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Turfgrass

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MANAGEMENT JOURNAL

Flood recovery wrap

Yarrawonga Mulwala, Kew and Barwon Valley

Problem patches

Novel patch diseases and their causal agents

Measuring up

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Back from the brink

Latrobe Golf Club's new lease on life

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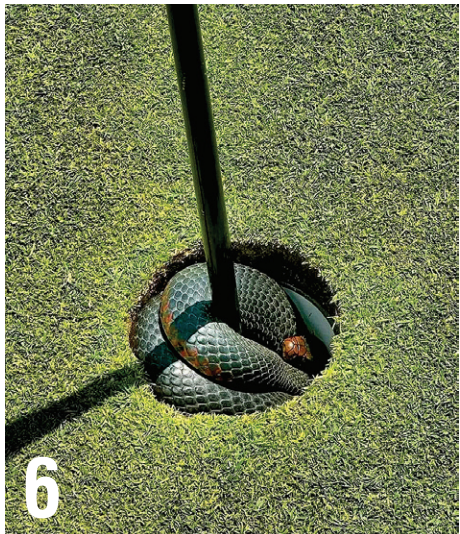
LATROBE'S NEW LEASE ON LIFE 8

When the final putt dropped on the fourth playoff hole of the WPGA's Melbourne International tournament in mid-January, it signalled the end of a remarkable period for Latrobe Golf Club superintendent Nathan Turner and his crew. Just a few months earlier the course had been decimated by two severe floods, which fast-tracked the club's decision to convert its cool-season fairways to couchgrass. ATM editor Brett Robinson catches up with Turner to reflect on what has been a whirlwind start to his tenure at Latrobe.

Cover: The 12th green on the Murray Course at Yarrowonga Mulwala Golf Club Resort became an island during last October's flooding. **Photo:** David Warnaar.



PHOTO: AUSTRALIAN GOLF MEDIA



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PHOTO: GARY BEEHAG

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Coping mechanism

If there is one trait a golf course superintendent or sports turf manager should never be without, it's a decent sense of humour, especially after what 2022 dished up for many across the country. Milton Berle, the famous American TV personality, actor and comedian, once noted that *"Laughter is an instant vacation"*, referring to its ability to take you away from the moment, albeit just briefly, and release feel-good endorphins which re-energise the soul.

One turf manager who knows all too well the importance of keeping a sense of levity when the silt hits the fan (pardon the attempted flood pun) is Colin Foster. Known affectionately throughout the Victorian golf course superintendent community as 'Shorty', Foster has plied the turf management caper for nearly 45 years and for the past eight has overseen the upkeep of the modest 18-hole Barwon Valley Golf Club in Geelong, Victoria.

Just one of the many wonderful characters this industry has a knack of producing, Foster has certainly had his share of knocks over the journey, but none quite bigger than the one he has endured in recent months. Over a six-week period, from mid-October through to late November 2022, as Victoria was lashed by continual rain events, Barwon Valley was inundated six times in as many weeks by the adjacent Barwon River.

With the Otway Ranges – one of the wettest regions in the state – as part of the river's wider catchment area, it was a mere inevitability that Barwon Valley, located on the southside of a wide sweeping bend in the river, would be swamped. It has happened on a number of occasions since the local council first built the course back in the 1970s – the club celebrated its 50th anniversary last year – but not quite to the extent experienced this past spring.

As the clean-up from each flood event began in earnest, along with a good pair of gumboots and a squeegee, Foster always made sure he packed his sense of humour. We all have different ways of coping with things when adversity strikes and for Foster it would be through sharing a joke or laugh with crewmates, the member volunteers who came out to help or the many colleagues who rang to check in on him that would get him through. Being able to make light of the predicament they were in and laugh about it gave them that brief respite, that "instant vacation" Berle talked about, and helped prevent them from getting down too much.

As an aside, if you read the excellent Victorian Golf Course Superintendents Association quarterly newsletter, do yourself a favour and check out the Course Reports section and peruse those from Foster and his Curlewis Golf Club counterpart Rob Bradley. The ex-pat Kiwi (and one-time goat whisperer – remember Morwood?) has for a long time used his course reports to trade hilarious barbs with his fellow superintendents, something which started back when Brad Marsden was in charge of another local course Clifton Springs. Since Marsden's departure a few years back, Foster has picked up the baton and run with it since arriving at Barwon Valley and the to-and-fro between the two elder statesmen (sorry gents) always elicits plenty of laughs.

Another who could do little but laugh at the predicament he faced last October was Nathan Turner. Arriving as the new superintendent of Latrobe Golf Club in Melbourne's inner eastern suburbs on the first day of September, Turner was just six weeks into the role when the Yarra River broke its banks twice in two weeks, causing massive damage to Latrobe's cool-season fairways. As you will read in this edition's lead story, the club made the brave decision to convert its fairways then and there to Santa Ana couchgrass, necessitating a mountain of work for Turner and his small crew. With a proactive committee, as well as support from many industry colleagues, the project was successfully enacted in the lead-up to Christmas. While a massive achievement in itself, especially from a logistics point of view, what was even more remarkable was the fact that the club hosted the WPGA's Melbourne International tournament in the weeks that followed the fairways being reopened.

In this edition we look back at the recovery efforts that Turner, Foster and a number of other Victorian superintendents instituted at their clubs in the wake of the floods last spring. Just like their colleagues north of the border went through earlier in the year, their endeavours to get their facilities back up and running were above and beyond and a reminder of the work ethic which is a hallmark of this industry. Let's hope 2023 is a little kinder weather-wise for us all. Enjoy the read...



Brett Robinson, Editor



International turf experts to headline Adelaide conference

Welcome to this first issue of Australian Turfgrass Management Journal for 2023. I'd like to start by wishing all members and the industry a happy New Year from the Board and team at the Australian Sports Turf Managers Association; I trust that 2023 has started well for all.

The association has hit the ground running and a key focus in recent weeks has been finalising the education program for the upcoming Australian Sports Turf Management Conference to be held at the Adelaide Convention Centre from 19-22 June. In mid-January we released the full conference program in conjunction with announcing an outstanding group of prominent international and local speakers for this year's event. Featuring world-renowned turf management experts and practitioners from the USA, UK and Europe who will complement our experienced local sports turf managers, the Adelaide conference is shaping up to be one of the most informative yet.

The first two international keynote speakers confirmed were University of Tennessee weed management expert **Dr Jim Brosnan** and former St Andrews Links superintendent and current BIGGA president **Gordon Moir**.

Jim is considered by many in the industry to be a world-leading expert on effective strategies for controlling turfgrass weeds, particularly those evolving resistance to herbicides which is a rising issue for Australian sports turf managers. His research has taken him to some of the most prominent golf courses and sporting stadiums in the world to assist with weed management in playing surfaces. We are really excited that Australian turf managers will be able to hear updates on the latest research and cultural practices around this and the ability to share their experiences with him.



Australian Sports Turf Managers Association

Gordon needs little introduction and is a legend of the industry, having spent decades maintaining arguably the most famous turf in world golf and overseeing preparations for the most famous tournament in world golf – the Open Championship. The experience and advice that Gordon has to offer Australian turf managers on both an environmental aspect and also on staff leadership are extraordinary and we cannot wait to hear his insights during his time in Adelaide. I'm led to believe he may also be bringing some copies of his new book – *'St Andrews: The Greenkeeper's Tale'* – which he released last year and is reviewed in this edition (see page 72).

Joining Jim and Gordon in Adelaide will be fellow internationals **Dr Nathan Walker** and **Dr Andy Owen**. Nathan is an integrated pest management and turf pathology expert from Oklahoma State University, while Andy is ICL Turf and Landscape's international technical manager. These are the first in a number of speaker announcements that the ASTMA will be unveiling over the course of the coming months in the lead-up to the event.

While the education component of the conference is especially important, a crucial aspect of each year's event is the two-day trade show. Pleasingly, this year's event completely sold out over six months ahead of the event, with a number of new exhibitors

coming on board. This year's trade show will cover a 3500 square metre footprint and feature more than 50 of the industry's leading product and service providers.

Shortly after the release of the conference program and announcement of our international speakers, the ASTMA opened up delegate registration (www.astma.com.au/conference/register-to-attend). ASTMA members can take advantage of discounted Early Bird rates up until the end of February.

Nominations continue to be taken for the National Turf Industry Awards which will be presented on the opening night of the Adelaide conference. Recognition can often be hard to come by and the annual awards represent a perfect opportunity for the industry to acknowledge the successes and achievements of its own.

Nominations can be made for the 2023 ASTMA Team of the Year Award (sponsored by Nuturf), the ASTMA Excellence in Sportsfields and Grounds Management Award (sponsored by Toro) and the ASTMA Claude Crockford Sustainability and Environment Award (sponsored by Syngenta). Nominations for the ASTMA Excellence in Golf Course Management Award (sponsored by Envu) and the two Graduate of the Year Awards (sponsored by Toro) are taken from the various state association award programs.

Looking ahead at the approach for 2023, the ASTMA team will continue to evolve initiatives relating to education and career awareness for the industry and expand its Women in Turf Strategy program through further support and mentoring opportunities, work placements and leadership education. Several of these programs were launched in 2022 with varying levels of success early on and all will be expanded upon this year. There will be several exciting developments for career awareness and talent attraction which will play a significant part of the association's activities over the 12 months ahead.

The second quarter of 2023 is shaping up to be significant for the association, with a range of announcements set to be released ahead of the conference in June. Following a number of discussions and working with our counterparts across the USA, UK, Canada and Europe, the group of national associations are working through the development of several international initiatives that will be shared and targeted at the continued promotion and awareness of the profession. Stay tuned for more information on these global initiatives throughout March and April. 🌱



Former St Andrews Links superintendent Gordon Moir is one of a number of expert international speakers confirmed for this year's Australian Sports Turf Management Conference in Adelaide



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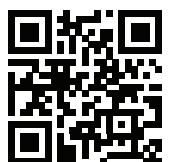
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Best on ground

ATM showcases some of the best social media posts and pictures from around the turf industry in recent months.



GLENELG GOLF CLUB COURSE MAINTENANCE

"Starting at greenkeeper time early on a Monday morning is hard work, but when this is our office we're pretty lucky. Jamie Gibson cutting the 18th green." (A stunning early morning sky captured by Glenelg GC biodiversity manager Monina Gilbey.)

GEOFF ELLIS

"Final rub-in ahead of our first event on the new Tahoma at Jubilee." (Jubilee Stadium's new couchgrass surface gets a topdress in mid-January.)



in DAVID STONE

"Photos taken over the last 12 months from our course rebuild here at Pymble Golf Club. Another 12 months to go and the course will be finished in time for the club's centenary in 2024." (Sydney's Pymble Golf Club continues to take shape and is looking a picture.)



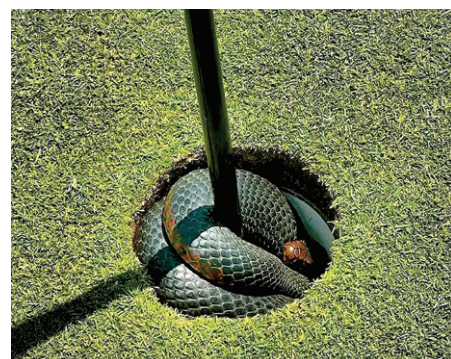
in MELBOURNE CRICKET GROUND

"Our Arenas Team joined in the tributes to Wornie at the 'G today, with the entire team wearing wide brim floppy hats to honour the King of Spin!" (The MCG crew get into the spirit of honouring the late great Shane Keith Warne during the Boxing Day Test.)



f PETER FRASER

"Tahoma 31 went down today and TifEagle green now at 3.5mm." (It was a busy summer for the Hervey Bay G&CC crew reconstructing the 11th green complex which opened in February.)



f AUSSIE GOLFER

"Gimme putts only at The Coast Golf and Recreation Club." (A four-foot long red-bellied black snake caused a hold up after taking refuge in the hole on the 2nd green at The Coast G&RC in Sydney's eastern suburbs.)



Back from the brink

Dealing with two major floods in a fortnight, converting fairways from cool-season to warm-season in a two-week period before Christmas and then hosting a WPGA tournament in January... As ATM editor Brett Robinson writes, it was an eventful first few months for new Latrobe Golf Club superintendent Nathan Turner.

Sitting in the confines of the Latrobe Golf Club clubhouse, Nathan Turner has just spent the best part of an hour recounting what can only be described as a remarkable first five months of his tenure at the Melbourne club. It's the morning after the dramatic conclusion of the Melbourne International WPGA event where Queensland's Cassie Porter won after a four-hole playoff. Outside, the crew go about their preparations as members start to trickle in through the front gate for their Monday morning round.

As Turner winds up discussing some planned course works, a group of lady members enter the lounge, deliberating what type of coffee they are going to have ahead of their round. After ordering, one of them faces Turner and says, "Nathan, can I just say congratulations. The girls [WPGA players] just thought it was fantastic and they were really happy. It was a major weekend for the club after everything we've been through and you and your team have done a wonderful job." Thanking her for her kind words Turner adds, "I'm definitely starting to relax a little bit now."

When the final putt dropped on that last playoff hole, it signalled the end of an extraordinary period for Turner, his crew and Latrobe Golf Club as a whole. Three months earlier, in mid- to late-October, the course was trashed by two severe floods in as many weeks. As well as the mammoth clean-up effort, the club also made the bold call to fast-track the conversion of its cool-season fairways to couchgrass, all this before turning the course around for a Tour-level event. Having only started at the club just six weeks before the floods, it was a baptism of fire for the new



Latrobe Golf Club was inundated twice in two weeks last October with all except two greens going under on each occasion. The second flood, pictured, caused much more damage than the first



Latrobe's five-hole short course, routed around the irrigation dam, was the first part of the course to go under

instead landed a job at Horsham Golf Club. Ironically, on his very first day there, Pelican Waters called him and told him he had the job if he still wanted it... That sliding doors moment proved a blessing as working under then Horsham superintendent Tim Warren would give Turner the perfect platform from which to launch his turf management career.

Horsham had a policy that once you completed your apprenticeship you had to move on. At that time, Turner's sister was working on Hamilton Island and during a visit there he played a round on the newly opened course on Dent Island and asked superintendent Brad Hole if there were any jobs going. That turned into a 12-month stint on the island which got Turner thinking about travelling. After a year back in Victoria working on the Old Course at The National Golf Club, he applied for The Ohio Program and was duly accepted. In the US for 18 months, Turner interned at Kirtland Country Club (Ohio), The Club at Mediterra (Florida) and Congressional Country Club (Washington DC).

Coming back to Australia, he picked up a seasonal position at New South Wales Golf Club and had intentions of heading to Scotland to work as a seasonal at St Andrews. A combination of factors, including the ill health of his father, would see Turner return to his home state instead, picking up the assistant's role at Sanctuary Lakes which was managed by Programmed. He was then appointed superintendent of the nine-hole Geelong Golf Club before joining Global Turf and dabbling in the construction side of the industry.

After nearly two years there, Turner got back into maintenance with a six-month stint at Portsea Golf Club, before receiving a call from Programmed asking if he wanted the superintendent gig at Growling Frog on Melbourne's northern outskirts. For the next

three-and-a-half years Turner would make the two-and-a-half-hour round trip to and from 'the Frog' every day from his home in Aspendale Gardens in Melbourne's bayside suburbs. In his first 12 months, Turner managed to raise the course's ranking by 17 spots, making significant gains on conditioning and doing so on a modest budget.

One of the members at Growling Frog was Scott Irving, the long-serving superintendent at Latrobe Golf Club. Turner had gotten to know Irving well during that time and when he saw the superintendent ad come up for Latrobe – Irving had accepted a role with Maroondah City Council – Turner quizzed him about it. With the appeal of Latrobe being a private club and with greater resources – and a little closer to home too – Turner put his CV in and was ultimately successful.

