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MANAGEMENT JOURNAL

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COVER STORY
AN HONOUR AND A PRIVILEGE 8

The Office of Australian War Graves (OAWG) plays a unique role in maintaining the many war cemeteries, plots and gardens of remembrance across the country, honouring those who served their country and commemorating those who sadly paid the ultimate sacrifice. ATM editor Brett Robinson catches up with Rowan Foster (pictured above left) who after starting his turf management career in golf is now the OAWG's Victorian Operations Manager based out of Springvale War Cemetery in Melbourne.

Cover: Springvale War Cemetery, Melbourne
Photo: Bruce Macphee, ASTMA



ALSO IN THIS EDITION...

Foreword Thinking	4
Best on ground	6
Regional Profile – Ballarat GC, Vic	58
Around the Trade	64
Association Reports	66
Obituaries	70

FEATURES

O’Callaghan a cut above	16
Parliament House pests in check	22
In the trenches - Drainage	26
The dirt on biochar	30





16

COLUMNS

JOHN NEYLAN	34
PETER MCMAUGH AM	40
JOHN FORREST	44
BEN GIBSON	48
KATE TORGENSEN	52
TERRY MUIR	56



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Their names liveth for evermore

Inscribed on the cenotaph in the main street of the NZ coastal township of Raglan, is the name 'L.H Hume'. It's one of 14 names, locals who paid the ultimate sacrifice serving their country during the Second World War. 2nd Lieutenant Lloyd Hamilton Hume, known as 'Jock', was my Great Uncle who at the age of just 23 was killed in action on 21 May 1941 during the Battle of Crete.



Jock (pictured) was the youngest of five brothers, born in early 1918. An accountant by trade, Jock loved his rugby, cars, fishing and horses – a typical young Kiwi bloke. When the Second World War broke out he did what most others of his age did and dutifully enlisted. Stationed in Greece, Jock was serving with the Allies when it was overrun by the Germans in April 1941. He was among the thousands of British and ANZAC troops hastily evacuated to Crete, but with the Mediterranean island being of strategic importance it wasn't long until war arrived there.

On 20 May 1941, the Germans unleashed Operation Mercury, a major airborne and seaborne assault of the Cretan north coast. Over 7000 Kiwi troops had been deployed to defend the coastal townships of Maleme and Chania, with Jock part of the 27th Field Battery unit stationed on the hillside above the Maleme Aerodrome. In charge of gun No.2, a 75mm French howitzer, Jock and his men were instructed to "give Jerry hell", shelling enemy concentrations attempting to land on the aerodrome and on the beach.

The Luftwaffe onslaught began with 280 bombers, 150 dive bombers, 180 fighters, 500 transport aircraft, 70-80 transport gliders towed by Junkers and 6000 paratroopers all descending on Maleme. Jock survived the first day, firing 350 shells with great effect despite coming under constant fire. According to letters, such accurate shooting was largely owed to a device which Jock had cobbled together – 'V' sights on the guns made out of sticks and chewing gum!

At 5pm the next day, however, Jock's war came to an end. The gun placements on the hillside came under ferocious machine gun fire and as the planes attacked Jock and his men would run to take cover in a number of small caves at the rear of their gun position. Following one of these attacks the men ran back to their gun only to find Jock dead next to it. Jock had waited until all his men were clear before seeking cover himself, only to be cut down and killed instantly.

Sixty-one years after Jock's death, in 2002 my uncles – Roly and Terry Hume, and their wives – embarked on a pilgrimage to Crete to find where their uncle had died and to locate his grave. It was initially believed that Jock had been buried by his fellow soldiers in an olive grove not far from where he had died. However, it became apparent in the years following that wasn't the case.

After Jock was killed at his artillery post and the Allies retreated, the Germans buried the Allied dead. After the war, the Commonwealth War Graves Commission exhumed them and reinterred them at the Suda Bay War Cemetery, east of Maleme. Some 1500 Commonwealth servicemen of the Second World War are buried or commemorated in the cemetery, 776 of the burials unidentified. Jock lays at rest in one of those 'unknown soldier' graves.

Many families have been touched by war over the years and commemorating those, like Jock, who paid the ultimate price is an important part of our nation's psyche. More than 13,000 Australians who lost their lives in the First and Second World Wars are commemorated at 72 war cemeteries, memorials and gardens of remembrance around the country and it is the role of the Office of Australian War Graves (OAWG) to oversee their care and maintenance in perpetuity.

In this edition's lead story we meet Rowan Foster who is one of a number of OAWG staff around the country charged with ensuring the final resting places of our war dead and post-war dead are maintained with dignity and honour. From a turf management background, it's not the sort of role the former Woodlands GC assistant superintendent would have thought he'd end up in, but it is one that has ultimately proved very rewarding. Enjoy the read...



Brett Robinson, Editor



Industry approaching 2022 with renewed sense of optimism

Close on 12 months ago, as the chaotic and unprecedented year that was 2020 drew to a close, I recall making a special note of thanks to members, partners and association staff for their efforts in supporting the industry through the most challenging 12 months many of us had ever experienced. Perhaps it was wishing thinking at the time, but as we said goodbye to 2020 there was a definite sense of positivity towards a better 2021 in the air.

Well, that effectively lasted less than a month. Several states were plunged back into extended lockdowns early in the year, travel restrictions were imposed once again and there was a renewed sense that the worst wasn't in fact behind us and that we were looking at another difficult year ahead dealing with the difficulties of COVID.

While some states were able to remain open, with others experiencing intermittent restrictions, the impacts were felt for community sport and a decreased need for facility availability for tournaments, national competitions and of course, international visitors. All of this made the past 12 months yet another difficult one for turf management teams to navigate.

The last quarter of 2021, however, has had somewhat of a silver lining with vaccination rates increasing and border restrictions dropping, resulting in increased freedom to travel, summer sport returning and memberships at golf clubs continuing its strong 18-month growth.

From many discussions over the past few weeks with members, it is apparent that the industry is approaching 2022 with a renewed sense of optimism, a part of which is the return of some seasonal staff to assist turf management teams at venues currently experiencing a shortfall in staffing. This sense of optimism of a more normal year ahead is also supported by members looking to get back to industry days and events in the months ahead.

Pleasingly, all state associations continue to grow in terms of memberships over the past year due to the support and assistance they continue to provide members. The past 18 months have had an impact to various education and trade days that were unable to be held in many states, with numerous events delayed until early 2022. Such an impact has been felt by almost all state associations, so I would strongly encourage all turf managers



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and the broader industry to support them and make an effort to attend as many of the education days and networking opportunities as possible.

The last year also saw some developments within the state associations. Earlier in year we saw the formation of the Tasmanian Sports Turf Managers Association (TSTMA), representing all turf managers throughout Tasmania. More recently we saw the formation of the ACT Sports Turf Managers Association (ACTSTMA), aligning to the Australian Sports Turf Managers Association (ASTMA). Both new entities have strengthened their offering and support of turf managers within their respective regions. Further discussions continue at a national level in supporting several states undertaking a review of their operations moving into the New Year, with updates to come.

I would like to thank each of the state association presidents and committees for their assistance and support over the last 12 months. Together we have continued discussions to work towards developing a strong and supported sports turf management industry. I also commend them for their continued investment in volunteering their time to support their members and running the various state events which are vital for the industry to remain connected.

CONFERENCE PINNACLE

Through a difficult year, the ASTMA has continued to undertake and deliver some great work, and I would like to thank the association team for their tireless approach to continuing to support members and the turf industry through a difficult 12 months.

As the saying goes 'Timing is everything' and the delivery of the Australian Sports Turf Management Conference and Trade Exhibition on the Gold Coast in June was an extraordinary feat – a combination of extensive planning and a bit of good luck. Requiring

multiple ASTMA staff members to spend weeks in quarantine away from family to ensure attendance, the conference was able to proceed, albeit with a number of last-minute changes and updates to the schedule and presenters. There were plenty of long days leading into the event, as well as a few long nights on the Gold Coast itself, to ensure the programme ran as smoothly as possible.

Less than 24 hours after the conclusion of the conference, we saw a range of border and travel restrictions reimposed across various states, resulting in some attendees needing to go into quarantine upon their return. It would be remiss of me not to note a special thank you to those turf managers and trade exhibition partners who made the effort to attend this year's event in uncertain times. Judging by the attendee numbers across the four days, it remains the pinnacle sports turf management event for our industry.

The 2022 conference in Melbourne next June promises to be even bigger! The ASTMA and Golf Management Australia (GMA) are joining forces, providing both expanded networking opportunities and variety to the education offering. It is anticipated that the combined event will likely see more than 1000 delegates attending, with the expanded trade exhibition space set to be a highlight of the week. As this edition was going to print, following the release of the floorplan to association partners, trade members and previous exhibitors, the trade exhibition was 90 per cent sold out, which again highlights the esteem in which the event is held. Registrations are set to open for delegates early in the New Year.

As always, the association remains constantly thankful for the support it has received throughout the year and I would like to pass on our gratitude to each of our trade partners who continue to support us, enabling us the opportunity to support the industry in turn. Their assistance and collaboration is truly valued and the programmes we are able to develop and deliver to thousands of sports turf managers wouldn't be possible without their support.

Last, but by no means least, I would also like to thank the diligent and continually-hardworking team at the ASTMA. They continue to push forward despite challenges, collectively strive to deliver the best support possible and remain committed to taking the industry forward. Dare I say it... here's to a more positive year ahead in 2022. 🙏

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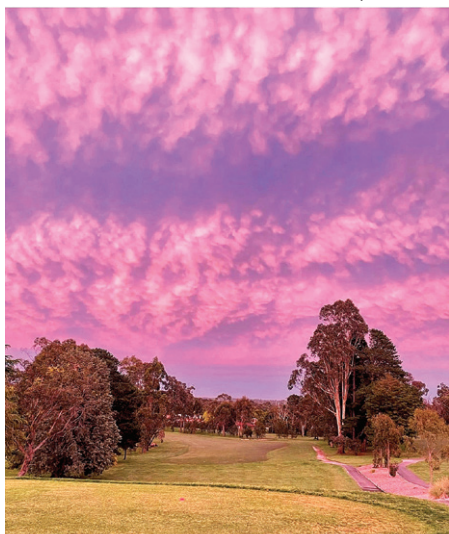


 TIM HOSKINSON

"We get a lot of rain at Cairns Golf Club, but the reward is some of the beautiful skylines that appear once the skies clear." (A picture perfect moment of the 13th snapped by superintendent Tim Hoskinson.)

 PETER CAWSEY

"Office views." (A cracking early morning sky over Eastwood Golf Club in Melbourne)



Best on ground

ATM showcases some of the best social media images from around the industry in recent months.





in TONY HEMMING

"Before I congratulate Aaron Finch and Justin Langer on Australia's success, I want to congratulate ICC head curator Toby Lumsden and the DSC Turf Management Dept on their achievements. Working without a day of rest from the start of the IPL (19 September) to the final of the ICC T20 World Cup on 14 November 2021. 56 days straight including 16 hours per day on event days." (Optus Stadium head curator Tony Hemming pays tribute to Toby Lumsden, CSTM, and his team.)

in TIM BILSTON

"I love calling in on clients and coming across things you're not expecting to see." (Living Turf rep Tim Bilston gives kudos to Woorayl GC, Vic for doing its bit to promote mental health awareness.)

f BRENT HULL

"Greens were coming back nicely after renovations... just what we needed." (Moruya Golf Club superintendent Brent Hull laments a major hydraulic leak on one of his pristine putting surfaces... it can happen to the best of them.)



in MARK HOOKER

"After four long years we are approaching the end of our Nicklaus Design rebuild here at Royal Auckland and Grange Golf Club. Two clubs amalgamated and embarked on an ambitious 27-hole project all whilst maintaining 18 holes in play for our members. I am so proud of our agronomy team for what we have collectively achieved." (Royal Auckland's director of agronomy Mark Hooker can see the light at the end of the tunnel.)

ig MATT OLIVER

"Ominous." (QSAC head curator @_mattyoliver had the best seat in the house as the weather closed in on The Gabba, pictured left, during the opening day of the first Ashes Test.)





An honour and a privilege

The Office of Australian War Graves is committed to the maintenance of official war and post-war memorials in perpetuity. In this role, OAWG staff maintain war cemeteries and individual graves throughout Australia, Papua New Guinea and the Solomon Islands (Guadalcanal). Pictured is Springvale War Cemetery in Melbourne



PHOTOS: BRUCE MACPHEE/OAWG; ROWAN FOSTER/BRETT ROBINSON

The Office of Australian War Graves (OAWG) plays a unique role in maintaining the many war cemeteries, plots and gardens of remembrance across the country, honouring those who served their nation and commemorating those who sadly paid the ultimate sacrifice. ATM editor Brett Robinson catches up with Rowan Foster who after starting his turf management career in golf is now the OAWG's Victorian Operations Manager based out of Springvale War Cemetery in Melbourne.

result is something Foster has come to truly appreciate and be grateful for.

FROM GOLF TO GRAVES

Like many budding turf apprentices Foster got his start in golf. Growing up in Melbourne's south east suburbs, a short drive from the famed golf courses of the Sandbelt, Foster snagged a work experience placement at the nine-hole public access Cheltenham Golf Club. That quickly turned into an apprenticeship and Foster found himself following in the footsteps of older brother Ross who was already on the crew at Metropolitan Golf Club and has since gone on to be a long-standing member of the grounds crew at Scotch College in Melbourne.

In the final year of his apprenticeship, Foster transferred across to Woodlands Golf Club. After gaining his ticket, he secured a placement at the All England Lawn Tennis and Croquet Club (Wimbledon) in 2006, again following his brother who had done likewise two years earlier. Foster worked for six months in the lead-up to and during The Championships and got to see turf management operations at one of the world's elite sporting establishments.

Returning home, Foster completed a Diploma of Sports Turf Management, all while gradually working his way up the Woodland ranks under the guidance of Glenn

When Rowan Foster embarked on a turf management career at the ripe old age of 17, little did he think nearly two decades on he would find himself in the role he currently has today. The turf industry can afford numerous opportunities across a variety of sectors, but in Foster's case it has led him down a path to perhaps one of its more unique roles.

Ask any first year turf apprentice where they would ultimately like to end up working, few, if any, would entertain the thought of maintaining war cemeteries as a possible career avenue. But as 36-year-old Foster will attest, the role that he now fills is not only

highly rewarding, but one that brings with it an immense sense of pride.

Foster is the Victorian Operations Manager for the Office of Australian War Graves (OAWG). One of a number of state managers across the country, Foster is charged with overseeing the care and maintenance of Australia's official war commemorations in Victoria. It's a mammoth job, overseeing war cemeteries, memorials and gardens of remembrance, and takes him not only state wide but all over the country and around the world as well. Whether it is meeting a local contractor to discuss the upkeep of war graves in a small regional cemetery, or spending two weeks at Gallipoli in Turkey, the diversity of the role and the skills he has developed as a



Rowan Foster (left, Victoria Operations Manager) and Dane Price (Deputy Operations Manager) oversee the care and maintenance of Victoria's official war commemorations for the Office of Australian War Graves. They are based out of the Springvale War Cemetery, Australia's second largest war cemetery

Stuart, before being appointed assistant superintendent under Rod Tatt in September 2011. During his time at Woodlands, Foster helped prepare the course for a number of Victorian Opens, Australian Amateurs and also volunteered at the likes of the 2005 Jacob's Creek Open at Royal Adelaide and the 2009 Australian Masters at Kingston Heath.

After a decade at Woodlands, in late 2013 Foster found himself assessing his career options. Superintendent roles in Melbourne, especially on the Sandbelt, rarely present, so it was with interest he spied an advertisement on the then AGCSA (now ASTMA) website. It was for a Victorian Senior Field Officer within the Operations Section of the OAWG, based out of the Springvale War Cemetery in Melbourne's south east. He applied, was successful and, as the saying goes, hasn't looked back.

Foster held the Senior Field Officer role for four years before stepping up as Acting State Operations Manager following a staff reshuffle in late 2017. That acting role remained up until the start of 2021 when he was officially appointed to the role. Now coming up to his ninth year with the OAWG, including four in charge, Foster can reflect on a gamble that has more than paid off.

"I remember seeing the ad on the website and thought what a great experience and honour it would be," reflects Foster. "To not only be able to do what you love as a turfie,

but also to give something back to your country is very unique. Because I had all the skills and experience from my turf and golf background – asset management, undertaking projects, managing machinery, stakeholder engagement – the transition across was a relatively easy one.

"I never thought I would end up doing something like this when I first started in turf, but looking back now I guess I was a little bit short-sighted. I had worked hard to get to the assistant superintendent level and never thought about anything else. I had always lived in that golf environment and was passionate about it, but then this came out of left field. I put a lot on the line in making the decision to leave golf and take it on, but I don't regret it for one moment. It complements my skills as a turf manager, but has also helped broaden my skills in so many other areas."

IN PERPETUITY

The OAWG is part of the Federal Government's Department of Veterans' Affairs (DVA). One of the DVA's key roles is acknowledging and commemorating the service and sacrifice of all those who served Australia and its allies in wars, conflicts and peace operations. The DVA commemorates Australia's war dead and post-war dead through war memorials and cemeteries in Australia and overseas, as well as gardens of remembrance (GRMs).

The OAWG is committed to the maintenance of official war and post-war memorials in perpetuity. In this role, the OAWG maintains war cemeteries and individual graves throughout Australia, Papua New Guinea and the Solomon Islands (Guadalcanal) and liaises with corresponding entities overseas to ensure that war graves or memorials of Australian personnel in other countries are provided and maintained to appropriate standards.

Following the establishment of eligibility of a veteran for the provision of a memorial, the OAWG undertakes the provision and maintenance in perpetuity of an official commemoration. These are in the form of grave markers and niche plaques and may be in a civil cemetery, lawn cemetery, crematorium or a GRM. The OAWG provides and maintains these memorials and employs both contractors and staff, like Foster, to achieve these objectives.

The OAWG cares for some 330,000 Australians who have died after a war or conflict and whose deaths have been determined to be related to their war service. They are at rest in more than 2400 cemeteries and crematoriums around Australia. The OAWG also serves as an agent for the Commonwealth War Graves Commission (CWGC) and cares for 13,000 of Australia's war dead from the First and Second World Wars

who are at rest in 72 war cemeteries and plots within Australia, three in Papua New Guinea and 10 GRMs.

The CWGC is regarded as one of the world's largest and most recognised horticultural organisations. It employs more than 900 horticulturalists worldwide who, collectively, care for over 2500 war cemeteries and memorials. CWGC cemeteries and memorials are renowned for setting the highest possible standard in horticulture, which is an essential part of commemorating the war dead.

As an agent of the CWGC, OAWG staff ensure these exacting standards are delivered at the many sites which they look after throughout Australia and the Pacific. OAWG staff fulfil the delivery of a promise of perpetual commemoration made by Royal Charter in 1917 through the Imperial War Graves Commission (now CWGC), and the Australian War Cabinet in 1922, of those who paid the ultimate sacrifice.

The scale of horticultural commitment is impressive, with borders measured in kilometres and the equivalent of almost 1000 soccer pitches cared for every week. No matter the size of the cemetery or memorial, each flower, each tree and each blade of grass is cared for with a passion that typifies the staff and their approach to commemorating the



There are 10 Gardens of Remembrance located around Australia. The Victorian Garden of Remembrance at Springvale houses 62,035 bronze plaques displayed across 159 brick walls commemorating those who served

war dead, not just yesterday or today, but tomorrow and always.

OAWG staff are headquartered in depots located at the major war cemeteries in the state capitals, with depots also in Townsville and Adelaide River (near Darwin). Sydney is home to the largest of the CWGC sites – Rookwood – which contains 744 war graves. Springvale in Melbourne, which Foster oversees, is the next biggest with 612 graves, followed by Perth (515), Adelaide River (435), Brisbane – Lutwyche (347), Townsville (222), Adelaide – Centennial Park (200) and Hobart (51).

As Foster's background demonstrates, OAWG employees come from a range of horticultural backgrounds, including turf management, landscaping and arboriculture. They are highly experienced and trained to meet the horticultural standards demanded. Working closely with the architectural teams, the horticultural staff play a major role in the look and feel of the OAWG sites, using guidelines set out by the CWGC to ensure uniformity of appearance.

For the war cemeteries that fall under their remit, the CWGC has dedicated horticulture manuals and structure manuals which provide

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Foster oversees a blended team of OAWG staff and around 30 contractors, among them Super Gardens, to maintain all aspects of the Springvale War Cemetery

standards and recommendations for OAWG staff to follow. These range from how the turf, plants and borders should look and be maintained, through to the construction, appearance and maintenance of headstones, grave sites, plaques and other structures.

Variety in texture, height and timing of floral displays are important considerations. Headstone beds are planted with a mixture of floribunda roses, herbaceous perennials and groundcovers best suited to the climatic conditions of each site. Perimeter borders and other garden areas may consist of group plantings, individual specimens, shrubberies and hedges.

Turf areas unify the architectural and horticultural features and are fundamental to the overall appearance. While these turf areas are considered 'amenity turf', they are maintained by turf professionals at a 'sports turf' standard in order to provide the highest possible aesthetic appeal. As an example, the Santa Ana couchgrass at the Springvale War Cemetery is cut at 10mm during summer and is striped up. All horticultural sites cared for

by OAWG have automated irrigation systems installed to prevent the horticultural features being compromised.

Trees, along with architectural features, complete the design and give each site a large part of its individuality. Trees are considered highly valuable assets, they are symmetrically placed to complement the architecture and provide shade in warm climates.

"Managing the turf is a fundamental part of what we do," states Foster. "The turf conditions that you will find at war cemeteries across the country are like those you would find standing on the 1st tee of a Royal Melbourne or a Royal Canberra. All our maintenance programmes relate back to the health of the turf and ensuring that it is in the best possible condition throughout the year.

"Every day is ANZAC Day for us. First impressions count and when you first drive in and see nicely manicured turf you know that the place is being well looked after, which shows a mark of dignity and respect for those who are laid to rest there. We want Mrs Jones, who may come here just once in her lifetime,

to walk through the gates and go 'Wow, what a beautiful place'. We want her to see and be reassured that her loved one is in a place that is being well cared for.

"And that starts with the basics – making sure the turf is manicured and weed free, the gardens are pruned and neat and the structures are well maintained. The turf marries everything together and helps to break up the hard structures like the walls, which we have a lot of. The turf, the plants, gardens, trees and structures all complement one another and make for a place of dignity and honour."

A DIVERSE ROLE

Opened on 13 July 1948, the Springvale War Cemetery resides across 2.5 hectares within the Springvale Botanical Cemetery. In addition to the 612 white marble headstones in the lawn cemetery, the site is also home of the Victorian Garden of Remembrance (GRM).

The GRM was established in the early 1960s and expanded to its current footprint in 1989. It houses 62,035 bronze plaques mounted on 159 brick walls honouring those who died post-war as a result of their service. Within the GRM, which is linked by an impressive wisteria arbour running its entire length, are three formal garden areas – the Asian Garden, European Garden and Australian Garden, the latter of which is currently undergoing refurbishment.

The site also houses the state OAWG office where Foster, Deputy Operations Manager Dane Price (a qualified arborist) and Trade Services Manager Simon Herdina (a qualified turf manager) are based, as well as a small maintenance compound. As the official OAWG staff stationed at Springvale, together they procure and coordinate a team of around 30 contractors to help maintain all aspects of the site, ranging from turf management companies and pest controllers, through to builders, engineers and stonemasons.

As well as maintaining the Springvale site, as Operations Manager Foster also oversees the care and maintenance of official OAWG commemorations (which number close to 100,000) at 500 sites across Victoria and southern NSW, as well as providing support for the Tasmanian operations. Every quarter Foster will endeavour to visit the sites under his jurisdiction, meeting with local contractors and cemetery trusts to discuss issues, facilitate any works needed and educate them on the standards that the OAWG adhere to. As an example of some of the more recent works, Foster has overseen structural refurbishments



While the turf areas at war cemeteries are considered 'amenity turf', they are maintained at a 'sports turf' standard in order to provide the highest possible aesthetic appeal. Pictured is the Brisbane (Lutwyche) War Cemetery

of the Sale and Bairnsdale war cemeteries and horticultural improvements at the Albury, Wangaratta and Benalla war cemeteries.

Foster's role is a broad one, and not just geographically speaking. Day-to-day tasks range from programming of work for staff and contractors to carry out horticultural and structural maintenance and the management of minor projects. Horticultural maintenance activities include professional turf care, maintenance of garden beds and shrub borders, pruning and diagnosis and treatment of plant diseases and pests.

From a turf perspective, the lawn cemetery at Springvale comprises a hectare of Santa Ana couchgrass and a further hectare of buffalo grass throughout the GRM. Under the large oak trees at either end of the lawn cemetery, fine fescues are oversown to provide coverage due to those areas being in constant shade.

