also ask:

- What attracted you to apply for this position?
- What are you looking for in a new role?
- What is your salary expectation?

WHAT YOU CAN AND CAN'T ASK

Prior to the Commonwealth Racial Discrimination Act (1975) and the Equal Opportunity Act (2010), you were legally allowed to ask a candidate anything about their personal life. It is now unlawful to ask a candidate any questions regarding their age, disability/impairment (physical and mental), family or carer responsibilities, marital or relationship status, parental status, political beliefs and activities, pregnancy, religious beliefs and activities, gender, sexual orientation or union or employer association membership. In Victoria, it is also unlawful to discriminate against a person on the grounds of 'physical features' (i.e.: height or weight).

Often, certain personal information is required from a person for them to be able to perform the job. If this is the case, you need to carefully prepare questions in advance to avoid breaching the Acts.

For example, if the job is physically demanding or requires heavy lifting, instead of asking the candidate 'Do you have any health or previous injury issues?', rephrase the question to 'This role requires heavy lifting. Are you able to do this?' Another example would be if the role required someone to travel interstate. Instead of asking 'Do you have any children?' rephrase the question to 'This role requires interstate travel for several weeks of the year. Do you have any restrictions on being able to spend time away from home?'

BEHAVIOURAL INTERVIEWING

If you have covered off most of the technical questions in the verbal screening, the face-to-face interview can be used to focus on the personal attributes of the candidate. The most difficult part of interviewing is trying to get an understanding of what makes someone tick and whether they will fit in with your team. It is a known fact – just ask any psychologist – that looking at a candidate's past behaviour is the best way to predict their future performance.

'Behavioural interviews' let you understand in detail how a candidate has acted in a specific situation and they generally following a three-pronged approach – a situation, the action taken and the outcome or result. When you are constructing your questions, think about real situations that occur regularly with your team or in the workplace.

Below are some examples of behavioural questions that you can tailor for your different roles and workplaces:

- Tell me about a recent task that required you to juggle a number of work tasks? How did you manage this? What was the outcome?
- Tell me about a difficult peer relationship at work? What did you do to improve or try and change the relationship? What was the result?
- What types of people do you find are the most difficult to get along with? Describe a situation where you had to deal with this? What was the outcome?
- Tell me about a situation where you had to develop relationships quickly in order to perform your job. How did you go about this? How would you rate the quality of the relationships?
- Describe a situation where your team were in damage control with the course? What caused the situation and what did you do to assist with fixing it? What was the end result?
- Tell me about a situation in which you had to be flexible to changes over which you had no control? How did you adjust? What was the result of your actions?
- What has been the most stressful situation you have had at work? What actions did you take to manage your stress levels? Did you manage to work your way through it?
- Please give me an example of a time you discovered you had made a mistake? What did you do to fix it? What was the result?

Finally, how are you going to benchmark each candidate against the other? Many recruiters use a sliding scale from one to five or a rating scale of competencies from 'unacceptable', 'weak in many areas', 'meets most requirements for the position' or 'meets all requirements for the position.'

Behavioural interviewing should give you a much clearer idea of the personality traits of each candidate. It is important to remember to hire for attitude not for skills as these can be taught; behaviours can rarely be changed.

Editor's Note: With HR management an ever-present issue for superintendents and turf managers, ATM encourages readers to send in any questions they may have for Vicki or any topics that they would like Vicki to address in this column. You can send your questions/ideas to ATM editor Brett Robinson via email brett@agcsa.com.au or call the AGCSA office on (03) 9548 8600.

BY THE NUMBERS…

Did you know that in the 12 months from the start of February 2017 to the end of January 2018, there were a total of 334 turf industry jobs posted through the AGCSA website www.agcsa.com.au/positions-vacant. Among those job ads…

- 83 were for a course superintendent, assistant superintendent or sports turf manager;
- 88 were for qualified greenkeepers;
- 42 were for groundspersons;
- 27 were for apprentice greenkeepers;
- 18 were for mechanics/turf technicians;
- 15 were sales-related trade positions.

Job ads are a sales tool to attract candidates to the position and the club and are vital in getting the right people applying

In addition to key accountability areas, also identify personal attributes you feel are important for a new recruit to fit in with your team

Coffs Harbour Golf Club superintendent Justin Sheehan keeps an eye on the recent reconstruction of the 9th green

Coffs keeps pace

It has been a productive 10 years in charge at Coffs Harbour Golf Club for course superintendent Justin Sheehan with a number of improvement projects paving the way for a better golfing experience.

After my appointment as course superintendent at Coffs Harbour Golf Club (CHGC) in 2007, I quickly found myself making some long-term plans for a raft of course improvements without even thinking how we were going fund or achieve an outcome. The main projects that were earmarked included installing concrete paths around the entire 27-hole course, a new irrigation system and converting the warm-season mix fairways to a single strain of couchgrass.

CART PATHS

After three years of very wet conditions between 2008 and 2010 (the course recorded 2500mm-plus each year), the club started investing in weather-proofing the course by installing concrete paths. Starting in 2009, this was a huge outlay for the club and by 2017 we had completely linked the course from the 1st tee to the 27th green.

All paths were installed by CHGC greens staff (over 8km in length), with 1.6m-wide paths laid from tee to green and 1.8m-wide paths around tees and greens. To say this has been a game-changer in regards to our golfing revenue is an understatement and means we can keep the course open for play when we do have periods of wet weather.

The reconstruction of the 9th green is the first of six green rebuilds that Coffs will undertake

IRRIGATION SYSTEM

One of the big infrastructure items that made it difficult to present quality turf surfaces was the club's ageing irrigation system. The old system was only ever designed to do greens and tees when the club had an 18-hole course, but when it was expanded to a 27-hole layout the club just added on to that system. With an eight-hour watering window just to irrigate greens, it was becoming a huge problem for us to move forward.

After many irrigation plans, the massive task was to convince members and management that the outdated system needed replacing. What made it challenging was that the club had just been through the 'big wet' of 2009 – why do we need a new irrigation system with all this water?! – and in order to undertake the project the club would need to go $1 million in debt.

A plan was adopted to install a single row fairway line with doubles on the dog leg holes, tees and back-to-back sprinklers on the greens. It was then put out to tender with Toro the successful supplier and Hydrotechnics the installer along with three of our own staff to help with the process.

In what would be one of the biggest turnouts for a meeting at the club, all but two of the 250 members present voted unanimously to go ahead with the irrigation upgrade. Works started in May 2011 and were completed in October 2011. The club hasn't looked back since, paying the 15-year $1m debt off in just five years which enabled us to move on to the next phase of course improvement works.

FAIRWAY CONVERSIONS

In 2013 Coffs Harbour embarked on a fairway conversion programme to change from the existing

mix of kikuyu, Queensland blue couch and carpet grass to a single strain of couchgrass (Greenlees Park). The plan was to tackle three fairways a year and after talking to a few people the club appointed Duncan Swinton from All Turf Solutions to undertake the line planting.

The existing fairways were sprayed with 7L/hectare of Round-up, two applications seven days apart. Any major hollows were then filled in and the fairways line-planted. We had to do some major earthworks to three fairways – 11, 13 and 23 – before planting, with around 2000 cubic metres of fill brought in and moved around. These fairways had some major drainage issues, so raising and levelling these before planting was a key priority. The line planting machine planted at 170mm row spacings at a rate of 800m^2 of solid turf per hectare.

In the first three years we completed nine holes as per the original schedule, but such was the success of the project the club decided to fast-track the process and we completed the remaining 18 holes in 2016 (holes 10-18) and 2017 (holes 1-9). We closed these holes for a period of four weeks while the stolons took root, then opened them back up to tee-up while the grass covered (usually eight weeks).

After a six week period we started applying herbicide to eradicate any regrowth of the kikuyu, blue couch and carpet grass. We applied a few products over the following few months – DSMA, MSMA, Tribute and Drive – with good results. To date we have eradicated 95 per cent of the regrowth of foreign grasses and the fairway quality is superb.

It has been a huge effort from all the staff, management and members to get through so much work in the past 10 years on a very limited budget and personally for me it has been a great achievement to see how much the golf course has improved and how some early planning came through even if it felt like a dream at the time.

GREENS REBUILD

With the above foundations in place, the next phase of course improvement works has just kicked off and we are looking at the rebuilding of six greens to USGA specification over the next 6-7 years, starting with our 9th green. The 9th hole at Coffs Harbour is a short par four, about 320m in length, that plays down through a dip then rises up to the green. The second shot is generally not long but the land rises significantly to the green.

The old green was 320m^2 in size and dropped 1.2m over 25m from back to front. This calculation meant that most of the putting surface was almost 5 per cent in slope measurement which was a doubtful 'legal' gradient. It is suggested that a 'fair' pin position should not sit on ground more than about 2 per cent. When the pace of the green was increased it was becoming very difficult, if not impossible, to keep a ball on the putting surface which in turn led to many complaints from golfers.

Richard Chamberlain Golf Design was commissioned to design the new green, with the simple solution of lowering the green at the rear and

The existing 9th green had a 5 per cent fall from back to front. The new green has been lowered at the rear and raised at the front to achieve fairer gradients for pin positions

As part of the fairway conversion project at Coffs Harbour, major earthworks were required on three fairways – 11, 13 and 23 – to rectify major drainage issues. Around 2000m^3 cubic metres of fill was brought in and moved around

The Coffs Harbour fairways were converted from a warm-season mix (kikuyu, Queensland blue couch and carpet grass) to Greenlees Park couchgrass

After completing nine fairways in the first three years, the club decided to fast-track the remaining conversions, knocking off holes 1-18 in 2016 and 2017

raising it at the front to achieve fairer gradients for pin positions. The only downside of this solution was that the putting surface would be virtually blind from the bottom of the fairway.