After a full-on time at Growling Frog, Turner was hoping to have a short break before starting at Latrobe, however, with renovations locked in for September that was never going to happen. Turner got stuck in straight away and in his first week successfully navigated his first greens and tees renovation. The surfaces responded well and were back in play not long after. Along with altering a few fairway mowing lines, lowering cutting heights around greens and rebuilding a few bunkers, Turner had managed to get some early runs on the board. There were a few challenges though, with some staff deciding to move on, but that would pale in comparison to what was about to hit just six weeks into his tenure.

WHAT DO I DO NOW?

Latrobe Golf Club is one of a number of courses in Melbourne's inner eastern suburbs that reside on the banks of the Yarra River. Immediately neighbouring Latrobe are Green Acres, Kew and public course Ivanhoe, while

superintendent, but together with his crew and the support of a proactive management, Turner has helped to bring Latrobe back from the brink.

NEW BEGINNINGS

Turner's arrival at one of Melbourne's larger private clubs last September was the culmination of a long and interesting journey for the now 33-year-old. Originally from Mortlake in Victoria's Western District, Turner played golf at his local club and as a 14-year-old would change holes and cut greens on Saturday mornings. Not overly keen on finishing school, he wanted to pursue a career in greenkeeping and started applying for jobs. One of those was at Pelican Waters on the Sunshine Coast and he actually flew up there for an interview. After not hearing back, Turner

PHOTOS: LATROBE GC/NATHAN TURNER/BRETT ROBINSON



Latrobe's iconic and emblematic English oak next to the 8th tee got wet feet during both flood events. This photo is taken from the adjacent 12th green which is nearly a foot under water

further upstream are Freeway GC, Yarra Valley CC and Rosanna GC. The river comes in from the northeast side, looping its way around Latrobe's five-hole short course which is routed around a triangle-shaped irrigation dam. From there the river runs down the entire left-hand side of the par five 2nd before making a right hand turn behind the 2nd and 4th greens and following the club's 5th and 6th holes along the southern boundary.

Floods have been a constant throughout Latrobe's 75-year history – its last major one coming in 2011 – and after a wet September and start to October there was an uneasy feeling that it could happen again. A 50mm dump in early October on an already saturated catchment sent river levels north and after further heavy falls the warnings started to come. On the phone regularly to Kew superintendent Cameron Hall just a few bends upstream, Turner and his crew started to take some precautionary measures for what was to inevitably come. Staff started removing satellite boxes along with course furniture, flags and

tee markers, while everything in the shed was put up high, just in case. From that point on it was watch and act.

On Friday 14 October, the Yarra River broke its banks for the first time and started spilling onto the course. Access to the short course area, which sits lower than the main course, was already cut off by the time Turner arrived at 6am. With water flowing steadily in from the 2nd, 5th and 6th holes, Turner spent the next 12 hours watching the course slowly disappear under water.

"It was pretty surreal," reflects Turner. "I had dealt with some minor floods when I was at Kirtland in the US, but that was only one or two holes and nothing like this. I stayed at the course the whole day watching it come in. There was nothing I could do, but I wanted to see it come in because I didn't think I'd see it again – little did I know! By 6pm pretty much the whole course was covered, with water lapping at the back bunker on the 18th green. All except two greens were under and I was like *"What do I do now?"*



With the inundation occurring on a weekend, Turner told his crew to rest up and be prepared to come in on Monday to go to work. And work they did. After the flood peaked on Sunday, water levels dropped at a steady rate in the days that followed. As soon as greens popped out, they were hosed down and squeegeed off, with most greens taking between 2-3 hours each. The course's three newer greens – 7, 8 and 18 which had been reconstructed about six years prior – suffered the most damage. Water came up through their drainage systems and when receding effectively acted like a vacuum, sucking out the sand and leaving depressions in the surface. While the 7th was easily repaired, 8 and 18 would ultimately require rebuilding later on.

Once they were able to get machinery out on course, the greens were solid-tined and sanded with a walk-behind pedestrian spreader. As the fairways slowly dried out, they were sliced to get some air into the profile, while a planned volunteer day saw 80 members turn out to begin the arduous task of removing silt out of the bunkers. There was also a lot of tree damage, with 40 medium to large trees down throughout the course.

Two weeks after the flood, Turner and his crew, with the help of the volunteers, had managed to get the course back up as best they could and a meeting was held on Thursday 27 October to discuss the possibility of reopening the following Monday. That plan quickly went out the window, however, and the very next morning it all started over again.

DEJA-VU

"Crazy, crazy this morning, trying to navigate our way around to mow greens before going under again. Fantastic effort from the guys. Access to most of the course has now been cut off." That was Turner's tweet on Friday 28 October as the Yarra River broke its banks for a second time in as many weeks. Coming in much quicker this time, staff were nearly caught out while trying to give the greens one final cut, with Turner having to call them off the course in case they got stranded.

Unlike the first flood, water would continue to flow in over the next 5-6 days, taking a different path through the centre of the course. The water also hung around a lot longer and was slower to recede, causing a heap more damage as a result, especially to the fairways.

With the water coming in for a longer period and taking longer to exit, heavy silt deposits would settle this time. What had been a 2-3-hour exercise to clean off each green after the first flood became a minimum four-hour slog. Some greens they couldn't

Course staff were nearly caught out getting a final cut on greens as flood waters quickly entered the course during the second flood

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Members of the Latrobe crew get to work cleaning off the 2nd green after the first flood. A 2-3-hour exercise after the first flood turned into a four-hour slog per green following the second flood

even access, with the 5th and 17th greens remaining islands for nearly two weeks. Despite the predicament, the whole club pulled together and at varying stages Turner and his crew were joined by staff from the clubhouse and pro shop and member volunteers.

Turner was particularly mindful this time around not to over-extend his crew. Mentally it was tough knowing they were back at square one, especially after having the course nearly back open from the first flood, and with a busy summer ahead he didn't want to burn them out. To that end he made sure the crew all worked normal hours each day, even if they were a full-on eight hours.

BIG DECISION

With the greens cleaned off, the conversation turned to what was going to happen with the fairways. Unlike Green Acres and Kew who some time ago had converted their fairways to couchgrass, Latrobe had persevered with a cool-season mix. Although damaged after the first flood, they were still salvageable, but

after being under water for the best part of 2-3 weeks during the second flood, the damage was almost irreparable.

Two fairways, however, were the exception. In the spring of 2021, during the last year of Irving's tenure as Latrobe superintendent, the 6th and 12th fairways were line planted with Santa Ana couchgrass. This had followed the earlier reconstruction of the short course holes which had also been turfed with Santa Ana. Compared to how their cool-season counterparts had fared, the two warm-season fairways on the main course were in much better shape and it quickly came to a head that the club had a very big decision to make.

"There was really no argument that when the waters receded those two holes were the standouts," explains Turner. "The cool-season fairways were a mess and the turf was rotten. We couldn't get machinery on them and the ones that we could get on we could only cut at 16mm. Six and 12 on the other hand we were able to drop them to 8mm and start to really work them. We gave them a good groom and

got as much silt out of the top of the profile as we could and aerated them.

"From a sustainability point of view, converting the remaining fairways to couch was definitely the way we had to go. The Board could see how good those two fairways were, so it then became a question of whether we wanted to put the members through a line planting program or sodding them and getting them back into play as quick as possible. Given we had the Melbourne International looming and the club still wanted to host the event, turfing was the only realistic option.

"We started to make enquires about sourcing six hectares of Santa Ana turf in maxi rolls at short notice and sorting out the logistics of doing it. I probably didn't realise at the time how big an issue supply was, but after a lot of phone calls we managed to get what we needed. Green Turf (Matt Dowlan) was able to get 3ha and I was able to source the remaining 3ha from Sun Country Turf just outside of Cobram. James there was fantastic and the quality of their turf was outstanding.

"It was then up to the Board to make a quick decision and to their credit they did. These sorts of decisions can take months if not years, so for the Board to be that proactive was fantastic. I'm not sure how we pulled it off, but we did and it was a big win for the club."

ROLLING OUT

With the conversion approved, two weeks before the first rolls arrived Turner and his crew rebuilt the 8th and 18th greens which had sustained damage during the first flood. Turf was removed with a sod cutter and set aside, before 100mm of thatch was stripped out and fresh sand imported. Amendments were applied before each green was reshaped and the turf re-laid. As part of the reshaping process, both greens had some of the contouring altered slightly to create more pin placements.

On Monday 5 December, the fairway conversion began in earnest. Green Turf brought in a Koro Topmaker and shaved off the compromised turf from 13 fairways, with the material stockpiled in the out of play areas for removal later. Amendments were spread – Mineral Magic on a few select fairways and Agrisilica on the rest – before the first trucks laden with turf started rolling through the gates on 8 December. Former Latrobe member and McMahons business development manager Theo Maroulakos kindly loaned two tractor-mounted maxi rollers and together Turner and his crew worked in tandem with Green Turf to start laying the turf (3ha each).

The two teams smashed out between 3000-4000m² each day and despite a few logistical issues with getting trucks in and out



Around 60 medium to large trees came down across the course during both flood events

due to curfews, the last roll was eventually laid on Christmas Eve – 13 fairways in essentially 14 days. Providing some welcome assistance with the laying were Mark Burchell and his fellow Melbourne Polytechnic teachers who helped unload and ferry the maxi rolls around the course.

The front nine holes, which effectively loop around the club's boundary, were laid first so that the members could get back out on the course as soon as possible given they hadn't played since mid-October. The last roll of turf on the 5th was laid on Friday 16 December and come Saturday the members were out playing, with tee-up provisions in place on the newly laid fairways. The back nine holes were then completed, while Turner would also later source some turf from Metropolitan Golf Club (who were reconstructing their 19th hole) to use around the greenside bunkers on the par three 9th.

The focus then turned to the grow-in and also putting plans in place for the Melbourne International which was teeing off on 21 January. With an old irrigation system only allowing a maximum of eight heads to be on at any one time, Turner spent some long days between Christmas and New Year juggling watering windows to keep moisture levels adequate within the freshly laid turf. With temperatures increasing and a spell of mid- to high-30s around Christmas, a lot of water had to go on, but the warm conditions did provide ideal growing conditions and the new turf quickly took root.

While the grow-in progressed, attention also turned to reinstating the course's 48 bunkers. Earlier, during the turf laying phase, contractor Josh Irving (Scott Irving's son) had come in and shelled out all the silt from the bunkers and repaired and reshaped those which had suffered structural damage. The old bunker sand was stockpiled and later used to topdress fairways. Once the bunkers were cleaned up, over a two-week period Burdett's trucked in around 800 tonnes of fresh sand to top up the bunkers, with the last one being filled on the Tuesday before the Melbourne International.

Right and below: Turner and his crew had to repair the 8th and 18th greens after they sustained damage in the first flood. The existing turf was sod cut and set aside, before 100mm of thatch was removed. After fresh sand was added, the greens were reshaped and turf re-laid



After the existing cool-season fairways were topmaked, six hectares of Santa Ana couchgrass was laid in maxi rolls across 13 fairways over a two-week period before Christmas

FINISHING LINE

All through this period, Turner had the WPGA Tour event as an end goal. Any special plans he did have for preparing the course had gone out the window with the flood, but he was still determined to present the course as best as possible for the two-day event.

Assisting greatly in that endeavour was the timely arrival of new assistant superintendent Ryan Thompson in the first few days of the new year. Thompson had served his apprenticeship at Sanctuary Lakes when Turner was assistant there and the two struck up a good friendship. In the years that followed, Thompson would head overseas to do an internship through The Ohio Program and most recently had spent over three years as an assistant at Sentosa Golf Club in Singapore.

Following the departure of former Latrobe assistant Brad Winnell last September, Turner offered Thompson the role, but he couldn't

start until the new year. Although missing all the fun of the flood and subsequent recovery effort, Thompson hit the ground running and didn't have a day off in the first month there. Given his experience with major events during his time at Sentosa, Thompson was charged with ensuring the greens would be tournament-ready, while Turner could focus on the remainder of the recovery works.

To even get the course in a position to be able to hold the Melbourne International was a major achievement and a testament to the incredible work put in by everyone. As well as the works immediately after the floods to clean off the surfaces and reinstate the course, 6ha of new fairway turf was laid, two greens were reconstructed, all bunkers were cleaned out and fresh sand imported and 60 trees cleaned up, all in an eight-week period.

As well as widespread appreciation from the membership, the WPGA was also full of praise for Turner and his team. Posting





PHOTO: NEARMAP

This Nearmap image was taken on 1 January 2023 and shows the recently laid Santa Ana fairways. Thirteen fairways were effectively sodded in 14 days, with the front nine holes completed first

on social media ahead of the tournament, accompanied by an aerial photo of the course before and after the floods, the WPGA commented: "A huge shout out to the team @LatrobeGC, led by course superintendent Nathan Turner, who have done an incredible job in making this weekend's WPGA Melbourne International possible after the devastating floods and a complete course reno."

"I was extremely happy with how the course came up for the tournament, especially considering what we had just been through," reflects Turner. "I think the ladies were in shock at how well the place played, especially the fairways. When you consider they were only six weeks old it was pretty amazing. You always want things to be better and it would have been nice to have a full month to prep everything, but given the circumstances we had to face it played pretty well."

"I can't speak highly enough of my team, the club and everyone that helped us to get

the course back and to be in a position to still host the tournament. My guys turned up every day when the going was tough and did what needed to be done without hesitation. I'm sure they all thought I was joking when I told them we had to lay 30,000 square metres of turf in the two weeks before Christmas – that was a big test for a new superintendent!

"It has definitely made us closer as a group and in a way it has galvanized the whole club as well. There is a really good vibe within our team, with the members and with the club at the moment and the feedback and positive comments we have received has been very humbling and overwhelming. To everyone's credit we got there and I think we outdid ourselves in the end."

Editor's Note: In a lovely postscript to this story, along with everything that Turner was dealing with on the work front, throughout the whole period he and wife Hannah were



800 tonnes of fresh sand was brought in ahead of the Melbourne International to help reinstate the course's 48 bunkers

preparing themselves for the arrival of their first child. Obviously sensing all the drama that dad had been through already, the little one, who wasn't supposed to arrive until late March, decided to come much earlier than expected. Born on Friday 17 February, young Billy, named after Turner's father who passed away a couple of years ago, came into the world in a hurry at just 33 weeks. Although needing specialist hospital care in the early weeks, ATM can happily report that bub, mum and superintendent are all doing well. 🙌

Left: The Latrobe Golf Club crew (from left) Luke Bolt (foreman), Ryder Geddes, Nathan Turner (superintendent), Ryan Thompson (assistant superintendent), Bradley McBride, Carlos Flores and Tobias Engevik. Absent is Duy Nguyen

Below: Latrobe's 18th green on the eve of the Melbourne International tournament



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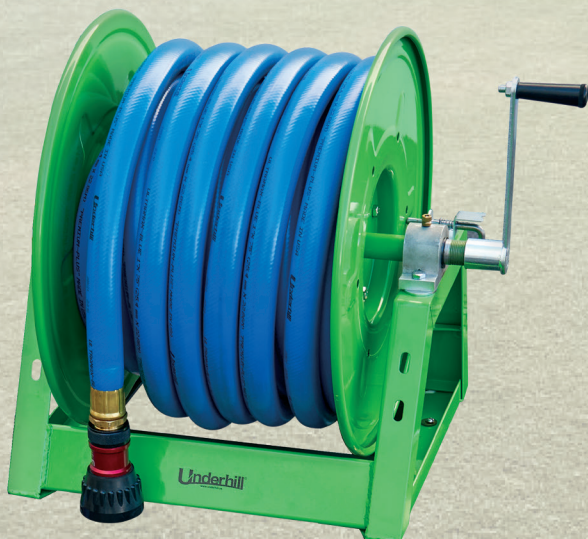
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PHOTOS: BARWON VALLEY GC/CAMERON HALL (KEW GC)

After Australia's eastern seaboard copped a hammering in the early and middle parts of 2022, last October and November it was the turn of Victoria. ATM looks at the flood recovery efforts at Barwon Valley, Kew and Yarrowonga Mulwala golf clubs and the long road back.