Foster formulates all turf management programmes – renovations, topdressing, aeration, pest and disease management and day-to-day maintenance – before sending them out to tender. The turf surfaces are scarified, cored and topdressed annually and Vertidrain three times a year. Soil tests are conducted at renovation time and help to set fertiliser programmes for the year, with



OAWG staff continually strive to make sure that what they present every day honours the legacy of those who have served for their country. Pictured is the Sydney War Cemetery (Rookwood) which is Australia's largest

applications made quarterly. Preventatives are sprayed for pests and diseases.

With taxpayer money used to fund OAWG maintenance and works programmes, Foster is also responsible and accountable for procurement administration and financial management of all related service provision. It requires the preparation and management of budgets and meticulous data and record-keeping. Every dollar spent has to be justified.

Communication plays a huge part in Foster's role also. Just as a golf course

superintendent interacts and reports to committees and management, as the state OAWG representative Foster liaises with the DVA National Office in Canberra, ex-Service organisations (RSL) and is often the first point of contact for veterans and their families seeking information about the provision of an official commemoration. With many of these commemorations located in general cemeteries around the state, Foster is in regular contact with cemetery authorities, funeral providers and local authorities, and



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Turf areas unify the architectural and horticultural features and are fundamental to the overall appearance of each war cemetery. Pictured is the Townsville War Cemetery

also deals with peak industry bodies such as the Australasian Cemeteries and Crematoria Association.

At various times during his tenure Foster has represented the DVA at formal and informal military commemorative events both in Australia and overseas. He has been deployed to Gallipoli in Turkey three times and in 2016 spent two weeks there post-ANZAC Day on a CWGC work placement. He spent a week

each with the structure and horticulture teams analysing work schedules, procedures and techniques and identifying opportunities to improve OAWG procedures. The job has also taken him to Israel for the centenary of the Battle of Beersheba, as well as ANZAC Day services at Hellfire Pass in Thailand.

"It's such a diverse role and one that has given me some wonderful experiences," says Foster, who is currently completing a Diploma

of Project Management. "I would absolutely recommend it to anyone. It's the sort of job that can take you far and wide.

"A lot of the job as a Public Servant is about project management, communication and administration. I may not be on the tools anymore and I do miss that aspect sometimes, but I know that what I can do from in my office will be seen out there in the weeks and months to come. I get more satisfaction now from facilitating and being the planner, an instigator and seeing it being executed on the ground.

"It's a big responsibility that we have, but we have the right tools, the right resources and, importantly, the right dedicated people. We set a very high standard with the presentation of our war cemeteries in Australia, Papua New Guinea, Solomon Islands and Norfolk Island and as OAWG staff we pride ourselves on that. We continually strive to do better and make sure that what we present every day honours the legacy of those who have served for their country. It's an all-encompassing role, but when everything lines up it is a very rewarding feeling knowing that you are doing a small bit for your country."

DID YOU KNOW...

OFFICIAL COMMEMORATION

Official commemoration is the last entitlement provided to eligible military veterans upon their death. The Australian Government recognises and acknowledges that the service undertaken by the veteran has caused or contributed to their death through the provision of a final and lasting commemoration. The commemoration can take the form of a memorial in a crematorium, or a general or lawn cemetery. Some eligible veterans and their families also choose to have a private memorial, but take up their entitlement of official commemoration by having the OAWG place a commemorative plaque in one of the 10 Gardens of Remembrance (GRM) around Australia.

EQUALITY AND UNIFORMITY

The official commemoration of Australia's war and post-war dead are governed under principles of equality and uniformity. These principles, together with the principle of commemoration in perpetuity, underpin the purpose and functions of the CWGC and OAWG. Those who die in war or post-war are commemorated individually and once only, by name, on either a grave headstone, or a plaque, or an inscription on a memorial. The headstones, plaques and memorial

inscriptions are uniform and there is no distinction in style of commemoration made on the basis of military rank, civil rank or wealth of the veteran or their family.

NO DATE OF BIRTH

If you have visited a war cemetery or GRM, you will notice that the headstones or memorial plaques do not list the date of birth. Since 1922, a standard official commemoration has been inscribed with the relevant Service emblem (Army, Navy, Air Force etc), Service number, rank, initials and surname, unit, date of death and age at death. As the date of birth was not recorded on First World War enlistment documents, it did not appear on the official commemorations of casualties of the war. This practice has been extended to all subsequent official commemorations of



both those who died during war or from a condition that was as a result of war service.

GOT IT COVERED

The distinctive, orderly rows of matching headstones and plaques, which characterise CWGC cemeteries, are bound by a set of guidelines relating to their appearance. In addition to shrubs and roses being used next to the graves, at the base of each headstone is a small groundcover plant. This is to prevent soil and dirt splashing onto the headstone during rain or while irrigation is running.

GRAND FINAL DAY

Remembrance Day, 11 November every year, is the equivalent of Grand Final Day for OAWG staff. In the case of Springvale War Cemetery, Rowan Foster and his team pull out all stops to make sure that the site is at its peak, with additional cutting and general maintenance scheduled to have everything in order for the RSL Victoria service.

Editor's note: For further information about the operations of the Office of Australian War Graves and Commonwealth War Graves Commission, visit www.dva.gov.au/wargraves and www.cwgc.org.



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O'Callaghan a **cut above**

Having landed the plum role of superintendent at the refurbished Sandringham Golf Links, Gerri O'Callaghan is determined to leave her mark at the new home of high-performance golf in Australia writes Rohan Clarke.

In early November, Royal Melbourne Golf Club confirmed that Gerri O'Callaghan was taking over as superintendent of the recently redeveloped Sandringham Golf Links, which is headquarters of the new high-performance Australian Golf Centre

As a schoolgirl, Gerri O'Callaghan dreamt of being a commercial pilot. She grew up in Cohuna on the Murray River under the Sydney-Melbourne flight path.

Upon leaving school she began studying for a private pilot's licence and was preparing for her first solo flight.

Then tragedy struck. At age 19 O'Callaghan's world was turned upside down when her mother Nancy suffered a fatal heart attack in 1997. Three months later her father Gerry suffered a massive stroke to the right side of his body. The next two years were spent caring for her Dad with three older siblings at their new home of Echuca. Meanwhile she did a bit of landscape gardening and lawn mowing around town before her Dad passed away in 2000.

To lose both parents before the age of 23 was a devastating blow. Without any ties, O'Callaghan spent six years backpacking around the world in what she describes as "a bit of a soul-searching journey". She returned home without a clue as to what she might do next.

Remarkably, 14 years later she has been appointed course superintendent at the refurbished Sandringham Golf Links across the road from Royal Melbourne. As home to the Australian Golf Centre, the national high-performance training and administration facility, the Sandringham posting was one of the most coveted positions in turfgrass.

"She's certainly deserving of the role," says Richard Forsyth, Royal Melbourne's director of courses. "We're very happy with how she's going about it. I think she'll be great for the facility because it's not just the public golf course. It's got the high-performance aspect to it. We've got a big 18-hole putting



O'Callaghan first came under the Royal Melbourne umbrella as assistant superintendent at Sandringham in 2011. Two years later she was on the RM crew

course that we're going to open. There's the driving range and just generally the rapport with the golf bodies that are there.

"She's a very good communicator. She's a good easy-to-talk-to personality so she's good in that role dealing with all those other aspects other than just the maintenance of the public golf course. We're proud of her and we're sure she's going to do the place justice."

THE ROAD LESS TRAVELLED

O'Callaghan, 44, is not your typical superintendent. She boasts a 1-handicap with a lowest-ever mark of +0.5. She has won 10

club championships, the first of which came at Cohuna at 17 years of age. Three more followed at Rich River after the family moved to Echuca in her late-teens. Then following a six-year hiatus travelling the world, O'Callaghan rekindled her love for the game and has won six more club championships at Southern Golf Club in Melbourne, the most recent this November.

O'Callaghan barely touched a golf club while overseas, playing just two social rounds in six years (2001-2007). During her time abroad she worked as a water-skiing instructor at a Jewish summer camp (Camp Towanda) in Pennsylvania. She also did a little bit of landscaping and bar work while on a two-year work visa in the United Kingdom.

She kind of got into greenkeeping during a hospitality stint at the Henley Rowing Regatta on the Thames River. An opportunity arose for someone to mow the car park. O'Callaghan offered her services and ended up maintaining the grounds for five months.

But turfgrass wasn't on O'Callaghan's mind when she returned to Australia in 2007. It was a fortuitous meeting at Sandhurst Club that changed her career path. She chatted with her cousin's husband's friend, Mark Brayshaw from the PGA. His wife had also been an instructor at a summer camp in the US.

Two days later O'Callaghan got a taste of greenkeeping at Sandhurst. Edging and raking bunkers while enjoying the camaraderie of three other 'girls' on staff left a good impression: "I was working in a small team and got along really well with them. They were all very like-minded and I thought, 'Oh, I think this is the caper for me'.

"It's a satisfying thing when you walk away from a job that you do. Even if it is just whipper snipping a bunker or pruning around a



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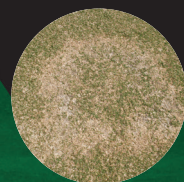


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As well as maintenance of Sandringham's public course, O'Callaghan also oversees facilities for the new centre of excellence, including a state-of-the-art driving range, a Himalayas-style 18-hole putting green and elite short-game practice facilities

sprinkler head. The golfer will come along and they'll notice all those little things that you do."

O'Callaghan was offered an adult apprenticeship at Sandhurst Club. At night she studied for a Certificate III in Horticulture (Recreational Turf) at the Northern Melbourne Institute of TAFE (now Melbourne Polytechnic). She later completed a Diploma of Horticulture (Recreational Turf) there.

O'Callaghan first came under the Royal Melbourne umbrella when she was appointed assistant superintendent at Sandringham Golf Links in 2011. Two years later she was offered and accepted a role as a qualified grounds person at Royal Melbourne. There was no title attached, which surprised quite a few people who saw it as a step backwards.

But it proved to be a wise move as two years later O'Callaghan was appointed foreman on RM's East Course under the tutelage of Craig Anthony. Among other achievements, she was in charge of bunkering for the 2019 Presidents Cup.

O'Callaghan returned to Sandringham to be a part of the team reconstructing the second nine holes. While it's a privilege to work at Royal Melbourne, the ground staff don't get to build something from the ground up. She says it was an amazing experience to shape tees, bunkers and greens. Now she can drive around the course and remember her little touches.

During 2021 O'Callaghan received a general manager's scholarship, which included a week's Business Management Institute training. She hopes to improve her skill set with the desire to give back to golf more than purely as a greenkeeper in a field such as golf operations or as an assistant manager.



As well as her skills as a turf manager, O'Callaghan is an accomplished amateur golfer and recently won her sixth club championship at Southern Golf Club

HANDLING THE SPOTLIGHT AS A FEMALE SUPER

O'Callaghan is in rarefied air and is just one of only a few females to be appointed as a superintendent in Victoria and Australia. Denise Hill-Symonds was in charge at The Dunes on the Mornington Peninsula in the early 2000s before stepping down from the role in order to start a family. She has since returned to The Dunes and currently works there part-time.

While there are a number of female assistants, foremen (or should that be foreperson) and senior greenkeepers around the country, Michelle Huzzey at the 9-hole Wynyard Golf Club on Tasmania's north coast is believed to be the only other current female superintendent in Australia. Previously, Kirsty Herring (CSTM) was superintendent at Cooroy Golf Club on Queensland's Sunshine Coast and then Katherine Country Club in the Northern Territory. She is about to leave golf to be coordinator of parks and maintenance at Mackay Regional Council where she will manage 1600 hectares of parklands, six cemeteries, botanical gardens and 200km of beachfront land. American ex-pat Brittney Goldsworthy was also the super at the 9-hole Sea View Golf Club in Perth for a period but has since returned to her homeland.

Gender hasn't been a hindrance to a turfgrass career says O'Callaghan. Her father Gerry, a local council street sweeper, had

a great work ethic. He impressed upon his daughter that she'd earn respect by performing the job one-and-a-half times as well as a man.

O'Callaghan does concede being a female superintendent places her in the spotlight. While out 'on the tools' it's not uncommon for a club member to single out 'Gerri' by name for a chat while ignoring her male colleagues. She feels a little embarrassed by the attention but realises it's just the reality of being in a male-dominated industry.

"I'm on show with Sandringham now," O'Callaghan says. "I know a lot of people that play there and I think, too, because I am the woman. So when you look at the groundkeeping crew, they always pick you out. I always like to do a good job because it's me representing myself. It's all the little two percenters that you do that make the golf course better. And that's what I'm going to do. Just go above and beyond."

She's an even more visible presence driving around Sandy Golf Links with a golden retriever riding in the back of her Workman. 'Ronald' O'Callaghan even has his own Instagram account!

O'Callaghan thinks the personal tragedy of losing her parents at a relatively young age made her stronger. Along with various life experiences from travelling the world, it's



While East Course foreman, O'Callaghan was in charge of bunker preparation for the 2019 Presidents Cup

provided a well-rounded resilience that's held her in good stead for a career in turf.

"It's hard enough to make your way as a male. But to do it as a female, she would have copped a few knocks along the way. So she has been very resilient," Forsyth says. "Not all males go well with someone as a woman organising them in a male-dominated industry. So she's had to deal with all that as she has come through."

MAINTAINING A PUBLIC SANDBELT COURSE

Much anticipation accompanied the creation of Sandringham's par-65 layout, designed and constructed by OCM (Mike Cocking) and finished off and grassed by RM links staff. As a multi-purpose practice facility, it attracts elite amateurs and professionals every day of the week. Demand is such that it has been averaging about 250 rounds a day from golfers

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O'Callaghan oversees a crew of eight on the Sandringham course, among them recently appointed Sandringham foreman Jack Lavery who has also come across from RM's East Course

seeking a Sandbelt experience at a fraction of the price. The 18-hole green fee is \$48 on weekends to tackle a course with the same Suttons Mix bentgrass putting surfaces and fine fescue surrounds as Royal Melbourne.

Thankfully, O'Callaghan now has a crew of eight to maintain the property while the old Sandringham layout had just three ground staff prior to redevelopment. By comparison, Royal Melbourne has 32 staff to maintain two courses, which is essentially 16 per course. Both the East and West courses average about 150 rounds a day – approximately 60 per cent of Sandringham's traffic.

So the challenge is to present Sandringham in the best condition with the resources available to deal with the play it's getting. Consideration must be given to staff allocation and what's going to be the best use of their time. For instance, recent storm damage left them without access to the chipper because it was needed across the road.

As part of Royal Melbourne's management team, O'Callaghan lives on-site in a house overlooking the 14th hole on the East Course. Which can be a double-edged sword. It enables her to get little things done in the twilight hours when Sandringham is empty. But it also means she's 'on call' for an emergency, such as monitoring greens on hot summer days or when there's an irrigation problem.

"You can't be married to the job every single day. You've got to have some time out," she says. "But in some capacity you never really turn off and you're always thinking about what's coming next. So you've got to stay ahead of the game."

Course preparation at Sandringham takes on a new meaning when it comes to providing premium playing surfaces. The aim is for it to play firm and fast while being mindful of less-accomplished golfers.

"For a public-golf course, you don't want the punters to be five-putting everything. You want to be able to hold the greens. On any given day, between 9 and 11 is around about what they would Stimp."

"I always like to do a good job because it's me representing myself. It's all the little two percenters that you do that make the golf course better." - Gerri O'Callaghan

Golf Australia's high-performance director Brad James is a massive fan of the new layout, measuring 5646 metres from the tips. "It's bloody awesome," says James who has played the course at least a dozen times. "It's short and hard. Like it's rock hard and caters for the good player but also caters for the average player."

Through the first few months since opening, the best score posted by any one of Golf Australia's amateur squad was 4-under par. So it's not as if elite amateurs can shoot the lights out.

James makes special mention of O'Callaghan's work ethic and golf IQ when considering the amount of play Sandringham gets on a daily basis. "She's doing a great job."



O'Callaghan (middle) with tournament volunteers Susana Oliveira (The Grange GC, SA) and Kim Kennedy (Kingston Heath GC, Vic) at the 2019 Presidents Cup

She treats it like a little baby. She gives it a lot of TLC out there. I can just tell how proud of the fact that this is hers now. And that she's really embraced it. She's really nurturing it."

CREATING A UNIQUE EXPERIENCE

O'Callaghan is determined to leave her mark at the new home of high-performance golf. Her first big test arrives early in the New Year when Sandringham hosts The Athena (26-27 February). The non-strokeplay event sanctioned by the WPGA Tour of Australasia will feature 12 female golfers with the winner to receive \$30,000. The Athena is designed to test a player's skills in challenging situations – so-called 'clutch shots' they would encounter when competing against the world's best.

Given Athena is an ancient Greek goddess of war strategy and wisdom, it will be interesting to see how Sandy Golf Links comes up on the big screen. The Athena will be broadcast on Fox Sports and Kayo for four hours each afternoon. More than 265,000 viewers tuned in to watch the inaugural event last year.

The next five years should be a fascinating period as Sandringham generates more attention. "It's in great nick now but there's still so much to do," O'Callaghan says. "You've got all the resources from Royal Melbourne. But because of the amount of golfers you get, some days you can't achieve a lot."

In the grand scheme, O'Callaghan wants to clear out a bit more of the tree, finish off the bunkers and establish mowing patterns from existing rough to make it more of a Sandbelt experience. "There's some great native heathland, which we've been doing a bit of clearing out," she adds. "There's bits and pieces where you'll be able to see through to the next fairway. Or be able to have a little vista across the dunes. That's great because a lot of people will never get to experience that if they don't play the private golf courses."

"But they come to Sandy and it's Royal Melbourne type greens. You can stand on some of the tees and think you're at Yarra or Commonwealth. That's a unique experience. And I get to play these courses so hopefully I can impart a little bit of my golfing experience onto a few of the holes."

Editor's Note: You can follow Gerri O'Callaghan on Twitter @gocallaghan14 and Instagram @gezza_ocallaghan



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PHOTOS: PAUL JANSSENS AND LEANNE CLARKE/LANDSCAPE SERVICES

Parliament House pests kept in check

At the Gold Coast conference earlier this year, Paul Janssens talked about the operations of the Landscape Services team whose job it is to look after the grounds of Parliament House in Canberra. Here, IPM officer Leanne Clarke discusses the wide-ranging integrated pest management program in operation which plays a key role in managing this unique landscape.

Parliament House in Canberra is famous for its well-manicured lawns and sweeping green ramps on top of 'the hill'. There are 23 hectares of turf and gardens to manage, however, many of the gardens are out of sight from the general public, hidden within the 17 internal courtyards of the building.

Maintenance of the famous landscape falls under the responsibility of the Department of Parliamentary Services. The department's Landscape Services Manager is Paul Janssens, who leads a team of 19 which

includes 15 gardeners, two apprentices and two support staff, to maintain the parliamentary landscape to a very high standard with minimal use of toxic pesticides.

To enable pests and diseases to be managed with minimal chemical use, Landscape Services has adopted an integrated pest management (IPM) program. IPM is the practice of implementing all available methods to manage pests and diseases and to minimise the amount of pesticides used within the landscape. IPM does not completely eradicate all pests and diseases, but is a sustainable

system that manages pests and diseases to an acceptable level.

Landscape Services has been developing its IPM program over the last 25 years with a strong emphasis on biological control. Several factors have been the catalyst for this type of approach including logistics, safety, chemical resistance and environmental protection.

Parliament House has a unique design where a large number of the gardens are literally within the walls of the building. It's a building that gets very busy, potentially swelling to around 5000 occupants in a sitting

The Landscape Services team, responsible for the maintenance of Parliament House in Canberra, has been developing its IPM program over the last 25 years, with a strong emphasis on biological control

period and it is not viable to be reliant on spraying toxic chemicals in this environment for both human and environmental safety.

Most internal courtyards contain large air-conditioning intake vents and if a chemical application is required, the vents must be covered and the air-conditioning shut down. Therefore, any toxic chemical applications must be done out of hours with at least a week's notice to relevant stakeholders. IPM has eliminated the need for the air-conditioning to be shut down and significantly reduced the amount of chemical usage that may be harmful to the public, the operator and the environment.

IPM STRATEGIES

The foundation of an IPM program is monitoring and identification. Knowing what pests, diseases and beneficial insects are present and at what levels, is critical and allows for softer methods of control. Landscape Services has a designated IPM Officer who performs weekly monitoring of the entire site and identifies and records levels of disease, pests and beneficial insects present. Action to be taken is based on this weekly observation.

IPM strategies used at Parliament House for pest and disease prevention, suppression and management include:

Cultural: Correct watering, fertilising and pruning techniques to ensure optimal health of a plant. The healthier a plant is, the more resistant it is to pests and diseases.

Sanitation: Pruning equipment is cleaned after each plant or cut, particularly if die back or cankers are present. Tools and machinery that may have contacted soil pathogens are thoroughly washed down. Leaf litter is cleaned up to remove any overwintering pests and diseases.

Resistant varieties: Where available, plant varieties resistant to pests and diseases are chosen such as:

- Turf species with high fungal endophyte to resist scarab grubs;
- Warm-season turf species have been chosen for their resistance to heat stress;
- *Lagerstroemia indica* 'Indian Summer' (crepe myrtle) varieties are resistant to the fungal disease powdery mildew;

Hippodamia variegata (variegated ladybeetle) are used for aphid control, particularly on perennials and groundcovers. Pictured far right are ladybeetle eggs



Harmonia conformis (spotted ladybeetle) are used for aphid control, particularly in trees

- Annuals for flower displays – species less prone to pests and diseases are selected; and
- Psyllid-resistant syzygiums.

Quarantine: All new plants are quarantined in the glasshouse/bush house area and closely monitored for pests and diseases before being planted out.

Physical and mechanical: Mulching is used to suppress weed growth in areas of the landscape. Blue and yellow sticky traps are used to attract adult leaf miners, whitefly, thrips and aphids which also aids in monitoring. Badly infested branches/twigs are pruned off and removed and low insect numbers are 'squished' with fingers. Tree-banding copper tape is used on *Laburnum vossii* to stop snails. Banding may also be used to monitor and trap pest larvae of elm leaf beetle and pear and cherry slug. Gnat sand for fungus gnat control on indoor plants.

Biological control: Use of biological control, both introduced and naturally occurring, is a fundamental part of the Parliament House IPM program. Biological control has three parts – introduced, naturally occurring and augmentation.

INTRODUCED BENEFICIAL INSECTS AND ORGANISMS

When biological control is mentioned, people immediately think of the cane toad that was introduced to control the cane beetle in the sugar plantations of north east Australia. Thankfully, the beneficial insects released in the IPM program at Parliament House have had a more positive outcome.

Introduced predators are purchased from insectaries in Queensland, South Australia and Western Australia. The introduced predatory insects have been developed in Australia and are very specific in what they eat, therefore, once pest populations have been eliminated the predators will disappear. For this reason,



predators are re-introduced on a regular basis, as both the beneficial and pest populations seesaw, maintaining an acceptable balance of the two.

As the weather cools, pests become inactive, however, introduced beneficial insects will not overwinter during Canberra's cold winter. It is crucial to monitor pest levels, especially coming into spring, as pest populations can occur in large numbers before the natural predators become established. If pest numbers are too high, they will need to be reduced by treating with a soft spray such as soap or oil before the beneficials are released. The soap or oil will kill a majority of pests on contact, however, pests that have avoided contact will remain, leaving a food source for the beneficial insects. Again, monitoring is key to maintaining this balance.

Introduced predators used in the Parliament House IPM program include:

- Parasitic nematodes – for scarabs in turf and tree borers;
- Green lacewing – a general predator for a variety of pests including aphids, mealy bugs, scale insects and azalea lacebug;
- Cryptolaemus lady bird larvae – for mealy bugs and a variety of scale insects;
- Harmonia conformis for aphids – particularly in trees;
- Hippodamia variegata for aphids – particularly on perennials and groundcovers;
- Several wasp species that parasitise pests by laying eggs in them including:
 - Metaphycus (a parasitic wasp for brown scale control);
 - Encarsia for white fly control;
 - Aphidius colemani, Aphidius ervi and Aphelinus abdominalis, to parasitise a range of aphid species;
 - Thripobius to control thrips.
- Predatory mites (persimilis and typhlodromus species) for two-spotted mites.
- *Bacillus thuringiensis*, a bacterium which kills lepidoptera caterpillars.
- Rhizo-iversity, to increase beneficial soil microbe populations which aid in suppression of soil pathogens.

NATURALLY OCCURRING BENEFICIAL INSECTS AND ORGANISMS

A reduction in chemical use over the years has seen an increase in naturally occurring beneficial insects which include:

- Several species of ladybeetles – general predators that consume a variety of insect pests.
- Hover flies – adults resemble small bees and the larvae resemble small green caterpillars which feed on aphids, particularly on rose bushes.