The initial hand-drawn draft was completed which met the necessary gradients and also added in a small pot bunker in the front-left corner. After deliberation between course architect and club personnel, it was decided to remove the bunker and replace it with a grassy hollow. The architect was keen to demonstrate that grassy hollows cut short, combined with interesting movement in the terrain of the green surrounds, can provide an excellent form of defence to the green without the need for a bunker and its associated construction and maintenance costs. Some subtleties in the contouring also ensured the green had plenty of internal interest and was not just a simple flat surface tilted at 2 per cent grade.

Local contractor Mackay's Earthmoving was hired to remove the old material from the green and stockpile the sand which would be used later for topdressing the surrounds. This exercise took two days before Gary Cox came in to start shaping the new green.

Course designer Richard Chamberlain was also on site at this time to inspect the peg-out of the new 420m^2 green and make any minor modifications to its perimeter. This was also an opportunity to discuss the design intent with all parties and ensured we stayed on track with the end goals. The communication between architect, superintendent and shaping crew is paramount throughout a process like this.

The bulk of the dirt was moved around in a combined effort between the bulk shaper and the fine trimmer. In just two days the bulk of the surrounds took shape and the base of the green was completed. At this point the Coffs Harbour crew stepped in to assist with the drainage works and the installation of the sand and gravel layers. The boys put in a tremendous effort to get this done over the weekend period so the remaining process could proceed early in the second week.

The importance of getting the base of the green accurate cannot be over-estimated. Getting this right means the sand and gravel can be installed without fear of large modifications on the surface. We all know the problems that can occur when we suddenly end up with a profile of 250mm or 400mm instead of a consistent 300mm across the board. The base of the green cavity must accurately reflect the final shape on the surface for this to succeed.

Once the drainage, sand and gravel were installed we undertook the irrigation work ourselves which included heads around the perimeter. As the irrigation trenching was done we needed to take extra care not to contaminate the green sand mix.

At the start of the second week the shaper continued with the final trim. Richard was again on site during this final process to ensure the subtleties worked well with the design intent. Two main pin placement corridors were created (at 2 per cent grade) with the water directed to the left sides of the green so as not to create wet areas in front.

During the fine trimming we made a slight alteration to create a small plateau about halfway up the green on the right. It really added an extra dimension to the green and was one of the little refinements that reinforce the importance of having the architect there on the ground and not simply handing over plans.

Once Richard had signed off on the final shape, the green was stolonised with 328 to match the other greens on the golf course and surrounds solid turfed with Wintergreen couch. Grow-in has gone well and we were due to open the new green as this edition of ATM was going to print.

Editor's Note: If you have any golf course projects recently completed, currently ongoing or about to get underway and would like them featured in Australian Turfgrass Management Journal, please contact editor Brett Robinson on (03) 9548 8600, 0434 144 779 or email brett@agcsa.com.au.

Shaping of the 9th green. The green was stolonised with 328 and was due to open for play in February

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Bunbury GC, WA

After a three-year stint in Fiji where he took on his first course superintendent role, Dave Brennan returned to his hometown of Bunbury, WA in 2016 to take the reins of the local course where he cut his teeth as an apprentice.

Above: The opening hole at Bunbury Golf Club in Western Australia. Having served his apprenticeship there in the late 1990s, Dave Brennan returned in 2016 to take on the superintendent role

Superintendent: Dave Brennan (37).
Nickname: Davo, Onemore.
Family: Wife Siobhan and daughters Sophie (7), Hollie (5) and Lucy (2).
Period as a superintendent: 4.5 years.
Association involvement: AGCSA (10 years) and GCSAWA.
Career: 1997 – apprenticeship at Bunbury Golf Club, WA and a further two years as assistant; 2003 – The Ohio Program (Sea Pines Resort, Hilton Head Island, SC); 2005 – assistant superintendent Sanctuary Golf Resort, Bunbury; 2006 – assistant superintendent Melville Glades Golf Club, WA; 2013 – superintendent Denarau Golf & Racquet Club, Fiji; 2016 – superintendent Bunbury Golf Club, WA.
Education: Cert III Sports Turf Management.

Where in Australia is Bunbury GC and what is the club/township famous/known for? Bunbury is Western Australia's largest regional centre (population 68,000) located 170km south of Perth. Known as the 'gateway to the south west' with its close proximity to the Margaret River surf and wine region, it is the regional base for commercial and industrial economics for the south west region. The Bunbury port is responsible for global trading of mineral sands, woodchips and alumina.

The Bunbury Golf Club is celebrating its 70th year on the current Clifton Park site. The old nine-hole course was located on a sea links site opposite Bunbury's back beach, but as the club steadily grew after World War II a new site was located some 10km north of Bunbury. It was bought off the Clifton sisters, with the condition that the area be known as Clifton Park.

Give us a bit about your background and how you came to be a superintendent. For me it started young when I was a keen lover of cricket and being in total awe of the WACA wicket and outfield. At that time my parents had just built a new house and the lawn was planted with Greenlees Park which was the same variety as the WACA outfield. Night after night I used to be out throwing the ball around on it trying to emulate my hero Ian Healy.

I used to watch my dad mow the lawn and one day when he went out I helped myself to his Scott Bonnar and went to town. The moment I learnt how to stripe was the beginning of the end of backyard cricket at our place and possibly the start of my OCD tendencies as the pitch and outfield had to be perfect before I allowed play to commence.

With every intention of one day getting into cricket wickets, I thought I would do my work experience at Bunbury Golf Club to get a taste of turf management. Within a week they had offered me an apprenticeship. The rest, as they say, is history and I still haven't stepped foot on a cricket wicket since!

Who were some of your early mentors and what did your early postings teach you about the industry and turf management? My first mentor was my first superintendent Brendon Large. Being a country apprentice we obviously didn't have the staff numbers or resources, but I was given a lot of responsibility early on into my time which I think gave me the confidence to learn and gain a lot more experience.

At the time our irrigation system was diabolical and I was handballed the task to try and keep the course semi-alive and I loved every bit of the

challenge. This confidence grew into other areas and I was allowed to make changes to course bunkering (it was kind of cool returning to Bunbury in 2016 to see those bunkers were still going strong). Looking back now I believe that responsibility and drive to keep the course alive gave me the love of a challenge and the work ethic and passion towards what we do.

You spent a period as superintendent in Fiji – tell us about your time there. Fiji was an amazing experience. It was my first posting as a superintendent and with the challenges we faced over there I quite often told myself (on a daily basis) that if I can do it over here then when I get back to Australia it should be a lot easier.

Fiji came up when I was in a bit of limbo with my career. I had been an assistant for some time at Melville Glades and was keen and ready to make the step up, but at the time there was absolutely no job movement in WA. The jobs that did come up and I had interviews for were filled by other superintendents. When told I interviewed well but unfortunately just didn't have the superintendent experience, I got to a point where I thought it was never going to happen and had started planning for life outside of golf.

Then one day I was scrolling through Seek and a job ad for a superintendent at Denarau Golf & Racquet Club, Fiji appeared. I jokingly said to my wife 'Fiji would be nice!'. She rolled her eyes but said 'You never know, try your luck'. After a couple of phone interviews things started to get serious and I was asked to jump on the next plane and head over for a formal meeting.

At that point in time life for us was already extremely hectic. We had just completed building a house in Bunbury and our second daughter Hollie was only four weeks old. After agreeing to the job, we packed up our belongings in Perth and moved to Bunbury. I lived in our new house for all of six days before setting off, with Siobhan and the girls following seven weeks later.

Fiji was an extremely challenging environment. The isolation often meant I had to plan for basic things 3-4 months in advance. It often took that long for the hotel to sign off on my orders, shipping from either New Zealand or Australia to arrive or basically the somewhat simple task for Customs to clear the items.

Fiji taught me how to be patient as simple everyday tasks we take for granted in Australia can easily spiral out of control. Having a large staff didn't necessarily equate to kicking a lot of goals out on the course, but once you adapted to that way of life and roll with 'Fiji Time', things started moving along.

The most rewarding thing that came from my time in Fiji was an article published in Golf Australia magazine highlighting the vast improvements I had

One of the most challenging aspects for Brennan is managing old push-up greens which range in age from 30 to 40-plus years. Pictured is the approach to the 17th green

The Bunbury crew (from left) Michael Newman (assistant superintendent), Connor Butlion, superintendent Dave Brennan, Barry McGill, Will Shaw and Chad Fauchoux

Bunbury's downhill 124m par three 10th has a drop in elevation of 40 metres

made to the property during my time there. We stripped everything back to the basics and focused on our playing surfaces. Removing the crowsfoot and carpet grass that plagued the course allowed us to make inroads toward presenting the course at a much higher level.

With the three major courses in Fiji (Denarau, Natadola and Laucala) all being managed at that time by Australian superintendents, it made for a good support base. Having Steve Lalor 45 minutes down the road at Natadola (host venue of the Fiji International) was invaluable, especially his knowledge of all things turf and the local way. From there the forming of the 'South Pacific Superintendents Association' began and I was elected to take minutes. For those who know how much Steve, then Laucala superintendent Mark Stanley and our trade representative Shane Summerhayes (Turfcare Australia) can talk, I was often stuck until the end of proceedings!