It was one of the more striking images to come out of all the floods which beset many golf clubs and sports turf facilities around Australia in 2022. Wedged up against the fence at the end of the Barwon Valley Golf Club driving range, the bulk of the club's course machinery fleet was parked up tight, one behind the other, on one of the last remaining patches of dry ground.

Less than a metre away from the 12 machines, which ranged from fairway mowers, rough cutters and greens mowers to topdressers, sprayers, blowers and utility vehicles, a sea of murky brown water from the adjacent Barwon River lapped ominously.

It would be a scene repeated not once, not twice, but on six separate occasions as Barwon Valley, located in the Geelong suburb

of Belmont, endured a period the likes of which superintendent Colin Foster, a 44-year industry veteran, had never experienced before. As unrelenting rain systems swept across Victoria last spring, almost every week for six weeks Barwon Valley was swamped, including three major and three minor flood events.

The first inundation came on 9 October and the last on 21 November. The two worst floods, on 14 October and 15 November, saw river levels rise to 3.86 metres and 3.84m respectively, not far off what is considered 'major' flood level. (To put things in perspective, the course usually closes when river levels reach 2.2m). That first major flood (14 October), would cause the most damage, leaving silt deposits up to eight inches thick on the lower reaches of the course.

During the three major flood events, pretty much the entire course, with the exception of one-and-a-half greens situated in the southern corner of the property, was consumed. The pro shop and maintenance facility had a metre of water through them, but thankfully the club's two irrigation dams were spared, just.

Damage to the shed and equipment was also thankfully kept to a minimum as the club was given plenty of warning by the local council. As mentioned, the bank that surrounds the perimeter of the driving range



Barwon Valley GC was inundated on six separate occasions in October and November 2022. This image, taken from the northern corner of the property looking south, shows the three worst affected holes – the 4th (to the left of the irrigation dams), the 8th (to the right of the dams) and the 3rd green site (bottom left)

Opposite: So close... a narrow strip of turf on a bank at the end of the Barwon Valley Golf Club driving range became a makeshift machinery storage area during the peak of the October-November floods

(designed more to keep balls from feeding onto the adjacent 1st fairway and green), became a very handy makeshift car park. Other important items in the shed were lifted out of harm's way, with only a few minor losses of product.

The 'minor' floods in between, which varied from 2.61m to 3.05m, didn't cause as much damage but hampered recovery efforts dramatically. They effectively undid all the hard work that Foster, his small crew of three and some hardy member volunteers had achieved to salvage the turf surfaces and put them back at square one.

"It was like Groundhog Day," reflects Foster, who has been superintendent at Barwon Valley for the past eight years. "You could almost set your clock by it. Each day we'd come in, put the gumboots on at the front gate, grab a squeegee and off we'd go. Same job, every day. We'd get all the greens cleaned off, but then it would rain again, the river would come back in and you'd have to start from scratch. It didn't feel like we were making any progress.

"Seeing all our work go to waste was very challenging. Mentally, not having that finish line and not being able to give the members a date that we expected the course back open was tough. It was by far the hardest thing that I have been through. I've experienced construction and irrigation issues and dealt with difficult committees, stuff that all superintendents go through at some point, but this was different and by far the worst."

BOUNCING BACK

It wasn't until 9 December, two months after the first flood hit, that Barwon Valley was able to get its driving range open, while it took a further 10 days before the back nine holes were opened for play, just in time for Christmas. Shortly after New Year, a makeshift 15-hole layout was brought into play, with members playing the back nine first, followed by holes 1, 2 and 9 before finishing with 5, 6 and 7. At the time of this edition going to print in late February, the worst affected holes – 3, 4 and 8 – were still a few weeks from coming back into play.

Despite multiple inundations and widespread damage to the course, Foster has been pleasantly surprised with how resilient the turf surfaces have been in the weeks and months that have passed. In recent years, Foster has been working hard to improve the biology in the bentgrass/*Poa annua* push-up greens to improve their health. Although losing a bit of turf (about 100m²) on two of the worst



Barwon Valley members rallied around multiple times to assist Foster and his crew to clean silt off greens

affected, the majority of the greens have come back well, especially considering they had little to no inputs for the best part of two months.

Aware of the potential long-term impact of silt migrating into the profiles, once the weather had normalised Foster engaged the services of Greg Whiteley and his team from Turf Conditioning Services. Coming in early December, they were able to give the greens a core and heavy topdress, with the surfaces also being verticut and Vertidrain on a couple of occasions since. Foster says they have worked the greens pretty hard and says they are back to performing pretty much how they were before the floods.

The fairways, however, have been a different story. The 15 that came back into play were virtually left to their own devices, although after the second major flood a swamp dozer was brought in to start removing silt in areas where it was heaviest. In some of the photos of the 4th hole that the club shared on its Facebook page, you can see a hardened cracked layer of silt from the first flood underneath the fresh deposits of silt from the most recent inundation.

A saving grace in many respects was the work the club did, going back a number of years, to convert the fairways to Santa Ana couchgrass. Again, Foster has been surprised by the Santa Ana's resilience to bounce back and since the first signs of recovery could be seen they have been doing whatever possible to promote it. Although hamstrung in regards to fairway irrigation, because of the late start to the irrigation season Foster has had some water up his sleeve, enabling him to give those recovering areas additional light feeds and an extra splash of water to help them along.

As for the three worst fairways – 3, 4 and 8, which were effectively under layers of silt the entire time – at one stage Foster thought they would be unsalvageable and got a price on running a Topmaker over them and re-turfing. Unfortunately too expensive an option to consider, the use of the swamp dozer and a loaned Ventrac unit with power broom attachment has enabled staff to clean them up as best they can. Some grass is starting to come back and when those holes do eventually reopen there will be restricted areas and no play zones to help protect the turf.



A swamp dozer was brought in after the second major flood to help shift built up silt deposits on the worst fairways



During the three major flood events at Barwon Valley, pretty much the entire course, with the exception of one-and-a-half greens, was consumed

A FEW TEARS

Just as the turfgrass has shown its resilience, so too have Foster and his crew. Cleaning up after major floods can put teams under great stress, especially as the focus falls on them to lead the recovery process. While Foster admits they all had their moments, there were a few things that helped to get them through. With just one other full-timer on the crew (Gary McKenzie-McHarg) and two part-timers, Foster says he was blessed with how well they tackled their work and their ability to not be fazed by the situation.

"The one thing I really learnt, aside from how resilient turfgrass can be, is that the best way to deal with adversity is through a good sense of humour," says Foster.

"Myself and Gary would always have a laugh and bounce jokes off of each other. We never allowed ourselves to get down too much. As much as it wasn't fun, you had to make light of the situation. Would you believe it was Michael Riordan who taught me the importance of that, which in itself is funny because he's not the sort of bloke you'd think you could learn too much from!"

While there were tears of laughter during some moments of the clean-up, on other occasions Foster was legitimately brought to tears and not just because of the predicament his club was facing. Instead, it was the generosity of those within the industry who were willing to either get on the end of a squeegee or shovel, loan machinery and equipment or just pick up the phone and check in on how they were travelling.

Foster is quick to laud the many superintendents who all sent staff at various stages to assist with the clean-up, among them Craig Molloy (Barwon Heads GC), Steven Hewitt (13th Beach) and Rob Bradley (Curlewis GC). Other superintendents from around the district, including Steve Burchett (Portarlington GC), Keegan Powell (The Sands Torquay) and Brett Balloch (Anglesea GC), would also regularly touch base. Peter Frewin, a past superintendent at Barwon Heads who is now with Syngenta, also offered whatever assistance he could.

Along with their help, Foster says the support from club management and the Board was fantastic, while the many Barwon Valley members, some of whom Foster had never met before, willingly gave up their spare time to come in and help push silt off greens.

One example in particular, however, sticks most with Foster. Just a few months before the floods, Barwon Valley had signed a new



Barwon Valley's 4th hole, which resides right next to the Barwon River, was one of the worst affected

deal with John Deere/Brandt which would see the club change over its maintenance fleet from red to green (thankfully the new gear would arrive after the floods hit). In the midst of the recovery efforts, Foster took a call from Toro area sales manager Dean Hill offering him the loan of a Ventrac unit which they were demoing at the time. The unit was subsequently put to work for a couple of weeks on the three worst fairways and did wonders to improve their dire situation.

"I actually get emotional talking about it," admits Foster. "For Dean to do that, after we'd signed a new deal with a rival company, who have been fantastic as well, just shows how

wonderful people are and what a great industry this is. The offers of help and the calls to see how we were going was overwhelming.

"Another was Craig Molloy. I'd only met Craig a few months earlier shortly after he started at Barwon Heads. It was at Peter Frewin's 60th and I jokingly said to Craig, 'You do know that you're our big brother and you have to look after us.' We had a laugh about it at the time, but little did we realise it would actually happen. Sure enough, one day Craig sent nine of his staff up to help and he came up himself. It was wonderful – we didn't even have to ask, they just came and offered assistance which was very much appreciated."

DOUBLE TROUBLE

"Here we go again. No flood for 11 years and now two in two weeks..." That was the tweet that Kew Golf Club superintendent Cameron Hall (CSTM) posted late on 27 October 2022, accompanied by a video of water rushing across the 3rd fairway. You could sense the deflated tone in Hall's post, especially considering the heap of work he and his crew had undertaken over the previous two weeks following the first flood. Indeed, a few days earlier, on 25 October, Hall was seemingly upbeat when he posted, "Starting to resemble a golf course again. Fairways been combed 2-3 times and cutting now occurring on 16 of the

YARRAWONGA MULWALA GOLF CLUB RESORT – MURRAY COURSE

With well above average rainfalls throughout 2021-22 leaving the vast Murray River catchment saturated, it was expected that the Murray-Darling Basin Authority would release water from Lake Mulwala in September and October 2022. Yarrowonga Mulwala Golf Club Resort is situated right next to the North Gate weir which regulates the river's flow downstream. During September the 18-hole Murray Course was under a moderate flood due to increased water releases that stopped all golf being played and it became a guessing game as to how long and how severe it would get.

On 16 October 2022, the golf club was notified that the North Gate would be opened further after a large rain event. All dams upstream (Hume and Dartmouth) were spilling over and air space was needed in Lake Mulwala to allow for the expected large inflow. Outflow from the North Gate increased from 70 to 130 megalitres a day which saw the Murray Course quickly inundated, with 85 per cent of the course going under in the days that followed. Fifteen holes were cut off from the rest of the facility, however, we were fortunate that none of the greens went under and staff could still access them with a tinny to perform basic maintenance.

After navigating the course by boat it was evident this flood was going to be as big as 2016 and we could see many significant trees had already fallen over due to the ground being saturated. On one day alone just before the major flood, we had 12 large trees all go in quick succession. One would fall and it would loosen the soil up and the one next to it would go – it was like watching matchsticks topple.

It wasn't until December when flood waters started exiting the course that we could start the long process to get the course back ready in time for the busy holiday season. An audit of trees was required before any staff and volunteers could enter the Murray Course as up to 60 100-foot high



PHOTO: DAVE WARNAR

The 12th green on the Murray Course at Yarrowonga Mulwala Golf Club Resort became an island during the height of the October floods

river red gums had toppled onto the fairways. We had a large job ahead of us, with the clean-up comprising the following:

- A team was put together to remove a large number of fallen trees, with forestry equipment brought in to make light work of their removal.
- Gravel cart paths were repaired with the club's earthmoving equipment.
- Repairs made to bunkers, replacing sand and drainage.
- Removal of silt washed on to all turf playing surfaces. Greens were lightly scarified, bayonet tined and dusted.
- Mowing of fairways, tees and surrounds back to their usual cutting height was a very slow process. Some areas hadn't been mowed for 12 weeks.
- Herbicide applications were applied to control weeds that had been out of control, while fungicide was applied to all greens to control pythium.
- Fairways, tees and greens were fertilised.

- Pumps were set up to remove water from the lower lying areas of the course.
- A band of 50 member volunteers helped to pick up all the rubbish that had been left deposited over all fairways.
- Volunteers removed dead plants and planted new specimens in and around the landscape areas and replaced mulch that had been washed away.
- Safety repairs were made to cart and foot bridges.

Following all the remedial works, a full safety audit was completed and the green light was given to open the Murray Course on 16 December. There are still many jobs left to complete over the months ahead to restore the Murray Course back to its original beauty, but we are knocking them off gradually and glad to see the members and golfers back out playing.

Chris Burgess
Superintendent,

Yarrowonga Mulwala Golf Club Resort



A slow tsunami... water creeps gradually across Kew Golf Club after the Yarra River breaks its banks for a second time in as many weeks in late October

18 fairways while greens that went under have been cored with 5/8" tines." Now, however, they were back at square one.

It was 4am, Friday 14 October when Hall had arrived at his course in Melbourne's inner eastern suburbs to find water cascading in over the levee bank behind the 13th tee and 12th green. After saturating rains for the best part of two weeks around the vast Yarra River catchment, it was only a matter of time before Kew and its neighbours Green Acres and Latrobe would be impacted. By the end of that Friday a total of 13 greens, 16 surrounds and 16 fairways were under water.

"It was unbelievable to witness," recounts Hall of the first flood event. "We knew we were going to go. We had a good dump of 50mm the week before and the river levels were pretty high then. With the forecast looking bad, we started bringing everything in off the course –

flags, furniture, rakes, markers etc – because we knew we'd lose everything otherwise.

"I woke up at 1am that Friday and looked at the warnings and saw that the river height at nearby Heidelberg was already 7.1m which was later upgraded to 9m, so that's when I knew we were in trouble. Water came in initially over the 13th tee and then as the river got higher it came in at multiple points. I got to the course at 4am and then I had to disappear off site at 8am. I came back at 10.30am and the place was virtually under. All we could do was watch from the clubhouse as it crept in like a slow tsunami."

In the two weeks that followed Hall and his crew, together with a strong contingent of Kew members (some days numbering up to 50), dutifully began the long clean-up as the water subsided. It was hard going, with some greens taking up to four hours each to clean

the silt and debris off. All the while Hall would pay close attention to the weather forecasts and rain radars and was fearful of what would happen if they were to go under a second time. Sadly, after another period of extensive rain in that last week of October, the inevitable happened again.

While levels the second time around were similar to the first, water receded significantly slower resulting in far greater damage. Ten greens were still fully under four days after the peak, with some of the playing surfaces not emerging for up to a week later. Once they did, they were prioritised, however, to compound matters Hall had to contend with a major irrigation issue. With two greens left to wash silt off, a major blowout occurred in the 150mm irrigation mainline on the 7th fairway which at the time was still 1.5m under water. Hall and his crew were only alerted to the issue when they noticed water bubbling up and to make matters worse the isolation valve was also under two feet of water!

Nearly a month after the second inundation, Hall and his crew had managed to get 12 holes back in play, a monumental effort considering the conditions they were working in. Posting on Twitter, Hall commented, "Six weeks after the first flood we finally welcome back members on a 12-hole layout. Conditions far from perfect but so proud of the guys to get something together. Still a long way to go in the recovery, but taking the small wins like the 11th green improving."

It wouldn't be until the end of November when the last remnants of flood water finally receded from the lowest areas of the course, allowing staff to start work on getting the 3rd hole back into play. A week before Christmas,



Three of Kew's greens had to be fully re-seeded, while 2500m² of fescue surrounds had to be re-turfed



Kew replaced 1.6 hectares of Santa Ana couchgrass, those areas topmaked and re-turfed with mega rolls

competition returned on a 17-hole layout and finally, after a backbreaking three months, by late January Kew had a full complement of holes back in play.