Green lacewing eggs. Green lacewings are a general predator for a variety of pests including aphids, mealy bugs, scale insects and azalea lacebug

Insecticides targeting specific pests such as aphicides and miticides can upset the balance of food available for beneficial predators.

Moving existing beneficial insects to a food source they haven't yet found is another way of manipulating beneficial insects to work in your favour. Many beneficial insects will only be predacious while at a particular life-stage. For example, only the larval stage of lacewings, hoverflies and wasps will consume pests. The adults will feed on pollen and shelter in plants, therefore having a diverse landscape with plenty of flowers year round will encourage beneficial insect populations.

CHEMICAL CONTROL

Chemical control is a last resort and only used if deemed necessary. Chemicals toxic to our beneficial insects are kept to a bare minimum. Softer options are used to reduce pest numbers, which include:

- Horticultural oils for scale;
- Bio oil for weed spraying;
- Soap sprays for aphids;

“The foundation of an IPM program is monitoring and identification. Knowing what pests, diseases and beneficial insects are present and at what levels is critical and allows for softer methods of control.” – Leanne Clarke, IPM Officer

- Stethorus sp – a tiny black beetle that feeds on two-spotted mites (often seen on cherry trees and acers).
- Brown lacewings – a general predator.
- Birds – particularly small wrens and spinebill honeyeaters.

AUGMENTATION

Augmentation is the practice of modifying the environment to encourage beneficial insects and organisms. Beneficial insects are very sensitive to chemicals. The elimination of toxic chemicals is crucial as many pesticides are broad-spectrum and will kill not only the target pest but will wipe out any beneficial insects as well.

Even 'natural' insecticides such as pyrethrum will kill beneficial insects.



It is crucial to monitor pest levels, especially coming into spring, as pest populations can occur in large numbers before natural predators establish

- Pest-specific chemicals (e.g. aphicides, miticides) if major outbreaks occur and beneficial insects are not in sufficient numbers;
- Pre-emergent herbicides for large area weed control;
- Roses are on a preventative non-toxic spray program (potassium carbonate and Hort oil) for fungal diseases;
- Dipel (*Bacillus thuringiensis*) for lepidoptera larvae including azalea leaf miner;
- Agri-fos (phosphonic acid) to increase root health and immunity and suppress phytophthora diseases.

Where necessary, chemicals are used as 'spot sprays', thus minimising total coverage and volume used. Chemical groups are rotated to reduce resistance.

IPM is a dynamic program that continually evolves as new methods, technology and beneficial organisms are developed. Every year is different as pests and diseases can vary in abundance, timing and damage caused, which is why continued monitoring is so important.

The Parliament House Landscape Services team continues to develop its IPM program into the future and we look forward to trialling and adopting new methods and technology as they come to hand. 🌱



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In the trenches



Good drainage is fundamental when it comes to producing high quality turf surfaces. AGCSATech senior agronomist Bruce Macphee gets to the bottom of what good drainage is and what isn't.

When we look at first class turf facilities throughout the world, whether a golf course, elite sports field or race track, good drainage is one of the key characteristics they have in common. While we often focus on keeping moisture within the profile during periods of warm weather, the removal of excess water during the cooler months or when there are significant rainfall events is becoming increasingly important.

With the recent weather the east coast of Australia has experienced courtesy of a *La Niña* weather cycle and a changing climate, short sharp rain events appear to becoming more commonplace and the ability to efficiently remove excess water from a surface and profile is what will set many of these great turf facilities apart.

When discussing profile design and drainage requirements with clients, we often hear "Oh it's not the MCG". Fair enough. But if we look into that statement a little more, the

fact is many of our municipal sporting grounds are under far greater pressure than the MCG in terms of usage and without the staffing or budget that goes along it.

For this reason alone, we should ensure that we get the basics right when redesigning a turf profile or drainage system. Good drainage will allow the turf manager to maintain turf quality throughout the winter period when recovery is often slow and grounds with inadequate drainage deteriorate quickly. The result being poor quality unsafe surfaces that

The installation of sand slits with collector drains and a sand carpet layer is becoming more commonplace and a cost effective alternative to a full perched water table construction



PHOTO: AQUATEK

remain that way for the rest of the season or until the weather improves. A municipal ground with excellent drainage will provide a solid playing surface through winter and allow for increased hours of use with a greatly reduced chance of the surface rapidly deteriorating.

WATER MOVEMENT AND SOILS

Before we look at the various drainage options available, we need to understand water movement in soils and how subsoil drains work. Being somewhat limited as to the level of detail that can be provided in a short article, there are several excellent books available through the ASTMA bookshop including *Drainage for Sportsturf and Horticulture* (by

Keith McIntyre and Bent Jakobsen) as well as *Natural Turf for Sport and Amenity, Science and Practice* by W.A. Adams and R.J. Gibbs. Both are excellent resources.

While there are variations on subsoil drains, they are primarily installed to remove excess water. One key point that should be understood is how water enters a subsoil drain. In a poor draining soil profile, we are trying to intercept surface water flow through a series of fast draining trenches back filled with a specified sand, gravel and pipe, rather than remove excess water from the soil profile.

In soils with a high clay content or fine texture, the lateral movement of water is extremely slow, even when the soils are saturated. Therefore, the movement of water through the soil and into the sand drain is going to be insignificant. Consequently, installing subsoil drains into a poor draining soil profile 'to drain the soil' is going to be ineffective.

This can be explained through understanding the forces placed on water molecules within soils. Water molecules are held within soils by adhering to the surface of the soil particles (adhesion) and the natural attraction of water molecules to each other (cohesion). These combined forces are often referred to as tension. Fine-textured soils consist mainly of small particles which have a large surface area and many small pore spaces, these soils will exhibit a high tension on soil moisture. Sands with larger particles have less surface area and fewer small pore spaces, therefore having less ability to place tension on water within the soil matrix. It is this tension in fine-textured soils that prevents water moving into subsoil drains unless the soil is completely saturated.

Only excess or free water will move into the drainage trench from the finer textured soil (this is typically a very small volume), hence the statement referring to subsurface drainage being ineffective at 'draining the soil'. This is not to say subsurface subsoil drains are not effective. Situations where there are slopes, natural springs, water courses and rising water tables are where subsurface drainage is the most effective.

Understanding the soils we are dealing with is equally important and an integral part of designing an effective drainage system. Sands ideal for drainage typically meet the USGA specification for particle size distribution. These sands have good drainage and aeration properties, often in direct contrast to

the surrounding poor-draining soils. Subsoil drains are essentially a cross section of a perched water table and as such need to be tested in the lab to ensure compatibility of both sand and gravel. The results will assist in determining the ideal depth of the sand within the trench to ensure an adequate volumetric water content to maintain healthy turf coverage throughout the summer months.

DRAINAGE DESIGN

Now that we understand water movement between soils of different textures, it is clear the expectation that subsoil drains placed at 3m or 5m spacings can effectively dry out a poorly draining soil profile or sports oval is unrealistic. Unfortunately, we often see sports fields which have been constructed using this exact method. This wider spacing is often undertaken in an attempt to save money, where in fact it is more often than not a complete waste of money.

The effectiveness of a proposed design can be calculated with a high degree of confidence using variations of Hooghoudt's equation. Originally Hooghoudt's equation was used to design drainage systems in agricultural land where a permeable rootzone sits over an impermeable subsoil and where a water table forms. The equation is just as applicable in turf situations where it can be used to calculate the drainage rate of the in situ soil as well as drain spacing and the time taken to effectively drain a profile.

The equation can be used to calculate the design drainage rate from variables such as the hydraulic conductivity and depth of the proposed sand to be utilised, the lateral pipe spacing, sand slit width and spacing, all of which can be adjusted to ensure a suitable outcome is achieved, also taking into account the local soils and climatic conditions.

Table 1 below shows the drainage rate of a soil with hydraulic conductivity of 20mm per hour. This simplified example highlights the use of Hooghoudt's equation to calculate the drainage rate and time taken to effectively drain the top 50mm of a 300mm deep soil profile using various drain spacings.

INTERCEPTOR DRAINS

In sports turf situations where the profile is constructed with poorly draining topsoil, we are trying to intercept water as it flows across the surface during rainfall events and before it has a chance to enter the soil profile between the subsoil drains. This relies on the

TABLE 1. DRAINAGE RATE – SOIL HC 20MM/H

Drain Spacing (m)	Drainage Rate (mm/h)	Time to drain top 50mm of profile
10 metres	0.025 mm/hr	400 hours (17 days)
2 metres	0.63 mm/hr	16 hours
1 metre	2.5 mm/hr	4 hours

Adapted from *Drainage for Sportsturf and Horticulture*

surface of the field having an adequate slope to effectively move water across the surface towards drainage trenches which are placed at an angle to the surface slope to cut off water flow.

Interceptor drains consist of a free-draining sand layer above a layer of drainage aggregate which surrounds a pipe installed on a blinding layer of aggregate within the base of the trench. For interceptor drains alone to be effective, surface falls of 1:70 to 1:80 are preferred. If the surface is relatively flat, the network of interceptor drains will be less effective and the inclusion of sand slits, which contain sand and aggregate only, will reduce the time and distance water has to travel before being intercepted by a drainage trench. As water moves across the slow draining surface, we rely on drains or sand slits to provide a highly permeable channel of free-draining sand which extends to the surface, allowing water to enter freely.

The surface slope will generally determine the most effective drainage design to maximise interception of water. Engaging a qualified agronomist to complete some calculations based on your soil type, rainfall data and climatic region will provide you with the information required to develop an effective drainage design and appropriate spacing.

As long as the water can enter the sand-filled drainage trenches unimpeded by thatch or topsoil contamination, the drain will continue to operate effectively. If there is insufficient surface slope or the subsoil drains are spaced too far apart, water will enter the poor-draining topsoil creating wet spots between the drainage trenches. The result is often having saturated and wet soils between the drainage trenches and the only dry areas are immediately above the drains.

Wet soils between the drainage trenches only increases the likelihood of fine soil particles being moved across the sand slits



A municipal ground with excellent drainage will provide a solid playing surface through winter and allow for increased hours of use with a greatly reduced chance of the surface rapidly deteriorating

and causing them to become sealed against water flow. Narrow trenches or sand slits can close over or become contaminated quickly if topsoils become overly wet and the surface is utilised for high traffic sports such as football or rugby. Ideally, sand slits of 100mm will provide the best value for money long-term in regards to remaining effective, resisting sealing over or contamination and the ability to intercept and transmit a greater volume of water during significant rainfall events.

With any construction project, planning and testing of materials is crucial to the success or otherwise of the project. Materials should be tested for compatibility and sand should also be tested for hydraulic

conductivity, total porosity, particle size distribution and bulk density.

SAND SLITS

The process of installing sand slits in conjunction with collector drains is becoming more commonplace and a cost-effective alternative to complete reconstruction. Sand slits are installed at narrow spacings (1-2 metres) and intersect with collector drains, allowing water collected through the sand slits to be efficiently removed and piped from the playing surface.

Sand slits also require good surface fall and can be effective with a minimum of 1:100 fall. The width and spacings can be modified to suit a particular situation and required drainage rate.

Sand slits are a viable alternative to complete reconstruction of a poorly draining sports field or to improve sections of a fairway where the cost of installing a sand-based profile may be prohibitively expensive.

As mentioned previously, a wider trench of 100mm provides a better value long-term option. The exception to this rule is horse racing tracks where a narrower trench is preferred for safety reasons as the horse's hooves are able to bridge the trench and avoid an unstable sand footing, which could otherwise potentially lead to a fall. Sand grooving is popular with racing surfaces and provides a cost-effective option which can be updated periodically.

Ideally, heavy sand topdressing of 25mm should be applied to the surface after the installation of sand slits and an ongoing programme of regular topdressing should be implemented. This will assist in protecting the integrity of the sand slits from contamination and prolong their usable life.

SAND CARPET PROFILES

It is not uncommon to see the inclusion of a sand carpet profile (100-200mm) in conjunction with sand slits and drainage in new constructions. This has the benefit of providing an adequate rootzone with very good drainage as a viable option to a full-scale reconstruction.

The sand carpet works on the theory that the shallow sand rootzone will provide rapid infiltration of water and an adequate depth for healthy plant growth, whilst also providing protection to the extensive network of sand slits and drainage which allows efficient removal of excess water, ensuring the profile does not become saturated.



Sports fields constructed with wider drain spacings, often in order to save money, will ultimately provide an inadequate playing surface due to the drainage system's inability to remove water quickly and effectively

Sand slits are a series of closely spaced trenches back filled with sand and gravel which intercept water as it flows across the surface. Water is then directed into wider spaced collector drains where it is quickly piped off the surface



PHOTO: AQUATEK

There is significant testing and calculations required to ensure a system such as this is suitable and will drain effectively, so an agronomist should be engaged if this option is to be considered.

SAND GROOVING

Sand grooving or sand banding is installed using equipment which creates a number of grooves about 200mm apart with blades or coulters which are then backfilled with sand in one pass. The grooves are narrow (20-30mm) with a depth up to 200mm. While there is minimal disruption to the surface, sand grooving will only be effective for a relatively short period in comparison to sand slits or drainage. This is useful for refreshing areas which already have subsurface drainage and the grooves can be linked in with existing drainage network.

Similar pedestrian equipment exists for use on golf greens and fine turf which can inject sand channels into the profile, which can be very effective on greens provided the channel extends beyond any thatch layer present to link with the sand below. Greens with a significant thatch layer which holds moisture can prevent the free movement of water into the sand profile below. Regular sand grooving can improve these surfaces without the need for costly reconstruction.

MAINTAINING DRAINAGE

Drainage or sand slits will only work while there continues to be a direct link to the surface. Maintaining the effectiveness of drainage and sand slits is an often-overlooked part of regular

drainage maintenance. Failure to maintain a clean sand profile to the surface of the trench can see a build-up of contamination or thatch. Even a few millimetres of heavy soil can stop the drain from functioning effectively. Once the surface is sealed, the drain will no longer work



Contamination of a sand drain with poor draining soil and thatch over the surface will reduce the effectiveness of a drain completely

to remove surface water as it is prevented from entering the trench.

For drainage to remain effective, washed turf should be used above trenches and regular sand topdressing should be applied to prevent dense layers of thatch developing above trenches. Ideally from installation, a 25mm layer of sand topdressing should be applied to the surface to protect the integrity of the newly installed drains or sand slits.

The effective life of a well installed drainage system is about 10-15 years before contamination, thatch and organic matter build up reduces the ability of water to effectively enter the drains. Drains which have reduced in performance can be renovated by hollow coring with large diameter hollow tines and then backfilling with sand, or by stripping the turf from the surface, removing any contaminated material back to clean sand, topping up with fresh sand and finishing with washed turf.

Before deciding on the installation of interceptor drains, a sand slit drainage system or sand grooving, a number of factors need to be taken into consideration. Possibly the most important to consider is that the efficiency of the drainage system will deteriorate over time. Choosing an option which will be short-lived or completely inadequate may be a waste of time and money.

Given the number of variables which need to be taken into account, it is highly recommended to engage an agronomist to complete a site assessment and the associated testing required to ensure your next drainage project is a success. 🌱



The dirt on biochar

Public awareness has increased regarding environmental issues which has led to more scrutiny by regulatory authorities. These issues include pesticide use, leaching of fertilisers and pesticides into water bodies and ground water and the factors that contribute to global warming.

In response to this, sports turf managers are always looking at ways to reduce inputs, including pesticide and fertiliser use, on their surfaces. Improving soil health that leads to improved plant health is one way to do that as a healthy plant requires less inputs of fertiliser and pesticides to produce a quality turf surface.

There are many success stories from using organic and high-carbon products to reduce reliance on chemicals. Recently, biochar has started to become popular and a lot has been made of the benefits of it by those companies selling the product, but little of the potential issues of using it as an amendment in sports turf rootzones.

Melbourne Polytechnic turf management teacher and former AGCSATech agronomist Steve Tuckett looks at the use of biochar as a sports turf profile amendment.

Biochar does have benefits for the soil's food web, such as increasing the soils cation exchange capacity (CEC) and therefore increasing nutrient retention (Glaser et al., 2002; Lehmann et al., 2003). According to various researchers (Karhu et al., 2011; Peng et al. 2011; Ding et al., 2010; and Basso et al. 2013), biochar can increase moisture retention (although the results vary widely), so it could be an effective amendment to be used in rootzones with high infiltration rate. Biochar is similar to zeolite as it has a honeycomb structure giving it a very high surface area.

A common theme for a sales pitch for biochar is... "Biochar is a stable form of soil carbon with a naturally porous structure which improves aeration, water-holding capacity and nutrient retention of soils and acts as a refuge for beneficial soil microbiology."

To improve the nutrient and water retention in sandy rootzones, peat moss is commonly incorporated (Waddington, 1992). However, over time the decomposition of peat moss adversely affects its positive impacts on the rootzone as it breaks down into fine particles and reduces water infiltration rates and thus losing some of its nutrient retention capacity in a sand-based system. (Bigelow et al., 2004). According to Brockhoff (2010), biochar would seem to be a viable alternative as it may have similar benefits to peat moss while being less prone to decomposition.

That all sounds positive, but the question is if we amend sports turf profiles with biochar where drainage is key, what will be the long-term effects of this practice? Biochar is not biodegradable so once it is in the rootzone



Biochar is a product produced by heating organic materials, such as wood, crop waste and manures, in a low oxygen environment. The result is a porous, charcoal-like biochar rich in carbon content that can effectively capture carbon and lock the carbon into the soil

PHOTO: SANGSIRIPECH/STOCK.ADOBE.COM

it is there permanently and any reduction in drainage rate will need a lot of remedial work to rectify. As well, there are many different types of biochar, so you need to do your research to determine which one is the most suitable for your situation.

WHAT IS BIOCHAR?

Biochar is a product produced by heating organic materials, such as wood, crop waste and manures, in a low oxygen environment. The heating process is called 'pyrolysis', where the organic materials are placed into a special oven where heating occurs in the presence of little or no oxygen. The result is a porous, charcoal-like biochar rich in carbon content that can effectively capture carbon and lock the carbon into the soil.

Many turf managers would be familiar with activated carbon which has been used for remediation of areas where chemical spills have occurred. Activated carbon and charcoal are also produced through the heating of organic materials via pyrolysis, so what is the difference, if any? Put simply, it's about the end use as biochar is used as a soil amendment, charcoal is used as a fuel and activated carbon for filtration, remediation and purification.

The temperature and duration of the pyrolysis process and the original ingredients will ultimately determine the biochar's properties. Biochar materials possess different particle size characteristics depending on the temperature and burn times of the pyrolysis process. Dall'Ora et al. (2008) note that fast

pyrolysis occurs at high temperatures with a short burn period and produces a fine-textured biochar (< .002mm diameter particle size). Conversely, slow pyrolysis produces a coarse-textured biochar with longer burn times.

HISTORY OF BIOCHAR

The name 'biochar' was coined in 2005, although 'charcoal' has been used for agricultural purposes as a soil amendment for thousands of years. Improved nutrient retention and nutrient availability for plants in Amazonian soils have been linked to the presence of char in the soil profile (Glaser et al., 2002).

These soils, within the Amazon River basin, are carbon rich and it is believed that a form of biochar or charcoal had been used in agriculture. These dark soils, known as '*terra preta*', were likely to originate from charred organic materials like manure, crop residue and bones that were set alight and covered with dirt to eliminate oxygen but hold in the heat from the fire which, in turn, baked the organic matter.

Carbon-containing materials such as plants are made from carbon that is sourced from the air. While alive and whole, that organic matter holds the carbon in place, but when it burns or decomposes the carbon is released back into the atmosphere in gases like carbon dioxide. These gases then contribute to climate change and global warming.

If the organic material undergoes pyrolysis, then the carbon largely remains locked as a solid in the biochar and can remain stable.

Because the half-life of the carbon found in biochar is greater than 1000 years, biochar, when applied to soil, is a carbon sequestration tool (Laird, 2008). Other by-products of the pyrolysis process include oils and methane that can be captured and used as an environmentally friendly fuel.

BIOCHAR RESEARCH REVIEW

Although there has been little research done on the long-term effects of biochar used to amend sports turf profiles, there has been extensive research into biochar's benefits on agricultural soils around the world. The following is a review of some of the research that has been conducted.

SOIL REMEDIATION

According to Beesley (2011), who reviewed the role of biochar in the remediation of contaminated soils in a number of studies, it was concluded that biochar can effectively remove persistent organic pollutants and some pesticides from soils.

Hilber et al. (2017) reviewed many papers on biochar and its effects on persistent organic pollutants (POPs) and heavy metals in soils and concluded that due to their high surface area, high CEC and persistence in the soil, heavy metals precipitate as phosphates on the surface of biochar due to the rise in pH (e.g. copper, zinc, lead and cadmium). However, metalloids and non-cationic negatively charged metals such as arsenic aren't precipitated out on biochar surfaces.



PHOTO: SMALLSCALEFARMING/STOCK.ADOBE.COM

While there has been extensive research into biochar's benefits on agricultural soils around the world, little research has been done on the long-term effects of biochar on sports turf

SOIL PH

According to Laird (2008), biochars are alkaline in nature and are effective liming agents. Qambrani et al. (2017) completed a literature survey and found that biochar pH ranges considerably depending on the organic materials from which the biochar was produced. The temperature during pyrolysis affects the pH of the biochar with higher pyrolysis temperatures resulting in increased biochar alkalinity (Hossain et al., 2011; Yuan et al., 2011; Cantrell et al., 2012).

WATER-HOLDING CAPACITY AND CATION EXCHANGE CAPACITY

While there are many studies that analysed the effect of biochar addition on soil and crop productivity, the results vary widely. In terms of crop productivity, a meta-analysis conducted by Jeffery et al. (2011) found that across the 14 studies analysed there was a slight, statistically significant, positive impact on crop productivity across the studies, improving crop productivity/yield by 10 per cent. Although the change in crop yield varied widely, the greatest improvements were often seen when biochar was added to acidic or pH-neutral soils and to those with medium/coarse textures.

In regards to moisture retention, according to Karhu et al. (2011), Peng et al. (2011), Ding et al. (2010) and Basso et al. (2013) the results vary widely, but studies have also shown that biochar addition to soil can improve the soil's water retention ability.

Anecdotal evidence from David Chammings, chairman of greens at Okehampton Golf Club in the UK, noted improvements in turf health on a newly-extended area of a green, which was constructed of sand and had been prone to

leaching. After a one-off application of biochar applied at 1kg/m² which was then brushed into core holes, there was a reduction in the number of applications of fertiliser which is most likely due to the increase in CEC. He mentioned that there was also a large reduction in fungicide use on a green where biochar had also been incorporated. This green was known as a 'disease indicator' green due to it being surrounded by trees and received very little winter sunlight, with fusarium always an issue.

DISEASE SUPPRESSION

Trials done in Israel showed that biochar could deactivate cell wall degrading enzymes produced by soil pathogens. The enzymes produced by these soil fungi dissolve and destroy plant cells and allow entry of the pathogen into the plant (Jaiswal et al., 2018).

BIOCHAR USE ON SPORTS TURF

The most relevant sports turf trial work was completed by Shane R. Brockhoff at the Iowa State University in 2010. Fast pyrolysis switchgrass biochar and USGA spec sand mixtures ranging from 0 per cent biochar up to 25 per cent biochar (increasing by five per cent increments) were tested for moisture retention, hydraulic conductivity and leachate constituents.

The six mixtures were placed in PVC tubes to a depth of 300mm over a 300mm depth of 10mm diameter pea gravel to replicate a perched water table. This was repeated three times and four replications of each treatment were evaluated in a randomised design in a controlled-environment greenhouse. T1 bentgrass growing on the sand/biochar mixes were evaluated for rooting depth.

According to Brockhoff, the optimum amount of biochar in the sand profile is 10 per cent based on the rooting depth of the T1 bentgrass and the water holding capacity of the media. Increasing the amount of biochar beyond 10 per cent in the profile has a detrimental effect on rooting depth and may decrease overall turfgrass quality. This research shows that biochar is able to provide nutrients and increase nutrient retention as well as increase water retention.

Previous research suggests biochar provides fixed carbon in the soil (Laird, 2008). Therefore, biochar meets all of the objectives of an ideal sand-based rootzone amendment (Bigelow et al., 2004) at this time. However the chemical and physical parameters of sand and biochar rootzones should be evaluated over time in a field setting to monitor the effects biochar has on a sand rootzone. Brockhoff's research can be downloaded through the Iowa State University library – search for 'Sand-based turfgrass rootzone modification with biochar' through an Internet search engine.