How did the job at Bunbury GC come about and why the decision to head back to Australia? I loved my time in Fiji but with Siobhan pregnant with our third child and our eldest daughter beginning school we made the decision to head back home at the end of my contract period. The sacrifices Siobhan made at the beginning of my posting, particularly with a newborn in a foreign country just to allow me to make that step up, were massive.

I returned back at the end of 2015 and after a short period of working on the house and playing the role of trophy husband, I was told to get out and look for a job. The timing couldn't have been better as a local council was looking for someone to join the turf team. I was very grateful for the position but it just wasn't golf and when the superintendent job came up at Bunbury Golf Club only three months into my tenure I threw everything at it.

What do you like most about being the superintendent at Bunbury GC? Pretty simple really – for me Bunbury is home and where it all started. I love the traditional layout of the course and it's a place I know well.

Give us an overview of Bunbury GC and some of its unique characteristics? As mentioned, Bunbury is an old traditional course. When I first started back in 1997 it was ranked inside the top 50 of Australia but that was well before a lot of the new courses entered the rankings. The best thing about Bunbury is that it's a hidden gem; a lot of the general public don't even know where the course is situated and we are often mistaken for the Sanctuary Resort a few kilometres up the road.

When the course was built back in 1948 they had great vision, building it around the base of a massive sand hill in the middle of the course which made for some picturesque and challenging holes. With ample bushland consisting of Jarrah, marri peppermint and banksia trees between each hole, it gave the golfer a sense of privacy on each fairway.

Bunbury is currently undertaking a greens replacement programme, with two greens revamped each year. Pictured is the 9th green prior to the rootzone being added

What are some of the unique features about Bunbury GC from a turf management perspective? As with most courses in WA we are entirely sand based making for easy drainage. The benefit of being built around a sand dune is we have our own sand quarry onsite, giving us access to a lifetime supply of clean yellow sand for topdressing and construction.

Is it an easy/hard facility to manage? What's the most challenging aspect? The most challenging part is the age of some of our greens, which are old push-ups ranging in age from 30 to 40-plus years. These greens also have shade and airflow issues which severely impact turf health and recovery. As part of our greens replacement programme, tree removal is at the forefront of our plans to open up the area around the greens and surrounds to allow them to breathe.

Take us through your turf management operations there. What changes have you implemented in terms of managing the course during your tenure as superintendent? When I began we had a big turnover of staff and I had the opportunity to build a fresh team. I wanted to surround myself with guys who were eager and showed an interest in the game and in the club. Raiding the club's junior program and getting two young guys to come on as apprentices has been beneficial. They are both low handicap golfers, so their understanding of the game is high and they take to things a lot quicker then somebody who is just there for a pay packet.

Out on the course, we focus highly on our water management. Due to trees and poor airflow, the leaf can remain wet for long periods. Daily moisture readings are recorded and we try and keep our greens around the 20-25 VWC percentage range. Other areas I have focused on is lifting the overall presentation of the course, turf quality and colour, as well as small simple tasks like edging tee boxes and keeping bunkers weed free and trimmed which lift overall presentation.

Turfing the new 9th green complex

What other maintenance changes are you wanting to introduce? With the amount of sand available to us, I want to start incorporating dusting programmes on our tees and green approaches in an effort to reduce thatch levels, firm up and increase the density of the surfaces. Off the golf course, discussions are taking place for the much-needed upgrade of our maintenance facilities and amenities which will bring another overhaul of SOPs and risk assessments.

Any special environmental considerations that you have to incorporate into the management of the course? With the club recently agreeing to take approximately 18,000KL of Class A treated wastewater per year from a neighbouring holiday park, the local council required us to put in place a Nutrient and Irrigation Management Plan. The plan ensures minimal leaching of nutrients from fertiliser application and treated wastewater to the Collie River and Leschenault Estuary which surrounds

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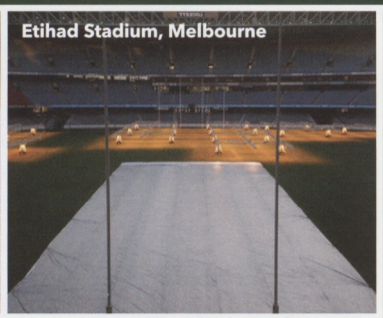

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two sides of the property. Although it will impact us slightly, it shouldn't have any major impact on our practices at present.

What are some of the major challenges facing Bunbury GC both from a turf and club management perspective? Being in a regional centre it is difficult to attract good experienced staff. We are lucky enough to have housing onsite and I have set up a programme of getting guys in from overseas on a Working Holiday Visa for a six-month contract over the summer months. As part of the contract they receive free housing and the use of a vehicle during their stay. Last summer we hosted a Scotsman and this year we are hosting a Canadian.

Having good experienced internationals on our team brings new ideas and is a great learning experience for everyone on the staff and opens doors up for our apprentices once they complete their time. By implementing this and the use of part-time workers gives me the flexibility to increase our staff numbers for times when we need them, while saving the club money in full-time wages.

Outline any major course improvement works recently completed or coming up. At the moment there is a lot happening around the club with the clubhouse undergoing a major renovation, while out on the course we have committed to replacing two greens per year. To cater for this, we increased

AT A GLANCE – BUNBURY GOLF CLUB, WA

Course specs: 6701 metres, 72 hectares with 25ha of maintained turf. Greens – Penncross bentgrass; Tees – Wintergreen/Santa Ana couchgrass; Fairways – Wintergreen.

Members/Rounds: 755/35,000.

Major tournaments: We have a lot of gold letter and open events throughout the year which I like to get the course up and about for. Our major pro event for the year is the Southwest Open at the start of June.

Course budget: Operating budget is $182,500.

Staff structure: Four full-time staff year round including myself. Each summer we have a seasonal worker for six months plus the use of part-time and casual staff when needed taking our total up to eight. Key personnel – Dave Brennan (superintendent); Michael Newman (assistant), Connor Butlion and Will Shaw (2nd Year apprentices), Chad Fauchoux (seasonal worker from Canada) and Barry McGill (3-4 days per week).

Annual Rainfall: 705mm (2017).

Soil types: The course sits on the Bassendean dunes system which runs from Perth down to Busselton some 45km down the road. The sand is mainly infertile and carries very low levels of nutritional elements. Low clay and silt content makes it extremely prone to leaching and becoming hydrophobic.

Water sources: South West Yarragadee aquifer – a massive freshwater aquifer which runs throughout the south west region of WA and stores some 1000 cubic kilometres of water with a depth of approximately 2km. We draw from 170m with a pH of 6.4 and iron levels of 23mg/L.

Irrigation system: Toro – Gemini Trident approximately 13 years old.

Cutting heights/regimes: Greens 3mm – cut 5-6 days per week dependent on play commitments; approaches and collars 6mm – cut 2-3 times per week; Tees 6mm – cut 1-2 times per week; Fairways 9mm – cut 1-2 times per week; and rough 38mm – cut when needed (approx. every 2-3 weeks).

Renovations: We do one major greens renovation for the year around the middle of September using a 17mm hollow tine. After the greens have been sanded we will go back over them again using a solid tine to incorporate more sand into the profile, particularly on our older and problematic greens. Throughout the year the greens are vented every six weeks, alternating between 7mm ninja tines and 19mm cross tines.

We have recently resurrected an old Vertidrain which we intend to run over the greens to achieve deeper penetration through that pan layer. This year I'm planning on using a much bigger tine and running two passes over the greens. Fairways are groomed three times over the summer period using the verticutting heads on fairway mowers, with the heaviest groom taking place in October. Direction is usually tee to green and then back tracked along the same line. Tees also undergo renovations around the same time, mowing them down hard to 4mm then following up with a good scarifying and hollow core.

Major disease pressures: To date disease pressure has been pretty good. Low nitrogen and high magnesium and potassium inputs over the summer months has reduced the pressure a little. Water management is another area we focus highly on particularly as we do have a lot of trees around our greens creating shade and poor airflow, so we try and minimise the amount of time the leaf remains in moisture.

Nutrition management: Greens are fed on a 7-10 day basis. We usually alternate between mixes with one feed specific to plant health and another specific to surface preparation, whether that be the inclusion of growth regulators or primarily colour and aesthetics. Once a month during the growing season we give the greens a good flush using a penetrant wetter then followed up with applications of dolomite at 150kg/ha. Fortnightly applications of wetting agents and soil products are applied throughout the growing season.

the size of our bentgrass nursery by an additional 840m², giving us a total of 1570m² to harvest from, plus the addition of a 1000m² Wintergreen nursery for green and bunker surrounds.

We are very grateful to have a member who has put his hand up to cover the costs associated with the replacement of the greens and since I began we have replaced two – the 15th and 9th. The 9th green was the most recent as part of our clubhouse surrounds programme that we put together. This area was extremely unsightly as it was heavily infested with kikuyu and Parramatta grass. This area is the first port of call for golfers, so when trying to entice new members to the club it wasn't the best first impression we were after.

Once the surrounds were sprayed numerous times and the old turf stripped, up to 27,000m³ of sand was brought in and reshaped and contoured. The area was then planted out with Santa Ana. As winter approached the area wasn't fully covered so we oversowed using Striker ryegrass to give us that coverage through the winter months. Once we got through the winter, we began tree removal around the green, with several trees taken out from the right hand side to remedy shade and debris issues.