Posting on Twitter on 24 January 2023, Hall announced: "Great to finally be able to open the full 18 holes @KewGolfClub 101 days after we were flooded the first time back in October... 12th green reopened yesterday after turfing was completed on the 12th last week. Amazing effort by all the staff over the last three months."

An amazing effort it was too considering all the work that was undertaken. Across the two flood events, all 18 holes had water across them at some stage. Thirteen out of 21 greens went under water which resulted in silt deposits being left across surfaces once the water receded. Three greens – 11, 12 and 16 – needed to be fully re-seeded, while 2500m² of fescue surrounds were also destroyed



With the reopening of the reseeded 12th green in late January 2023, Kew was back to a full complement of 18 holes, 101 days after the first major flood event on 14 October 2022

and had to be re-turfed. Thirty-six out of the course's 41 bunkers were completely flooded, resulting in the need to replace all existing sand. Pleasingly the Capillary Concrete was not damaged and once all sand had been removed and the aggregate hosed down, the drainage was still working and fresh sand imported.

About 1.6 hectares of Santa Ana couchgrass needed to be topmaked and re-turfed with mega rolls. At one stage it looked like this was going to be closer to 3ha, but the efforts of the crew immediately after the floods – combing, coring, Vertidrainning, gypsum application and fortnightly fertiliser applications – saw most of the couchgrass come back.

Outside of the playing surfaces, all tracks throughout the course and the main maintenance track were washed away. Over 20 mature trees were also lost, their root balls compromised by the sodden ground

and eventually felled by the high winds which buffeted the course in the weeks that followed. Hall says that even now a number of the course's exotic trees, some of which were sitting in flood water for the best part of 2-3 weeks, are starting to perish.

One of the heartbreaking aspects of the floods was the significant damage to course vegetation. Over the past five years Kew had invested a significant amount of time and money into naturalising out of play areas around the course. Such was the extent of the work that Hall and the club were bestowed the ASTMA Claude Crockford Sustainability and Environment Award, sponsored by Syngenta, in 2020. Hall estimates that between 60-70 per cent of that vegetation work was damaged by the floods, with the most recent work carried out last winter wiped out. Thankfully, some of the more established areas are now showing signs of recovery and slowly regenerating.

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Tournament time

Maintenance crews on both sides of Port Phillip Bay were in the spotlight as the PGA Tour of Australasia descended for the TPS Victoria and Vic Open tournaments.

The Vic Open returned to 13th Beach Golf Links on Victoria's Bellarine Peninsula in early February, with course superintendent Steven Hewitt and his crew again showcasing the outstanding Beach and Creek courses during one of the most popular events on the Tour calendar.

After home-grown products Dimitrios Papadatos (NSW) and Hannah Green (WA) claimed the titles in 2022, this year it was the turn of the internationals to reign. Kiwi Michael Hendry collected his first Australasian title since 2017 and former two-time women's

British Open champion Jiyai Shin from South Korea won the women's. Shin did so after Queenslander Cassie Porter, who led the women's field for three consecutive days, had a horror final round 79, her game faltering in the wind which got up for the first time during the week. Shin, a former world number one, by contrast was a model of consistency and ran away to win by five shots. Hendry, who shot an even-par 72 final round, finished at 21-under, equalling the tournament scoring record set by Min Woo Lee in 2019.

Hewitt and his crew have become well accustomed to preparing the 36-hole

establishment for the tournament each year, with a 28 strong team working from well before dawn and after dusk to prepare this year's surfaces.

Getting both courses up to tournament standard is always a challenge at that time of year, with the facility heavily patronised from Boxing Day through to the week of the Open. Compounding matters a little this year was a very windy January, with both day-time and night-time winds making irrigation difficult. Distribution uniformity was a challenge, especially at night time with persistent winds between 15-20kph coming from the south.



The Creek Course at 13th Beach which hosted the Vic Open in early February. The mixed-gender tournament is played across both the Creek and Beach courses, with the latter hosting the final two rounds

PHOTO: 13TH BEACH/GARY LISBON

In among its usual busy summer golf schedule, Hewitt was able to get a good dust on greens and a final application of fertiliser (minimal nitrogen) to get the required pace out of the greens. They were rolled the Thursday before tournament week to get them to the 12-foot mark and were managed thereafter with a single cut each morning at 3mm which had them running between the desired 10.5' to 11' for the tournament.

Some 15mm of rain two weeks prior to tournament week helped with the uniformity on the fescue fairways of the Beach Course. That was the rain event where nearby Geelong

copped up to 90mm in parts, but fortunately the heavier falls skirted the course. It was a nice change of luck for Hewitt who has had to contend with more than his share of damaging weather events in the lead-up to past Opens. Less than two weeks out from last year's Open, a storm cell dumped 35mm which ruined all the bunkers, with the 14th fairway on the Beach Course taking a direct lightning hit.

"We had a further 7mm fall on the Friday and Saturday morning prior to this year's tournament which meant control over green speed was taken away a little," explains Hewitt. "Greens sped up to 12' on the Tuesday as

they started to dry out which was too fast. They were kept at 11' for the tournament week with a nice amount of bounce and check on approach shots which was perfect. I was very pleased with the consistent speed and ball roll on the greens over the four days."

With benign conditions greeting the field on the opening two days, the scoring was not surprisingly hot. On Thursday Deyen Lawson shot a course record 9-under on the Beach Course only to find himself two shots behind leader Ryan Ruffels. Ruffels had club officials running for the record books as he shot a career-best and equal course record 11-under



Brodie Fox cuts aprons while Joe Peck changes pins on the 13th hole of the Beach Course during the Vic Open

par 61 on the Creek Course. Ruffels matched the previous course record set by Jake McLeod in 2017 and in the process combined with playing partners Elvis Smylie (-7) and Nathan Barbieri (-7) to post a group total of 25-under par for the round.

Hendry would go close to emulating Ruffels' feat in the second round, posting a 10-under on the Creek Course to lead the men's field going into the weekend. Porter also shot a women's course record 64 (9-under par) on the Creek Course on Friday in perfect conditions. With tighter pins on the Saturday and the wind finally arriving Sunday and buffeting the course, scoring as much tougher over the closing two rounds.

HELPING HANDS

With COVID restrictions a thing of the past, Hewitt's crew was bolstered by a number of volunteers who made the trip down the Princes Freeway. Koorlingal Golf Club seasonal greenkeepers Joe Thomson (England) and Nolan Ross (Canada) joined Yarrowonga Mulwala Golf Club staff Sam Rennie and Ryan Smith to volunteer for the week.

Hewitt was also ably supported by a number of industry companies and fellow superintendents. Andrew Boyle from ASTMA Bronze Partner Greenway Turf Solutions supplied tournament shirts for the crew, while Dean Hill from ASTMA Platinum Partner Toro loaned a fairway mower. Neighbouring Barwon Heads Golf Club superintendent Craig Molloy loaned a walk mower and fairway mower for the week, while 13th Beach member Phil Draper cooked breakfast for the crew each morning of the tournament.

"It was a very successful event," reflects Hewitt, who last year was bestowed life membership of the Victorian Golf Course Superintendents Association. "Tournament director Trevor Herden was very relaxed and I did not hear from him from the Thursday to the Saturday when we had to discuss how we

were going to take the sting out of the greens with the forecast winds on Sunday. Once the field was past the short par 3 7th (our normal 16th) which has the most exposure to the wind off the ocean, I think everyone could relax and let the golfers battle it out to the end.

"The staff worked tirelessly in the lead-up to and during the tournament. Last year, due to COVID, we had a team of 20, but this year we had 28. We had an increase in our own staff numbers and with the four volunteers also coming in for the tournament it meant we were able to change how we allocated tasks. Greater responsibility and ownership were given to staff who had not been involved at that level before and it worked well, with all staff up to the challenge and performing their duties with confidence.

"We had minimal logistical issues for the week and it was amazing how well they all worked as a collective. It was very pleasing from my perspective to see that and they not only produced a great result but also enjoyed the week."



Hayden Smith and volunteer Ryan Smith rake bunkers on the 6th of the Creek Course during the Vic Open

RETURN TO ROSEBUD

Across Port Phillip Bay on the Mornington Peninsula, two weeks earlier it was the turn of superintendent Ian Todd and his crew at Rosebud Country Club who oversaw another exciting edition of the TPS Victoria event. The first of the four Webex Players Series tournaments which feature on the PGA and WPGA Tour of Australasia schedules, it was the third occasion that Rosebud had hosted the increasingly popular mixed-gender event.

South Korean Min A Yoon became the second woman to win a TPS event with an eight-under final round 63 to secure the title by a shot, joining the likes of Hannah Green (TPS Murray River last year) and Linn Grant (the DP World Tour's Scandinavian Mixed event last year) as the only women to triumph in a 72-hole professional mixed-gender tournament. The following week at the TPS Murray River event at Cobram Barooga Golf Club, Sarah-Jane Smith would join them after collecting the title by five strokes.

"The ground staff worked exceptionally well in the lead-up and during the TPS Victoria event which was extremely pleasing," reflects Todd, who has been superintendent at Rosebud since August 2017. "For four of our staff this was the first time they had experienced a tournament and to see them enjoying the challenge was really encouraging.

"The club has really embraced the event over the past three years and the staff throughout all the departments are invested in its success and want to maintain the 'feel good' nature of the TPS into the future.

"The relationship between the club and the PGA has evolved over the years. Graeme Scott (tournament director), Damien Winsor (assistant) and myself work together well to produce the best possible playing areas so that the event runs smoothly and the players enjoy their experience. Due to the nature of the tournament involving mixed genders, elite young amateurs and some all ability players, the management of the greens can often be challenging. With the men and women playing for the same prize, it's important that one gender is not disadvantaged over the other regarding green speeds and firmness.

"Throughout the tournament the process was transparent between the club and Scotty on how Damien and I were managing soil moisture and speeds, which was recorded and relayed each day. These two critical areas were maintained pretty well over the four days with little variation thanks to some kind weather."

TOURNAMENT LEAD-IN

Todd says it was an interesting lead-up to this year's TPS with planning for the event starting around six months prior. After being postponed due to COVID, the club successfully hosted the European Tour School's qualifying event in



Course masterplan works have continued at Rosebud this past year, including the addition of fairway bunkers and sandy wastes on the North Course. Pictured is the new fairway bunker on the 8th

late August and in between that the crew also continued a raft of course improvement works. Those works, highlighted in the May-June 2022 edition of Australian Turfgrass Management Journal ('Rejuvenating Rosebud'- ATM Vol 24.3 p14-20) have been ongoing ever since Todd arrived at the course, with OCM masterplan works also beginning recently.

Between hosting the 2022 and 2023 TPS events, works completed included;

- Extending the sandy waste on the left-hand side of 10 North fairway towards the green;
- Construction of a new small sandy waste on the right-hand side of 16 North fairway;
- Extension and enlargement of the back tee on 18 North;
- New sandy waste areas on 6 and 8 North carries, including indigenous planting of 4000 plants;
- A large amount of tree works, including removals and heavy pruning;
- Increasing fine turf areas and linking of playing areas around the 1st, 2nd, 9th and 10th holes;
- OCM masterplan works to holes 1, 2 and 8 North including re-contouring of the greenside bunkers on 1 and 8 and the installation of fairway bunkers on 2 and 8. New waste areas on the 2nd carry.

Course masterplan works were undertaken during late September and early October for three weeks and the ensuing grow-in progressed through the following 6-8 weeks. During that time the crew renovated greens, but altered the plan a little to just solid tine and sand the North Course greens due to the poor weather, while the South greens were hollow tined. (The TPS Victoria event is played on a composite course comprising 16 holes from the North and two holes from the South; North holes 6 and 7 are dropped, with South holes 1 and 18 included.)

In the middle of November, Drum Drum Alloc Creek that runs through the middle of the Rosebud property broke its banks, flooding sections of the course. Due to the visual nature of the creek crossing a couple of fairways, it is usually trimmed and sprayed for weeds many weeks prior to the TPS event, but this year it wasn't possible to trim until two weeks before.



A job well done – the 28-strong 13th Beach Vic Open tournament crew

After a wet spring, Rosebud recorded just 6mm of rain from mid-December through to mid-January and with an increase in temperatures, combined with a lot of cool-season grass greens surrounds, a great deal of additional watering was required.

The rise in temperatures also created disease pressures with extended periods of high humidity. There were outbreaks of dollar spot in the greens surrounds and some tees and anthracnose in areas of many greens. Fungicide applications were applied right through to the week prior to the TPS teeing off.

With 36 holes and three bowling greens to look after, and a crew of just 16 to manage it all, when a tournament arrives some compromises are required. In this instance the South Course, which closed for play on Pro-Am day (Wednesday) and re-opened the following Monday, only had the bare minimum of maintenance as the crew's focus switched to the North Course.

Unfortunately, a faulty satellite caused a couple of the South greens to overheat in the hot conditions which prevailed on the Saturday, but they have since come back. Fairway mowers were lapped each day and kept for the tournament, and despite Primo applications being made on the South fairways

prior to the tournament, the mowing units were baling grass when they eventually went back out on the Monday.

As for the tournament course that Todd and his crew presented, it would provide a fitting stage as the tournament went right down to the wire on a gripping Sunday. Twenty-year-old Yoon started the final round five shots back from 18-hole, 36-hole and 54-hole leader James Marchesani and she kicked off her assault with a steady front nine 33.

The Epson Tour player was in the mix for the first half of the day, but the spotlight was well and truly shining on her male rivals, with hometown hero Marchesani, Elvis Smylie, David Micheluzzi and Nathan Barbieri tussling for top spot.

After the turn Yoon found another gear and once she got going could not be stopped. A birdie at the 10th began her charge before a four-hole blitz from the 13th to the 16th turned the tournament on its head. A trio of birdies pushed her into a share of the lead and the defining moment of the tournament arrived when she holed-out for eagle from the greenside bunker at the par-5 16th to jump out to a two-shot lead. In the group behind Yoon, Marchesani attempted to force a playoff but was unable to make a birdie at 17 or 18. 🏌️



The Rosebud Country Club crew (superintendent Ian Todd fourth from right) with the TPS Victoria winners

PHOTO: AUSTRALIAN GOLF MEDIA



Amateur

focus

It was a busy start to the new year for a number of course maintenance teams around the country, with a raft of major amateur and junior tournaments being held. ATM looks back on the Australian Amateur, Master of the Amateurs and Jack Newton Week of Golf events.

A total of 312 leading amateur golfers descended on New South Wales Golf Club and neighbouring St Michael's Golf Club in Sydney for the 2023 Australian Amateur Championship in early January. After being played at Cranbourne Golf Club last March, the nation's premier amateur championship returned to its traditional time slot from 10-13 January, with the field almost doubling in size.

With COVID travel restrictions eased, a strong contingent of international players teed up for the 72-hole strokeplay event, with 13 different countries represented. Along with

a strong Australian cohort, players came from as far afield as Europe, Japan, South Korea, New Zealand and the United States. As it transpired, it was the internationals who would master the two coastal courses. Japan's Mizuki Hashimoto prevailed by a shot to win the women's title, while Japanese-born New Zealander Kazuma Kobori shot a superb final round 6-under 66 to win the men's competition by two shots.

For St Michael's, home to course superintendent Lee Sutherland (CSTM), it was the club's first hosting of the Australian Amateur, while New South Wales had

previously hosted the event solely in 2007. It was New South Wales's first major tournament since the 2009 Australian Open which was won by Adam Scott. In a similar set up to the ISPS Handa Australian Open held on the Melbourne Sandbelt in early December 2022, the opening two rounds of the Amateur were contested across both courses, with the deciding two rounds played at New South Wales.

"It was great to kick off the new year hosting the Amateur alongside Lee and his crew at St Michael's," says New South Wales GC superintendent Mark Parker. "It's amazing to see the crew switch into tournament mode,



The iconic New South Wales Golf Club hosted all four days of the 2023 Australian Amateur

PHOTO: AUSTRALIAN GOLF MEDIA/BRETT COSTELLO

working split shifts and weird hours to get the course ready for a major event. It was nice to see and reinforces that you have a great crew and the right people. They did a great job as did Lee and his team at St Michael's.