RATES

Rates of application vary greatly depending on the carbon content and the source of the biochar. One product showed rates ranging from 4.5kg/100m² to 36kg/100m². The product used at Okehampton Golf Club in the UK mentioned earlier used rates as high as 100kg/100m². Brockhoff (2010) recommends rates on v/v basis 10 per cent.

CONCLUSION

The widespread adoption of biochar as a soil additive should not be done until more research is done on the pyrolysis conditions, organic ingredients, initial soil qualities and the amount of biochar that should be added to maximise its positive effect. Until long-term studies have been conducted, it is difficult to access biochar's value as a soil additive for sand rootzones.

Brockhoff (2010) recommends to not use greater than 10 per cent v/v biochar otherwise drainage will be adversely affected. Anecdotal evidence suggests that some turf managers are applying biochar to their surfaces after renovation procedures on a regular basis. The negative effects of this practice over time may reduce the infiltration rate of the profile leading to inferior surfaces.

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Field VS lab

ATM expert columnist John Neylan discusses moisture retention within sports turf profiles and some of his recent research and monitoring that looks at how sands perform in the field compared with how they measure up in laboratory testing.

The supply of sands and gravel for sports turf construction has been under stress for some time with the increasing demand from numerous infrastructure projects being undertaken around Australia. This demand has siphoned much of the available sands for concrete and other construction materials.

In reviewing the resource availability across Victoria and New South Wales, there is a common theme around the high demand for natural sand and gravel deposits. These resources are in high demand due to resource depletion and land use constraints. In Victoria

(June 2018) there is a strategy for increasing the availability of natural resources to meet the current and future demands. At the current rate the demand would increase to over 100 million tonnes/year by 2050, more than doubling the 2015 annual production.

In Sydney, sands are equally in high demand, with sand typically imported from outside the Sydney region. Due to the current and future demands, NSW has even explored the use of marine sand deposits (2016). The implications for the turf industry are that a consistent source of sand is not always available and compromises are often required.

Providing sands for the turf industry is a specialist process with specific requirements for particle size distribution, capillary porosity and drainage rate. With the larger suppliers of sands, the turf industry can be seen as too demanding and there is somewhat of a 'take it or leave it' attitude. The result is that more than ever the turf industry is being faced with having to use less conventional sand sources which makes the selection process even more important. This highlights the importance of testing and understanding any significant changes in the physical properties and how this will affect the profile design.

Providing sands for the turf industry is a specialist process with specific requirements for particle size distribution, capillary porosity and drainage rate

Sand is potentially the single greatest cost in a construction project and accounts for about 20-25 per cent of the total cost. Over the past five years the cost of sports field construction has increased by about 20 per cent across the entirety of the project (SPORTENG, 2021) with sand being a significant component.

Consequently, on some lower level fields, the decision is often made to reduce the depth of the rootzone sand layer as a cost-saving measure. If the rootzone depth is reduced by about 50mm the cost of the sand can be reduced by about 20 per cent. However, while costs can be reduced, the depth of the rootzone must not compromise the overall performance of the playing surface and the value of the asset.

Soil science and soil physics in particular is an area of science that has intrigued me throughout my years at university and subsequently throughout my working life. My research into the characteristics of various sands for greens construction (*ATM Volume 16.5 – 'Hard and fast', pages 40-44*) provided a number of observations on how sands perform in the field and the relationship with how we measure these characteristics in the laboratory.

The results of laboratory analysis have always been a constant source of debate and in particular how does the laboratory data relate to the field experience. While the merits of testing can be debated and understanding that soil tests are not absolute, they are a repeatable approximation of what can happen in the field. With the potential for having to use different sands and designing profiles at a reduced profile depth, sand testing is becoming even more important.

In contemplating these issues around sand selection, sand depth, laboratory testing and field performance, I have undertaken both large container research trials and monitored two sports fields in terms of the moisture profile and changes as it relates to rainfall events. The field and trial data has been compared against the laboratory measurements.

RESEARCH TRIALS

To assist in determining whether a particular sand will drain adequately at a particular depth, the moisture release curve (MRC) is often used. McIntyre and Jakobsen (1998) introduced the MRC as a method for designing the profile depths of golf greens and sand-based sports fields. The principle was to establish the best balance between water storage, aeration porosity and drainage.

In making decisions on sand selections based on MRC results, as well as field



To further explore the relationship between sand type and depth and moisture retention characteristics, a project was established using large containers constructed as a turf profile. Pictured are the samples being saturated by capillary rise

observations of golf greens and sports fields, there often seems to be a disparity between the laboratory results and the field observations. Throw into the mix the differences in MRC results from different laboratories and the story becomes even more confusing.

In 2014 (*ATM Volume 16.5*) and 2015 (*ATM Volumes 17.3 and 17.4*) trials were undertaken on different sand types and their relationship with surface firmness. As part of this work the soil moisture profile was measured and compared against the standard MRC. The results indicated a disparity between a 'field' type situation and the laboratory.

To further explore the relationship between sand type and depth and the moisture

retention characteristics, a research project was established using large containers constructed as a turf profile. Across the trials there were several profile combinations constructed, including sand over gravel, sand over an impermeable base and sand over a modified clay subgrade. All profiles had drainage outlets to allow for the removal of excess water after they were saturated.

There were two sand types tested – a medium-fine sand and a very fine sand (Table 1). The sands were tested at 300, 250, 200, 150 and 100mm depths with three replicates of each treatment. Each container was saturated by capillary rise to exclude all air bubbles and to ensure complete saturation. Once saturated, the containers were removed from the water and allowed to drain for 24 hours.

It had been previously determined that after 24 hours the sand would be at equilibrium/field capacity where all of the free water had drained and there was a balance between air-filled and water-filled pore spaces. At this time the soil moisture was measured at 50mm depths using a soil moisture probe.

RESULTS

Sand depth: The influence of sand depth on the moisture profile was as would be expected in that as the sand depth was reduced the soil moisture content in the top 50mm of the profile increased (Figures 1 and 2, see next page). Conversely, as the moisture content increased there was a corresponding reduction in the aeration porosity. If we use the USGA Guidelines (2018) for the porosity of rootzone sands, the medium sand was not suitable at

**TABLE 1:
SAND CHARACTERISTICS**

Sieve Size (mm)	% Particles Retained	
	Medium Sand	Fine Sand
2	0.9	0
1	4.9	0.5
0.5	16.3	6.4
0.25	53.7	20.5
0.15	21.2	32.3
0.053	2.8	39.9
<0.053	0.2	0.4
Total fines	24.2	72.6
Fineness modulus	0.97	0.6
Hydraulic conductivity (mm/hr)	300 - 400	>150
Capillary fringe - Lab test (mm)	225	475



Figure 1: Medium Sand - Volumetric Water Content and Aeration Porosity in the top 60mm at different depths

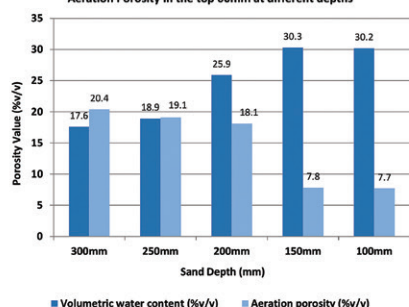
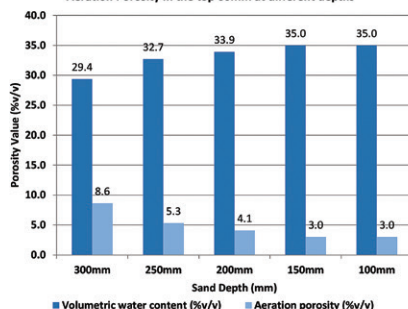


Figure 2: Very Fine Sand - Volumetric Water Content and Aeration Porosity in the top 60mm at different depths



Figures 1 and 2. The influence of sand depth on volumetric water content and aeration porosity. As sand depth was reduced, soil moisture content in the top 60mm of the profile increased

150mm depth, with an aeration porosity of 7.8 per cent and moisture retention of 30.3 per cent.

With the very fine sand, a depth of 300mm was very marginal with the aeration porosity being marginal and the moisture retention elevated. As the depth was reduced the aeration porosity was extremely low and would adversely affect root growth and health.

Moisture retention characteristics: The moisture retention characteristics are detailed in Figure 3 (below) and demonstrate the sharp contrast between the two sands being tested. The medium sand shows a relatively sharp change in the curve as the large pores begin to drain and air replaces the water. In the very fine sand there is a gradual change in the moisture content as the tension (sand depth) increases. This reflects the fineness of the sand and the larger number of small, water-retaining pores.

Both curves demonstrated a similar relationship (shape) to the laboratory (Figure 4, below) derived curves though over a considerably shorter range of tension (i.e. 300mm compared to 700mm). What is most noticeable is that the theoretical air entry point occurred at a lower tension compared to the laboratory test (Figure 5, below). This may in part be due to some 'suction' from the gravel layer in the container tests. What it highlights is that a shallower sand layer can potentially be used with a reduced risk of a saturated profile.

SPORTS FIELD MONITORING

Over the past eight months the moisture profile of two sports fields in Melbourne has been monitored following high rainfall events (Table 3). The purpose of the monitoring was to determine the moisture characteristics in the field versus the laboratory and large container testing. Both sports fields are sand-based with subsoil drainage and no gravel drainage layer. The characteristics of the sand is detailed in Table 2. It was noted that at sports field No.2 the turf had a thin layer of soil. At each location there were three sampling points to assess the site variability and the results detailed are an average of the three readings.

The moisture retention profiles are detailed in Figures 6 and 7 (opposite page). At both sites there was a 30-35mm thatch/organic matter layer and on all occasions there was a very high moisture content. On sports field No.1, immediately below the thatch layer, there was a dramatic reduction in the volumetric water content below the thatch layer. From immediately below the thatch layer to the gravel layer, the moisture retention profile generally followed the profile of the laboratory generated curve, however, the likely air entry point was at a lower tension compared to the laboratory. This result was similar to what was observed in the large container trials.

TABLE 2:
SAND CHARACTERISTICS -
SPORTS FIELDS 1 AND 2

Sieve Size (mm)	% Particles Retained	
	Sports Field 1	Sports Field 2
2	0	0
1	0	0
0.5	9	7
0.25	58	55
0.15	29	34
0.053	3	2
<0.053	1	1
Hydraulic conductivity (mm/hr)	600	250
Sand profile depth (mm)	300	150 - 200
Thatch/organic matter depth (mm)	30	30 - 35 (soil layer on turf)

The other noticeable aspect was that the moisture retention characteristics varied considerably across the five measurement periods. This inconsistency in the moisture profile is a function of:

- Spatial variation in soils, thatch and turf cover;
- Intensity of the rainfall event. During very high intensity rainfall events there was runoff generated and not all of the water entered the profile;
- Soil compaction reducing infiltration;
- The profile probably never reached saturation despite the highest rainfall events.

On sports field No.2, the shape of the moisture profile never matched that of the laboratory generated moisture release curve. It was more linear with no clear air entry point and indicated that the profile may have been marginally too shallow. As with sports field No.1, the surface had a very high moisture retention due to the thatch and thin soil layer.

TABLE 3: RAINFALL (MM) AT SPORTS FIELD SITES

Date	5/5/21	19/5/21	26/5/21	11/6/21	18/10/21	17/11/21
Rainfall (mm)	19.6	23.0	6.8	34.8	42.0	50.0

Figure 3: Large Container - Soil Moisture Retention Characteristics

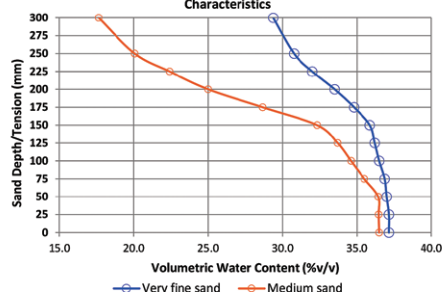


Figure 4: Laboratory derived soil moisture retention curve

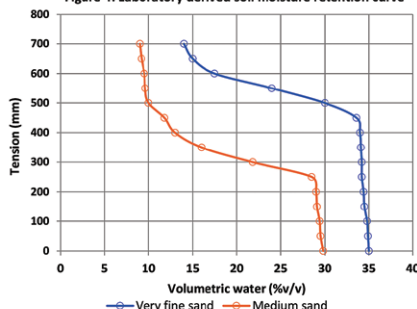
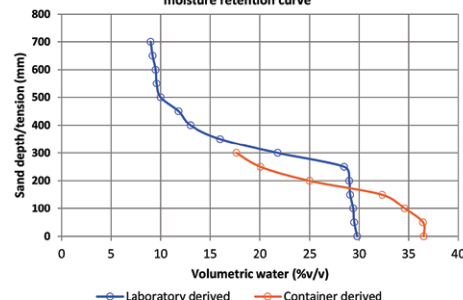
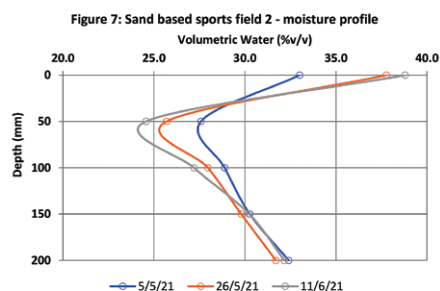
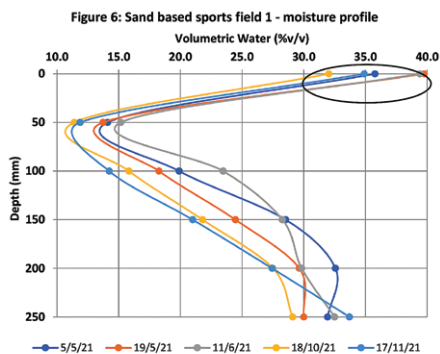


Figure 5: Medium sand - Laboratory vs Container derived moisture retention curve



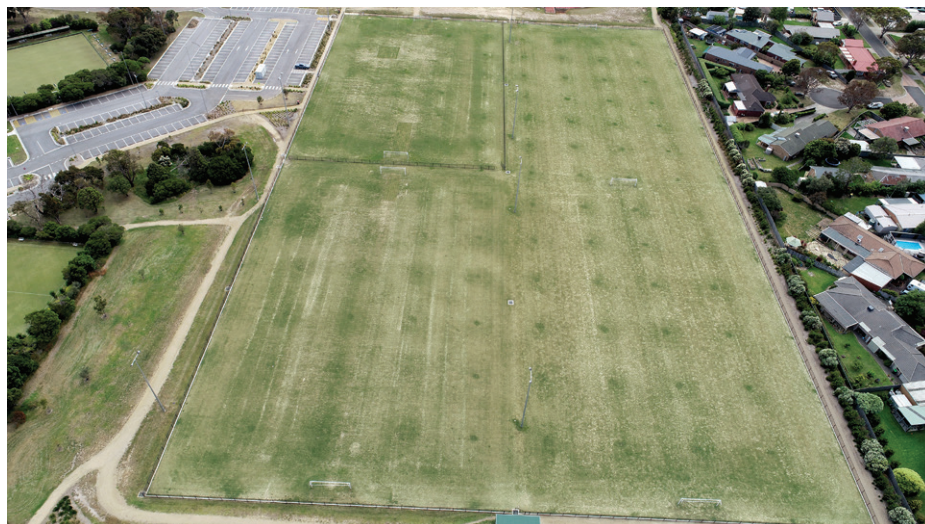
Figures 3, 4 and 5. Figure 3 (left) shows the sharp contrast in moisture retention characteristics between the two sands. Both curves demonstrated a similar relationship (shape) to the laboratory (Figure 4, middle). The theoretical air entry point occurred at a lower tension compared to the laboratory test (Figure 5, right).



Figures 6 and 7. Moisture retention profiles of Sports Fields 1 and 2

SUBSOIL DRAINAGE AND SAND DEPTH

Field observations are always useful in considering the practical versus the theoretical. During a recent sports field assessment, soil moisture content was measured following a 46mm rainfall event. This particular sports field had a subsoil drainage system and a 150mm layer of a fine-medium sand rootzone. The soil moisture content of the top 120mm was measured at 20 locations using a TDR moisture probe with a variation in the soil moisture of 11-18 per cent v/v with an average of 14 per cent v/v. Given the relatively shallow



The moisture profiles of two sports fields in Melbourne were monitored following high rainfall events to determine the moisture characteristics in the field versus the laboratory and large container testing

profile, the expectation was for the profile to be considerably wetter. The performance of the profile was contradicting the theory of what would be expected.

The field had subsoil drains at 3m spacings and were effective in removing the excess water. In theory this should not be necessarily affecting the moisture profile given the drains are only removing water that is in excess of field capacity.

This example does raise another question as to the implications of creating a shallow sand layer and the effect this has on the field design drainage rate. In Table 4 (below), the field design drainage rate has been calculated for various rootzone sand depths and subsoil drain spacings. As can be seen, as the sand depth is reduced there is a reduction in the field design drainage rate.

This calculation provides a useful means of determining whether the profile design can cope with local rainfall conditions and how long a field may be out of play following a particular rainfall event.

TABLE 4: EFFECT ON FIELD DESIGN DRAINAGE RATE

Sand depth (mm)	Field design drainage rate (mm/day)	
	3m drain spacing	4m drain spacing
100	5.3	3
150	12	6.8
200	21.3	12
250	33.3	18.7

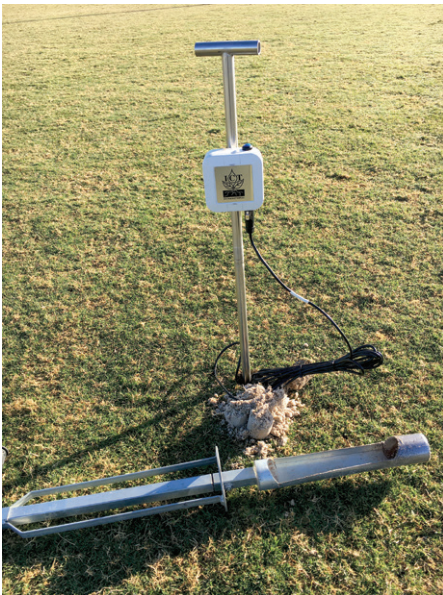
CONCLUSIONS

From my field observations and having taken many core samples from sand profiles, very few of them have the moisture profile as determined in the laboratory. There are several reasons for this:



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At each location there were three sampling points to assess site variability

- Thatch and OM accumulation modifies the hydraulics of the profile, keeping more moisture trapped at the surface.
- Rarely does irrigation or rainfall on a well grassed sports field saturate the entire profile allowing the perching effect to be recharged or maintained.
- Turf management is very much about surface management and root systems are not deep enough to draw moisture from the lower layers.
- Based on the field observations it appears that during high intensity rainfall events there is runoff generated and there is less water entering the profile to recharge the perched water table.

In other research it has been noted that there is a substantial difference in the moisture profile generated when comparing a sand that is wetted up by capillary rise with a sand that is wetted from above. Wetting up by capillary rise fills all of the pore spaces and excludes all of the air. When a sand or a sports field profile is wetted by rainfall or irrigation, there will be air trapped in the profile that reduces or makes it more difficult for water to move into and through the profile.

So what do we get out of this? The most obvious result is the difference between field observations and controlled laboratory tests. In this trial the moisture profile does not always provide the sharp point of critical tension where the large pores quickly drain. I suspect that this is due to the laboratory technique using suction to draw the water from the pore spaces and maintained at that tension until equilibrium is reached (i.e. no further moisture can be drawn from the pore spaces at that particular tension). There are several possible reasons as to why these discrepancies are occurring:



In the field there are numerous factors that can affect moisture movement and retention, including organic matter accumulation.

- In the laboratory the sample is smaller and far more homogeneous and there is less spatial variability compared to the large container trials and field observations.
- In the theory of perched water table profiles, the effects of suction by the gravel layer is often discussed and this may in part be influencing the moisture profile of the large containers.
- The laboratory technique is a very controlled process. The sample is relatively small, it is wetted up through capillary rise and then suction applied at different tensions. There is minimal opportunity for particle movement.
- The laboratory test also measures the changes in soil moisture content at smaller increments and provides a high degree of precision.
- In the field there are numerous factors that can affect moisture movement and retention including organic matter accumulation, compaction, spatial variability in the infiltration rates across the field and differences in the characteristics of the sand imported. These may be relatively small but sufficient to create some variation in the results.

I use the MRC somewhat reluctantly because there is a theory that it provides a high degree of precision in designing sand-based profiles. What has always bothered me is that if the critical point of where the macropores drain is not interpreted correctly then the profile may be too shallow. Consequently I have always erred on the side of having a slightly deeper profile, ensuring that it is likely to be drier rather than wetter.

The results from the large container and field trials indicate that the MRC is probably overstating the moisture conditions and

sand profiles could potentially be shallower depending on the sand type. There are several factors to consider:

- The theoretical air entry point in the field appears to occur at a lower tension.
- The hydraulics of the profile change once a turf/thatch layer develops.
- The subsoil conditions and the gravel drainage layer are creating some additional suction on the soil moisture.

The MRC is a useful tool when making a decision about finer sands or sands that do not comply with what we may describe as the industry standard. However, it is important to note that all laboratory tests are designed to be a repeatable method that gives us a good indication of what may occur in the field. There will always be a need to interpret the data and to put it in the context of the situation. This comes with knowledge and experience of working with different sands over many years. The other option is to test the sand at the tension/suction that equates to the design profile depth (e.g. 25cm tension for a 250mm profile). This will at least provide an objective method of determining the balance between moisture retention and, more importantly, the aeration porosity.

While the sand resources change and there is a desire to reduce the costs of construction, sand testing remains as the cornerstone to good design and measurable outcomes. Making arbitrary decisions should be avoided with understanding of the implications, particularly around the design drainage rate of the field and the ability to maintain healthy turf. The key is to continue with testing and assessing, undertake the appropriate soil tests and understand the local rainfall conditions and the influence this has on the design drainage rate. 🌱



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PETER McMAUGH AM

The amount of water that a given soil profile can store is a definitive amount and, unless replenished, it can be exhausted by the plant

Sensing change

Australia's leading turfgrass mind Peter McMaugh AM discusses turfgrass water usage rates and the importance of soil moisture sensor technology.

In recent times there has been a lot of fuss within the turf production industry regarding the awarding of grasses a tick of approval regarding their water usage rate. One particular grass was granted such an approval for the east coast of Australia, but not the whole of Australia. Why not? Because the turf community in Western Australia, headed by the researchers at the University of WA, were not happy with the data presented for the request of such approval and rejected it being given for the state.

So how do you sensibly test grasses so that you can quickly tell if they are high water users or low water users? This is not easy because the quickest way is to use pot tests of restricted root volume under rain out protection, using weighing replacement of water lost.

The key here is restricted root volume, because the expression of their genetic root volume by grasses in the field is the only real meaningful way of characterising one grass against another. Restricted root volume means restricted data on water use. In this context let us look further into the crystal ball and see where we get to.

How much water does your turf need to perform and what makes for efficient use of water by various turf grass varieties? Over the

last century there have been a huge number of studies looking at these basic problems and how to understand them. The concepts of LAI (leaf area index) and ET (evapotranspiration) measurements and all the derived data from these using Penman-Monteith equations, the relationships of these to a standard Class A Pan evaporation surface, detailed weather stations etc... have all featured along the way.

Soil/moisture tension meters to tell you what the soil was holding were early attempts to measure available soil moisture in situ. These used ceramic cups, while Australian inventor Ken Cumming used gypsum blocks more successfully.

Are we any nearer to getting solutions? In the 1960s to 1970s there were many sprinkler set ups created to provide moisture gradients for investigating water use by various turf grass species and varieties. The man whose name stands out in almost every meaningful study of this kind is Dr Gerald Horst. Never mind how many other names were on the papers produced, he was the brains behind the design work. It was also at this time that we saw an explosion in the sophistication of irrigation design both in the area of sprinkler heads and the control valves, but also in the computer hardware and programmes for managing delivery.

One of the leading lights in this area was Ed Hunter, initially in his days at Toro and then later with his own company, Hunter Industries. Along with these developments were the rising tides of design reform in delivery pumps as electronics made submersible pumps a reality.

In 1985 a seriously good publication *Turfgrass Water Conservation* was put out by the University of California Riverside (UCR) edited by Dr Vic Gibeault and the late Steve Cockerham. This eminently practical book was later issued in 2011 in a revised edition with Cockerham and Bernd Leinauer as editors. Another excellent reference, *Evapotranspiration and Irrigation Scheduling*, was published in 1996 in the Proceedings of the International Conference of the American Society of Agricultural Engineers.

In Australia, CSIRO and various universities have looked at any number of the limiting factors for crop production and soil water capture. Among the leading lights in the area was Dr E. Linacre who was at both Sydney and Macquarie University and whom I was privileged to have on my scientific advisory committee at the Australian Turf Research Institute. The most recent research in Australia for turf has been done at the University of WA funded by HIA industry funds and the Federal Government.