Six weeks out we started spraying the green on a fortnightly basis with glyphosate with three applications needed. Once the club championships were completed we made a start on the earthworks with the old turf cut and stripped and the top 250mm of rootzone removed and used for mounding around the green. Some 35,000m³ of sand was brought in for rootzone (that's why I love our sandpit). As part of the agreement and the club's constitution, we can't make drastic changes to the greens contours, so the rootzone is shaped to as close as possible to the old green (it is pretty hard to get it exact so a little subtle flattening of swales and sneaking in an extra couple of pin spots may occur).

Once shaped and floated off we begin the process of laying turf from our nursery and with the help of a couple of extra guys we can usually knock it off within the day. Once the green is down, we stolonise the green surrounds with Wintergreen then oversow with Striker rye for a quicker establishment. Usually from closure to reopen we can have the green back in play between 4-6 weeks dependent on weather as we are usually just waiting for the surrounds to fill in.

The completed look of the 9th

Next on the list is our 12th green and that is scheduled for the beginning of March and will include the rebuild of our 17th ladies tee along with the 1st tee also coming up for replacement. All of this work is being done in house.

The weather and climate is always a great leveller for a course superintendent. How has Mother Nature treated the course in recent times? The seasons have definitely changed over here. Summers haven't been anywhere near as hot as they once were; we still get the hot days but temps usually drop back down to the mid to high 20's for the next few days. Gone are the days of the consecutive 40-plus. We have also been experiencing wetter summers and a later start to winter so at the moment I'm quite fond of this weather pattern.

The one product I couldn't manage my course without is... Good wetting agents. With the nature of the sand over here, it's very hard to re-wet once dry.

Are expectations of course presentation and conditioning any less than that placed on your metropolitan counterparts? I believe so. Having worked at a busy private course in Perth, there is a

The 15th was also revamped during the first year of the greens replacement programme

As part of Bunbury's greens replacement programme, tree removal is at the forefront of plans to provide a better growing environment

massive difference between the attitude of members. Understandably they do pay a little more for their membership so they have higher expectations, but their general attitude towards the course and what we do is completely different to that of regional based members. Regional members, although having expectations, have a better understanding of the budget constraints and lack of resources.

Do you have to be more resourceful as a regional-based superintendent? You probably don't tend to rely on outside labour as much as you would in the metro areas. Resources are based on what our budget allows, but we tend to try and keep as much in-house as possible which also has the benefit of helping with ongoing staff development.

How important are the relationships you have with other course supers/trade reps? Very important. Being able to have guys in a similar position to talk with and bounce ideas off is good to build the knowledge base, but it's also pretty handy to blow off a little steam every now and then.

What have you got in your shed? 3 x Toro 3150 (2 greens, 1 tees), Toro 3100 (greens collars and approaches), Sand Pro 5040 bunker rake, Toro 3020 bunker rake (generally used for construction projects), 2 x Toro 5510 fairway mowers (one set of scarifying heads), Toro Groundsmaster 360 and Toro 4500 rough mowers, Toro HD Workman with Propass 200 permanently attached, Toro HD-X Auto with 710L spray tank permanently attached, 2 x Toro MDX electric Workman utilities, Toro GTX Workman, 2 x Tru-Turf petrol greens rollers, Toro ProCore 648 and 2 x ProForce blowers.

Brennan undertakes one major greens renovation around the middle of September using a 17mm hollow tine. Throughout the year the Penncross greens are vented every six weeks, alternating between 7mm ninjas and 19mm cross tines. Pictured is the 16th green

What's your favourite piece of machinery and what's next on the wish list? The HDX sprayer ranks up there – gives me peace of mind that what we are putting out is correct and it's a lot nicer to operate then our previous antique. The next major purchase will be the replacement of the two fairway mowers along with the addition of a couple more Workmans as part of a lease deal. On my wish list is probably a decent Vertidrain or ProCore for the use on fairways and we may as well throw in a new tractor to pull them as part of the deal!

Do you have any old/interesting pieces of machinery? We salvaged an old power broom/sweeper from the junk yard and have got it up and running. We have lots of gum nuts around the place so it's quite handy to send that out and pick them up before our rough mowers go over them. We also have an old Gallagher forager that I have set aside as next winter's job.

Favourite spot on your course? The 8th tee – there is something about this hole that I love. It's a 171m downhill par three with an old peppermint tree guarding the left and protecting part of the greenside bunker. Usually this green sits in shade most of the day so you get a good contrast from shadows and amazingly it has adapted to its own climate and is one of the best and trouble-free greens on the course.

Best advice you have received about being a course superintendent/greenkeeper? The best advice I received and still use today was from Brendon Large who once told me 'Everyone's got an opinion, trust your own judgement and back it in'. Another piece of advice I always pass on to the boys is to always remember that someone's watching... as I once found out the hard way when a little old lady appeared from behind a bush.

What do you think is the most challenging aspect of a superintendent's role today? The superintendent's role is so diverse nowadays. It comes with many requirements and one of the most important tools in the arsenal is the staff. Listening to staff and taking on board their key attributes and giving responsibility helps keep that morale level high as it gives them a sense of ownership. For me personally, it's been about building on confidence. I was always a pretty quiet guy but working on public speaking and dealing with members has helped me become a better communicator.

Most rewarding moment during your time as Bunbury superintendent? Starting off with brand new staff had its fair share of challenges early on, but the way everyone gets on and works together nothing is ever too much. Most importantly they all want to learn and be out here which is probably the most satisfying thing to date.

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GEOLINK TECHNOLOGY NOW AVAILABLE FOR TORO MULTI PRO SPRAYERS

Application of chemicals is an integral component of managing and presenting turf surfaces, but does come at significant expense. In a bid to improve spraying efficiency and reduce the cost of chemical application, AGCSA Platinum Partner Toro Australia has introduced its new GeoLink system which is now available on its Multi Pro® 1750 and 5800 spray units.

GeoLink is an innovative GPS spraying solution designed to maximise efficiency, deliver precision coverage and minimise chemical costs by eliminating overspray. The GeoLink GPS spraying system ensures turf managers apply only what is needed, where it is needed. It is equipped with individual nozzle control that can turn off single nozzles if it senses any portion of the area has already been treated on a previous pass.

The GeoLink system is available with an advanced Real Time Kinematic (RTK) correction configuration, which delivers precision to within a centimetre. This configuration also saves time, since operators only need to define the target area once, not every time they spray.

Another advantage is that GeoLink is based on turf applications, not agriculture or farming. It's designed specifically for the way golf courses or sports grounds need to use it, with unique features like multiple inclusion zones and exclusion zones. This allows operators to select all greens or sports pitches and define them as one job. Then when that job is selected, GeoLink will tell the operator the total area and how much chemical to mix.

A large, weatherproof, touchscreen shows the machine's location and allows the operator to create and choose spray jobs containing multiple spray zones. In addition, GeoLink includes a convenient automated reporting feature. Just plug a flash drive into the USB port on the side of the monitor and managers can download data such as coverage, how long it took and how much chemical was used. Information can also be shared between sprayers if a club or facility has multiple GeoLink systems. The system can also be transferred (along with all application history) to a new sprayer when needed.

In trials conducted by Toro, clubs utilising the GeoLink system were able to reduce their chemical usage by a double-digit percentage. For courses and sports grounds with a significant chemical budget, the savings could effectively pay for the system quickly. For additional peace of mind, GeoLink is backed by support from Toro's National Service Centres and the Toro National Support Network.

For more information call 1800 356 372, visit www.toro.com.au or contact your Toro golf area sales manager.

Above: Toro's GeoLink system is an innovative GPS spraying solution for its Multi Pro spray units designed to maximise efficiency and deliver precision coverage

Bio Nutrients 8-0-9 is now available from Oasis Turf

OASIS LAUNCHES BIO NUTRIENTS

AGCSA Bronze Partner Oasis Turf has recently released Bio Nutrients 8-0-9, manufactured by Growth Products, onto the Australian market.

Bio Nutrients is a unique, dry, 100 per cent soluble blend of humic acid, natural wetting agent, kelp, natural L-amino acids and exclusive combination of beneficial soil bacteria along with fortified natural carriers that add rich organic material to soils. Bio Nutrients can be used on all greens, tees, fairways and sports turf and has the added advantage of containing a natural bio stimulant to promote strong rooting.

The Bio Nutrients formulation is designed to improve soil quality by adding rich organic nutrients that are often depleted in old and worked soils. A powerful natural wetting agent ensures deep penetration into even the most compacted soils. Once in the rhizosphere, a combination of L-amino acids, kelp and natural soil bacteria colonise and revitalise the soil with active communities of living microbes. The humic acid and plant extracts are rich in carbon which becomes a food and energy source for the soil bacteria colonies.

For more information on Bio Nutrients, contact an Oasis Turf specialist or visit www.oasisturf.com.au.

QUICKLINKS FROM GROWEQ

Sydney-based company GrowEQ has developed QuickLinks, a 'cloud-based' safety and environmental management system tailored specifically for golf courses. Developed in conjunction with the New South Wales Golf Course Superintendents Association, QuickLinks helps superintendents achieve management goals in the simplest possible way by ensuring their operations are compliant with their safety, legal and environmental responsibilities.

According to GrowEQ's Matt Murphy, QuickLinks can be tailored to meet individual clubs'

circumstances, with all the policies, procedures and other documentation required to get their golf course on the road to certification. In addition to safety and environment aspects, it is also designed to cover all aspects of a course superintendent's job, including staff management, chemical logs and equipment maintenance.