"We have a crew of 26 and this year we had six overseas summer casuals as part of that number. Four have come through Envoy Golf and two others from a club in Sweden where a former Scottish intern I had 15 years ago is now superintendent. They have been great to have around. We also recently put on three new apprentices who got to experience what it's like to be involved with a tournament.

"From a course perspective, it was quite a bizarre period in the lead-up to the tournament. It was very cold and while the couch greened up it really wasn't actively moving, so we were chasing recovery there for a bit. Being on the coast we are a lot cooler than the inland courses, but even so it was unseasonably cool. We lightly scarified the fairways just before Christmas knowing we had just three weeks before the tournament and, luckily, we had a few warm days around Christmas to aid recovery.

"With both courses hosting the first two days, where possible we tried to have them playing similar. Lee has quite a few new Pure Distinction greens and they are a bit more protected than some of our green sites and can get them quicker than we can as most of ours are exposed. We typically rely on the wind to present that level of challenge here, but it happened to be the calmest week of the year for the tournament, so the greens were a little on the slow side and the players shot some low scores. Overall, however, everyone was happy with how it went."

CHANGES COMING

The Australian Amateur kick-started what is set to potentially be a busy few years coming up for Parker and his crew. Last November the club announced the appointment of UK-based international golf course architecture firm Mackenzie and Ebert to come up with a course masterplan.

The club had previously engaged a number of architects over the past 20 or so years, most recently Tom Doak who made changes to the iconic par three 6th green which was lowered by a couple of metres. Representatives from Mackenzie and Ebert were out scoping the course to begin their masterplan works as this edition was going to print and subject to member approval the club is hoping to break ground in September 2024.

"It's going to be a really interesting period," says Parker, who has been superintendent at New South Wales for the past four-and-a-half years. "The existing layout



The New South Wales crew out early prepping the course for the Australian Amateur



PHOTO: AUSTRALIAN GOLF MEDIA

New South Wales GC is known for being a tricky course due to its coastal location, however, calm conditions prevailed for this year's Amateur which meant scoring was low

and landscape are brilliant, but there are still some gains to be made out there in terms of the green complexes. The trick of course will be not losing the strong characteristics which make New South Wales such a good course. The landscape is there, the ocean is there and the feedback has been around doing minimal work to the world-class holes we already have and elevating some of the inland holes – like 4, 8 and 12 which are all side-by-side – to that

standard and creating some strategic and visual interest.”

A change of greens grass variety is also on the cards as part of the impending redevelopment, with Parker currently trialling a number of options. While not a bad grass, the existing Mackenzie bentgrass, which was installed across all greens in the spring of 2011, is more open which means *Poa annua* control has been an ongoing challenge. Seven



Trial plots of 007 and 777 creeping bentgrass have been sown into the 6th green at New South Wales

varieties were trialled on the NSW nursery green, with square metre plots of 007 and 777 subsequently sown into the 6th green five months ago for further evaluation. Interestingly, 007 was one of the varieties trialled alongside Mackenzie ahead of the 2011 conversion.

“From the trials we have done so far, the 007 and 777 have performed the best,” explains Parker. “We have put some small trial plots of both on the 6th green because it’s

GOLD CREEK COUNTRY CLUB BACKS UP FOR JACK NEWTON WEEK OF GOLF

For the second year in a row, Gold Creek Country Club in Canberra hosted the Jack Newton Week of Golf which saw 112 of some of the best junior male and female golfers from across Australia compete over four rounds. The event was held from 3-6 January with the 2nd being set down as a practice day. This time period is obviously very difficult for staff with no one having time off over Christmas and New Year in order to get the course ready for the event.

The course (pictured right) presented very well and I was very happy how all our playing surfaces were presented for the week. The scoring certainly reflected the good condition of the course with eventual winner Chun-Ta Wu (Long Reef GC) shooting nine birdies in his final round to claim victory in the boys, while Grace Lee (Concord GC) won defeated Amy Hodgkins (Royal Queensland GC) in a playoff.

Leading up to the tournament, the Transcontinental couchgrass fairways were renovated with a Terrarake and then the height of cut dropped to 8mm and double cut. They were then swept clean and in the days that followed were sprayed with a liquid fertiliser and Primo. From that point the fairways were kept at 10mm.



Greens were double groomed and aerated with 8mm ninja tines a month out from the tournament and followed up with a light dusting. We try to stay on track with Growing Degree Day modelling with Primo applications on our bentgrass/*Poa annua* greens to avoid any flush of growth and height of cut is always 3mm. The ryegrass tees and surrounds were cut at 9mm.

The week of the tournament saw staff working in split shifts morning and afternoon. The morning stint saw staff cutting greens, rolling greens, raking bunkers and course setup, as well as blowing off surrounds and greens if they needed. In the afternoons, fairways, tees, surrounds, approaches and rough areas were cut, with greens probed for moisture levels and hand-watered if there were any hot spots. After a warm opening round in the mid-30s, temperatures were in the low- to mid-20s for the remaining rounds.

I can't thank the Gold Creek Country Club and members enough to give up the course to allow the tournament to happen; giving up their competition days to allow this event to take place was very appreciated.

I would also like to give a massive shout out to the green staff team at Gold Creek Country Club. We only have a small team and to get all the work done prior to the tournament and the hours of overtime put in during the week of the tournament, which in our industry we all know goes unpaid, was a massive task, especially over the Christmas/ New Year period. I can't thank the guys enough.

Simon Snedden
Superintendent, Gold Creek CC, ACT

right by the ocean and is probably the harshest part of the course as it is exposed to the elements. They've only been down five months so it's too early to make any assessments at this stage, but they are performing okay."

AMATEUR DEBUT

While it was the fourth occasion that New South Wales had hosted the Australian Amateur in its 95-year history, across the boundary at neighbouring St Michael's it was all new territory with Lee Sutherland and his team impressing in their first hosting of the event. It also proved the perfect platform to showcase the ongoing course improvement works which St Michael's has carried out now for the best part of more than a decade.

After converting its fairways from kikuyu to couchgrass throughout the 2010s, a few years ago the club embarked on a gradual greens replacement program with the assistance of Ben Chambers. To date, 10 of the old *Poa annua*/bentgrass mix greens have been converted to Pure Distinction bentgrass, with a number of architectural changes also made to the greens complexes and surrounds.

After works had been completed on holes 1, 2, 3, 4, 8, 9, 11 and 16, holes 5 and 7 which back on to each other were completed last September. Some 4500m² of turf was used across both holes, with that turf being heavily



PHOTO: AUSTRALIAN GOLF MEDIA/BRETT COSTELLO

St Michael's is in the midst of a greens reconstruction program which is seeing the surfaces converted to Pure Distinction. Pictured is the 2nd hole which was completed in 2021

affected by flooding at the production farm. Sutherland says the crew at Dad and Dave's Turf did an incredible job to have turf coming off the farm as early as they did.

For the tournament itself, preparations were slightly disrupted with the Christmas and New Year breaks so close to the practice rounds, not to mention the number of golfers the course was pushing through during the holiday period. And just like his counterpart

at New South Wales, the weather also threw Sutherland a few curveballs.

"The weather leading into the event was favouring the growth of the bent greens and keeping growth rates down was a challenge," states Sutherland. "Growth regulator was applied every 10 days at 400ml/ha, with the Growing Degree Day count changing to seven days the week of the event and the volume changing to 500ml/ha.



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"By contrast, the slow start to the couch season heightened the need to be prepared well in advance. We had renovations to the couch surfaces completed by early December and relied on growth regulator applications to keep surfaces nice and tight. Scheduled insecticide and fungicide applications were gradually reduced and the health of all the playing surfaces was very encouraging for that time of year.

"For the tournament, Golf Australia had requested green speeds of 10.5, which is slightly slower than what we have them at for the members. This was to ensure there were no issues if the weather was to blow up. We managed speeds over the week with cutting height and irrigation inputs.

"Set up saw all fairways cut at 9mm, tees 7.5mm, collars 5mm and greens at 3.25mm. Daily prep included all surfaces mown, greens



The 2023 Australian Amateur was the first time that St Michael's Golf Club had hosted the event

rolled and bunkers and wastelands raked. We also had the blowers out clearing away debris in several areas surrounding the bushlines.

"As both courses were hosting play across the first and second rounds, we didn't have to change holes ahead of the second round as they wanted to keep the courses playing the same both days. Markers were only moved

forward about 400mm-500mm for relief in the teeing areas on the par threes.

"The staff performed their duties in the lead-up and throughout the event without fault. Some long days were worked to ensure all the little jobs had been completed and all of the membership, Board, general manager and myself could see what a difference all that effort made."

The Amateur proved a good test run for the St Michael's crew which will be back in the tournament spotlight come the start of May. The club will be playing host to the Australian Interstate Teams Matches, with each state side represented by four men and four women. Victoria became the first state to hoist the Australian Interstate Team Matches trophy in the event's new mixed gender format last May, after a 5.5-2.5 win over South Australia in the final held at Sorrento Golf Club in Victoria. 🏆

SOUTHERN GOLF CLUB HOSTS FIRST OF THREE MASTER OF THE AMATEURS

2023 kicked off in the biggest possible way for the course maintenance team at Southern Golf Club in Melbourne as they played host to the Australian Master of the Amateurs (AMOTA) tournament. Held from 2-6 January, more than 170 leading amateur golfers from Australia and around the world descended on Southern for the 26th staging of the event, with many going on to contest the Australian Amateur in Sydney the following week.

It was Southern's first AMOTA after the club was announced last May as the new home of the event for the next three years after it had been held at Victoria Golf Club between 2018-2021. For Southern superintendent Shaun Taylor, assistant Shaun Page and the crew it was the biggest international tournament of any kind and as such the pressure was on to ensure the course was at its best. However, it wasn't exactly smooth sailing, with Melbourne's fickle spring and early summer weather ensuring a challenging lead-in.

With just over seven months to get the course prepared for the event after being confirmed as host venue, it was a busy period for Taylor and his team as they undertook a number of major course projects. This included continuing with the club's bunker renovation program and vegetation enhancement plan which was fast-tracked to be completed in time for the tournament.

A wet and cold Melbourne spring did little to assist with the club's planned course programs. Constant rain and soft, water-laden ground meant the crew were unable to get machinery out for the majority of spring.

Adding to that, fairway and tee scarification programs were brought forward from December to early October in order to have the Santa Ana couchgrass back to full

health for the tournament. The cool and wet conditions which prevailed meant the turf took a lot longer to recover, with some areas under water for days.

By the time December came the weather started to improve, which enabled the crew to fast-track their preparations. Despite having a team of just 10, Taylor's crew smashed out a huge amount of work in the lead-up to Christmas to ensure the course would be on point for the opening week of the new year.

Like many clubs across the industry have experienced in recent times, Southern had advertised for a couple of full-time positions a few months out from the tournament and didn't get a single application. Two weeks out from the tournament Taylor was thrown

another curveball when a full-time staff member resigned. Already down a staff member who was going to be away on leave during the tournament (which had been approved before the club knew it was hosting the event), it was decided to mow greens with triplex mowers for the tournament instead of walk-behinds.

Taylor did, however, have some much-appreciated assistance from Southern's Dads Army volunteers. Southern has a passionate group of members that volunteer their time on course every Tuesday morning and that transferred across to the tournament. During the event, most of them turned up to lend a hand, whether it was raking bunkers or making sure the sand bins were kept full, which allowed Taylor and his crew to concentrate on the playing surfaces.

During the tournament the crew worked split shifts – 5am-9am and then 3.30pm-7.30pm. Greens were mown at 2.25mm with triplex mowers every morning followed by a roll, with green speeds averaging 12.5 over the four days. Fairways and tees were mown at 7mm, twice during the week before the tournament and once during the tournament, while surrounds were mown at 7mm twice during the tournament.

Feedback from players and officials about the course was nothing but positive and according to Taylor gave the whole crew a real sense of pride that they were able to present the course as good as it has ever been, especially considering the challenging lead-in. The course they turned out was obviously to the liking of the large international contingent that ventured Down Under, with Englishman John Gough collecting the men's section and Japan's Yuna Araki winning the women's.



Southern Golf Club is home to the Australian Master of the Amateurs tournament for the next three years

PHOTO: AMOTA FACEBOOK



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Problem patches

PHOTO: GARY BEEHAG

*Disfiguring doughnut-shaped symptoms on a Tiidwari golf green caused by *Gaeumannomyces avenae**

Gary Beehag and Dr Percy Wong provide a comprehensive review of novel patch diseases and root-infecting fungi on couchgrass greens and the ongoing challenges of proper identification and management.

In recent years, turfgrass managers in many regions of mainland Australia have observed a number of severe and intractable patch diseases on closely-mown couchgrass playing surfaces. The patch-like symptoms range from entire blighted patches, 'banana-shaped' or crescent rings, all the way to multiple, disfiguring 'doughnut-shaped' rings (see photos opposite and right).

Whether these patch diseases are new or 'novel' diseases or diseases that have appeared in the past and been misidentified remains speculative. Several newly discovered ectotrophic root-infecting (ERI) fungal species have been shown to be the cause of some of these diseases. However, the precise identification of these root-infecting fungi and their predictable management remains challenging and problematic.

All of these different, patch-like symptoms have been widely observed by the authors and reported by co-operating bowling greenkeepers and golf superintendents during numerous visits conducted throughout the coastal and adjacent tablelands of southern Queensland and New South Wales. Patch-like symptoms may appear either during autumn under favourable conditions or reoccur the following spring coinciding with increasing temperatures. In some cases, different disease symptoms may occur simultaneously in the one bowling or golf green or tennis court.

Detailed laboratory work conducted by the second author and graduate students Albie Leggett and Ben Evans (NSW) has led to the discovery of an ever-increasing number of species of root-infecting fungi. Some have been found to be new species (see Table 1), several have only been tentatively identified to genus level and the identity of others remains undetermined. Of significance, however, is the common isolation of more than one fungal species on the same infected root system.

The presence of multiple species of root-infecting fungi is suggestive of a disease complex rather than a disease caused by a single pathogen. This article outlines the known root-infecting fungal pathogens and their reported patch-type diseases on closely-mown couchgrass in Australia and discusses the implications and problems for their precise identification and effective management.

KNOWN ERI FUNGI AND THEIR DISEASES ON COUCHGRASS

Numerous genera and species of root-infecting fungi and their resultant patch-like diseases are known on couchgrass and certain other warm-



PHOTO: GARY BEEHAG

Disfiguring doughnut-shaped symptoms on a hybrid couchgrass golf green in southern Queensland

season grasses in Australia (see Table 1). Host couchgrasses are Australian ecotypes (e.g., Greenlees Park, Legend, Wintergreen and others) and American hybrid bermudagrasses (e.g., Champion, Santa Ana, Tifdwarf, Tifgreen and others). The full extent of the geographical distribution, host range and virulence of these known root-infecting fungal species on couchgrasses in Australia remains unknown.

Investigations into the biological nature and causal agents of patch diseases on couchgrasses in Australia began in the 1960s in NSW on bowling greens. **Spring dead spot**, the first studied patch disease on couchgrass, is well-known among bowling greenkeepers, golf superintendents and tennis court curators. Spring dead spot, caused by *Ophiosphaerella narmari* and *O. korrae* (formerly *Leptosphaeria narmari* and *L. korrae*) expresses primarily

as roughly circular, blighted patches on couchgrass greens. Spring dead spot was first investigated by Dr. Alan Smith and later by Nick Hawkes in South Australia. Effective management of spring dead spot is relatively predictable and effective.