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THE BASICS

No matter what equations and leaf measurements, counting stomates and seeing what side of the leaf on which they concentrate numbers, there are some basic principles.

- Plants have leaves and the more leaves and leaf area they have the more water will proportionally leave the plant.
- Plants have roots. The depth and volume of those roots is partly controlled by the genetics of the plant and partly by the soil type and the environmental condition of that soil. The bigger the root volume, the greater percentage of the available soil water supply the plant can access. This is especially important at the depth to which the roots penetrate and what volume percentages of roots and water are where.
- The amount of water that a given soil profile can store is a definitive amount and, unless replenished, it can be exhausted by the plant. The rate at which that happens has several simple factors controlling it, including the pore space relations for water storage and the volume and depth of both the soil and the plant roots.

- The rate of water loss from the plant is directly related to the moisture deficit gradient of the air surrounding it. In a hot dry environment this will be higher than in a hot wet environment. It will be naturally related to temperature gradients but other factors such as air movement (wind) will also play an important part.

SOIL MOISTURE SENSORS

In many field studies in turf the favourite way of measuring water use has been field lysimeters. In discussing this with one of my irrigation engineering friends recently, he described lysimeters as being a one dimensional approach to a four dimensional problem. This is an acutely accurate summation of the situation. Is there any simple answer to this? There is, and the answer is soil moisture sensing.

Turf irrigation providers are already using this technology in many of their more recent installations. The knowledge around this has been in existence for more than 50 years. However, in turf, the main areas of use have been in sports turf. There are some

basic limitations to the model that sports turf irrigation designers use.

- They assume limited depth profiles of 300mm as their standard. This is quite true of most golf greens and stadium type sports field constructions, but is an immense fallacy in most local community turf facilities, including parks and sports fields.
- There are assumptions made of the infiltration rates of the soils that are being watered without investigating their actual profiles and their performance. These then feed back into the piping design and the control of delivery design.
- There are too often assumptions made about the adequacy of the water supply available both in terms of quantity and quality which can easily be solved with a 24-hour pumping test.

If you make initial limiting assumptions you will wind up with defective designs and consequently defective turf that isn't fit for purpose.

When you move your thinking out of the sports turf sector onto the production sector of the industry the story becomes much more complicated. This is because you have many more variables to contend with. These include variable soil types, variable soil depths, variable grass types, very variable soil quality (in terms of soil health) and more varied modes of delivery of water. It is here that we have these various situations for which we need a simple way of making our appraisals of water use rates of grasses.

Fortunately there is a simple answer available – soil moisture sensing – which has been developed to its peak by Australian company Sentek, which leads the world in such technology. Their equipment has a solid scientific base and is a permanent system which can give you digital readouts of the changes in soil moisture at whatever depths you choose to use it.

This means that over any period of time that you choose you can simply take the soil moisture percentage reading on day one, minus the reading on day seven and get the water usage rate for the crop you are measuring for that period. In a field situation you will need a less intensive pattern of sensors than you might need on a stadium with its differing microclimate zones.

The readings are going to be obviously variable over time, but at least you will have the data to plot. What you will find will be obvious:

- Grasses with a high growth rate will use more water than those with a slower growth rate.
- The more verdure the grass has the more water it will use.
- The deeper its root system the longer it will take to show stress.



The rate of water loss from the plant is directly related to the moisture deficit gradient of the air surrounding it

- After stress, the deeper its root system is the quicker it will show recovery.
- You will still see that within a group of varietal types that there will be a similar pattern of water use.
- If a variety has rhizomes it will show greater stress resistance and recovery.

How can I be so certain about all this?

Because the data says so. Here I am talking about data without spin attached. It is very easy to put spin onto turf data. If you do your testing on a high nutrition site and then compare it with data from a low nutrition site, it is apples versus oranges and not a valid comparison. If you collect data from an unrestricted water supply test and compare it with a limited water supply test, again you are comparing apples with oranges.

Grasses with a luxury water supply will use more water. It is very simple. If you see claims that a couchgrass uses 'x' per cent less water than other varieties, then it is a case of too good to be true. Why? Because the variability between couchgrasses is not genetically that great, especially when the phenotypical expression of those genes produces a much higher LAI in the supposedly more frugal grass.

Once you start using a routine soil moisture assessment system you won't need



Water use in the turf production sector has many more variables at play - varying soil types, depths and quality, variable grass types and more varied modes of water delivery

to worry about the derivation of equations from Class A pans. You won't have to worry about crop factors or ET losses and percentages of ET that you need to keep your crop growing and performing well. You will have at your fingertips what you have used and what you need to replace. And you will have the added benefit of knowing objectively how efficiently you are watering because if the theoretical amount doesn't arrive in the soil as

a measurable entity, then you have another problem to solve (and that is an entirely different article in itself).

The fact that properly used soil moisture sensing covers all the dimensions of water use rate means that scientifically it is the only really reliable way to measure and report your findings. Historical systems may have been useful in the past, but that is where they belong. 🌱



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C O U N T R Y C L U B . C O M . A U



ATM columnist John Forrest looks at the recent works undertaken on the 17th and 18th fairways at The Western Australian Golf Club in Perth to improve safety and playability issues.

The Western Australian Golf Club (WAGC) in the Perth has a stunning Tudor-style clubhouse positioned with sweeping views across the course's irrigation lake (between the 1st and 9th holes) towards the Perth CBD to the south and the Darling Range to the east. Part of the appeal of the course is its topography. The maintenance shed is located on the lowest part of the course and from there the ground rises to the 12th tee with an increase in elevation of 52 metres.

While the views are a feature of the course, even sitting from a wonderful vantage point like the clubhouse, golfers playing up the 18th hole could not be clearly seen until they came up over the final rise about 100m-120m short of the green. The second shot in was blind and for the bigger-hitting golfers it would often take some time to determine whether it was safe to make their approach shot. Any perception of depth and distance was difficult to gauge, especially with a small dip in front of the green. The hole is 468m in length from the championship tee and an increase in elevation of 5-6m further increases how long the hole plays.

Having earthmoving equipment on site, it made sense to reduce the hill on the 17th at the same time. The 17th is Index 2 on the men's card and 438m long. If the golfer is capable of driving about 245m-250m from the back of the tee, they can get over the apex of a hill from where the ground slopes down towards the green. Once again, the shot is blind and to safely hit from the tee someone would have to go forward as a spotter, significantly slowing play.

To remedy the issues they were having, the club engaged Graham Marsh Golf Design to create a new design for both holes that would meet the following criteria:

- Improve safety;
- Remove the issue of play slowing due to spotters being required to view if it was safe to play; and
- Improve the aesthetics and playability of the two finishing holes by removing the blind shots and enhancing the natural topography of the landscape.

Marsh introduced the club to Andrew Harris of Harris-Kalinka who created a digitally rendered animation for the members to view what was to be developed and constructed.

Around 100 photographs were supplied, including heights of trees, CAD drawings and drone fly-bys to show what the changes would look like.

Idris Evans is the long-standing course superintendent at WAGC and both he and his staff are very experienced at major works on the golf course. Evans has been on the WAGC staff for 35 years, 22 of those as superintendent. As an aside, while this project was being completed, Evans was recognised for his years of service at WAGC at the Clubs WA Awards night.

Mark Bunce is WAGC assistant and has 28 years' experience, while fellow crew members Mark Fay (25 years), Wade Lincoln (23 years) and Tim Holdunk (12 years) make up a skilful senior staff roster. As Evans states, they did a fantastic job working some long days to get the project completed in the fastest possible time.

While the weather was cool during construction, it is known in Perth that once December hits, hot weather is not far off. One of the bonuses was that kikuyu was the grass to be planted which loves the hot Perth climate.



In places the mat layer was 200mm thick, not unusual with kikuyu growing on a sand profile in WA

Other people that assisted and made it possible to get the kikuyu turf down quickly were volunteers from the club, including three casuals from the pro shop. Lecturer Simon Wood from South Metropolitan TAFE also took about 15 1st year apprentices to experience a large planting project which was a win-win for both the club and the students. Evans was full of praise of their attitude and enthusiasm.

DIGGING DEEP

Prior to the earthworks the irrigation mainline was capped and sprinklers and risers removed. DM Civil completed the earthworks with three 950 G Cat loaders and a Cat 330 CL (32 tonne) excavator. Ground was broken on 25 October 2021 to grub out the top 10cm. A rotary hoe was used to turn over the turf and the underlying mat layer. In places the mat



The ridges from both the 17th and 18th fairways at WAGC were removed in order to improve safety, playability and aesthetics. All up the project took five-and-a-half weeks to complete

layer was 200mm thick, not uncommon with kikuyu growing on a sand profile in WA.

The 950 loaders were then used to pick up the rotary hoed material before the excavator with a batter bucket cleaned up the surface. A total of 15,000m³ of grubbing material was stockpiled on site. WAGC is located on the interface of two well-known dune systems in WA – the Spearwood and the Bassendean – and these two systems meet on the 17th and provide an excellent growing media.

On the 18th fairway, the highest point was dropped by 1.8m which equated to moving 2500m³ of sand, while on the 17th the height was dropped 1.2m, moving 1700m³ of sand. Sand makes for a profile that is reasonably easy to move around and a timeline of two weeks was set for earthworks. Both fairways were scalloped out to enable the golfer to

have a clear view of their target and to ensure spotting would no longer be required. In addition, the view from the clubhouse was opened up and now affords a spectacular panorama of the golfers coming up the final hole.

Former Lake Karrinyup Country Club superintendent Trevor Strachan was the site project manager and after two weeks WAGC staff started contouring as well as constructing 500m² of new bunkers. To achieve finished levels, CAD drawings were used to guide the operator of the laser to highlight high or low areas with paint to assist operators to reach tolerances of +/-50mm. One comment Evans made after the project was completed was that if he was to do it again he would not worry about the rotary hoe and just let the excavator with the batter bucket remove the top 100mm.

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Grubbing the ridge in front of the 18th green. The ridge, about 100m-120m from the green, meant a second shot into the green was blind. Removing it has helped to improve playability and aesthetics

In the third week of works, irrigation company NewGround installed a new 225mm poly mainline on the 17th fairway. Eighteen laterals were installed including 54 sprinklers on 17 and 76 sprinklers on 18. All sprinklers were Toro Infinity Series valve-in-heads. The aim was to have a hard edge from the irrigated grass to the treeline.

After irrigation installation, a team of WAGC green staff came in behind to shape and develop the final levels. Assistant Mark Bunce showed his skill and experience on the Bobcat and the rest of the staff worked many 12-hour days to keep the project on time. Most of the bunkers were finished by hand with Graham Marsh even spotted on the end of a shovel at one point!

Six *Eucalyptus camaldulensis* were removed during earthmoving. While not ideal to remove trees, these were red river gums

whose natural environment is along water courses. They are not ideal in a drying climate like Perth's, especially when growing in among endemic species such as jarrah and banksia. WAGC has an ongoing programme to plant native trees and other plants to improve the environment around the course.

TURF DOWN

The kikuyu turf was supplied by West Coast Turf and arrived in excellent condition. After the irrigation was installed, planting of the first 7500m² of kikuyu began. The first day of planting (a Tuesday) saw 2000m² planted on the 18th in three hours. Members came out on the Thursday to assist and 4000m² was planted in four hours, with the final 1500m² completing the planting on the 18th on the Friday. Week 4 saw 6000m² planted on the 17th. All up the job took five-and-a-half weeks.



WAGC crew and members, who assisted in turf laying, celebrate a job well done. Some 13,500m² of kikuyu turf, supplied by West Coast Turf, was re-installed



Removing sand from the ridge on the 17th



The finished product has a bunker on the left side of the 17th fairway requiring a drive of 260m to carry it

MISSION ACCOMPLISHED

The finished product sees a new bunker on the left side of the 17th fairway at the 253m mark requiring a drive of 260m to carry. On the right-hand side of the fairway the land falls sharply down to the trees if the fairway is missed, with an errant shot coming to rest among the trees with a very difficult second shot to green.

Three new bunkers are in place to protect the 18th, two on the left and one on the right. The closest to the tee is on the left and requires a 240m drive to clear it. The bunker on the right requires a 260m drive to fly it, while the second bunker on the left needs a 280m drive to carry it. Again, the fact that the hole plays uphill further compounds the distance required and increases the challenge for golfers.

Overall, the project came in just below budget (cost was about \$290,000) and on time. Meeting some of the timelines was Evans' biggest concern, such as having the irrigation working prior to planting and getting the turf down quickly without impacting the quality of the outcome. Looking at the end result, it has to be said that WAGC has definitely accomplished what it set out to achieve and has delivered two holes where aesthetics, playability and safety have been greatly enhanced. 🏌️



Students from South Metropolitan TAFE spent a day helping lay kikuyu turf on the 18th

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The power of culture

The New Zealand All Blacks are renowned as one of the most successful sporting teams of all time and have an impressive 84 per cent win ratio across all games played and a 74 per cent win ratio in international Test rugby union. How does a team create and maintain such success? Why do people move heaven and earth to play for the All Blacks?

Is it how much they pay their players? Personal prestige? So they can brag to

their mates? No. It is their culture. People want to contribute to something bigger than themselves. As you will see watching any form of the ceremonial dance or challenge of the traditional Māori haka prior to an All Blacks match, the passion, commitment and willingness to die for the guernsey is unheralded. (I don't know about you, but I wouldn't want to run in against the All Blacks straight after the haka and first whistle!)

In James Kerr's 2013 bestselling analysis of the All Blacks' success, *Legacy*, he

describes how the organisation has created a self-sustaining (and self-policing) culture so powerful it supersedes money, fame and personal gratification. As is the case in all great cultures, team vision and success are paramount. Teammates are brothers and any member would sacrifice his own success to see his colleagues succeed.

Kerr emphasises this when he describes the Māori concept of 'whanau', 'being of team' and 'flying in one formation... following the spearhead'. The All Blacks maintain a simple

A leader's responsibility is to develop an engaged culture that not only motivates and encourages those within the team, but also represents the organisation's brand in the wider industry

Want your team to play with the passion of the All Blacks? As management expert Ben Gibson writes it's all about developing a strong and enduring culture through effective leadership.

ethos (borrowed from the Sydney Swans) of 'No dickheads'.

When a leader conveys a vision effectively and a strong culture is developed in a team, the beauty and reward for this success is the momentum a positive culture maintains. The leader becomes less of an enforcer and rarely needs to intervene to 'police' team members as the team does it as a group on their own behalf. Not wearing PPE or following procedures? The team pulls you into line.

If an individual selfishly acts against the agreed morals and ethics or code of the team, nine times out of 10, it will not need to get to leadership as others in the team will have the confidence and conviction to intervene and ensure the wayward team member is clear on the right pathway forward.

The team knows how hard they have worked for their culture and are driven to defend it. Toxic team members or those without the commitment to the vision of the



It is a great leader's culture that advertises for them and creates environments people want to work in

group quickly stand out and are sorted out by the team, not an authoritarian manager. As the ancient Arabian proverb tells us, "It is better to have 1000 enemies outside the tent than one inside it."

AN AMBASSADOR OF CULTURE

The turf industry is faced with a big challenge in terms of attracting new talent and tradesmen to the industry. It is tough for all turf managers with the lure of higher wages in other industries and potentially less 'hard work' in careers elsewhere.

"In Perth, retention is very difficult with the higher-paid mines jobs taking many staff," reflects Idris Evans, long-serving golf course superintendent of the Western Australian Golf Club. "In order to increase retention, I have introduced service payments after two years and payments for sick days not used during the year.

"I try to have staff trained on multiple tasks quite early on in order to keep them engaged. Rotation of duties is also important so new employees are not left to do the more mundane tasks for extended periods.

"Teamwork is vital in this industry and we regularly interact socially with cooked breakfasts or BBQ lunches. I always endeavour to provide the best working conditions and remuneration possible for my staff. I am a very hands-on superintendent and try to be out with the staff on course the majority of the time and only in the office when I absolutely have to be. I put the highest possible value on my staff."



Mitch Hayes (left) and Idris Evans

As the leader of our team, it is our responsibility to develop an engaged culture that not only motivates and encourages those within the team, but also represents our brand in the wider industry. To attract new talent to our team, we need people to understand that we do things properly, support our team and that the opportunity to work with us is a valuable learning and career experience. Think about the following;

- Is someone going to be better off having had the opportunity to work with your team?
- Do you provide training and development opportunities that could help to organise volunteer opportunities, reaching out to your network to help their career development?
- Would you come and work for you?

Running a safe and systems-driven work environment is a big indicator of professionalism, planning, commitment and the value you place on your team. Have a good look around the industry and see who places an emphasis on safety and environmental management and team structure. It is a safe bet that if you looked across other aspects of their operation you would see systems, planning, good consultation and consistent levels of high-quality performance.

New Living Turf team member and former golf course superintendent at The Brisbane Golf Club, Mitch Hayes, was always working on developing his team and culture. Mitch has seen the power of giving staff ownership and support and providing staff with more than just a regular pay cheque.

"I am always looking for opportunities to develop our team culture and provide opportunities for staff beyond their wages," says Hayes. "We are in a tight spot in the turf industry with limited resources and we have to look for ways to engage staff beyond money. I worked with the club to provide regular meals,



PHOTO: IDRIS EVANS

Something as simple as a celebratory lunch for a job well done or to say thanks can help engage a crew

training opportunities and team-building events to raise the profile and professionalism of the team. I have really found this engaging and enjoyed watching the team flourish and work well together as a result."

It is a great leader's culture that advertises for them, creates environments people *want to work in* and which they may even sacrifice to do so by driving further, or taking a pay cut or a less senior role. This is the power of culture and being an ambassador for your team and their brand.

So how can we develop a stronger and safer culture? Here are a few key pointers...

Share your vision and safety goals: Being an effective communicator is a must! Share your vision and ideas with the team. Building an engaged safety culture starts with the consultation and effective communication of why safety is important to you as a leader. Tell the team you care about them! If you can communicate your motivations beyond 'the club makes us tick these boxes', you are miles in front in terms of getting team buy-in.

Consult and involve in planning: Involve the team in decisions that affect their work and safety. When you show staff that you genuinely value their input and feedback, they are more willing to innovate, contribute and generally get involved. If a team member has significant input to the planning and decisions surrounding a particular project, they are going to be hugely more motivated and enthusiastic to participate and get the job done.

Explain the 'why': In our consultation, it is important when possible to give the team context to decisions and actions for the team. Explaining the 'why' behind the work you do as a group is a powerful way of increasing the team's engagement and willingness to get stuck in.

Let them choose the 'how': The clincher in consulting with the team and explaining the 'why' is then giving them the opportunity to brainstorm and decide on the 'how'. The ability to choose the 'how' is the backbone of culture and ownership for the team and is a statement to the team that you are confident in their abilities, you are not a micromanager, you trust them and you support their professional opinions and decisions.

Delegate authority, not just work: Want a team of decision makers and problems taken off your plate? Empower your teams and give them the confidence and authority to make decisions and take action. Let them try and make mistakes (not with training or high-risk scenarios obviously). Don't be the micromanager. If you just order your team to work and complete tasks, you limit their ability to grow and build independence, and you stop them from completing more tasks with less and less instruction.

Trust them before you have to: Show the team that you have faith in them before they have necessarily 'earned it'. Possibly not spraying greens on day one, but find tasks that give them the opportunity to extend themselves. When someone shows they trust you before you have spent months or years earning it, in the majority of cases it accelerates the connection to the leader and team. It pulls the team members into the culture and the way we do things around here (again, not with high-risk plant and equipment!). Give people clarity, responsibility and support and watch them thrive.

Teach them to fish: I am sure you have heard the old adage, 'Rather than give them a fish, teach them to fish'. Sounds obvious, but it's a huge win for them, the team and you as a leader. The more you can let go, the more freedom you will enjoy as a leader.

Hold them to account: It is important to create an environment in which the team is fairly held to account. A sure way to dismantle a safety culture and damage high-performing staff is to show little or no accountability in the team. If we do not promote and maintain standards and expectations, how can we expect anyone to meet or exceed them? Be fair, communicate to the team what to expect and then hold them to account.

Ask for and give feedback: A good leader with a strong culture of ownership and trust gives and asks for regular feedback. A leader showing their team that they are open to and value their feedback shows confidence, humility, character and desire to 'get the best result for the team' while leaving ego or self-importance aside. Have the courage to ask for and provide regular feedback. 🕌



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Glenelg Golf Club has recently embarked on a three-year course enhancement project with one of the aims being the return of open sand areas. Pictured are works in progress on the 8th



PHOTOS: MONINA GILBEY/GLENELG GOLF CLUB

Glenelg going green

Monina Gilbey (biodiversity manager) and Tim Warren (course superintendent) look at the many ways in which Glenelg Golf Club in Adelaide is ticking all the boxes when it comes to proactive environmental management of their facility.

Over the last three and a half years, Glenelg Golf Club in Adelaide has implemented a wide range of biodiversity and environmental sustainability projects. To some this may sound like idealistic work which only benefits the environment, however, these projects are helping the club to save money and establish links with the local community and other golf courses, as well as helping to develop a national and international profile.

Last year, as reported in Australian Turfgrass Magazine Journal (Volume 22.5 – Sep-Oct 2020), Glenelg held its inaugural Grazing the Course dinner. Ingredients were harvested from indigenous plants around the course and used in a degustation dinner planned by one of the club's members, Australian native foods chef Andrew Fielke.

The dinner was subsequently chosen by the GEO Foundation as one of the top three worldwide sustainable golf highlights of 2020. In a public vote, the dinner was voted as the best highlight.

South Australia's Minister for the Environment, the Hon. David Speirs MP, is genuinely passionate about the environment – and his brother happens to be a pro golfer. The Minister attended Grazing the Course and spoke about the integral role that golf courses play in urban biodiversity.

As habitat disappears in urban areas at a rapid rate, golf courses provide a much-needed refuge for fauna. Glenelg Golf Club is home to various insect, reptile and bird species. Frogs, dragonflies, native bees, geckos and skinks are commonplace around the course. Birds regularly breed at the course and there have been a few generations of

white-faced herons, black-shouldered kites and Australasian grebes. The course is also visited by smaller and less common bird species such as singing honeyeaters, yellow thornbills, yellow-rumped thornbills and grey fantails.

A local ecologist has been undertaking bird surveys every quarter for the last 10 years, which builds a picture of the birds visiting the course. Some of club's birding members also help out with bird spotting.

To encourage more member involvement in course biodiversity, a Biodiversity Inventory has been established on iNaturalist, one of the world's most popular nature apps which is a joint initiative of the California Academy of Sciences and the National Geographic Society. Glenelg Golf Club has been added as a place to the website which means any photo taken of a plant or animal within the tagged area is automatically uploaded to the club's inventory.

Birds regularly breed at the Glenelg course and there have been a few generations of numerous species, including black-shouldered kites (pictured)

(You can check out Glenelg's inventory at www.inaturalist.org/projects/glenelg-golf-club-biodiversity-inventory).

Glenelg, along with The Grange Golf Club, has been chosen amongst a few metropolitan sites for an insect survey funded by a Green Adelaide Grassroots Grant. This study is the first extensive insect study to be conducted in Adelaide. Insect specimens pinned as part of the study will be donated to the South Australian Museum where they will provide an insight into the insect profile of Adelaide and provide baseline data for any future insect studies. The local magpie population has been enjoying the study and a few insects caught in traps have become an easy snack!

FLOURISHING FLORA AND FAUNA

In recent times, Glenelg Golf Club is trying to increase habitat and biodiversity by planting indigenous plants. These plants attract local fauna and save water as they only need watering in their first year of growth and do not need soil modification.

The course has a history of planting indigenous plants – a local plant grower once managed the club's plant nursery. The club has refocused plantings to concentrate on a wide variety of flowering plants which are of different heights to increase the habitat for birds, bees and butterflies. Butterflies are not only a purely visually-attractive addition to the course, they are an important food source for other fauna.

In November, the club received a Green Adelaide Grassroots Grant for a cooperative project with Royal Adelaide and The Grange golf clubs. The project, '*Establishing a plant preservation partnership and creating habitat connectivity on Adelaide's sand dune golf courses*', aims to:

- Connect vegetation pockets within the courses;
- Create habitat corridors between the courses;
- Hold educational workshops on local Kauria history and cultural burning practices; and
- Install nest boxes and bee hotels made by the nearby Camden Park Men's Shed.

In Adelaide, golf courses host some of the last remnant populations of indigenous plant stock on the Adelaide Plains. As part of the project, Glenelg will swap seeds and plant material between courses to create back up populations. These plant populations on

Glenelg has refocused plantings to concentrate on a wide variety of flowering plants which are of different heights to increase habitat for birds, bees and butterflies. Pictured is a southern grass dart



each other's courses will secure seedstock and plant material for projects, for approved growers to use for other projects and will preserve the plants for future generations.