"One of the features that superintendents really like is the ability to assign tasks to their staff from anywhere," says Murphy. "QuickLinks can be accessed on your smart phone and also on your staff's smart phone. You can assign a task to one of your employees who's out on the course and he'll receive it as an email on his phone. Even better, you can do that from anywhere. So even if you're away from the course on other business, you can still quickly and easily communicate the job with your staff. Then when they finish the job, you'll see an acknowledgement on your phone.

"One of the other features that's very popular is the chemicals log. You can assign a fertilising job to one of your staff via QuickLinks on your phone, direct to your staff member's phone. When they finish the job, they can record the usage of fertiliser on their phone. The fertiliser inventory is automatically updated so there's no double entry or calculations to perform."

For more information on QuickLinks or an obligation-free demonstration, contact Matt Murphy on 0414 714 077 or visit www.groweq.com.au.

GRADEN JOINS EQUIPMENT SOLUTIONS FAMILY

Equipment Solutions is now the exclusive distributor of the Graden turf range within Australia following an agreement reached between the companies in late 2017. Globe Australia's business manager Peter Frewin says the Equipment Solutions team is looking forward to providing Graden with a pathway to grow its local business.

"The addition of Graden to the Equipment Solutions portfolio reinforces the commitment to provide quality renovation products to the turf industry," says Frewin. "It perfectly complements the current range that includes Dakota, 1st Products, Amazone and Groundsman."

Adds Graden's Mark Bainbridge: "Graden is a proudly Australian owned/made company with a long history in the turf industry around the globe. "This alignment will assist in growing the brand locally with Equipment Solutions ideally placed to expand the business in our home country. Based from our Thomastown (Melbourne) facility, we can service the industry in all areas of turf maintenance with our product offering which includes scarifiers,

Equipment Solutions is now the exclusive distributor of the Graden turf range in Australia

sand injectors, clean-up units and rollers."

For all Graden enquiries contact the Equipment Solutions team – Jordan Tishler (NSW) 0419 493 164, Stan Wells (Vic and SA) 0428 263 516 and Brian Taylor (Qld and WA) 0439 808 840.

JOHN DEERE BOLSTERS ITS COMMERCIAL ZERO-TURN LINE-UP

AGCSA Silver Partner John Deere has recently added two new commercial zero-turn radius mowers – the ZTrak Z945M and ZTrak Z955M – to its fleet. The new models offer professionals electronic fuel injection (EFI) engines with higher horsepower for increased fuel efficiency and power in varied mowing conditions.

The Z945M (featuring a 20.1kW/27hp, 824cc EFI engine) and the Z955M (featuring a 21.6kW/29hp, 824cc EFI engine) are available with multiple deck offerings – 152.4cm (60 inch) side discharge or 152.4cm (60") Mulch On Demand™ (MOD) is available on both models, and a 182.9cm (72") side discharge is also available on the Z955M. The increased horsepower makes quicker work of common activities, such as material collection, mulching and mowing in thick turf conditions, while the EFI engine improves overall fuel economy.

The John Deere Z955 EFI ZTrak zero-turn mower

Bunker Dry is an Australian designed system to keep golf course bunkers free from water

In addition to increased power and improved fuel economy, John Deere has also enhanced ride comfort and ease-of-use on the new models. To help operators stay more comfortable on long mowing days, the new mower offers an optional premium suspension seat on the M and R series machines. The newly-designed seat offers a thicker bottom cushion, additional padding on the back with ergonomic contouring, and adjustable armrests to improve ride comfort and the overall mowing experience. For added convenience, users will also notice an enlarged and angled fuel filler neck to complete fuelling with less mess on all new Z900 Series ZTrak mowers.

For more information on the ZTrak Z945M and ZTrak Z955M commercial zero-turn radius mowers, see your local John Deere dealer or visit www.deere.com.au

STAY DRY WITH BUNKER DRY

Managing bunkers has become even easier and more cost-effective with the development of Bunker Dry. Designed by Sydney-based engineer Russell Druce, the Bunker Dry system simply drains water from bunkers at a higher flowrate than other systems and eliminates sand ingress into drains. It is easily installed to any bunker without undertaking major works and with six years of development and testing in real golf course conditions comes in at a fraction of the cost of other bunker drainage systems.

The Bunker Dry device simply acts as a hydrostatic weir. Rainfall enters the bunker and depending on rainfall intensity and location of the bunker, begins to saturate the sand. The bunker fills with water when the sand becomes saturated. Even if the bunker has good performing conventional drainage, the balance point between the bunker staying dry and filling with water, depends on the discharge flowrate.

When the flowrate into a bunker exceeds the flowrate out of a bunker, water will accumulate. Conventional drainage has small holes/slots to filter water and limit sand entering the pipe, which restricts flowrates. High flowrates in, must be balanced with high flowrates out.

Bunker Dry is unlike conventional drains. It relies simply on gravity to remove water from the sand at a higher flowrate plus eliminating the ingress of sand. The absence of sand allows free flow inside the drain which is a major factor for performance and maintenance of the drainage system.

The Bunker Dry device is designed to be installed between 125mm and 200mm below the surface of the sand (bunker). The size and shape of the bunker will determine how many Bunker Dry units should ideally be installed.

For information on the Bunker Dry concept and the benefits it can provide, visit www.bunkerdry.com.au

BUNKER DRY© SYSTEM

INDUSTRY APPOINTMENTS

GREENWAY GROWS

Greenway Turf Solutions (GTS) has recently appointed **Dean Mosch** and **Dan Norton** (pictured) to enhance its Queensland operations.

Mosch comes with a wealth of experience having worked in the Queensland, South Australia and Victorian regions. He will complement the current GTS maintenance product sales team in the golf, sports field, landscape and council markets. Mosch can be contacted on 0435 799 327 or email deanm@greenwayturfsolutions.com.

The appointment of Norton bolsters GTS's project management operations servicing councils and sport field facilities. His many years working within this sector providing agronomic advice, turf management programmes and project management adds another offering to the products and services of GTS. Norton can be contacted on 0411 295 843 or dann@greenwayturfsolutions.com.

GTS principals **Paul Spencer** and **Chris Chapman** are looking forward to the knowledge and experience their new recruits will bring to the company: "Bringing both Dean and Dan on board will ensure the needs of our customers are looked after by very capable and experienced personnel," says Spencer. "Our role in the engine room of GTS is to ensure the five sales team members in Queensland have access to the technical knowledge and product supply to provide a high level of support to their customers."

RAIN BIRD'S VINTAGE ACQUISITION

AGCSA Silver Partner Rain Bird has brought on board former The Vintage Golf Club superintendent **Steve Harris** as a golf specialist servicing the NSW and Queensland markets. Harris (pictured) finished up at The Vintage in mid-January before starting his new role on 10 February.

Harris spent nearly 16 years as superintendent of the Hunter Valley-based course, joining in the latter stages of its construction. During his time as superintendent the course was widely lauded for its conditioning and easily resided within Australia's top 50 ranked courses.

"I'm really looking forward to the new role," says Harris, who is approaching 30 years in the turf industry. "It was time for a change and I'm glad to be able to stay in the industry which is in my blood. I had a great time at The Vintage and among the highlights were hosting four NSW Opens."

HUME JOINS FERNLAND

Queensland-based turf supply company Fernland has announced the addition of **John Hume** (pictured) to its turf sales team. Hume brings 36 years of industry experience to the role and joins the Fernland team to build on the strong relationships he has established and developed with sporting clubs, golf courses, local councils, schools and universities throughout Queensland over the years. Hume can be contacted on 0429 505 145 or email john.h@fernland.com.au.

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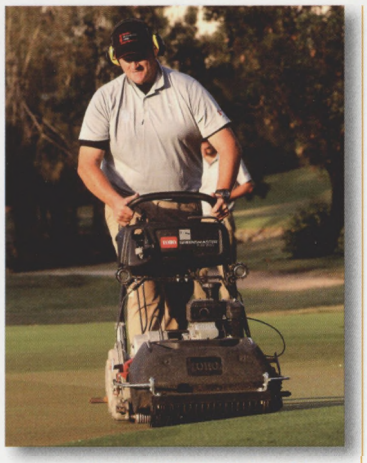


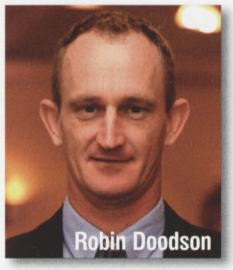
Brendan Clark, pictured here volunteering at the 2016 Queensland Open, will be back on the tools after taking on the role of superintendent at Atherton Golf Club

I trust everyone had a great Christmas and a safe New Year because it's back to reality for our members in 2018. With extremely high temps and low rainfall in January, it has been a very tough start to the year for most of us. As an example, the Gold Coast BOM station recorded just 51mm of rain for January, with maximum day-time temperatures ranging between 28-34 all month.

With most clubs in Queensland recovering from course renovations over the last few months, the heat and, for some, thunderstorms, means many of us are struggling to keep up with the cutting schedules as the grass has been literally growing as fast as we can cut it.

All this paled into insignificance of course when we learnt of the terrible injuries suffered by Townsville Golf Club superintendent **Jason Foster** in an explosion at his club on 11 January. Jason was tending to the club's on-site sewage treatment plant when what is believed to be a build-up of methane gas led to an explosion. Jason suffered burns to a third of his body and was transported to a specialised burns unit at Royal Brisbane and Women's Hospital. At the time of writing this report he had undergone three skin graft operations which according to wife Cas had gone well. On behalf of all members we wish Jason a speedy recovery.