Subsequent investigations during the late 1990's conducted independently by Dr. Walter Scattini, Dr. Marcelle Stirling (Queensland), Dr. Percy Wong and the now defunct Australian Turfgrass Research Institute (NSW) highlighted the damaging presence of ectotrophically-growing fungal species on deteriorating golf and bowling greens in mainland Australia.

All this work culminated in confirmation of a second patch disease, caused by *Gaeumannomyces avenae* (formerly *Gaeumannomyces graminis* var. *avenae*). The causal agent was identified by Dr Wong in 1999 from an aged Tifdwarf golf green in northern NSW. The infected green displayed disfiguring 'doughnut-shaped' symptoms (see main photo opposite). This second finding was highly significant, being the first time the fungal species *Gaeumannomyces avenae* had been positively identified from symptomatic couchgrass in Australia.

Adelaide patch is attributed to a newly named fungus, *Wongia garrettii* (formerly *Magnaporthe garrettii*). Symptoms of this disease were initially reported in the spring of 2002 on a Greenlees Park couchgrass bowling green in Adelaide (South Australia), hence the disease name. **Deniliquin patch**, caused by another newly described fungus,

TABLE 1. COUCHGRASS PATCH DISEASES AND CAUSAL AGENTS

Patch disease	Causal agent
Adelaide patch	<i>Wongia garrettii</i>
Deniliquin patch	<i>Budhanggurabania cynodonticola</i>
Fairway patch	<i>Phialocephala bamuru</i>
Spring dead spot	<i>Ophiosphaerella narmari</i> and <i>O. korrae</i>
Summer decline	<i>Wongia griffinii</i>
Take-all	<i>Gaeumannomyces avenae</i>
Wongoonoo patch	<i>Gaeumannomyces wongoonoo</i>



PHOTO: GARY BEEHAG

Fairway patch is a widespread and highly disfiguring disease throughout eastern mainland Australia

Budhanggurabania cyndonticola, was initially observed in the autumn of 2012 on a couchgrass fairway in Deniliquin (NSW). This fungal pathogen has since been positively identified by Dr Wong on bowling and golf greens in NSW, Queensland and the NT.

Fairway patch is a widespread and highly disfiguring disease throughout eastern mainland Australia (see photo above). The causal agent of fairway patch is primarily attributed to *Phialocephala bamuru*. However, in some cases, another pathogenic root-infecting fungus, *Penicillifer martinii*, and *Phialocephala bamuru* have been isolated from the same diseased root systems by Dr Wong, suggesting co-infection. *Phialocephala bamuru* has also been identified in New Zealand.

Interestingly, a fungal isolate recently confirmed to be *Phialocephala bamuru* from the fungal herbaria collection of Dr Wong and collected during mid-1980 from a now-defunct bowling green in the Illawarra (NSW), highlights the probability that misidentification of ERI in previous decades can occur.

Summer decline is a term coined by Australian golf superintendents in the late 1990's describing the progressive loss of putting surfaces and dieback primarily on golf greens in coastal southeastern Queensland. The causal agent of summer decline is now recognised as *Wongia griffinii* (formerly

Magnaporthe griffinii). In the United States, the well-known disease known as summer patch on cool-season turfgrasses is caused by *Magnaporthe poae*, a fungus not yet scientifically confirmed to occur in Australia.

Wongoonoo patch is caused by the fungus *Gaeumannomyces wongoonoo*, a new species in the take-all genus. The species name is an Australian Aboriginal word meaning 'grass'. The disease name was coined to distinguish it from take-all patch of turfgrass. Another fungus, *Gaeumannomyces incrustans*, has been isolated from symptomatic couchgrass roots but its role in turfgrass disease in Australia has not been studied. Overseas, it has been shown to cause root rot in zoysia grass.

Most recently in Australia, four more ectotrophically-growing root-infecting fungal species in the genus *Magnaporthe* have been isolated from symptomatic warm-season turfgrasses in eastern Australia by the second author and colleagues. They have been named *M. dharug*, *M. gadigal*, *M. yugambeh* and *M. gumbaynggirr*, acknowledging the Aboriginal custodians of the land where they were first discovered. They appear to be indigenous pathogens as they have not been found in other parts of the world. The national distribution of these new *Magnaporthe* species remains to be investigated.



PHOTO: NEW ZEALAND SPORTS TURF INSTITUTE

WHAT IS AN ECTOTROPHICALLY-GROWING FUNGUS?

Ectotrophic root-infecting fungi (ERI) is a commonly used, generic term stated on certain fungicide labels. As noted above, these fungi comprise multiple fungal genera and species that actively grow on the surface of roots and can penetrate the roots to cause infection. Some species can also colonise leaf sheaths and host stems as well.

Typically, infected underground grass stems display abnormal and blackened sections with misshapen or stunted roots and may very occasionally bear characteristic fungal structures (see photo below). In the main, these pathogens have almost no distinctive features to differentiate from each other. Therefore, it must be stressed that just the presence of ERI fungal mycelium or fungal threads is not diagnostic of a specific fungus or a disease. More research is required to develop sophisticated identification methods, perhaps employing DNA technologies, to differentiate between the various ERI fungi.

The results of these aforementioned investigations emphasise how little is collectively known in Australia of the species composition, degree of virulence and the environmental conditions that favour the development and severity of disease on couchgrass cultivars. Observations conducted by the authors suggest that certain fungal pathogens and their respective diseases may be more common in certain regions.

DISEASE COMPLEX AND DISEASE TRADING

The apparent suppression of certain patch-like symptoms and unexplained emergence and annual recurrence of others brings to the discussion two terms used by pathologists – 'disease complex' and 'disease trading'.

A 'disease complex' is a combination of two or more fungal or microbial pathogens causing an infectious disease. One pathogen is the primary causal agent and others are secondary or minor pathogens. In other cases, two or more primary pathogens may occupy the same ecological niche and contribute to disease symptoms under different environmental conditions. However, if the primary causal agent is managed by a specific fungicide which does not affect the secondary pathogens, then one of the secondary pathogens could then become the dominant pathogen and may even exhibit different disease symptoms. This latter phenomenon is called 'disease trading'.

It must be noted that the isolation of one or more root-infecting fungal isolates from diseased couchgrass roots does not necessarily mean a 'cause-effect' relationship

Dark-coloured mycelium and structures which are characteristic of root-infecting fungi on a couch stolon

exists. Pathogenicity must be demonstrated using a procedure called 'Koch's postulates', usually carried out in a glasshouse under controlled conditions.

ROOT DECLINE OF WARM-SEASON TURFGRASSES IN USA

Coincidentally, similar genera and species of root-infecting fungi have been isolated from symptomatic couchgrass (bermudagrass) cultivars in the United States. Fungal species in the genera *Candidacolonium*, *Gaeumannomyces*, *Magnaporthiopsis* and *Pseudophialophora* have been identified from bermudagrass cultivars. Consequently, many American turfgrass pathologists have adopted the term 'root decline of warm-season turfgrasses' to describe the disease complex. The associated term 'take-all root rot' is also used; however, 'take-all' implies the fungal genus *Gaeumannomyces*.

Bermudagrass decline, primarily attributed to *Gaeumannomyces graminis*, is associated with hybrid bermudagrass cultivars in southern United States. This disease represents the first root decline disease of a single, warm-season turfgrass having the grass species as part of the common name.

US turf pathologists nowadays generally avoid the adoption of different disease names for a specific host-root pathogen combination. Such designations are now considered inappropriate. It is unfortunate the disease name 'Bermudagrass decline' is stated on certain turfgrass fungicide labels in Australia.

Similarly, as has been demonstrated in Australia, more than one root-infecting fungus have been isolated and identified from the same bermudagrass patch or on the same symptomatic plant. The current weight of

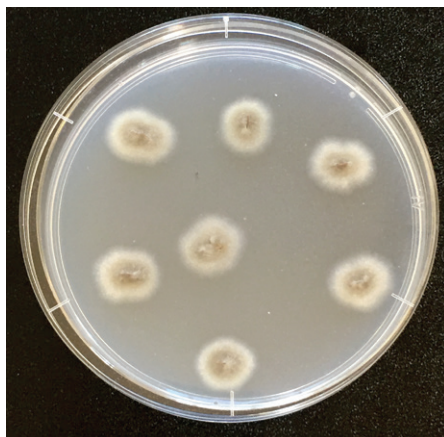


PHOTO: DR PERCY WONG

Fungal pathogen growing from diseased root pieces

scientific evidence strongly supports the view that root decline diseases of closely-mown couchgrasses are most likely caused by a complex of fungal genera and species. In other words, the overall symptoms are not generally diagnostic of one specific disease or one root-infecting fungal pathogen.

PROBLEMS OF PRECISE ID AND EFFECTIVE MANAGEMENT

The existence of multiple genera and species of root-infecting fungi on couchgrass cultivars has both scientific and practical implications for the wider Australian turfgrass industry. Discussion of the issues assists in understanding the problems of the precise identification of the fungal species and the effective management of the diseases they cause. These issues include:

Precise identification of ERI fungal species:

Differentiation between the various genera and species of root-infecting fungi and their precise identification of species and strains requires

highly skilled and university-trained personnel. Therein lies the first issue. Regrettably, very few people in Australia have the specialised expertise and experience in the identification of root-infecting fungal species that occur on turfgrass. Currently, few Australian universities are turning out plant pathology graduates.

Many of these newly described root-infecting fungi species are sterile. In other words, they do not produce recognisable and diagnostic spores in nature or in the laboratory. Thus, specialised genetic-based methodologies (e.g., DNA sequencing) are required for identification to species level. Few Australian turfgrass disease diagnostic laboratories are set up to carry out DNA sequencing for pathogen identification. It is hoped that more forward-looking laboratories would invest in these technologies to provide high quality diagnosis of turfgrass diseases.

From the aforementioned discussion, it should become evident to turfgrass managers that the precise identification of root-infecting fungi to species level requires specialised skills and time. Turfgrass managers and others need to treat any turfgrass pathology diagnostic report that states specific species of root-infecting fungi with considerable caution.

Effective management of root-infecting fungal diseases:

A turfgrass disease is the physiological expression of complex biological interactions between a susceptible host, a virulent pathogen and a range of environmental (e.g., temperature) and management-induced factors (e.g., irrigation, mowing, liming and nutrient application), all of which are far from fully understood.

Currently, in Australia there is no co-ordinated turfgrass research program



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PHOTO: GARY BEEHAG

Doughnut-shaped patches on a Tifdwarf bowling green in NSW infected by a *Magnaporthiopsis* sp.

being conducted into the identification and understanding of environmental factors favouring root-infecting fungal pathogens. Limited studies have indicated most of these root-infecting fungi grow optimally in culture between 25-30°C, depending on species. The temperature at which each ERI fungus actually results in host infection requires further work and has practical significance of the timing of fungicide application. After all, root infection by ERI long precedes patch symptom expression.

Hence, development of an effective and predictable management plan to mitigate against patch diseases caused by root-infecting fungi can only be extrapolated with a high degree of uncertainty from what is known about other soil-borne diseases.

Genetic resistance among couchgrass cultivars:

An effective disease management plan is often predicated on the selection and cultivation of a disease-resistant cultivar. At this time, it is unclear if any significant disease resistance against these new root-infecting fungi occurs among hybrid couchgrasses. Limited studies conducted in the United States have shown experimentally that there is some resistance against certain root-infecting fungal species in selected couchgrass cultivars but not in all host-fungal combinations.

Proof of disease resistance requires considerable time and effort. In any case, a couchgrass cultivar may demonstrate a degree of resistance against one pathogen under the conditions of small plot trials but may prove otherwise a few years later in real-life situations. No complete studies concerning disease resistance against these new root-infecting fungi among couchgrass cultivars have been published in Australia.

Sourcing of non-infected propagation material:

Sourcing of disease-free, vegetatively-propagating material is highly problematic. Bowling greenkeepers, golf superintendents and others will need to give

serious consideration when contemplating a couchgrass source, whether it be from a commercial sod farm or another bowling club or golf course. Knowledge of the history of the grass source and careful examination of the current material is imperative.

The following case illustrates this point. The authors are aware of one instance where infected couchgrass material from a green at one NSW bowling club having a known history of 'doughnut-shaped' symptoms was used to establish another, newly-reconstructed green at a second bowling club. The patch disease history was unknown to the greenkeeper of the second club. The passage of 18 months saw the emergence of the same symptoms (see photo above), caused in both cases by a species of *Magnaporthiopsis*. Symptoms continue to recur annually at both clubs.

Minimising spread of root-infecting fungal pathogens:

Minimising and prevention of the physical transfer of fungal inoculum (e.g., mycelium) from club-owned and externally-contracted renovation equipment (e.g., shaving and tining machinery) may be achieved by thoroughly washing the machinery with pressurised-water equipment and disinfecting solutions prior to use.

Biological and cultural manipulation of the turfgrass rhizosphere: Experience in managing soil-borne diseases in cropping systems has long shown effective disease management can only be achieved by attempting to manipulate the rhizosphere (the region immediately around the plant roots) culturally and biologically using scientifically proven cultural and biological practices.

The impacts of turfgrass cultural practices, most notably irrigation, nutrition and soil amendments (e.g., lime and gypsum) on these novel fungi is unclear. Alkaline pH and nitrate-nitrogen favours the severity of take-all patch (*Gaeumannomyces avenae*) on cool-season turfgrasses.

Observations conducted by the authors over many years and comments by astute bowling greenkeepers and golf superintendents have led us to conclude there is a strong association between uncontrolled thatch-mat accumulation and the occurrence of 'doughnut-shaped' symptoms on greens. Observations clearly indicate that the worst affected greens are those having the greatest thickness of thatch-mat accumulation.

Association between excessive thatch-mat accumulation and the incidence of root-infecting fungal diseases may be explained from two perspectives. Firstly, decomposing plant material provides an ideal food source for facultative saprophytes (e.g., *Gaeumannomyces* and *Ophiosphaerella*) to survive and proliferate. Emerging grass roots are quickly infected in the presence of these pathogens. Secondly, accumulated organic colloidal matter is known to irreversibly adsorb soil-applied pesticides used to target soil-borne organisms. Hence, only a limited amount and concentration of fungicidally-active ingredient reaches the root system.

Some bowling greenkeepers and golf superintendents have stated that disfiguring symptoms are more severe on newly-established greens, but the disease slowly declines in frequency and severity over time. Whether these novel, fungal patch diseases are subject to a natural decline (e.g., take-all decline) by antagonistic and suppressive microbes (e.g. *Bacillus*, *Trichoderma* and others) remains unknown.

Currently, aside from several species of *Gaeumannomyces* and *Ophiosphaerella*, the precise identity of some of these novel, root-infecting fungal species and their degree of sensitivity to the current range of fungicides remains unknown. Hence, until the identity of the causal agent(s) and their fungicide sensitivities are determined, predictable and effective outcomes will not be realised.

In the current climate of knowledge paucity, Australian turfgrass managers may have to extrapolate results from overseas research, often with unsatisfactory outcomes. In any case, the overriding objective to reduce occurrence and severity of root-infecting fungal diseases is to promote and maintain healthy root systems. This is especially relevant as many of the newer, as opposed to earlier cultivars of American hybrid bermudagrass, have relatively shallow root systems.

Editor's Note: At the upcoming Australian Sports Turf Management Conference in Adelaide (19-22 June), authors Gary Beehag and Dr Percy Wong will be conducting an ERI workshop in conjunction with Oklahoma State University turf pathologist Dr Nathan Walker and John Neylan. For a full list of cited references for this article, contact the editor. 📄

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Data driven

As John Petrovsky from the USGA Green Section writes, collecting and recording data like clipping volume and green speed allows superintendents to measure how different maintenance practices and inputs impact putting green performance.

I remember the first time I saw a moisture probe on a golf course. As a seasoned hose-dragger, I was particularly curious and pondered its potential to make my life easier. Still, I was sceptical about this new technology – after all, a quick look at our typically dry greens sometime around lunch seemed to work fine for letting us know if it was time to start hand watering. It wasn't until I gave it a try as part of our moisture management program that I realised the value of this new tool.