This year, with Green Adelaide's assistance, Glenelg planted a rare plant called sticky daisy bush (*Olearia passerinoides* ssp. *glutescens*). The plants were grown by the South Australian Seed Conservation Centre with seed collected from remnant populations. The specimens at Glenelg will provide seeds for future growing projects.

Further cooperative work with Green Adelaide (formerly the Adelaide Mt Lofty Natural Resource Management Board) has led to the club planting more *gahnia filum* (chaffy saw sedge). *Gahnia filum* is an important habitat plant for the yellowish sedge skipper butterfly. This butterfly was last seen in Adelaide in 1985 at the Adelaide Airport, which is across the road from the course. Green Adelaide has been working on rewilding the butterfly and Glenelg has been earmarked as a future release site.

There is some evidence that the yellowish sedge skipper prefers to lay its eggs on freshly

burnt foliage of *gahnia*. The club has been experimenting with ecological burning on the course as a way to remove dead biomass underneath grasses and to reduce the amount of green waste. Burning indigenous plants helps them to regenerate and increases biodiversity.

Last year, one Glenelg member, who is a beekeeper, donated a beehive and a swarm. The club's biodiversity manager Monina Gilbey is a registered beekeeper, which is particularly helpful when swarms visit the course. Over 18 kilograms of honey has subsequently been harvested which is sold in the club's front office, with the funds from the honey sales used to cover beehive costs. Gilbey has also been experimenting with using the honey and dried deadheaded flowers from clubhouse in hand-made soaps which have been used for promotional items and could be sold as wedding bonbonniere.

ENHANCING GLENELG

Glenelg Golf Club has recently embarked on a three-year course enhancement project. New irrigation will replace the course's ageing

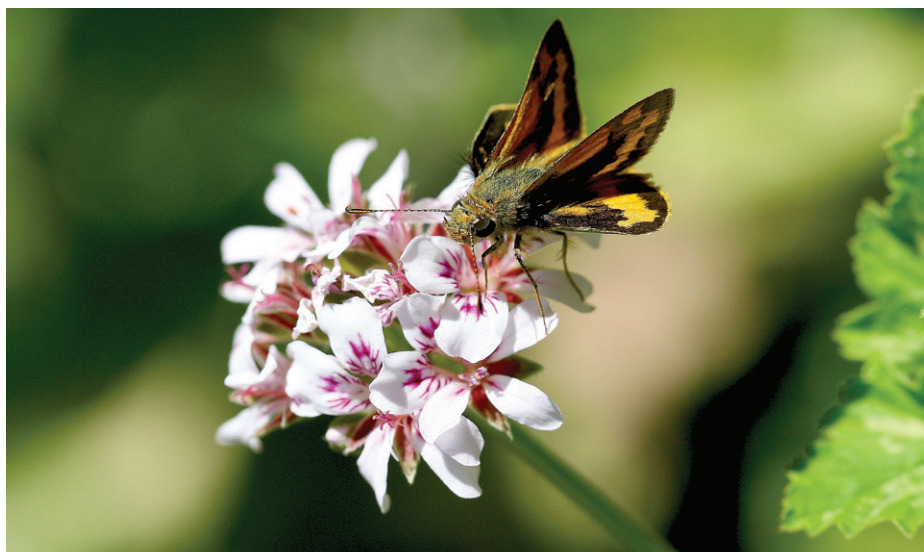


PHOTO: STUART HOCKING



As habitat disappears in urban areas at a rapid rate, golf courses provide a much-needed refuge for fauna. Pictured is a blue-banded bee

infrastructure and make watering more efficient. Avoiding the unnecessary watering of rough and vegetated areas saves water, reduces weeds and saves on chemical and resource inputs.

Another aim of the enhancement project is the return of open sand areas around the course and reduced maintained turf rough areas. Sandy heath roughs will be planted with sparse and low vegetation – some fescue grasses and indigenous plantings of *danthonia* sp (wallaby grass) and *baumea juncea* (bare twig rush). Weed control is critical and occasional runs with the bunker rake machine and the use of pre-emergents in the open areas will keep the sandy heaths open so that balls entering these areas are found easily and are playable.

Earlier this year, Glenelg tried to reduce its administrative time and paper use, particularly for machinery pre-start checks. Course superintendent Tim Warren conceived the idea to use QR codes for pre-start checks. Each machine in the Glenelg workshop has a QR code which, when scanned, opens a checklist of pre-start actions. The checklist also includes the manual and the standard operating procedure for that machine. The club has also assisted The Grange and Royal Adelaide to set up a QR code pre-start check system which has led to a course administrative group where resources are shared online to avoid triplication of work.

Such a system at Glenelg has since been expanded to include QR codes for volunteer check-ins, safety data sheets and monthly task lists. At the suggestion of one Glenelg member, the club has also recently installed QR codes on course for local rules.



In recent times, Minister Speirs has led the South Australian Government phaseout of single-use plastics. As part of this process, the Glenelg clubhouse now uses paper to wrap sandwiches, ahead of the ban of plastic clamshells next year. This has diverted 7500 clamshells – around 120kg of plastic – from landfill.

Some members have also been collecting broken plastic tees as they walk the course. In the last year, they have collected nearly 2.5kg of tees. The Camden Park Men's Shed have made tee boxes for members to deposit their broken tees on the par threes.

The South Australian Office of Sport, Recreation and Racing has also asked Glenelg to participate in their *Clubs of the Future* project. The project shares socially and environmentally responsible case studies from sports clubs around the state. At a recent conference Gilbey was part of a discussion panel exploring innovative ideas to improve

club operations, volunteer involvement and increasing memberships.

Social media has been a very effective way for the club to share its course activities and environmental projects with members and followers from around the world. The GEO Foundation has been a good supporter of the club's posts and have reposted activities and used photos on their new website. The GEO Foundation website shows the impact of sustainable golf projects internationally and you can find out more about Glenelg's projects and be inspired by projects from around the world on the Highlights section of the GEO Foundation webpage <https://sustainable.golf/highlights>.

Editor's Note: To find out more about Glenelg's environmental exploits, connect with the club's maintenance team through social media – Instagram (@glenelggolf_maintenance), Facebook (www.facebook.com/glenelggcmaintenance) and Twitter (@glenelggreens). Also, check out biodiversity manager Monina Gilbey's Instagram page (@monina_greengecko).



Left: Glenelg is trying to increase habitat and biodiversity by incorporating indigenous plants. Pictured is climbing saltbush

Below: Glenelg Golf Club has been chosen as one of a few metropolitan sites for an insect survey, the first extensive insect study to be conducted in Adelaide





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Governments and their regulatory agencies are already seeking to mitigate the impact of climate change with far-reaching regulations

Climate change a risky business

PHOTO: ARTEKOM/STOCK.ADOBE.COM

Two things are certain about climate change. First, its complex environmental, health and safety impacts will directly affect sports turf managers. And second, governments and their regulatory agencies are already seeking to mitigate its effects with far-reaching regulations.

Until recently, companies have for the most part freely emitted carbon, but they will increasingly find that those emissions have a steep price, both monetary and social. Those greenhouse gas emissions are now being scrutinised, they will be regulated and will come with a price if not managed.

The sports turf industry has a high carbon exposure and golf clubs can no longer rely on their golf course turf system sequestering their carbon emissions. In fact studies are now showing that some golf course turf systems may actually become carbon sources after around 30 years of operation.

The sports turf industry has a high carbon exposure and golf course maintenance operations have been found to emit 4.5 tonnes of CO₂e (carbon dioxide equivalent)/per hectare/per year. It can be tough to wrap your head around what a 'a tonne of CO₂' looks like. To visualise how much carbon that is – one tonne of CO₂ is enough to fill 13,700,000 golf balls! For every hectare under maintenance on a golf course emitting on average 4.5-tonne

Compliance expert Terry Muir discusses how climate change is now being classed as a foreseeable risk and warns businesses of the need to start planning for and managing it.

CO₂e/per hectare/per year, enough CO₂ is emitted to fill over 61 million golf balls!

Government policy and regulations are being formulated to manage carbon and to mitigate and manage climate risk. Those regulations will set the rules and clubs need to know how to respond. As US environment and sustainability scholar Andrew Hoffman noted in respect to climate regulation, "If you're not at the table, you're on the menu."

Here are some climate change projections for the east coast of Australia (Source: www.climatechangeinaustralia.gov.au):

NSW/ACT

- NSW and ACT will continue to get hotter into the future, with less warming on the coast and more warming inland.
- NSW/ACT can expect an average annual temperature increase of around 1.4-2.3°C.

- More than double the number of hot days (>35°C) in Sydney and Canberra are expected, increasing from about four to eight days per year in Sydney and from about six to 14 days per year in Canberra.
- By mid-century the climate of Sydney is projected to be more like the current climate of Grafton. The climate of Canberra is projected to be more like the current climate of Albury-Wodonga.
- NSW and ACT can expect longer fire seasons, with around 40 per cent more 'very high fire danger' days.
- Sea levels are projected to rise by around 27cm along the NSW coast.
- While rainfall is expected to increase over most regions in summer, large regions show projected decreases in rainfall during winter, with these reductions being largest along coastal NSW.
- Extreme rain events in NSW and ACT are projected to become more intense and the likelihood of such events will increase.

Queensland

- Queensland will continue to get hotter and can expect an average annual temperature increase of around 1.3-2.5°C.
- The number of hot days (>35°C) will increase from about two to eight days per year in Brisbane and from about four to 14 days per year in Toowoomba.
- By mid-century the climate of Brisbane

is projected to be more like the current climate of Mareeba. The climate of Cairns is projected to be more like the current climate of Cooktown. The climate of Longreach is projected to be more like the current climate of Port Headland (WA).

- Queensland can expect longer fire seasons, with around 40 per cent more 'very high fire danger' days.
- Sea levels are projected to rise by around 26cm along the coast of Queensland.
- Extreme rain events in Queensland are projected to become more intense.
- As a whole, Queensland is likely to become drier in the May-October period. Average annual rainfall change is unclear in the monsoon region, with significant change possible. Both wetter and drier futures should therefore be considered.

Victoria

- Victoria will continue to get hotter. Global climate models project warming of 1.3-2.0°C (central estimate of 1.6°C). Regional modelling shows a plausible higher end to this range (1.4-2.4°C).
- The number of very hot days (>40°C) will increase from 0.83 to 2.7 days per year in Melbourne and from 7.8 to 17 days per year in Mildura.
- By mid-century the climate of Melbourne is projected to be more like the current climate of Wodonga. The climate of Warrnambool is projected to be more like the current climate of Benalla.
- Victoria can expect longer fire seasons, with around 40 per cent more 'very high fire danger' days.
- Sea levels are projected to rise by around 24cm along the Victorian coast.
- Extreme rain events in Victoria are projected to become more intense.
- Approximately three quarters of climate models are projecting decreased rainfall, especially in winter and spring.

How will these climate impacts affect golf course operations? Epar's Liam Hall-Muir has been investigating climate risks to outdoor



Climate change projections for the east coast of Australia indicate that extreme rain events will become more intense and the likelihood of such events will increase

workers as part of his Masters in Disaster Risk Reduction and Sustainability. He comments:

- Outdoor workers will have more frequent, intense and longer exposure to UV radiation. They will be at increased risk of adverse eye effects, skin cancer and possibly immune dysfunction.
- Extreme weather events or natural disasters, such as floods, landslides, storms, lightning, droughts and wildfires will become more frequent and intense. Weather disasters may cause deaths, injuries, diseases and mental stress and as they increase in frequency and severity, there will be an increased need for effective emergency response.
- The prevalence of water-borne and food-borne pathogens could increase.
- Pollen, associated with allergic reactions, also may increase with earlier flowering and longer pollen seasons.
- Higher temperatures or longer, more frequent periods of heat may result in greater heat stress, potentially leading to more cases of heat-related illnesses (heat stroke, heat exhaustion, etc.), increased susceptibility to chemical exposure

and fatigue. Exposure to increased temperatures can also result in reduced vigilance and or lapses in safety.

- Elevated temperatures can increase levels of air pollution, with outdoor workers having longer exposure to such air pollutants, which are linked to respiratory diseases and allergic disorders.
- Climate warming scenarios will also influence the distribution of weeds, insects and pests, all of which could change the types and amounts of pesticides used.

All States are enacting climate laws and regulatory agencies are reviewing their environment and health and safety regimes to best regulate greenhouse gas management and climate change health, safety and environmental risk management. Climate change risks are now being viewed as foreseeable risks.

Legally, they will require management and clubs that choose to sit on the sidelines will be significantly handicapped relative to those that have already commenced developing and implementing their strategies to reduce and manage climate risk and find competitive advantage in a warming world. 🌍



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Ballarat GC, Vic

You don't last 36 years at one club without knowing a thing or two about turf management. Jeff Powell has seen more than his fair share during his tenure at Ballarat Golf Club, including the past 31 as the man in charge.

Superintendent: Jeff Powell (58).

Family: Wife Vicki, son Nicholas (25) and daughter Lauren (23).

Social media: On Facebook, Instagram @jefpow63.

Years as a superintendent: 31.

Association involvement: ASTMA/VGCSA.

Career: 36 years at Ballarat GC.

Qualifications: Cert III in Turf Management, Diploma in Turf Management, Diploma in Horticulture and Cert III in Agriculture.

Where in Australia is Ballarat GC? Ballarat is an hour's drive west of Melbourne with a population of nearly 110,000. The golf club itself was founded on 11 April 1895. Play commenced on an 11-hole course on 24 May 1895 but the course only lasted two weeks – it was too short for a single round match and too long for a double round. From 8 June 1895 it became a nine-hole course and in 1909 increased to a full 18. Originally the course was a cow paddock, with the greens fenced in summer to protect them from grazing cattle. By 1907 the course was regarded as the best inland course in Australia.

In the 1920s some land was added to the course and holes were lengthened. A new clubhouse was built in 1924 and during the Second World War in 1943 American Marine officers used it as their Ballarat headquarters – the annual Marines Cup is still a club event. In 2009 the course was rebuilt where it is today along with a new clubhouse. Small parts of the original course are retained – parts of the old 3rd, 7th, 13th and 14th – while the new clubhouse is on the 15th, so it can still be claimed as Australia's oldest 18-hole course on original land.

Tell us a bit about your background and how you started out in the turf industry.

I was on the family sheep and crop farm in Lake Bolac, about an hour west of Ballarat, and completed a Certificate III in Agriculture. During that time I was also working as a roustabout and part-time with an earthmover when things were slow, driving belly scrapers, dozers and graders building roads and dams. When my father decided to sell up, I went from business to business around Ballarat putting my name down for a job where I thought I'd

like to work and ended up getting a call from the Ballarat Golf Club. That was 36 years ago! I started as a groundsman and after my then superintendent left was offered his job and have remained in the position for 31 years!

What do you put your longevity down to and what is it about the place that has made you stick around?

Coming from the farm life, working in wide open spaces suited me. I love golf course work and presenting the course in top shape when it all comes together. Other than the cold winters, Ballarat is a nice place to live and close enough to Melbourne and Geelong. The club is a good place to work and the people within the club are great. With the course redevelopment, it has given me a chance to enhance something that I've been involved with from the very start. The great Peter Thompson had a vision for Ballarat to be the best regional course and it's something I'd like to see through.

You have no doubt seen plenty of changes in the way golf courses are managed over the years. What has and hasn't changed?



PHOTOS: JEFF POWELL

Ballarat Golf Club is one of the oldest running clubs in Australia, dating back to 1895, and in 2009 was redeveloped under the auspices of Thompson Perrett

Since the redevelopment what other changes have you undertaken and what does the current masterplan have in store?

We had to do a lot of drainage work, especially on the fairways, and to date we've completed around 15km. On the 4th hole we had to level out a section of the hole as it was too sloped to one side and balls would all roll into one small area. This part of the fairway and rough had to be stripped, lifted on one side and reduced on the other, with around 25 truckloads of soil removed, reshaped and all grass replaced. The 4th blue tee was widened as it was too narrow and the path re-routed around the tee complex to prevent golfers from taking short cuts to the fairway.

On the 7th we've just recently realigned the tee complex, moving it 30m to the left. The fairway was widened on the right-hand side and the rough widened on the left, including dense plantings with advanced trees. We've also completed stage one of our new course masterplan which incorporated widening and joining fairways on the 1st, 10th and 18th holes, along with planting 13,000 trees, shrubs and native grasses.

Bunkers are still our biggest challenge. In most we have found that drainage pipes are lower in the base than the outlet pipes, so all bunkers hold water and will need to be re-drained at some stage at a high cost. Faces wash down after a rain or irrigation event, constantly mixing the clay washed off the face with the sand, sealing everything up.

We have trialled a product called Golfex bunker lining on the 18th greenside bunkers since May 2021. It's a flexible and porous

concrete base using crumbed rubber from tyres and has so far improved these bunkers enormously. We've had no washouts on the faces and improved drainage, keeping the sand clean through the winter.

Going forward, other stages in the masterplan include improving and adding large landscape areas around the course, widening fairways on the landing zones and joining some fairways in a few areas. These are a work in progress and all being carried out by staff in-house.

Is it an easy/hard facility to manage? Winter is always hard. Nothing grows, so wear areas struggle to recover. By the time spring hits so do the comps, with the course busy until December. Couch renovations are done in January as February is normally our hottest month, but in the last couple of years there hasn't been much of a summer at all. Trying to do any renovations in spring is sometimes challenging due to the weather as you can get some nice weeks and then some cold wet weeks which hampers recovery. Also, with the increased number of rounds coming out of winter, the surfaces are under more pressure.

How has COVID-19 impacted your operations there? When the lockdowns first started only two of us were allowed to work three days per week, carrying out the basics such as cutting greens and surrounds, although we did take the opportunity to Vertidrain the greens. During subsequent lockdowns we weren't allowed to work at all, other than go in and check the course which was frustrating. The guys didn't mind the fact they were getting more money on JobKeeper than with normal hours, but they still would have rather been working.

Machinery has improved so much over the years. There is a lot of good reno machinery on the market now, but the Vertidrain would have to be the biggest game changer to relieve compaction; it's hardly off the tractor! Chemical-wise, Specticle has been fantastic and we've had a good response with it keeping the fairways clean over winter. What hasn't changed? Basic turf management has remained much the same over the years as have the hours – I'm still working from daylight to dark. Oh, and my wage!

The course was redeveloped significantly in 2009. What were the biggest changes from the old course and how has the course matured? Going from the old course that was on heavy clay-based soils with push up *Poa* greens, to the new course with sand-based bentgrass greens and sand-capped fairways with no CEC, was challenging. I had to train myself in how to feed the turf totally different, keeping nutrients trickle-fed constantly at the start until the greens and surrounds matured. The other major challenge was having the new course open very soon after grow-in. The grass never had time to really mature and with the high volume of traffic large areas would stress out and, in some cases, fail altogether, especially in the surrounds. The course now has matured really well, the grass is looking after itself and settled down into a routine.

Assisting Ballarat GC superintendent Jeff Powell is his crew comprising (from left) Connor Patterson, Jayden New, assistant superintendent Tim Cates, Tom Lyon, Harry Hann and Ashley Brown





The 2009 redevelopment transformed the course, going from heavy clay-based soils with push up Poa greens to sand-based G2 bentgrass greens and sand-capped Santa Ana fairways. Pictured is the 4th hole

The hardest and most frustrating part was seeing the course unmaintained and not being able to do anything about it. We are trained to be perfectionists, so that messed with my head. It was only the last lockdown where we were all able to work due the earthworks on the 7th. It took a long time to play catch up and get the course back into shape, but I guess we were lucky – bar and bistro staff were off work way longer than us.

Were there any positives to come out of COVID? The course loved having no golfers. I have never seen it so healthy, with worn areas back to full health and greens boasting a great coverage of grass. That was short-lived, however, as by the end of the first day of golf unrepaired pitch marks were all over the greens! It was easier to maintain the course and get things done as when golfers did come back they were only starting off on one tee. Golf numbers increased with the club noticing a slight increase in membership.

What lessons have you taken out of the whole COVID experience? In hindsight, I couldn't see why we couldn't have worked through while others were. We could have gotten so much more done with no golfers on the course. I understand lack of income would have been a factor, but it also showed up just how poor wages are in the industry when the government pays more for staff to be sitting at home instead of working.

How has Mother Nature treated the course in recent times? Mother Nature hates me! In winter we can get down to -4°C overnight and

in summer up to 42°C. The course can be wet to the point where we can't cut roughs, then two weeks later we are needing to irrigate to prevent the ground from becoming concrete. And then there's the once-a-year snow! The couch goes that dormant that hard it's white and flattens down with traffic. It comes out of dormancy around the last week of October and goes back in around early May.

Frosts are the killer here. They can brown off a lot of the turf and stunt the growth when you get 4-5 in a short period of time. We've had such heavy frosts that the greens have iced over – I recall one morning it was -4/-5°C and as I walked onto the 13th green near the shed the ice was cracking under my feet! The frosts don't lift until around 9.30-10am. We are meant to activate the sprinklers so the members can get on the course quicker, but on those mornings the water turns to ice as soon as it hits the ground.



The one product I couldn't manage my course without is... Tribute. We have so much bloody Poa here as the conditions are great for it – wet, cold winters – and the fairways can be covered in it.

Do you use volunteers to assist with the management of the course? Our Dad's Army has about 14 members in total. They are a great help with picking up debris around the course, sprinkler trimming, sanding divots in fairways and tees (because golfers don't do it), help with the odd sodding work and gardening about the clubhouse. These guys are a great help and takes some pressure off us.

What have you got in your shed? 2 x Toro 3250 greens mowers, 2 x Tru-Turf rollers, 2 x Toro fairway mowers (5510 and 6500), 2 x Toro 3100D, 2 x Sand Pros, Toro 4000-D rough cutter, Toro 3500D first cut mower, Toro Multi Pro 5800 sprayer, reel grinder set, 3.5T excavator, 5 x Toro HDX Workman utilities and an MDX Workman, Toro 3250 tees mower, Vertidrain 7215, Aeravator, TR50 scarifier, Aerway aerator, Bandit 90 chipper, 2 x Kubota tractors, Dakota topdresser, Toro Pro Force blower. We're pretty lucky to have all this.

What do you think is the most challenging aspect of a superintendent's role today? How many pages is this magazine? It seems to be getting harder and harder to get staff into the industry and that's mainly because of wages. Once upon a time in the regional areas we were lucky as you'd find the young farm lads, but not anymore. Expectations are also challenging. Golfers seem to be getting more and more demanding of what they expect

Greens are cored once a year, normally early December, and scarified late December or January

for what the budget allows. Unfortunately I've noticed it has gotten worse since returning from COVID lockdowns. Sands seem to be getting harder to find as well, not only for turf but also bunkers. And communication – trying to help the Board to understand our issues.

What have you worked on personally in recent years to improve your skills? I bite my tongue a lot more than I used to. Apparently being blunt and to the point doesn't cut it in this day and age, as people are easily offended. Unfortunately, it still pops out every now and then.

Earlier this year you received the VGCSA Recognition Award for your many years of industry service. What did that mean to you? I was pretty bloody chuffed to say the least. When you take on the job as superintendent you don't do it to win awards, you're just doing your job the best you can with the resources you have, so it was a nice surprise. To receive this award, especially as a regional superintendent, is something that I never thought would happen to me, but it's great to be recognised for one's service and the people you've helped along the way.

From your many years in the industry, what do you see as the key traits a superintendent needs in order to survive what can be a very challenging role? Have really thick skin! Be honest and upfront. Don't talk the talk if you can't walk the walk as you'll get caught out very quickly. Keep your manager, greens director and even your pro informed so there aren't any surprises. Don't give up on educating yourself, whether that's through conferences, workshops, networking with other supers and trade people, or just



With temperatures hitting as low as -4°C in winter, frost damage can cause some severe turf issues

surfing the Internet for information. Learn by your mistakes – we've all made them. Never be afraid to ask questions or ask for help if you have an issue, as you'll find that someone will have had the same issue and a solution.

Above all else, treat your staff the way you want to be treated. Working alongside your staff will get you more respect than driving around the course in a cart barking orders. Give your staff the praise they deserve when it's warranted. Communication is the biggest thing too, especially to the Board or greens director, even your pro shop. You'll have odd ones at times that won't believe a word you say because they think they know more than you. Keep your daily records updated – you'll need the info and facts to prove them wrong.

You've mentored a number of apprentices over the journey with some going on to win the VGCSA and ASTMA Graduate of the Year Awards. What's your secret and what sort of satisfaction does that give you? Our job as managers is to train people, especially

apprentices. I've found that throwing them into the deep end works best. By the end of the first week they might be on a fairway mower then progress to the greens by the end of the month. If you don't keep them interested, they'll lose interest in the job. I've never believed in making them rake bunkers for six months straight or giving them all the rubbish jobs. All your staff should be treated equally and able to do any task within your workplace, including the apprentice.