On a more happy note, congratulations to two long-serving GCSAQ members – **Brent Robinson** and **Brendan Clark** – who have both moved away from the sunny Gold Coast to take on new challenges. Brent, formerly at Arundel Hills, has been appointed superintendent at Ballina Golf Club in northern NSW, while Brendan (formerly with e-par) is heading back to Far North Queensland as superintendent at Atherton Golf Club, inland from Cairns. What makes Brendan's move rather unique is that his wife is taking on the role of general manager at the same club – interesting times ahead!



Robin Doodson

Congratulations also to our very own 'William Wallace' AKA former Doha Golf Club superintendent **Robin Doodson** and his wife Kerry who have purchased a new home on the Sunshine Coast. Robin has returned from the Middle East to take on a new role as Nuturf's Queensland territory manager. We wish Robin well during his stint on the 'dark side'.

And finally, in local news from the south east of the state, Gold Coast City Council has, in its wisdom, decided to start charging for recycled (effluent) water starting from 1 July 2018. This will be a significant additional cost to those currently using this resource for free. The proposed pricing will begin at 10 cents a kilolitre this year and over a five-year period increase to 50 cents. In some cases, this will probably be a luxury that a lot of small sporting clubs just can't afford.

PAUL MCLEAN
PRESIDENT, GCSAQ

SAGCSA

Activities have been a little quiet here in South Australia over the past few months. We held our AGM at the Royal Adelaide Golf Club in early December with around 28 attending. This was a late meeting as our usual July was postponed due to low numbers.

The meeting was more casual than previous AGMs with the main focus being on discussing new ways the SAGCSA can encourage members to become more involved. **Barry Bryant** (Mt Osmond Golf Club) stepped down as president after five years, so on behalf of the SAGCSA committee and members I would like to thank Baz for all the work and time he has put in. We are lucky, however, that Baz has decided to remain on the committee.

The weather has been a bit hit and miss recently. We have had some unusually cool weather along with some extreme temperatures to deal with. Hopefully the weather holds out for Kooyonga Golf Club superintendent **Richard James** who is holding the 2018 ISPS Handa Women's Australia Open in mid-February.

Richard prepared The Grange Golf Club for the same event back in 2016 and I'm sure he will have Kooyonga in amazing condition, just as he did at The Grange. The Women's Open has been a huge success here in South Australia. It was well patronised for the previous two events at The Grange and Royal Adelaide (2017) with record spectators through the gates. We all hope that the event will continue in SA over the coming years and wish Richard and his team all the best.

NATHAN BENNETT
PRESIDENT, SAGCSA

Kooyonga Golf Club hosts the 2018 ISPS Handa Women's Australian Open in mid-February

STANZ

So far the summer season across New Zealand has been one of climatic extremes – extreme heat, extreme rainfall and extreme drought! In the more northern climes of the islands the summer has been perfect for the establishment of warm-season turfgrass species, in particular couchgrass and kikuyu. In Auckland, the council has committed to trialling the establishment of selected sand carpet sports fields in the 2018/19 construction season with a seeded couch variety as a means of assessing the pros and cons of this practice versus traditional stolonising.

From an industry perspective, this time of year tends to be rather quiet. The dry weather has resulted in the uncontrolled spring growth coming to an abrupt end and many of the city's parks have turned from what resembled native rough to a scene from the Serengeti! Auckland rainfall for the 2017 year was up by 120 to 145 per cent, but by early January 2018 the soil moisture levels had dropped below the 'normal range' for the North Island. This data provides an indication of how quickly things have turned dry for much of NZ this summer.

Aside from the challenges of an increasingly fickle climate, other industry news has seen plans for the redevelopment of sporting facilities in Palmerston North approved. This upgrade project of the existing Manawatu Arena sports precinct will take a number of years and involve additional grandstand upgrades, resurfacing of the stadium and installation of artificial training fields within the surrounding training facility.

In addition, plans are also underway at another central North Island location (near New Plymouth) to establish an elite training centre for Central North Island Football. So there are signs of significant planned investment in the central North Island regions in the years to come.

In keeping with the quiet nature of the time of year, no big moves within industry roles occurred. Turf managers and curators around NZ are head down and backside up preparing wickets and sports fields for busy summer schedules. New Zealand has just finished hosting the U19 ICC Cricket World Cup (13 January-3 February) with venues all the way around the country used for the tournament.

It has been encouraging to see the associated investment going into some of our more provincial facilities such as Cobham Oval (Whangarei) and Bay Oval (Mt Maunganui) over the past year. Bay Oval in particular has enjoyed the installation of LED lights and a digital scoreboard which all add to the value of this rapidly improving cricket venue.

From the STANZ executive, we wish all members a prosperous, healthy and safe 2018.

WILL BOWDEN
COMMITTEE, STANZ

Cobham Oval (top) and Bay Oval (above) were among the host venues for the U19 ICC Cricket World Cup held in New Zealand this summer

STA WA

A belated happy New Year to everyone from the Sports Turf Association (WA). I've been writing these WA state news reports for some years now and each time I have tried my best to steer clear from mainly reporting about the weather. But, it has been a quiet few months event-wise on the west coast, so it's all I've got to write about, especially that amazing downpour we received on Monday 15 January. Wow! It just kept on coming down all day and into the night until we emptied 103mm from the rain gauge by the grounds shed.

Now I know that many of my eastern state counterparts will be very quick to point out bigger numbers gotten from some of the flood level rains they experienced in the recent past, but from our little outpost it was quite unexpected for January, and all the more for it, very appreciated. January's average for Perth is listed as being only 16mm and that's over three whole days.

Not surprisingly with temperatures back into the 30s immediately following the downpour, turf around Perth was going gangbusters! The warm nights and cloudy days have also provided ideal conditions to give sports fields a real boost and left us all thinking just how good it would be if we had mid-summer rains like this every year! Hopefully it is an omen to a good year ahead!

The first major STA WA event for 2018 is the annual WA Turf Awards night where we celebrate our 2017 graduating class of turf students and apprentices. I look forward to writing a full report on this great night in the next edition. As they say, come on 2018!

TONY GUY
PRESIDENT, STA WA

ON THE MOVE

OLIVER BELL: From assistant superintendent Terrey Hills Golf & Country Club, NSW to superintendent Dunsborough Lakes Golf Club, WA.

HARRY CAIN: Appointed assistant superintendent Paradise Palms Country Club, Qld.

BRENDAN CLARKE: From e-par to superintendent Atherton Golf Club, Qld.

BRENDAN DOOLEY: Appointed assistant superintendent The Sands Golf Club, Vic.

MARTIN GREENWOOD: Appointed superintendent Settlers Run Golf & Country Club, Vic

KYLE GUNN: From groundstaff to assistant superintendent Heidelberg Golf Club, Vic.

THOMAS JONES: From superintendent Riverside Oaks Golf Resort, NSW to assistant superintendent Royal Sydney Golf Club, NSW.

TONY MCFADYEAN: Appointed superintendent Nedlands Golf Club, WA.

STA VIC

The STA Vic Cricket Pitch Preparation Guide video is now available for viewing

Welcome to 2018! STA Victoria is looking forward to providing valuable information to the turf industry and staging some great events. The first two events for the year are:

- **17 April 2018:** OH&S & Tour, Junction Oval
- **25 July 2018:** Sports Turf Seminar, MCG

Following on from our very successful Pitch Preparation Day in September last year at Edwin Flack Reserve, a 19-minute video was produced by Turfmate and funded by Cricket Victoria, Cricket Australia and STA Victoria.

Narrated by cricket wicket expert **John Shannon** (Melbourne Grammar School), the video looks at all aspects of cricket wicket preparation including string-lining, watering, rolling, cutting, grassing up, marking up and covering the pitch. To view this fantastic resource, go to www.vicsportsturf.asn.au/cricket-pitch-preparation-video.

STA Victoria is once again sponsoring a student undertaking the Diploma of Sports Turf Management – Horticulture. For more details and the application form, including criteria, visit www.vicsportsturf.asn.au. On the website you can also download the recently added second milestone report for the STA Victoria research project titled 'Compare possible hours of use for different sports field construction types and maintenance inputs'.

COMMITTEE, STA VIC

TURF QUEENSLAND

Nearly a year on after surviving Cyclone Debbie in March 2017, many Queensland and Northern Rivers turf producers are still in recovery and reinvestment mode due to the high level of damage to equipment fences from wind, flood waters and silt deposits on the property. Cyclone Debbie grants closed on 12 January 2018.

Having been hit by the cyclone, no rains were then received until early October placing the eastern seaboard of Queensland in an extremely dry state. In fact, Townsville is still under severe water restrictions. Thankfully, in early October most farmers from Gladstone to the border received around 100mm that assisted greatly. This has had follow-up storms and heavy rain with some flooding. Now as we enter our wet season steady rains (not cyclones, but who knows) are again expected.

Over the past couple of months there has been a shortage of turfgrass in the state primarily due to the fact of excellent growing conditions. Construction crews continued to work through the sunny weather and have therefore installed considerable amounts of turfgrass in various varieties. The Queensland turf industry works together and helps each other with supply. In some instances there were farms running short of water as well as turf!