This sentiment about the now-ubiquitous moisture probe is not unlike scepticism occasionally heard today about measuring clipping volume and other forms of putting green data collection. What will I do with the data? We don't have time to collect data. My greens are great, why change anything? These are valid considerations, but the trend certainly seems to point toward increasing use of data collection and analysis in golf course management.

Superintendents that commit to data collection preach the return on investment from spending just a little extra time and effort

collecting putting green management data like green speed, clipping volume, firmness and percent organic matter. So why is there still resistance in the industry and can we address some of those concerns?

Recently the USGA Green Section asked some superintendents who haven't considered data collection, or were hesitant to give it a try, what their reasoning was. Some responses were expected and some were slightly surprising, but it also became apparent that there are misconceptions out in the industry about what is required to gather meaningful data and the potential impact this information can have on the management of putting greens.

We heard several of the same questions and concerns repeatedly and our hope is that by highlighting and addressing them in this article, we can provide some insight into the process of data collection and analysis and explain the potential benefits.

Let's look at some of the key issues that are keeping superintendents from collecting data for putting green management and see if we can put some of those concerns to rest.



There are some common misconceptions about what is required to gather meaningful data and the potential impact this information can have on putting green management



I JUST DON'T HAVE TIME

In today's world of labour shortages and packed golf courses, most maintenance teams are already stressed for time, so hesitation about adding data collection into the mix is understandable. This was by far the most common concern so it's crucial to delve into the time commitment involved with data collection.

Jared Nemitz, director of golf course and grounds at the Ford Field and River Club in Savannah, Georgia, started collecting and analysing putting green surface management data over 14 years ago on ultradwarf bermudagrass greens. He emphasises how it wouldn't be possible without the maintenance team's cooperation. Nemitz explains that, "When you create the process, you get the whole team involved and it takes very little time at that point. Everybody on staff knows their role. The mowing team measures the clippings and relays the data to our first assistant who plugs the numbers into the spreadsheet, adds a few notes – like how many times did you cut it – and it's done."



Superintendents who commit that little bit of extra time and effort to collecting putting green data, like green speed, preach the return on investment and usefulness of the information it provides

A key reason why many superintendents worry about data collection involving a significant time commitment is the misconception that you need to measure something like clipping volume every day from every green to obtain useful information. You can certainly do that, and it's interesting to see that data, but a daily process on every green may not be practical for some courses.

Collecting clipping volume or green speed from select greens on certain days to observe trends in putting green response to various practices and inputs can still be extremely valuable and it will require less time. A common approach is to collect data from one or more 'average' greens along with the best- or worst-performing greens, or even just from a green close to the shop to make it easier to record the data.

Nemitz has noticed that it becomes second nature for staff to record clipping volume for their allotted greens. "They do it themselves – they're mowing the greens and dumping catchers anyway, so it adds very little time," he says. In over a decade

“Beyond helping superintendents make decisions and refine their management plan, one of the most important benefits of data collection is improved communication.” - John Petrovsky

of data collection Nemitz has never found it burdensome. He reports that the whole process takes from five to 10 minutes per day – time that he has found to be well worth it for the valuable information generated.

Skipping unnecessary practices or applications adds up to significant time savings, especially when the maintenance team is already stretched thin. The time invested in data collection pays for itself quickly considering the time and money that is saved on labour, fuel and other inputs that aren't providing any significant benefits.

WHAT WILL I DO WITH ALL THAT DATA?

This question came up often among superintendents who aren't currently collecting

putting green management data. When addressing it, it's important to keep in mind that there's no standard method for collecting data. Some superintendents collect lots of data while others focus on one or two key metrics – it all depends on priorities.

A useful way to get started is to think about what's important to you and your golfers. Is trying to save time and money the primary concern? Are you looking to achieve certain playability goals? Answering these questions will allow you to focus data collection on your most important management considerations.

Beyond helping superintendents make decisions and refine their management plan, one of the most important benefits of data collection is improved communication. "Superintendents have a lot of pressure



Collecting and recording putting green data adds very little time to the morning routine once implemented

“Science and data elevate the art of greenkeeping.” - John Petrovsky

on them to justify costs – the economics of greenkeeping,” says Nemitz. Trying to identify what can be cut or what maintenance a course can do without is a popular exercise in green committee or stakeholder meetings at courses everywhere. Superintendents are also continually trying to make improvements in their maintenance operations, which sometimes means asking for additional investment from the facility. These conversations are much more productive when they’re guided by data.

“When you come to a meeting with all your data – exactly how many times you cut and rolled greens, clipping volume, how much sand you put on, cultural practices and how much each cost – it no longer becomes a guessing game,” says Nemitz. “When you have numbers and you can show exactly how much each practice or input costs, and the direct impact it has on putting green performance, it makes it a lot harder on them to take things away from you.”

This information also makes it much easier to explain the potential benefits of investing in new equipment, additional staffing or infrastructure improvements. Showing the time, money and playability metrics associated with various practices and highlighting the potential savings or improvements that could come with changes is a powerful tool. It takes the complex world of agronomy and golf course management and puts it into terms that golfers and facility managers can readily understand and relate to.

Nathan Hagel, superintendent at Mount Paul Golf Course in Kamloops, British Columbia, is relatively new to data collection, but measuring clipping volume each morning has already had an impact on how he manages his mixed bentgrass and *Poa annua*

putting greens. “We have limited fungicides and plant growth regulators available to us in Canada, with more on the chopping block, so managing putting green growth and plant health through nitrogen applications is necessary. Collecting clipping volume daily is how we do it,” explains Hagel.

Like many other superintendents, he took part in casual data collection by looking in mower catchers, but two years ago he decided to take a formal approach. He uses an Excel spreadsheet that tracks clipping volume and estimates the amount of nitrogen removed via clippings. “I’ve found targeting nitrogen rates that replace what’s removed by clippings works well for us,” Hagel says.



Handheld moisture sensors have become a valuable tool for turf managers over the past decade

Clipping volume data has given him insight into how nitrogen application rates and timing affect his putting green growth and helps him achieve more consistent growth with less inputs. The biggest impact has been on nitrogen applications.

“I’ve reduced the amount of nitrogen I apply by nearly 50 per cent, but we’ve also reduced *Poa annua* populations significantly and lowered disease pressure – all with no negative impact to putting green quality,” says Hagel, a self-described “modest-budget superintendent.” With current fertiliser, chemical and labour costs, the positive impact on Mount Paul’s maintenance budget can’t be overstated.

MY GREENS ARE FINE, WHY CHANGE ANYTHING?

One comment we often heard from those with reservations about data collection is that their greens are doing just fine and they don’t know if the benefits will be worth the time and effort. Our answer would be that there is always the possibility your greens can be even better, or you might be able to achieve the same putting green quality with less inputs. One of the primary reasons superintendents stick with data collection is because it improved their putting green performance and/or maintenance efficiency – even if they weren’t sure it would help at first.

Nemitz isn’t alone in observing meaningful playability benefits from data collection. Many other courses that are pleased with their putting green performance are collecting data and find it worthwhile, especially for improving maintenance efficiency.

At Cascata Golf Club in Boulder City, Nevada, director of golf course maintenance Scott Delpiere already had his bentgrass greens in great shape when he began collecting data. At certain times, it seemed that time-consuming maintenance practices and costly inputs weren’t significantly improving playability, so he sought a way to quantify putting green growth and performance. He now relies on green speed and clipping volume data to make better-informed maintenance decisions.

“I can skip a mow, a roll or even both and still get the same putting quality and green speed as if both practices had taken place together,” says Delpiere. Clipping volume and green speed data help him decide whether to mow or roll with complete confidence. Cascata is also not immune to the labour and material cost challenges facing the industry and skipping unnecessary maintenance allows Delpiere to redirect resources to other tasks. It also reduces unnecessary wear and tear on equipment and putting green turf, which can lead to better playing conditions and lower maintenance costs.

GREEN SPEED ISN'T MY HIGHEST PRIORITY

While the exact green speed number on a given day might not be of particular concern to many golfers, regular players at a course likely notice inconsistencies in speed and variations in putting green performance. They may also be aware of how the greens at your course compare to others in the area and they almost certainly notice what they pay for a round and whether putting green maintenance disrupts playability or access to the course.

Some level of golfer awareness regarding green speed, firmness and trueness is a reality that most golf courses have to accept and maintaining the best conditions possible within the budget should be something all courses are striving for, regardless of the resources available. Measuring clipping volume, green speed and other characteristics offers an objective way to consistently provide the putting green conditions and speed that are ideal for your golf course and budget. This information can also help you field questions about green speed should they arise – and they inevitably do.

I'M NOT A DATA PERSON

Getting started with data collection doesn't involve buying a new computer or learning



Measuring clipping volume helps determine how fertiliser and plant growth regulator inputs affect putting green growth and how turf growth influences green speed

statistical software. Most superintendents use some form of spreadsheet program to track their budget or other aspects of the management operation already, so the foundation for collecting and analysing putting green data is likely there.

A productive way to start is by collecting clipping volume or other basic putting green surface measurements and entering the data into whatever spreadsheet program you are

familiar with. As discussed, you may already be collecting data without knowing it. For example, many courses check green speeds from time to time, even if they aren't entering the information into a spreadsheet. The same is true of monitoring data from putting green soil tests. Formalising the process using some basic software allows you to visualise the data and identify trends or issues – which ultimately leads to making better decisions.

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One of the primary reasons superintendents stick with data collection is because it improves their putting green performance and/or maintenance efficiency

At Mount Paul, Hagel got started using Excel spreadsheets built by a fellow superintendent. "It really is a simple process – the greens mower measures the clippings in litres, puts the number on a clipboard and they enter it into a spreadsheet when they get back to the shop," says Hagel. In the US, data collection is made even easier with new programs like the USGA DEACON™ platform, which allows superintendents to quickly enter surface measurements on a mobile device and automatically uploads data so you can see trends in clipping yield, green speed and other metrics in real time. You can also create



Making evidence-based, data-driven decisions on inputs and cultural practices can take putting green conditions and maintenance efficiency to new heights

presentation-quality figures that are invaluable for communicating with decision-makers, golfers and other departments at your course.

GREENKEEPING IS MORE ART THAN SCIENCE

Imagine for a moment you're at a conference listening to an esteemed plant pathologist present findings from a new fungicide trial. Now imagine someone asked how they knew the product worked and the scientist answered, "Listen, I've been doing this a long time, I get out on those research plots and take a look around – I can just tell this product works better than all the other treatments – next question." Not only is this turf professor's tenure in jeopardy, their argument isn't credible without good data.

There are some aspects of putting green management that may always skew toward art rather than science, but in cases where you can put a number on something it usually ends up being beneficial. Every course superintendent has looked in a mower catcher to judge clipping volume, but there's a decent chance that your visual assessment won't match your assistant's or the mower operator's, so when you talk with each other about clipping volume you might not be speaking the same language.

Tracking clipping volume and other data collection doesn't necessarily mean setting 'target' numbers and it shouldn't be the only factor in a superintendent's decision-making process. The real value is developing a way to consistently and objectively measure how aspects of your program are working, and being able to put that information into terms that people on your team and at the facility can all understand. Take advantage of being able to quantify anything that helps you better manage your greens. Science and data elevate the art of greenkeeping.

FINAL THOUGHTS

As more superintendents incorporate data collection into their putting green management program, the process will only get more and more user-friendly. One day, mowers may even measure and report clipping volume automatically. There was scepticism and uncertainty about the moisture probe when it debuted 15 years ago and the same was true of many other practices and tools that are commonplace today. It's likely that in 15 years we'll be looking back at putting green data collection in much the same way.

Making evidence-based, data-driven decisions on inputs and cultural practices can take putting green conditions and maintenance efficiency to new heights. If you still have reservations, perhaps the topic is best summed up by renowned 19th-century physicist William Thomson: "When you can measure what you are speaking about, and express it in numbers, you know something about it. When you cannot express it in numbers, your knowledge is of a meagre and unsatisfactory kind."

ACKNOWLEDGEMENTS

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KEY TAKEAWAYS

- An increasing number of superintendents are incorporating data collection into their putting green management programs.
- There are some misconceptions about the time and effort involved with collecting and recording putting green data and the value of the data for improving management decisions and playing conditions.
- Superintendents have found that data collection takes minimal effort and adds very little time to the daily routine.
- For superintendents who collect data, the information gained is a critical tool for managing greens and communicating with golfers and decision-makers.
- A comprehensive data collection program may not be practical for some courses, but quantifying key aspects of putting green performance has proven well worth the effort for those who give it a try.

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The turfgrass agronomist

A good turfgrass agronomist needs to have an open mind, be inquisitive and have a healthy dose of scepticism writes ATM columnist John Neylan.

When I graduated as an agricultural scientist, I was often asked "So, you're going to be a farmer then?". It was difficult for many people to understand that all forms of agricultural production are based on science and scientific research and that agricultural scientists study the many factors affecting the production of the food that we eat.

When I started to specialise in turfgrass science, the common theme was "So, you look

after lawns?" The term 'turfgrass agronomist' is even more baffling for many, as you explain that agronomy is the scientific study of soil, plants and the environment. Some may suggest that it is a 'jack of all trades'.

As a turfgrass agronomist, the challenge is having an understanding of all of the elements that affect turf growth and health, including turfgrass species and cultivars, soil physics and soil chemistry, weeds, turfgrass diseases, fertiliser programs etc. Peter McMaugh AM, as a mentor and friend to many of us in the turf



Undertaking your own research doesn't require a sophisticated set-up. All you need is a methodical and well-planned approach to researching the problem

PHOTOS: JOHN NEYLAN

industry, describes himself as a problem-solver and this very much sums up the role of a turfgrass agronomist. The turfgrass agronomist has to have the ability to look beyond the surface symptoms and to determine the true cause.

Many years ago, a course superintendent who was under the guidance of another well-known superintendent/consultant, was applying fungicides weekly to control an outbreak of rhizoctonia sp. disease with limited success. The same consultant didn't believe in renovations and consequently the soils were severely compacted, there was poor soil aeration and a lack of viable roots. When the course superintendent took control of the situation and aerated the greens, the disease symptoms quickly disappeared.

As a turfgrass agronomist this was a great lesson learnt in that we shouldn't disregard anything when trying to resolve turf problems. We need to stop just treating the symptoms



Growing grasses out is an interesting exercise. You get to observe their development, reaction to drought, fertility requirements and recovery after being harvested

and to identify the cause. The fundamentals of soil science, fertility and irrigation will generally apply.

Readers of Australian Turfgrass Management Journal would have read the many articles of Peter McMaugh AM and there is a constant theme around research, observation and education. In my career as a turfgrass agronomist I have been fortunate to be involved in a variety of research projects, particularly during my time at the now defunct Turf Research and Advisory Institute and at the AGCSA (now ASTMA).

Both provided opportunities to learn a lot about grasses, diseases, water quality, weeds (in particular *Poa annua*) and the use of diagnostic tools. In undertaking any research there is always the unexpected result or even a nil result, however, there is always something to be learnt no matter the outcome. Undertaking research teaches you to be sceptical and to expect the unexpected. One could say that a good turfgrass agronomist needs to have an open mind, be inquisitive and have a healthy dose of scepticism.

One of the most enjoyable parts of being a turfgrass agronomist is spending time with turf managers and discussing how they manage their turf. These interactions provide an opportunity to learn, observe and scrutinise and makes you realise there are multiple ways of achieving an outcome. It also throws up challenges that require more research.