Let them know your door is always open for anything. Always be prepared to help them, whether that's with training on machinery, job tasks or school work. Take an interest in their schooling and what they've learned after they've returned to work the next day. The Gordon Tafe is great at communicating on what they are up too and Paul Dellar and Chris Deppeler do a great job managing the apprentices.

The biggest reward is watching your apprentices grow, putting the effort in and winning awards like the Apprentice/Graduate



Powell (right) with 2021 ASTMA Graduate of the Year recipient Tom Lyon



In recent times Powell has started to experiment with drone photography, taking some stunning pictures such as this of Ballarat's 17th



of the Year. I've been lucky to have two, with Will Koopmans winning both the state and national awards in 2016 and Tom Lyon doing likewise this year. Keegan Mead, who was also a former apprentice, went overseas on The Ohio Program for 12 months after he completed his apprenticeship, then came back to work at The National and is now 2IC at St Andrews. That's the biggest satisfaction for

me – knowing you've helped set these guys up for their future and hopefully becoming great managers.

What has been the most pleasing/rewarding moment during your time at Ballarat? Having larger events like the ALPG and PGA Futures when the course all comes together. They are always appreciative of how the course is



Above: Powell has been successfully trialling a bunker lining product called Golfex, a flexible and porous concrete base using crumbed rubber from tyres, on the 18th greenside bunkers

Left: The G2 bentgrass greens are oversown every second year with 007 to keep their density. Pictured is crew member Harry Hann cutting greens

presented. It's also rewarding when members are complimentary about the course and seeing your team gel together and getting on with the job. Standing on our irrigation dam bank as the sun rises and watching the course move with the sunlight is also an amazing sight and one I never grow weary of. But having two apprentices win the ASTMA Graduate of the Year Award is pretty high up there for me. 🌱

AT A GLANCE – BALLARAT GOLF CLUB, VIC

Course specs: Thompson Perrett designed, par 72, 6282m. One hectare of greens (G2 oversown with 007) and 1.1ha of surrounds. Half a hectare of tees and 13ha of fairways (both Santa Ana couch), about 25ha of rough (fine fescue).

Members/rounds: 1200 playing members, 3000 social memberships/50,000 rounds.

Major tournaments: Before COVID we held the PGA Futures, ALPG, Aboriginal and Torres Strait Islander Golf Championships, Australasian Fire Brigade Golf Championships, Ballarat Icon Pro-Am.

Course budget: \$920,000 (incl. wages).

Staff structure: Superintendent Jeff Powell, assistant Tim Cate, foreman Tom Lyon, qualified greenkeeper Jayden New, labourers Ash Brown and Harry Hann and 1st year apprentice Connor Patterson. We have just got approval for another apprentice in 2022.

Climate/rainfall: 650mm yearly average. Temperatures range from -4°C to 42°C.

Terrain/soil types: Slightly undulated. Sand-capped fairways, tees and surrounds, USGA spec greens. Roughs are heavy soil.

Water sources/irrigation system: We harvest stormwater off a neighbouring estate which feeds through a series of ponds before being pumped into two dams. We also have a bore with a licence of 144ML. Quality is manageable with salts around the 1000ppm and high in bicarbonates. Toro decoder system and Grundfos pump set.

Cutting heights/regimes: Greens 3mm spring through to late autumn, then lifted to 4mm. Greens are cut four times a week normally and rolled three times a week. Fairways 12mm cut twice a week, tees 8mm twice a week and surrounds 10mm twice a week. Roughs first cut 40mm twice a week, main rough 90mm twice a week in spring backed off to once a week thereafter.

Renovations: Greens are cored once a year, normally early December, and scarified late December or January. We Vertidrain with needle tines every 2-3 months, 12mm tines going in to winter. They are groomed monthly, dusted twice monthly and oversown every second year to keep density. Surrounds and tees are Vertidrain with hollow tines in late spring, and with solid tines (12mm) and needle tines every 3-4 months. They are groomed 1-2 times year. This was the first year we have Vertidrain fairways. We also use the Aerway in summer to help with compaction, scarify lightly and the aeravator over the top to shake things up. We have had contractors in twice in the 10 years to deep scarify and clean up.

Major disease pressures: Winter fusarium! Ballarat gets so cold and wet that one day greens can be looking good, the next fusarium is everywhere. The frosts that we cop can be so severe between June and August, with temperatures down to -4°C degrees, not to mention the once-a-year

snow we get. It's not uncommon to get 3-4 heavy frosts in a row which browns off the bentgrass, slows the growth then the disease attacks. Growth is almost non-existent over these months – you are lucky to get a cupful of clippings off the greens.

Scarring will occur if it gets too bad and will take until late spring to recover. Early preventative sprays of systemic fungicides before it gets cold seems to help. I use a lot more organic type fertilisers, such as fish emulsions and amino acids, during the year and needle tine during these months. I also add a little bit of copper to the tank mix which also helps prevent it. Systemic and contact fungicides are used for prevention/cure and no nitrogen is applied during the winter as it only encourages the *Poa*. Liquid trace elements are mainly used over winter. A couple of applications of penetrant seems to help in the wetter months.

Nutrition: We mix it up on the greens with granular and liquids. I use a lot of organic fertilisers such as fish emulsions, seaweed and carbons and try not to overdo it with the nitrogen. Surrounds are much the same but don't get fertilised as often as the greens. To help push the fairways and tees out of dormancy once there is some green leaf, I use a liquid mix of nitrogen, Mg, Mn, Fe and GA to start off, then granular slow release thereafter. I also apply the odd nitrogen/iron mix to boost it up at times.

ASTMA CERTIFICATION PROGRAM

The ASTMA congratulates the following sports turf managers who have achieved certification and can proudly use the **'Certified Sports Turf Manager' (CSTM)** designation after their names...

Tim Allen The National Golf, Belgium	Ryan Fury Killara GC, NSW	Damien Murrell Easts Leisure & GC, NSW
Dean Bailey Rosanna GC, Vic	Jake Gibbs Elanora GC, ACT	John Nelson Grafton District GC, NSW
Shane Baker Mosman Park GC, WA	Danny Hack Wellington Shire, Vic	James Newell Magenta Shores G&CC, NSW
Brett Balloch Anglesea GC, Vic	Cameron Hall Kew GC, Vic	Kelvin Nicholson Palmer Coolum Resort, Qld
Ed Barraclough Cardinia Beacons Hills GC, Vic	Gareth Hammond Terrey Hills GC, NSW	Matthew Oliver QSAC, Qld
Mark Bateman Koorringal GC, Vic	Brendan Hansard Kew CC, NSW	Shaun Page Southern GC, Vic
Tim Bayard Evergreen Turf, Vic	Nick Harris Wentworth Club, UK	Luke Partridge Manly GC, NSW
Duncan Begley Horizons Golf Resort, NSW	Marcus Hartup Vattanac Golf, Cambodia	Mick Pascoe Noosa GC, Qld
Nathan Bennett The Royal Adelaide GC, SA	Mitch Hayes Brisbane GC, Qld	Ben Payne Peninsula-Kingswood CGC, Vic
John Berthon St Georges Basin CC, NSW	Matthew Heeps Evergreen Turf, Vic	Michael Pearce RACV Torquay GC, Vic
Paul Bevan GTS, Qld	Luke Helm Meadowbrook GC, Qld	Keegan Powell The Sands Torquay, Vic
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Hamish Buckingham Commonwealth GC, Vic	Tony Jonas North Shore GC, NZ	Wesley Saunders Dunblane New GC, UK
Chris Burgess Yarrawonga Mulwala GC, Vic	Jason Kelly Royal Fremantle GC, WA	Robert Savedra Wesley College, Vic
Greg Burgess Northern GC, Vic	Nick Kinley Hartfield CC, WA	Travis Scott Riversdale GC, Vic
Jacob Burridge Victoria GC, Vic	Dylan Knight Gisborne GC, Vic	Bill Shuck Evergreen Turf, Vic
Jason Bushell Rowes Bay GC, Qld	Blaine Knox Burleigh GC, Qld	Cameron Smith Bonnie Doon GC, NSW
Aaron Cachia Bayer, NSW	Lance Knox Busselton GC, WA	Gary Smith Commercial Albury GC, NSW
Patrick Casey Kalgoorlie GC, WA	Steve Lalor Townsville GC, Qld	Thomas Smith Waterford Valley GC, Vic
David Cassidy The Cut, WA	Kane Latham Elanora CC, NSW	Mathew Soles The Australian GC, NSW
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Paul Chalmers St Aloysius College, NSW	Jason Lavender Beenleigh RSL & GC, Qld	Daniel Stack Windaroo Lakes GC, Qld
Brenton Clarke Warrnambool GC, Vic	Dean Lenertz St Michael's GC, NSW	Kenji Steele Riverway Stadium, Qld
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Lincoln Coombes RACV Royal Pines, Qld	Josh Leyland Box Hill GC, Vic	David Sutherland The Ridge GC, NSW
Phillip Cooper GTS, NSW	Nathan Lindsay Hamilton Island GC, Qld	Lee Sutherland St Michael's GC, NSW
Dion Cope Redland Bay GC, Qld	Peter Lonergan Coolangatta-Tweed Heads GC, NSW	Shay Tasker Carnarvon GC, NSW
Mick Cornish Cazaly's Stadium, Qld	Ben Lucas Tocumwal GC, NSW	Aaron Taylor Cronulla GC, NSW
Shaun Cross Byron Bay GC, NSW	Toby Lumsden ICC Academy, UAE	Heath Taylor Blacktown ISP, NSW
Joshua Cunningham All Outside, NSW	Bruce Macphree ASTMA, Vic	Nigel Taylor Sports Turf Solutions, Malaysia
Bruce Davies CIT, ACT	Stephen Mallyon Renworx, NSW	Shaun Taylor Southern GC, Vic
Kevin Davis St Margaret's-Berwick GS, Vic	Dave Mason Metropolitan GC, Vic	David Thomson Bermagui CC, NSW
Luke Diserens Roseville GC, NSW	Garry McClymont Twin Waters GC, Qld	Colin Thorsborne Parkwood Village, Qld
Nicholas Douglas Spring Valley GC, Vic	Tony McFadyean Programmed, WA	Ben Tilley Headland GC, Qld
Mark Doyle Hume City Council, Vic	Paul McLean Sanctuary Cove G&CC, Qld	Steve Tuckett Melbourne Polytech, Vic
Cameron Dunn Woollooware GC, NSW	Michael McMahon GTS, Qld	Lee Veal Mt Derrimut G&CC, Vic
Peter Dunn Federal GC, ACT	Peter McNamara Brisbane GC, Qld	Michael Vozzo Fertool, Vic
Ben Evans Ryde TAFE, NSW	Ryan McNamara Rosanna GC, Vic	Earl Warmington Newcastle GC, NSW
Tim Fankhauser ASTMA, Vic	Mick McCombe Maleny GC, Qld	Tim Warren Glenelg GC, SA
Timothy Fewster Doncaster BC, Vic	Keith McPhee Maitland City Council, NSW	Rob Weiks Hoiana Shores GC, Vietnam
Peter Fitzgerald Belmont GC, NSW	Brett Merrell Ras Al Hamra GC, Oman	Shannon White Baileys Fertilisers, WA
Aaron Fluke NSWGC, NSW	Daniel Metcalfe Beverley Park GC, NSW	George Widdowson Geelong GC, Vic
Jason Foster Riverway Stadium, Qld	Jack Micans Elanora GC, NSW	Darren Wilson Wembley GC, WA
Jason Foulis HG Turf, Vic	Braydan Millar Rowes Bay GC, Qld	Issac Wojewodka Camden GC, NSW
Patrick Fraser Landscape Solutions, NSW	Ben Mills Hawks Nest GC, NSW	Tim Wright K&B Adams, Vic
Peter Fraser Hervey Bay G&CC, Qld	Craig Molloy Cypress Lakes Resort, NSW	Matthew Young Moonee Valley CC, Vic
Adam Fry Kooyonga GC, SA	Colin Morrison Flinders GC, Vic	

For more information on the ASTMA Certification Program visit www.agcsa.com.au

TRU-TURF ROLLS ON UNDER NEW OWNERSHIP



After 33 successful years of operation, Ray Dufty (left) has sold Tru-Turf to local Gold Coast businessman Scott Bullard (right)

After 33 years of operation, Gold Coast based Tru-Turf's ownership has changed, with founders Ray Dufty and Dorothy Rix choosing to retire after much success in building the business from the ground up.

After establishing the business on the Gold Coast in 1988, Dufty was keen for Tru-Turf to remain in the hands of a local who was young, energetic and a knowledgeable buyer to take the company and its products to new heights. And with that, Gold Coast local Scott Bullard has acquired the ownership and is already inside the business, getting his hands dirty and ensuring Tru-Turf continues to deliver quality products both in Australia and abroad.

"Both Dorothy and I have had an incredible journey here at Tru-Turf and we were keen to depart while the business was still at the top of its game," says Dufty. "I have designed these machines myself and been part of it for as long as I can remember, so it will be difficult to not come into work each day but the time is right to hand it over."

"I love Tru-Turf and will continue in an ambassadorial role, so I will never fully depart the operation I took so much pride in building. I will be assisting Scott and the team at Tru-Turf to ensure a smooth transition of the business and wish Tru-Turf continued success."

Bullard has a strong business background and when the opportunity arose to purchase Tru-Turf there was not a lot of hesitation.

"Tru-Turf is a real Australian success story," says Bullard. "Ray and Dot should be commended for their efforts in building a brand and product that has taken the turf world by storm. Ray set the business up with his own bare hands and has continued to develop the product to be a market-leader."

"Haylee (Bullard's wife who will also play a key role) and I are committed to keeping Tru-Turf at the top of the game in this space and will put in the same amount of love and care to the operation that both Ray and Dot have."

As part of the change of ownership, Bullard has appointed Nick Thornton as general manager who has a long association with the game of golf.

"Nick has a strong background across all areas of the golfing landscape and I'm excited about what he can bring to Tru-Turf as an operation," adds Bullard. "Both Nick and I have been working hard behind the scenes to ensure that Tru-Turf maintains its position as the premier golf and sports turf roller in the world."

"Nick is charged with controlling the business operation both in Australia and around the world. We want to continue to deliver both a quality service and product across every aspect of the business."

Tru-Turf has dominated the roller market for many years, with its greens and turf rollers being preferred at the highest quality courses and tours. Among them are St Andrew's, Augusta National, Pebble Beach and Royal Melbourne, while Tru-Turf is an official licensed product of the PGA Tour.

Tru-Turf boasts a suite of quality products to suit every level of course and any weather conditions, with the electric-powered RE50 model the newest to the range. In a sign of the times, Tru-Turf has ensured that all state-of-the-art electronics have been used and guarantee to deliver the speed and crease-free results that the petrol-powered machines do.

A full range of Tru-Turf products can be viewed at www.truturf.com or for a more detailed discussion contact the team on +61 7 5594 7199.

CAMPBELL CHEMICALS INCREASES ITS STATURE

A STMA Bronze Partner Colin Campbell

Chemicals has introduced a new herbicide for broadleaf weeds called Stature, complementing its existing products Methar Tri Kombi and Sportsground. Stature is a three-way mix containing three active ingredients with three different modes of



Campbell Chemical's latest broadleaf weed herbicide Stature

action. The active ingredients are diflufenican (Group F), bromoxynil (Group C) and MCPA (Group I).

"Stature brings real flexibility for turf managers," says Campbell Chemical's marketing manager Nadeem Zreikat. "The three actives from three different modes of action have never been put together in a single product. What's more, the formulation is an advanced emulsifiable concentrate (EC) which allows for virtually nil odour and low rates. In fact, we have very low rates of 500mL-2L per hectare for Stature."

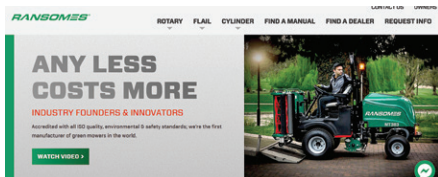
"Trial work showed that the 1L/ha rate performed statistically the same as the 2L rate and the standard product (a leading broadleaf herbicide). Stature also allows for various tank mix partners to control other weeds such as grass and woody weeds. However, please speak to us or our distributors on this."

Stature is available in 5L pack sizes from Campbell Chemical's primary distributors. For more information on Stature, visit www.campbellchemicals.com.au.

RANSOMES LAUNCHES NEW WEBSITE, CAMPAIGN

Mower manufacturer Ransomes is cutting a path to electric-powered commercial and municipal mowing under the Any Less Costs More campaign and its largest brand investment this century.

Ransomes' new mission and vision are focused on providing short-term and long-term benefits to customers, consumers and the environment. The digital investment comes through a new web presence, which will provide an industry-leading digital offering, while on the turf, the target of electric lithium powered commercial mowing has been firmly set for launch in 2022.



The new-look Ransomes website

For everyone involved in the process, including Ransomes marketing manager Adam Underwood, this has been an opportunity to speak to customers about what matters most to them and deliver value under the 'Any Less Costs More' banner.

"We want people to be confident when they are sat on a Ransomes mower that they are sitting on the benchmark for commercial and municipal mowing," says Underwood. "It's very important for people to understand the value of incredibly specialist machinery. So, the 'Any Less Costs More' campaign is really about the lifetime value of our products and how it pays to invest in us.

"Getting that message out is important, but listening is even more important. We spent the last year engaging with consumers, dealer customers and colleagues to understand what Ransomes means to them and what great will look like for the next 5-10 years for the brand."

Throughout early 2021 Textron, which owns the Ransomes and Jacobsen brands, focused all mower manufacturing on Ipswich which has created a space where the sole

focus is on building fine turf machinery. For Ransomes, this year provided the opportunity for 15 million test hours of lithium battery technology to be integrated into their commercial mower range.

"We're excited about developing new technologies, and Ransomes will borrow a lot of the expertise from other brands within Textron," Underwood explains. "As a result, we will be able to safely put technology that will be good for the environment, good for everybody and most importantly, gets the work done, into our Ransomes products.

"You'll see throughout 2022 that we are going to be expanding our range into electric lithium technology, and in other parts of the business, we have already got turf machinery out cutting in environments that are a commercial or municipal setting."

Visit the new website www.ransomes.com.

SOUTHORN REPLACES EVANS AT TROON INTERNATIONAL



ASTMA member Clinton Southorn has been appointed as the new director of construction and agronomy for Troon International. Beginning his new role in October, Southorn has taken over from 20-year Troon veteran Robin Evans.

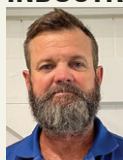
"While we are extremely sad to see Robin leave the office, we are delighted for

him and his retirement which will see him return to Australia with wife Jan," says Troon International's executive vice president Mark Charleski. "Clinton has been a rockstar for us in the field for many years and we look forward to him transitioning into the corporate office and supporting our talented agronomists and owners across our regions."

Southorn has over 20 years' worth of experience in the golf and turf industry, 18 of which have been with Troon. Among his postings include Brookwater Golf & Country Club in Queensland, Fiji, the Azores, growing in Saadiyat Beach Golf Club and Agalarov Golf Estates and The Els Club Dubai. Most recently he was the cluster director of agronomy across Abu Dhabi Golf Club, Saadiyat Beach Golf Club and Yas Links Abu Dhabi.

"I am very proud and excited to start this new role," says Southorn, who originally hails from Tasmania. "We are extremely fortunate to have some exceptionally talented team members working within the agronomy portfolio. The importance and focus will be to continue working closely with the associates to support them at their respective facilities and help them grow, along with the reputations of the Troon International Facility portfolio. Showcasing the importance of working with our owners, partners and team members, makes for a privileged position and one I'm truly excited about starting." ﷲ

INDUSTRY APPOINTMENTS



TORO PICKS PELLING

ASTMA Platinum Partner Toro Australia has appointed **Rod Pelling** (pictured) as its new North Queensland area sales manager, looking after commercial and construction equipment. Pelling has extensive industry experience, previously selling turf care supplies and looking after sports fields including the Townsville Rugby League headquarters and the Cowboys Centre of Excellence. He arrives at Toro having spent the past six years at Globe Growing Solutions prior to their closure earlier in the year.



BROWN TO NUTURF

ASTMA Silver Partner Nuturf has appointed **Lucas Brown** (pictured) to the position of territory manager for South Australia. Having held several senior turf management and operations positions over the past decade, Brown joins Nuturf from West Beach Parks Resort in Adelaide where he held the position of golf course

superintendent and operational manager. Prior to this, Brown honed his turf management expertise as superintendent at Mildura Golf Resort and Emerald Golf Course. Brown started his role in early October and is based out of Nuturf's Welland office and warehouse site. He can be contacted on 0408 027 165 or email lucas.brown@nuturf.com.au.



ADAMA ADDS DAVIS

ASTMA Bronze Partner Adama Australia recently announced the appointment of **Ben Davis** (pictured) to the position of turf and IVM (integrated vegetation management) commercial manager.

Davis brings a wealth of experience and qualifications to those market sectors, starting his career as a turf manager in Australia before spending the past two decades in Asia as a turf and industrial vegetation specialist. For the majority of this experience, Davis was the managing director of an international landscape, golf and sports turf maintenance and construction operation.

Based out of Victoria, Davis will support Adama clients in Victoria, South Australia, Tasmania and the ACT, as well as southern NSW. Davis can be contacted on 0498 242 283 or email ben.davis@adama.com.

TURFCARE BOLSTERS RANKS

Turfcare Australia has added five well-known industry figures to its sales and agronomy team across the country. After Globe Growing Solutions closed its doors unexpectedly in May 2021, Turfcare Australia was in a position to join together with **Chris Blagg** in NSW and **Mark Dougherty**, **Brett Chivers** and **Chris Newman**, along with new warehouse manager **Chris Burridge**, in Victoria.

Blagg has joined the NSW sales and agronomy team operating out of McGraths Hill in western Sydney where he will be servicing the Northern Beaches and Sydney area. Dougherty, Chivers, Newman and Burridge have formed the company's new Victorian branch. They will serve the Victorian and Tasmanian sports turf sectors from a new warehouse facility located in Dandenong.

Greetings and Merry Christmas from New Zealand to our fellow turf professionals in Australia. Summer has arrived here with temperatures rising and irrigation systems beginning to ramp up.

Twelve months on from my first report for this publication and it seems little has changed. We are still in the grip of COVID here with borders and regions closed, but a hint of change may be on the horizon. With vaccination rates rising, it appears that our country will be let out for summer and our turfs can expect golf courses full of players over the coming months. There is still no word on 'free' travel to Australia (and back) but hopefully we are closer to that now than we have been for some time.

Turf managers here have been busy fighting some phenomenal spring growth in some parts of the country, but the emphasis will now turn to irrigation and keeping everything alive and thriving through the drier summer months.

Usually by this time of the year our awards have been presented and completed. Unfortunately because of COVID border restrictions, we have had to postpone our premier NZGCSA Parkland Excellence Award until next year. The final phase of judging for this award involves travel to the candidate's golf courses to inspect their work, but with Auckland in lockdown it could not take place. We are planning to complete the award judging early in 2022.

FTMI

It was great to see the FTMI programme up and running again with a great group

ON THE MOVE...

CRAIG ANTHONY: From superintendent East Course, Royal Melbourne GC, Vic to superintendent Spring Valley GC, Vic.

CHARLIE BOLTE: From Bayview GC, NSW to assistant superintendent Cromer GC, NSW.

SCOTT BARNETT: Appointed superintendent at Marri Park GC, WA.

BRENDAN CLARK: From superintendent Atherton GC, Qld to superintendent Palmer Sea Reef GC, Qld.

JAKE GIBBS: From superintendent Royal Canberra GC, ACT to superintendent Elanora CC, NSW.

ALEX GORRIE: From assistant superintendent to superintendent Neangar Park GC, Vic.



Pukekohe GC course manager Hayden Williams is one of two NZ delegates undertaking the current FTMI programme sponsored by Jacobsen

of turf professionals engaged in this year's programme. I was fortunate to be invited to sit in on the introductory Zoom session with the delegates, our Jacobsen sponsors, the mentors and **Mark Unwin** and **Simone Staples** from the Australian Sports Turf Managers Association (ASTMA).

Each delegate introduced themselves and told a little about who they are and where they have come from. It was very enlightening to see the dedication to their craft from this group and if that is the standard of our future turf managers then our industry is in very good hands. Congratulations go to the two NZ representatives **Hayden Williams** (course manager, Pukekohe GC) and **Hayden Stuthridge** (foreman, North Shore GC).

I would like to wish all the delegates my best wishes for the programme and I know they will all gain a great deal from it. Thank you to Jacobsen Asia Pacific for their continued support of this programme. As is usual with these programmes, sponsorship is a key ingredient and they would not take place without our trade partners' valued inputs.