In a snapshot survey conducted by Turf Queensland, SEQ growers supplied 18.3 million square metres of turf in 2017

Turf Queensland targets visiting and talking to turf farmers at least once a year. This past year we undertook a small 10 question survey for the Department of Natural Resources and Mines as part of the Rural Water Use Efficiency Irrigation Futures project, which provided some interesting information.

If we average it out across our member base in south east Queensland, based on the answers across 30 turf farms in the region (the larger ones in the state);

- 18.3 million square metres of turf was supplied into the south east Queensland marketplace alone (+ NQ).
- An average farm investment over the past six years was $1.112 million.

This investment is at a time when precision agriculture uptake was extremely high within the turf industry. Big end items such as centre pivots/variable rate irrigation and automatic harvesters were included as the industry worked hard to maintain management best practice.

An interesting area for energy use efficiency was the uptake of solar on many farms. Water use efficiency also increased through the application of variable rate irrigation, centre pivot and lateral irrigators along with moisture monitoring.

At this stage Turf Queensland has only undertaken the survey in south east Queensland and once north Queensland numbers are included this would produce a much more realistic figure across the state, taking into account the variable size of the farms and their production.

JIM VAUGHAN
TURF QUEENSLAND

With January flying past already, the VGCSA will hold its first education meeting for 2018 on 5 March at Frankston and The National (Long Island course) golf clubs. As with the previous few years, the meeting is based on a 'walk and talk' format with superintendents **Dean Hadfield** (Frankston GC) and **Simon Page** (Long Island) acting as guides. The day will conclude with a presentation from sponsor Nuturf and lunch.

Our summer research trials have been completed following on from the 2017 winter trials. Part one of the trial reports will be distributed to members soon with part two to be published in the coming months. The trial work consisted of various products for the post-emergent control of *Poa annua* in couch. Results have been interesting and we hope members can utilise the results in their *Poa annua* management strategies. Further trial work from the VGCSA will be conducted this year.

The VGCSA's new look website – www.vgcsa.com.au – has been launched with a more modern feel and user-friendly options. In 2018, the aim is to further develop the site's content and facilities, making it a 'go to' resource for members.

The association is also expanding its programme this year to include a regional forum/committee meeting to be held at Cranbourne GC. The forum will be open to both members and non-members in the Gippsland area and superintendents will be contacted in March to gauge interest in the event.

Finally, last November panel interviews were conducted for the VGCSA Apprentice of the Year and 2nd Year Diploma Scholarship awards. Each year proves to be a challenge for the selection panel due to the high calibre of nominees and this time was no exception. Congratulations to **Dechlan Turkington** (Green Acres GC) who won the apprentice award and **Jeremy Clarke** (Peninsula Kingswood CGC) who received the scholarship award. Both winning candidates were nominated by Holmesglen Institute of TAFE.

MAT POULTNEY
PRESIDENT, VGCSA

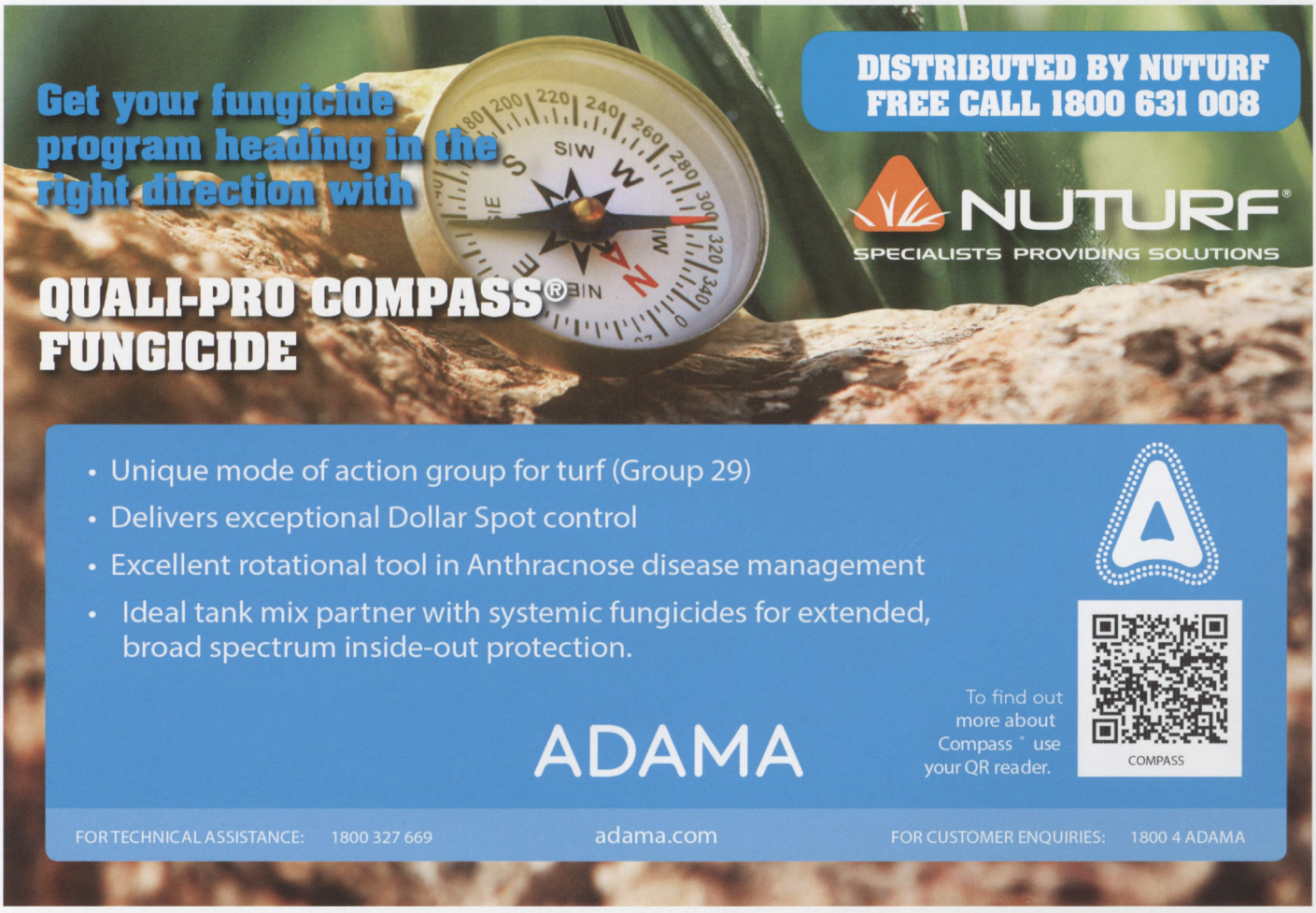
ON THE MOVE

WILLIAM KOOPMANS: Returned to Ballarat Golf Club, Vic as assistant superintendent following Ohio Program internship at Liberty National Golf Club, USA.

MATT PAGE: From curator WACA, WA to curator Melbourne Cricket Ground, Vic.

BRENT ROBINSON: From superintendent Arundel Hills Golf Club, Qld to superintendent Ballina Golf Club, NSW.

BRENDAN ROBJANT: From assistant superintendent Heidelberg Golf Club, Vic to superintendent Berwick Montuna Golf Club, Vic.



After six productive years as chair of the NTEWG, Bruce Davies has handed over the reins to co-chairs Hugh Gardner and Albert Sherry

TAFE QUEENSLAND HOSTS ANNUAL NATIONAL SPORTS TURF VALIDATION MEETING

In early December 2017, sports turf management educators from across the country met as part of their annual National Sports Turf Validation Meeting at Southbank Campus, Queensland. Congratulations to **John Hagan** and **Eddie Bennett** who did a terrific job hosting the event.

Our industry is fortunate to have a truly national organisation – the **National Turf Education Working Group (NTEWG)** – which meets biannually to discuss all matters relating to turf education. This group is made up of representatives of TAFE institutes delivering sports turf qualifications and industry representatives from each state and national association, including the AGCSA, Sports Turf Association and the Bowling Greenkeepers Association.

The huge amount of work conducted over time has provided us with a unique status and the NTEWG is the envy of all other industries in Australia. And now with the endorsement of three industry representatives – **Simone Staples** (AGCSA), **Jyri Kaapro** (Bayer) and **Paul Janssens** (Parliament House, Canberra) – on the National Industry Skills Council, it allows for a more streamlined communication of curriculum concerns.

This most recent gathering was a particularly important event due to the roll out the new Agriculture, Horticulture and Conservation (AHC) training package in 2017 and provided an opportunity to make comment for continuous improvement of unit material.

With the AHC40816 Certificate IV in Sports Turf Management qualification having been endorsed by industry previously, each institute provided assessment and delivery strategies for eight units of competency in AHC31316 Certificate III in Sports Turf Management and AHC51016 Diploma in Sports Turf Management qualifications which were debated before being endorsed and validated by industry.

The result is a consistent delivery of assessments across Australia. Once quality assurance has concluded, these Delivery and Assessment Guidelines will be posted on industry websites and provides employers and students the opportunity to gain an understanding of the minimum assessment standards undertaken in every unit of each qualification.

Tuesday started with a presentation on *Poa annua* resistance by Jyri Kaapro, followed by **Sam Papasidero** of Skills Impact who spoke about the newly formed Skills Council. **Jenny Zadro** (Sports Turf Association/Turf Growers Association) then spoke about preliminary plans for the introduction of a Certificate III Turf Production course. **Anthony Barkey** (Australian Quality Skills Authority) also discussed volume of learning and the auditing process.