A huge thank you to the mentors as well, one of which is our own (NZGCSA) **Sam Keats**. Sam graduated from the 2016 FTMI and he was the first to put his hand up to give back to the programme. The mentors give their own time and play an integral part in the success of our future turf managers. Last, but certainly not least, I would like to thank **Simone Staples** and **Mark Unwin** for their organisation of the event. Simone put in a lot of time and

countless emails to get the selection process completed and everyone where they needed to be.

LOOKING AHEAD

We have a couple of new events on the calendar for 2022. The first Turf Days field day is a two-day exhibition event that is being organised by a group of turf industry suppliers. The event is being held at Kimihia Research Centre near Christchurch in the South Island on 6-7 April. It will feature hands-on machinery demonstrations, trade focussed educational events, product trials and disease workshops.

Also, the first Golf Matters Conference is being held in August in Christchurch. This conference brings together the NZGCSA, Golf Managers Association of NZ, NZPGA and Golf Tourism. It is shaping up to be a great event encompassing all golf sectors and it will be the first of its kind in NZ.

To finish, I would like to take this opportunity to say some thanks for the year. First, to the NZGCSA Board – **Spencer Cooper** (Remuera GC), **Rick Machray** (Arrowtown GC), **George Flynn** (Royal Auckland and Grange GC), **Brad Sim** (Cape Kidnappers GC) and **Sam Davis** (The Hills). Thank you all for your dedication to our association and making the time and decisions that keep our association one that our members can be proud of. I look forward to us continuing our work next year. A big thank you also to Sam Keats who stepped down from the Board this year, but continues to help through mentoring in the FTMI.

To our sponsors and trade members – thank you; without you sponsoring our awards, advertising with us and giving us your general support we could not function as an association. To our members – thank you all for displaying the sort of camaraderie and goodwill throughout our industry that you do. I have witnessed plenty of that member pride this year that makes me proud to be a part of such an association.

Last of all a huge thank you to our administration officer **Fiona Izzard**. She really does do a fantastic job and keeps members, sponsors and advertisers up to date and well informed of news from our association, as well as running our business and accounts – thanks Fiona! Merry Christmas to all and a Happy New Year for 2022.

JASON PERKINS
PRESIDENT, NZGCSA

It has been a busy end to the year for the NSWGCSA. The association held its 2021 Annual General Meeting via Zoom (hopefully for the last time) on 25 November. There were 20 people who logged on for the meeting with no general business or questions arising.

At the AGM the NSWGCSA took the chance to award three life memberships that will be formally recognised at the Elite Sand and Soil Rube Walkerden event to be held at Killara Golf Club on 21 April 2022. The NSWGCSA congratulates;

- **Mark Schroder** (Liverpool GC) – 45 years in the industry and nine years on the NSWGCSA Board;
- **Richard Kirkby** (Pennant Hills GC) – 28 years at his club and nine years as a NSWGCSA Board director); and
- **Mark O'Sullivan** (Roseville GC) – 32 years at his club and six years on the NSWGCSA Board.

On behalf of all members I would like to congratulate all three on their outstanding careers and receiving one of our association's most prestigious honours. Long-time life member **Peter McMaugh AM** was asked his thoughts on the appointments, to which he agreed all were "extremely worthy inductees".

The NSWGCSA is looking for two Board members to fill vacant spots after myself, **David Sommerville** and Mark Schroder stepped down at the AGM. The Board wishes to welcome Hawks Nest GC superintendent



Roseville Golf Club superintendent of 32 years Mark O'Sullivan was one of three awarded life membership of the NSWGCSA at the November AGM

Ben Mills to the Board. I encourage superintendents to put their hand up and have a term helping the association. It is in a really strong position and with technology changing so has the way the association is run, meaning less time away from your workplace.

A few days prior to the AGM, on 22 November, the NSWGCSA conducted interviews for its Graduate of the Year Award, sponsored by JT Turf. Five apprentice greenkeepers from across the state were invited to Liverpool Golf Club to be interviewed by NSWGCSA Board member Mark Schroder,

former Board director and life member **Mal Harris** and administration manager **Alison Jones**. The five finalists were:

- **Jonty Smith** (Emerald Downs GC);
- **Andrew Fletcher** (Nelson Bay GC);
- **Ngatiwai Hertaraka** (Eden GC);
- **Daniel Mion** (previously Royal Sydney GC now Pennant Hills GC); and
- **Jack Parker** (previously Pennant Hills GC now Oatlands GC).

The feedback on each candidate was exceptional and a really tough decision had to be made as they all were very impressive. The eventual winner was Jack Parker who will go on to represent the NSWGCSA in the final of ASTMA Graduate of the Year Award, sponsored by Toro, to be announced at next year's conference in Melbourne. NSWGCSA wishes all candidates the best in their future endeavours in the turf industry.

Finally, the NSWGCSA was saddened to hear of the passing of life member **Reg McLaren** on Wednesday 17 November. Reg was still an attendee of our Rube Walkerden events up until COVID hit last year. Reg was 89 and we can report he insisted on being buried in his NSWGCSA jacket. Our condolences go to all of Reg's family and close friends (**see obituary page 72 - Ed**).

NATHAN BRADBURY IMMEDIATE PAST PRESIDENT, NSWGCSA

TSTMA

First, I would like to say a sincere thank you to outgoing TSTMA president **Phil Hill** (Barnbougle) for all of his hard work and dedication in his role for such a long period of time. The results that Phil, along with all other outgoing/ongoing committee members, achieved for the association really did speak for itself at the TSTMA conference held in Hobart back in May. It was a fantastic event that was very well run and I feel all who attended would have taken something away from it. A huge thank you to all the sponsors of the event also – your ongoing support of events like this and of our association is very much appreciated.

We were certainly very lucky with the timing of the event, as COVID took hold of the eastern states soon after the conference. I, like all others that attended, would like to express thanks to all of the speakers and guests who

travelled from across the country to help make the event what it was. You certainly gave us all some very valuable learnings and discussion points.

Just quickly touching on the future of the association, with what now sees a number of new faces on the TSTMA committee, please know that as a group we will continue to work on the massive efforts by those past and present to ensure the association and, most importantly, sports turf as a whole in Tasmania can continue to grow and succeed. The new committee will meet in the coming weeks and more details regarding future information/training/social media options will come to hand.

Finally, a quick thank you for the support I have received since taking over as TSTMA president. I know I have huge shoes to fill with Phil's massive input to the association

over many years. Together with a fantastic committee, I will do my best to ensure the association continues to forge ahead. I hope spring has treated you all well and I wish everyone the best for the summer months ahead.

ADAM SPARGO PRESIDENT, TSTMA

ON THE MOVE...

TOM HOGAN: From assistant superintendent Barwon Heads GC, Vic to superintendent Flinders GC, Vic.

DARREN LEE: From superintendent Palm Meadows GC, Qld to Gold Coast City Council, Qld.

COLIN MORRISON: Resigned as superintendent Flinders GC, Vic.

VGCSA

After a long year in and out of lockdowns, it was great that the VGCSA Open Golf Day went ahead as planned for our final event of the year, despite the wintry weather in mid-November. Due to density limit restrictions still in place at the time, it was a more intimate four-ball Ambrose event than usual with 58 in attendance. Our sincere thanks to sponsors Oasis Turf and Brandt (formerly Glenmac Sales & Service) and Barwon Heads Golf Club (superintendent **Adam Lamb**) for hosting a terrific day of golf followed by dinner and presentations.

As the year wraps up, our CEO **Mary Napier** will be taking a few weeks break over the Christmas and summer season, returning mid-January in the lead up to our first committee meeting for 2022. Zoom has been a great solution to travel restrictions and, in general, a great time saver when it comes to avoiding lengthy travel. After numerous months, however, it will be worthwhile getting together in person again.

With our annual events program recently launched, we look forward to 2022 which hopefully will be a new year of hosting several educational events that had to be postponed over the last 18 or so months. Fortunately, we

SAGCSA

This year has seen the SAGCSA, like others, limited in the number of events we have been able to hold, but over the last few months we have been able to get back to a little bit of normality. In August we held a joint education day with the SA STA. With around 150 attending and some great speakers, the day was very much a success. This is the second joint event we have held with the SA STA and most likely not the last.

In October, the SAGCA AGM was held at Kooyonga GC, with good numbers attending and some new faces coming on the committee. **Barry Bryant** (Osmond GC), a former SAGCSA president, stood down after 14 years on the committee. Barry has worked tirelessly on the committee over the years, and we would like to acknowledge his contribution.

Rowan Daymond (The Grange GC) also stood down after two years on committee. Rowan came in for a pinch hit and has been involved in some important developments behind the scenes. A big thanks to both gentlemen.

Coming on to the committee is **Tim Warren**, superintendent at Glenelg GC. Tim



Kingston Heath Golf Club will jointly host the opening VGCSA meeting of 2022 with Yarra Yarra Golf Club in early March

now move into a new era where vaccination status grants us the freedoms that we once took for granted. The event calendar for 2022 comprises:

- **7 March 2022:** Education Meeting – Kingston Heath and Yarra Yarra GCs (sponsored by Brandt and The Toolbox Team).
- **2 May 2022:** 95th Annual General Meeting – Peninsula Kingswood CGC (sponsored by Bayer and Toro Australia).
- **7 June 2022:** Course Staff Education Meeting – Rosebud GC (sponsored by Colin Campbell Chemicals and Toro Australia).
- **1-2 August 2022:** Country Meeting –

Murray Downs G&CC (sponsored by Anco Seed & Turf, Bayer, Brandt, Colin Campbell Chemicals, Greenway Turf Solutions, Living Turf, Oasis Turf, Pacific Coast Design, Rain Bird, Syngenta Australia, Turfcare Australia, Turf Culture and Toro Australia).

- **18 October 2022:** Education Meeting – Ballarat GC (sponsored by Syngenta Australia).

Best wishes to everyone for the upcoming summer period and festive season. Let's all look forward to 2022. It will be great getting out and catching up with everyone again.

SHANE GREENHILL
PRESIDENT, VGCSA



Thaxted Park superintendent Jordan Sherratt, winner of the 2021 ASTMA Golf Championship, has joined the SAGCSA committee

has been on the committee previously and has now jumped back on, excellent commitment

considering he is moving into a very busy period at his course. **Jordan Sherratt** is another that has come onto the committee. Earlier this year Jordan won the SAGCSA Graduate of the Year and is already the new superintendent at Thaxted Park GC. It's a huge effort from Jordan considering he's new in the role yet still willing to get involved. It caps off a big year for Jordan as he also won the ASTMA Golf Championships held at Coolangatta and Tweed Heads Golf Club during this year's Gold Coast conference.

The weather here in SA has been a little unusual the past few months. We had some reasonable rain over late winter and early spring, but it has been a bit hit and miss over the October-November period. As far as the warm weather goes it has almost been non-existent. There have been very few warm days so far this season, making renovations a little slower to recover. Hopefully over the next few months we will see weather patterns return to normal.

NATHAN BENNETT
PRESIDENT, SAGCSA

MASON ON THE MOVE AS METROPOLITAN TO SEEK NEW SUPERINTENDENT

One of the most highly sought after course superintendent positions in Australia has come up for grabs following the announcement that **David Mason** (CSTM) will be leaving Metropolitan Golf Club in early 2022. Mason, who has been superintendent at Metropolitan for the past six-and-a-half-years, finishes up on 17 February 2022 before taking on his new role as superintendent at The Brisbane Golf Club from 1 March.

Brisbane's committee confirmed Mason as their new superintendent on Wednesday 24 November, with Mason tendering his resignation at Metropolitan the next day. The news came just a week after Metropolitan general manager Peter Paccagnan announced he was leaving the club to start as general manager at neighbouring Commonwealth Golf Club in early 2022.

The decision to leave Metropolitan was not an easy one for Mason who has spent 17 of his 28 years in golf course management at the famed Melbourne Sandbelt club. Mason started his apprenticeship there in 1993, rising to the role of assistant under previous superintendent and now Royal Melbourne director of courses **Richard Forsyth**.

After 11 years at Metropolitan, Mason took on his first superintendent posting at Warrnambool Golf Club on Victoria's south coast in 2004, before returning to Melbourne four years later to take over at Riversdale Golf Club. In August 2015 the journey home was complete when he was appointed superintendent at Metropolitan. Mason says there were a number of factors at play in his decision to leave Metropolitan and that it was one of the hardest decisions he has had to make in his career.

"Metropolitan is such a great club and it has been a huge part of my life and career to date," says Mason (45). "I've spent 17 years over two eras and I would not have come back to work here if it wasn't for the great people



David Mason will depart Metropolitan Golf Club next March to take on the superintendent role at The Brisbane Golf Club

and culture of the club. I have absolutely loved my time at Metropolitan and it wasn't an easy decision, but for a number of reasons the opportunity that was on offer at Brisbane was too good to turn up.

"My wife and I have been for some time looking at possibly moving north. Certainly the impact of COVID here in Melbourne and the tough times through lockdowns did play a part in prompting a change sooner than we may have otherwise anticipated. But it is more the opportunity that the Brisbane role will provide. Those sorts of roles don't come up often and it was just the right time to make the move."

Going from managing cool-season to warm-season greens does not faze Mason, who leaves a club that has been renowned over the years for having some of the best couchgrass fairways in the world. A number of southern superintendents have also successfully made the transition north, among them current ASTMA president **Peter**

Loneragan (Coolangatta and Tweed Heads GC), Royal Pines superintendent **Lincoln Coombes** and Indooroopilly's **Ben Grylewicz**.

Despite that, Mason is under no illusions that he'll be learning plenty from the first day he walks through the Brisbane GC gates.

"I'm relishing the challenge that Brisbane will present," says Mason. "It's the only club in the country to have Champion ultradwarf couch greens and that is a really interesting aspect and something I am looking forward to learning more about. I hope to build on the successful platforms that **Mitch Hayes** and **Brett Morris** have set up there. Brisbane is a progressive club and I'm really chuffed that the committee has given me the opportunity to move the club forward."

Among many highlights of Mason's time in charge at Metropolitan include hosting the World Cup of Golf in 2018, as well as installing a brand new Rain Bird irrigation system in the 12 months leading up to the tournament. Mason has also spent the past couple of years undertaking in-depth trial work on new bentgrass varieties and different profile construction methods in anticipation of Metropolitan's greens replacement programme. The results of that research have been borne out in the successful redevelopment and subsequent performance of the club's new practice green and short game facility. Of most satisfaction for Mason, however, has been his interactions with the staff and members.

"The pinnacle for me during my time in charge has been the culture change in staff and building a great team," says Mason. "We lost a lot of staff early on, so to see the team we have now and how some of the guys have gone on to better things – like **Nick Launer** taking the super's role at Keysborough – is really satisfying. I've been fortunate to get to know so many great people here – both staff and members – and I am very thankful for that."

ON THE MOVE...

CHRIS NATION: After four years as track manager with Perth Racing (Belmont and Ascot, WA), Nation has started as general manager of tracks and facilities at Newcastle Jockey Club, NSW where he replaces the outgoing Marshall Howarth.

GERRI O'CALLAGHAN: From assistant superintendent East Course, Royal Melbourne GC, Vic to superintendent Sandringham Golf Links, Vic (*see article on O'Callaghan page 16 - Ed*).

MAT POULTNEY: After 15 years at Green Acres GC, Vic, Poultny departed as superintendent in mid-October ahead of a family move to Brisbane.

DAMON QUIGLEY: From superintendent Mt Martha Valley Estates (formerly Safety Beach GC) to superintendent Darwin GC, NT.

MITCH HAYES: Resigned as superintendent The Brisbane GC, Qld.

BLAINE KNOX: From superintendent Beenleigh RSL, Qld to superintendent Palm

Meadows Golf Club, Qld.

LIAM SOMERS: From assistant superintendent Mt Lawley GC, WA to superintendent at Hamersley GC, WA.

NIC STAFF: From superintendent Sandringham Golf Links, Vic to superintendent East Course, Royal Melbourne GC, Vic.

JAMES STEWART: From superintendent Cranbourne GC, Vic to superintendent Green Acres GC, Vic.

ANDREW MAGGS (24.9.1982 – 7.11.2021)



Andrew Maggs was course superintendent at Maryborough Golf Club for five years, with members and management lauding him for his passion and dedication to the role



The Australian golf course management and superintendent community farewelled up and coming course superintendent Andrew Maggs in early November after he succumbed to a two-and-a-half year battle with cancer. An ASTMA member, the former superintendent of Maryborough Golf Club in central Victoria passed away at Maryborough Hospital on 7 November 2021 surrounded by his family. He was just 39.

Loving husband to Josephine and father to their two boys Sam (5) and Leo (2), Maggs was a down-to-earth and hard-working turf manager who was passionate about his profession and his family. He was also an adept all-round sportsman who excelled in hockey, cricket and golf, representing both the Victorian and Australian Country teams in the former.

Maggs got his start in sports turf management through an apprenticeship at Thurgoona Country Club in NSW in 2000. After successfully completing that, he served three years on the ground staff at the Lavington Sports Ground before moving back into golf at The Commercial Club in Albury. After nearly seven years there, Maggs was successful in gaining his first course superintendent posting at Maryborough Golf Club in Victoria in early 2015. Following his cancer diagnosis in April 2019, he continued on as superintendent up

until early 2020 when he had to step aside to concentrate on his health battles.

Among the many to post tributes in the week following Maggs' passing was former Commercial Club superintendent Anthony Toogood. Toogood hired Maggs to his crew after his time at Lavington and like all those who came to know Maggs over the journey, he remembers him as one of the real good guys who was liked and admired by everyone.

"We had an opening for a new staff member and I was recommended this 'ripper

bloke' by another turfie," recalls Toogood. "Maggsy started shortly after and worked with us for about seven years. He was a ripper bloke and a talented athlete, playing hockey for the Australian Country team and the Albury Spitfires, opening the batting for his local cricket club and playing golf off low single figures.

"He was popular with everybody and a natural leader and was always going to get a chance to be a superintendent. Maggsy left us when he applied for and got the superintendent's job at Maryborough where for several years he did a great job and raised his young family before being cruelly diagnosed with stomach cancer.

"Andrew was amazing in his humility and how stoic he was over the last few years and will be missed by family and friends of the many sporting clubs in which he was involved. Probably none more so than our mate Joel from The Commercial Club greenstaff. Joel is a special needs person and the friendship that Maggsy struck up with Joel showed the class and empathy of the guy that taught me plenty.

"In our infrequent chats over the last few years, our talks became less about work and turf and more about nothing! I gratefully last spoke to Maggsy about 10 days before he passed away and he was still talking about how he was looking forward to taking his caravan away with Jo (who he described as a saint) and his children. The loss of Andrew will be felt across many communities, not just the turf community, and we have all lost a true mate who was one of a kind."

Josh Lacey, who took over the superintendent reins at Maryborough after Maggs stepped aside due to his health, posted on Facebook that he and the crew were at a loss after learning of their former boss's passing: "It's absolutely devastating for all of us at Maryborough. He was a great boss and mentor to myself and the staff here, great turf manager and an even better bloke. He was



Maggs' love for sport, in particular hockey, cricket and golf, were celebrated at his funeral

loved by absolutely everyone here, we are all shattered for his family. It has been tough coming to work this morning but myself and the staff are committed to honouring Maggsy the best way we can."

The VGCSA, of which Maggs was a member of, also paid tribute to the young superintendent: "It was such sad news to hear that Andrew had passed away," says association chief executive Mary Napier. "Andrew joined the VGCSA in 2016 until ongoing ill health forced him to resign in the early part of 2020. Despite such a difficult period for him, Andrew remained positive saying, "It has given me extra time with my two young sons and that time has been great". Andrew remained an honorary member with the VGCSA and stayed in contact with the association throughout. Our deepest condolences to his wife, family and close colleagues at a time of tremendous grief and loss. Andrew touched the hearts of many."

Just three months after the birth of his second son Leo in January 2019, Maggs was diagnosed with a tumour on his appendix. He began cancer treatment at the Peter Mac Centre in May and over the course of the next two-and-a-half years fought hard to beat the insidious disease. A member of the ASTMA since 2015 and a regular attendee at the annual Australian Turfgrass Conference, Maggs' diagnosis prevented him from attending that year's conference and ASTMA Golf Championships in Brisbane. A few weeks later, family and friends turned out en masse for a fundraising event held in Maggs' honour at The Commercial Club. More than 400 turned up to support Maggs and his young family in a tremendous outpouring of love.

In October this year, Maggs posted on Facebook that he had just undergone his 50th chemotherapy session. Sadly just a few weeks later, following a round of golf at Maryborough Golf Club, Maggs was back in hospital after

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Maggs was a regular attendee of the annual Australian Turfgrass Conference and contender in the ASTMA Golf Championship

experiencing pain. True to his stoic nature he posted on Facebook that he had encountered “a little setback” which necessitated surgery. Ever the optimist, he posted, “Was a bit scary there for a while but after the surgery the pain has subsided which is great. Still not sure exactly what is wrong, hopefully something manageable. Been a rough day for the family and I’m sorry to you for putting you through that. Fingers crossed we’re on the mend now.” Maggs would pass away just four days later.

Shortly after his passing, the Maryborough Golf Club posted on its Facebook page: “It is with much regret that we announce the passing of our much loved former course superintendent Andrew Maggs. Andrew was an

inspiration to us all and will be sadly missed. Andrew played his last round of golf with us on Tuesday with Sam and Leo as his caddies.”

A celebration of Maggs’ life was held on 17 November at Maryborough Golf Club, with hundreds of friends and family gathering on the 4th fairway, one of Maggs’ favourite holes on the course, to pay their respects. In beautiful tributes during the near two-hour service, Maggs was remembered as being a loyal son, brother, nephew, husband, father and, above all else, friend. His exploits in hockey were lauded, while he was also remembered for his passion and skill as Maryborough’s superintendent, helping improve the course in many areas.

Next to the stage, a golf cart was parked with Maggs’ golf clubs strapped on the back (he was a long-time single-figure handicapper and pennant player), while his hockey and cricket kit bags lay next to the cart. Maggs played over 260 games for the Spitfires and 67 games for the Victorian Country hockey teams and was remembered as a great team player and “brother” wearing the No.3 and No.6.

Dan Leddin, who spoke at the service and who initially interviewed Maggs for the superintendent role at the club, recalled that within a week of Maggs starting the job how impressed members were with the immediate changes he made to the way the course was presented. Over the course of his time in charge, up until his cancer diagnosis, Maggs would play a major role in developing a strategic plan for the course, as well as instituting a dedicated water management plan to help nurse the course’s playing surfaces through years of prolonged drought.

“Andrew was an inspiration to all, and Maryborough Golf Club was blessed to have such a dedicated course superintendent. His legacy and friendship will be fondly remembered by all who were privileged to know him.”

REGINALD MCLAREN (1932 – 2021)

Former ASTMA Distinguished Service Award winner Reg McLaren passed away on Wednesday 17 November after a long illness. He was 89. One of a pioneering group of golf course ‘greenkeepers’ and ‘curators’ to emerge in NSW between the 1950s and 1970s, McLaren started out in horticulture and turf management as a trainee with the Concord Council in 1946. After a couple of years there he moved across to Concord Bowling Club, before taking on his first golf course role at The Australian GC, a course where his grandfather had been a curator.

After a period at Concord Golf Club, in 1957 McLaren moved out to Sydney’s western suburbs where he took over as head curator of Cumberland Golf Club, a position he would hold for 11 years. After finishing at Cumberland, McLaren headed back to Concord as course manager before leaving to take on the construction superintendent role at the new Liverpool Golf Club, starting there just before the Christmas of 1970.

During his years at Cumberland, Concord and Liverpool, McLaren would serve an



Reg McLaren was bestowed the ASTMA’s highest honour – the Distinguished Service Award – in 2007

impressive 20 years on the Board of what was then the NSW Curator’s Association,

the current day NSW Golf Course Superintendents Association. That included nine years as president, served across two stints. For his dedication and commitment to the state association, in 2002 the NSWGCSA granted McLaren life membership.

Five years later, at the 2007 Australian Turfgrass Conference held in Cairns, McLaren became the 17th recipient of ASTMA’s Distinguished Service Award. In doing so he joined the likes of fellow NSW turf luminaries Vince Church, Peter McMaugh AM, Dr Peter Martin, Peter Brown and Rube Walkerden (posthumously awarded in 2004). Upon winning the award, at the grand age of 75, McLaren commented:

“To win the award is quite out of the blue. It was a complete surprise to get it and I think it would have surprised a few others out there. I think they probably thought I was dead! I’m pleased in my mind what I achieved in my time, even if it did cost me my health. It was all for the one aim of bettering the NSW association and it’s very pleasing to see where it (the state) and ultimately the national association, has come to today.”

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