The NTEWG meeting saw excellent attendance from both the state and national industry associations as well as RTO's from across the country. The meeting centred on building student numbers and reducing skills gaps, improving the apprentice selection process, the implementation and sign off of delivery and assessment standards as well as some of the issues, expectations and perceptions of our industry and trainers and opportunities for the future.

The NTEWG comprises the following representatives:

- Simone Staples (AGCSA)
- Bruce Davies (CIT, ACT)
- Wade Turner (NSWBGA/Queanbeyan BC)
- Jim Porter (STA, VIC)
- Frank Dempsey (STA, NSW)
- John Forrest (Challenger TAFE, WA)
- Gary Lee (QLD TAFE)
- Albert Sherry (Kurri TAFE, NSW)
- Malcolm Harris (NSWGCSA/Northbridge GC)
- Garry McClymont (GCSAQ)
- Steve Tuckett (Melbourne Polytechnic)
- Paul Dellar (The Gordon, Vic)
- Hugh Gardner (STA WA)
- Evan James (Ryde TAFE, NSW)

Lastly, I would personally like to thank **Bruce Davies**, who elected to step down from the role of NTEWG chair after a very productive six years. The role will now be co-hosted by **Hugh Gardner** (STA WA), representing industry, and **Albert Sherry** (TAFE NSW), representing education. The next NTEWG meeting is planned for Wellington, NZ as part of the inaugural Australasian Turfgrass Conference in June 2018.

For more information regarding turf education training please contact your local TAFE college or either co-chairs; Albert Sherry – albert.sherry@tafensw.edu.au or (02) 4936 0215; Hugh Gardner – hugh.gardner@iinet.net.au or 0418 245 557. Delivery and Assessment Guides can be downloaded through the AGCSA website - www.agcsa.com.au.

- ALBERT SHERRY

The National Turf Education Working Group met in early December. During the meeting, assessment and delivery strategies for the Certificate III and Diploma in Sports Turf Management courses were debated before being endorsed

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Whether it's on course in his role as foreman at Melbourne-based Riversdale Golf Club or playing Pennant, golf is an all-encompassing affair for Mark Brooks

Drive for show, cut for dough

There are some pretty handy golfers amongst the turf management ranks. Riversdale Golf Club foreman Mark Brooks is one of them…

"Golf is the closest game to life. You get bad breaks from good shots, you get good breaks from bad shots – but you have to play the ball where it lies." This Bobby Jones quote best describes how I have approached the challenges I have faced over the years as both a dedicated greenkeeper and competitive representative golfer.

My love for the game developed early, with the golfers in my extended family getting me hooked. My first set of golf clubs was a Christmas present at the age of 11 and I joined the Otago Golf Club (Dunedin, New Zealand) as a junior member. I'd spend many hours practising and hanging out at 'Balmacewen' (New Zealand's oldest golf course) and over several years I worked the holidays there alongside the greens staff.

This experience ultimately determined my career choice post-school, completing two years of study at Otago Polytechnic Campus in Cromwell (Central Otago) and gaining my Level 4 Certificate of Turf Management. During my secondary school years I was selected to play in Otago representative age grade teams and also for Otago Boys' High School.

While studying in Cromwell, I was named in the Otago senior men's golf team and had my first real taste of high level golf. I can remember feeling extremely nervous when I teed off for the first time at the Toro NZ Men's Interprovincial tournament held in Nelson. During this period I also enjoyed success in a number of tournaments with some results of note including winning both the Cromwell and Queenstown Senior Men's Championships, the Central Otago Senior Men's Championship and the Southland Stroke Play Championship in 2008.

At this stage I was working as a greenkeeper at Queenstown Golf Club, but my passion was to travel and experience working in the USA, so I applied for an internship through The Ohio Program. I was placed at Quail Hollow in Charlotte, North Carolina and headed there in March 2009, just in time for the huge 100-hour weeks associated with preparing the course for the annual PGA Tour event. Not only was it exciting to be part of such an amazing event, but as a golfer it was awesome to see some of the best in the world in action, including Tiger Woods.

I graduated from the intern programme with a Distinction in Golf Course Management and after 13 months I headed to Wisconsin to join the course staff for the US PGA Championship at Whistling Straits. I spent just under six months there before my visa expired. Not ready to return to New Zealand, I then headed to England and landed a greenkeeping position at Sunningdale Golf Club where I was able to live on site. I spent two years at this course and was also fortunate to have the opportunity to volunteer for The Open Championship held at Royal Lytham & St Anne's Golf Club in 2011.

On my return to New Zealand, I secured a position at The Hills Golf Course, home to the NZ Open for several years. I quickly regained my position in the Otago senior men's golf team and for two years I definitely had no work-life balance, as I juggled full-time work and very early starts with hours of practice after work as often as I could. It was also an expensive time as there were lots of travel and accommodation costs involved and on a greenkeeper's wage this definitely had an impact. There was support with uniform, balls and meals, but travel and accommodation costs were high.

Best results for me during these years was winning the Queenstown Open and making the semi-finals of the Toro NZ Men's Interprovincial Championships in 2012 and the final in 2013. It felt good to be the 'anchor man' of the team, teeing off first and hopefully securing a win. I can still recall my excitement when I won both my semi-final and final matches in the 2013 national final which got the team off to a great start.

Golf was good during these days and I formed friendships with guys that will last a lifetime. However, the lure of the opportunity to work at Royal Melbourne Golf Club proved to be too strong and in 2015 I moved across the 'Ditch' to Melbourne. Being such a sports fanatic, I have loved the variety of big events Melbourne offers.

I was keen to continue my competitive golf by playing Pennants, so I approached several clubs with teams in Division One and I was invited to play a trial game alongside the Pennant team manager at Victoria Golf Club. I must have played well because I was offered a membership almost immediately. Being involved with a prestigious club like Victoria and playing Pennant for them is a great honour, especially when you consider some of the legends of Australian golf, such as Peter Thomson, once represented the club at this level.

Being a member of Victoria's Division One Pennant team demanded a serious commitment both physically and mentally – gym fitness sessions as often as I could, a training meeting every Wednesday evening after work for the squad, playing every Saturday in their competition and then Pennant matches on Sunday during the season which generally lasts two months.

I had to work hard at producing my best game on a weekly basis, which was challenging after working long hours on the course in the heat, then to practise for sometimes two or more hours. After Saturday's competition, the Pennant team for the following day was announced based on your results, with the selector liking to pick the team on form which would change throughout the season. There was definitely plenty of competition within the squad.

Over the two seasons I represented Victoria (2016 and 2017), I achieved a win rate of over 50 per cent (eight out of 14) and the team maintained its position in Division One. I was proud of playing against young guys who play golf full-time and don't face the challenges of balancing work and golf.

The advantages of being a competitive golfer in my role as a greenkeeper have been gaining the respect from fellow club members, providing me with new ideas to take back to my work place and showing me how to set up a course to a high standard. Having that extra eye for detail and understanding of the game has also helped tremendously. To add to my busy life jugging full-time work with competitive golf, I have spent the past two years also studying for my Diploma in Sports Turf Management at Melbourne Polytechnic which I completed at the end of last November.

I have taken a break from competitive golf this year as a result of the heavy financial burden associated with playing competitive golf, especially on a greenkeeper's salary, and also the amount of extra work commitments I now have as foreman at Riversdale Golf Club (handwatering Saturday afternoon if the weather is hot and the build-up to our biggest annual tournament, the Riversdale Cup).

As I complete this article about my career as a greenkeeper and competitive golfer, I can reflect on not only what I have learnt about myself and life in general through golf, but also about some of the challenges I believe greenkeepers face when they are also competitive golfers. The game of golf has taught me how to find and maintain the personal motivation required to undertake the huge amount of practice needed to play sport at a high level, the importance of following etiquette and the self-management required of being a role model in golf.

I've also learnt that mistakes are part of the game and it's how well you recover and learn from them that will make the difference. As the late, great Payne Stewart once said, 'A bad attitude is worse than a bad swing', while another famous quote tells us that 'in life, as in golf, it is the follow through that counts.' It's not about how good you are; it's about how good you want to be.

Brooks represented Victoria Golf Club in Division One Pennant competition in 2016 and 2017, winning eight of his 14 matches

> "Being involved with a prestigious club like Victoria and playing Pennant for them is a great honour, especially when you consider some of the legends of Australian golf, such as Peter Thomson, once represented the club at this level."
>
> – MARK BROOKS

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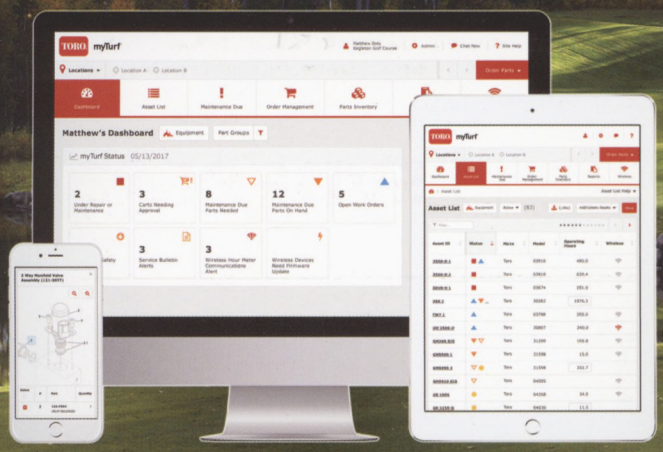

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