Since leaving the AGCSA, I have continued my passion for research and I have been fortunate to undertake projects on behalf of the Victorian Golf Course Superintendents Association and the Sports Turf Association

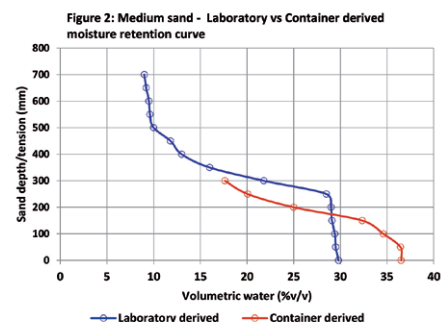
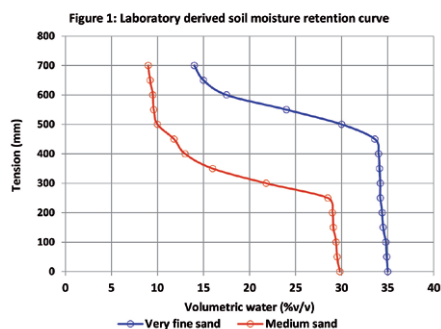
(Victoria). It is unfortunate that the turf industry and, in particular, the sports that benefit from the research that is undertaken has failed to support a sustained program of research.

As a turfgrass agronomist, it becomes obvious when there are gaps in the knowledge and that the overseas literature cannot always provide the specific answers required. Just as Peter McMaugh AM has done, I have also undertaken my own research projects to try and fill my knowledge gaps. What I have come to realise is that you don't need a sophisticated facility, you just need to have a methodical and well-planned approach to researching the problem. Having a large backyard has certainly helped as well! Across the last few years, I have undertaken a number of projects, many of which have been written up in this journal.

SANDS FOR GOLF GREENS

In 2014 it became apparent that golf clubs and superintendents were trying to achieve firmer and fast putting surfaces and finding it difficult to do so using the available USGA-type sands. There was a desire to return to the typical 'Melbourne Sandbelt' sand.

The first question was, 'What is a typical Sandbelt sand?' and secondly 'Why did we change greens to the USGA-type sands in the first place?' The desire to change was clearly to do with surface performance and to some degree was forgetting that many of these native sands had poor drainage characteristics and the surfaces were poor over winter. Consequently, many greens were reconstructed using USGA-type sands to improve winter playability, but often proved difficult to manage during the summer months



Figures 1 (top) and 2 (above). Moisture release curves generated from John Neylan's sands project

when trying to achieve surface hardness without losing grass in the process.

The research aim was then to test several sands for surface firmness, moisture retention and drainage rate (see photo below). The next question was what will happen once we grow grass on these sands (see main photo previous page). The research determined several interesting facts:

- The proportions of very fine sand and silt plus clay determine surface hardness.
- There is a fine balance between the proportion of fines and maintaining adequate drainage rates.
- The USGA sands are at their firmest when at field capacity. This finding challenges the typical maintenance regime where minimal water is applied in an effort to maintain a firm surface. In reality, for these sands to be firm they need to be saturated and then allowed to drain to field capacity.
- USGA sands can go from field capacity to being very dry within 6-12 hours.
- The finer sands have a slower reduction in moisture content which allows the surface to dry out while retaining sufficient moisture to avoid turf stress.
- Establishing a turf surface rapidly reduces the natural surface hardness provided by the sand and regular sand dusting is critical. Without dusting, the firmness is significantly less within four months of turf establishment due to organic matter accumulation.
- The process of dusting dilutes the organic matter and the depth of organic matter actually increases. Dusting maintains a very open organic matter matrix.

MOISTURE RELEASE CURVES – FIELD VS LABORATORY

I have questioned the use of moisture release curves (MRC) to determine the optimum sand depth for sports turf surfaces because the field observations of golf greens and sports fields highlight a disparity between the laboratory results and the field observations.

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 combinations 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 saturation.

There were two sand types tested – a medium-fine sand and a very fine sand. The sands were tested at 300mm, 250mm, 200mm, 150mm 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.

The curves generated demonstrated a similar relationship (shape) to the laboratory derived curves (see Figure 1 above) 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 2). This may in part be due to some 'suction' from the gravel layer in the container tests.

What it highlights is that the laboratory-derived moisture release curve is only at best an indication of the optimum profile depth. A shallower sand layer can potentially be used with a reduced risk of a saturated profile.



Testing sands for surface firmness, moisture retention and drainage rate



Some zoysia cultivars have extensive rhizome systems and excellent drought tolerance

PLAYING WITH GRASSES

Over the years I have collected various couchgrasses that have looked interesting and growing in harsh locations or were off-types in more established cultivars and warm-season grasses collected from bentgrass putting greens. It is interesting to observe the development of the grasses, reaction to drought, fertility requirements and recovery after being harvested. Some of the most interesting grasses in the field can be absolute rubbish when they are given a bit of love.

At times there seems to be an endless parade of new grasses being marketed, including some that are somewhat foreign to the local growing conditions. I have been particularly interested in the zoysia grasses and how they perform in southern Victorian conditions. The establishment rate from sprigs is slow, though once established they can be quite vigorous in their upright growth. Some cultivars have extensive rhizome systems (see photo above) and excellent drought tolerance. It is noticeable that when growing next to couch, zoysia can be quickly swamped by the couch due to the vigorous stolon growth.

Using native grasses in turf situations has often been attempted with varying results, however, there is still an ambition to include them in out of play areas on golf courses. I have collected the seeds of wallaby grass (*Austrodanthonia* spp., formerly *Danthonia*) and kangaroo grass (*Themeda triandra*) and nurtured weeping grass (*Microlaena* spp.) as a lawn grass. Germinating native grasses has been an interesting exercise with excellent results establishing wallaby grass, though kangaroo grass has been another story.



Using native grasses in turf situations has often been attempted with varying results. Germinating native grasses can be an interesting exercise, with excellent results establishing wallaby grass (pictured)

UNDERSTANDING POA ANNUA

In my many years in the turf industry, understanding *Poa annua* has been one of my obsessions. Over the years I have gone from just trying to kill it, to understanding its growth characteristics and the associated seedbank. Much of the research on the morphology of the plant and the seed bank has been undertaken in the home laboratory as I have grown hundreds of plants. Growing plants and observing how they behave has provided an excellent insight into the complexities of the plant and why it is so difficult to eliminate.

Another research project that I began when Melbourne first went into COVID-19

lockdown was to monitor the lifecycle of *Poa annua* in Santa Ana couchgrass. This project has been going now for a good 30 months and has provided good data related to the stimulus of germination, plant growth and expansion and natural decline. The following is a general summary of what has been learnt:

- The seed bank is large.
- There is a variation in the pattern of germination depending on the ecotype. That is, some types germinate in one pulse while others will germinate in several pulses over 42 days. This pattern of germination will influence the effectiveness of pre-emergent herbicides.



Growing *Poa annua* plants and observing how they behave has provided an excellent insight into the complexities of the plant and why it is so difficult to eliminate

- Even on sites where there is strong herbicide resistance, there is still enough variation in the *Poa annua* population to provide scope for survival.
- Even in a population of herbicide tolerant/resistant plants, there was some observable variation in the reaction to the herbicide applications.
- Once plants flower and set seed they can rapidly establish within the turf sward, particularly if there is adequate soil moisture. Having an adequate pre-emergent program is critical.
- In herbicide trials where half the plant was sprayed with glyphosate, there was strong survival in multi-tillered plants and what appears to be a lack of translaminar movement of herbicide. Applications must provide a high degree of coverage and follow up applications are essential.
- The germination of *Poa annua* in Santa Ana is strongly related to decreasing temperatures with temperatures less than 22°C. There was no positive correlation to rainfall or soil moisture content, with temperature being the main driver for germination. 🌱

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Unveiling the holy grail

ATM expert columnist Peter McMaugh AM reflects on one of the biggest breakthroughs in biological science that was announced last August.

The year 2022 will go down in history as one of the most crucial of all time. Not only have we seen the most reckless grab for power by Russian president Vladimir Putin that we have seen since Hitler, and the death of a woman who was the epitome of the anthesis of what Putin represents, but last August came the announcement from DeepMind of a step forward in biology the like of which the world has not seen since the mystery of DNA was unravelled.

DeepMind (www.deepmind.com) is a British artificial intelligence (AI) company which was formed in 2010 and acquired by Google in 2014. It comprises a team of scientists, engineers, ethicists and more who are “committed to solving intelligence to advance science and benefit humanity.” You may have heard about their earlier accomplishments using AI to play chess, but late last year they announced a breakthrough which was effectively the equivalent of unveiling the holy grail of biological science.

After years of research, they have developed an AI program called AlphaFold

which provides the folding sequences and patterns of the 200 million proteins known to science. AlphaFold can accurately predict 3D models of protein structures and as such is accelerating research in nearly every field of biology.


Why is this such a big deal? To put things into perspective, you have to appreciate how painstakingly long it took to unravel the structure of DNA. The conventional pathways of crystallography, the almost 10 years of laboratory slavery by British chemist Rosalind Franklin, set the stage for two ‘almost’ cowboys in the scientific sense, Watson and Crick, to see the inspiration in Rosalind’s images and to work out the patterns of repeating amino acids which gave the key to the structure of DNA – at that time another version of the holy grail of science.

The great predictions that DNA studies would unravel the key to all human diseases and see an explosion of medical cures have been slow arriving. Why? The big stumbling block was that what DNA does is give the templates and tools for putting together the sequences of amino acids that give us

proteins. It does this indirectly through RNA which controls the enzyme proteins which are the key to the building block proteins and systems which produce functioning organisms.

Even the massive Human Genome project which set about uncovering every gene (or DNA sequences) in man took more than 10 years to reach its goal. It did get quicker and quicker along the way, bringing the costs down from hundreds of thousands of dollars to merely a few thousand. It also provided the springboard for developing new techniques, many of which are in daily use in routine lab techniques all over the world and in many industries.

That the flowering of medicine flowing from DNA sequencing got stuck was caused by the lack of advancement in working out how to manipulate enzymes. It has long been known that enzymes, which are proteins, work like keys. They have specific shapes, which are dependent on the way their structural proteins fold, that give them their unique properties. We can easily represent the components of a protein and the bonds which hold their structural elements in place in a



Proteins are the building blocks of life and act like keys. They have a specific 3D shape, which is dependent on the way their structural proteins fold, that gives them their unique properties

It mainly uses the genes already in the plant to increase their number and effectiveness. A good example of this is what the University of Cambridge achieved in its wheat breeding program. It increased the number of genes for flower expression by three. This gave a 30 per cent increase in grain yield without essentially changing the plant.

The impact of this protein folding technology is going to change the whole way we approach disease diagnosis, whether human, animal or plant. There will be a huge explosion in 'template matching' technology where a simple blood or plant sap extract can be put on a template and the proteins in it matched to known disease patterns. This will be done with a very high degree of accuracy. While the new technology is not currently 100 per cent perfect in its predictions, it is well above the 90 per cent mark which is a lot better than we currently achieve with our present techniques.

We can also expect that we will see very different approaches to herbicide and other pesticide developments. In the world of herbicides, when I started in turfgrass science over 50 years ago we did not see any emphasis on the mode of action in the physiology of the plant. That was something you really had to go looking for. Today when you see how herbicides are classified, it is all related to their mode of action and the same applies to the various insecticide groups.

It is going to be much more common for the formulators looking into the development of chemicals that may have properties that shut down more than one metabolic system. This alone will lift the bar on the development of herbicide resistance. It is quite amazing that after over 70 years of use, the hormone herbicide group which includes 2,4-D, 245T, MCPA, MCPP and Dicamba still show very little resistance. This is because they work on the most fundamental systems of plant growth.

While a much better understanding of the lock and key systems of enzyme function will come from this latest breakthrough, it is not going to change the fundamentals of plant metabolic systems and the essential nature of the energy transfer between ADP (Adenosine di-phosphate) and ATP (Adenosine tri-phosphate). It is also not going to change the fundamentals of the need for understanding how the timing of herbicide applications affect the outcomes.

In another new announcement from Stephen Long at the University of Illinois Urbana-Champaign, there have been some considerable advances in upgrading the efficiency of photosynthesis. While this work has been done primarily with soy beans, they are also working on extending it to rice. While previous work of this kind has been done in tobacco plants, this is a first for a food crop.

linear diagram on paper, but we can't easily predict exactly how they will fold. Indeed, two different enzymes may have the same set of amino acids on paper, but because they fold differently they will have totally different effects on what is produced. These are the very bare bones of the processes and there are a multitude of variations that depend on quantum properties of constituent particles like electron spin that influence outcomes. We won't try to go there or else we'll all end up in a spin!

So, what does all this mean for us in practice? It means that it will be much quicker and much cheaper for structural chemists to create and explore new chemical structures in the search for biologically-reactive molecules. If you know the structural shape of proteins then you can design a key to open the protein, be it viral, bacterial or fungal, or an antidote vaccine or drug treatment.

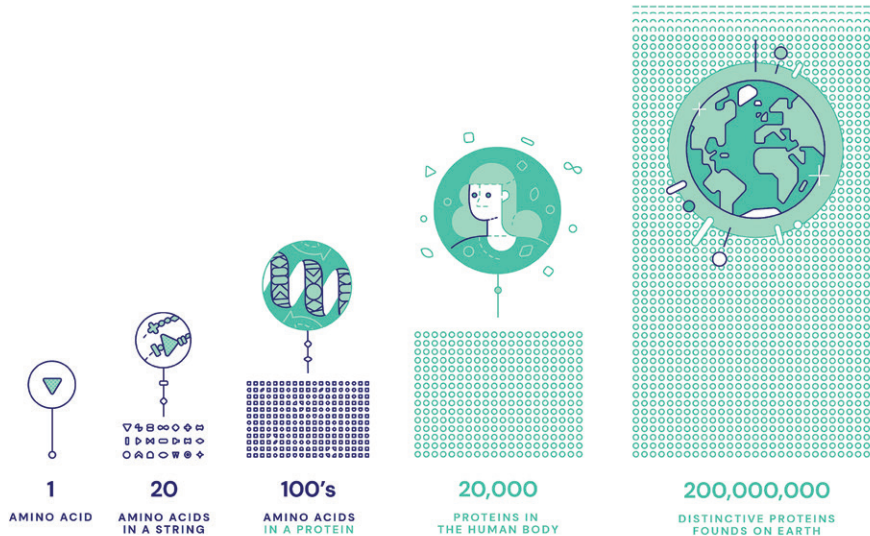
This is a mind-blowing advance. It changes the whole game, especially in pharmacology and immunology. For pharmacology read veterinary and agricultural chemicals as well as human. It cuts the time taken for a new

product development from tens of years to potentially 5-10 years from design/discovery to market.

A discovery of this scale cuts not only years of development but potentially billions of dollars from the costs of the chemicals you will use in the future. I am supremely jealous because this great discovery has come at a time in my career when I probably won't see its full development, let alone take a part in it. This is not going to be a page turner for the small third-tier chemical companies that by and large service the turf industry and you probably won't see the benefits for a minimum of five years.

What does it mean for other areas of biology such as plant breeding? Plant breeding has seen incredible advances in the last 50 years, firstly with the discovery of gene shears pioneered by Dr Jim Peacock who was a doctoral student at Sydney University in my time there. He later became chief of CSIRO Biology. This great advance was later eclipsed by the development of CRISPR which is a technique that removes the fear of introducing foreign genes into plants (GMOs).

ILLUSTRATION: STOCK.ADOBE.COM/CHRISTOPH BURGSTEDT



British artificial intelligence company DeepMind has developed a program – AlphaFold – which provides the folding sequences and patterns of the 200 million proteins known to science

Scientists have long been aware that in terms of energy capture, plants are relatively inefficient, capturing as little as 30 per cent of the incident energy they receive. Especially at high light levels, chlorophyll becomes over excited and has a high level of fluorescence which in turn produces oxygen radicals which damage the surrounding tissues. Plants have a natural protective mechanism against this called quenching. Most plants turn quenching on and off rather slowly. This is especially important in plants under shaded conditions, which don't want to lose any of the energy they get.

Long and his team have looked at genetic manipulation as a way of controlling the speed of the quenching reaction. By using CRISPR to add extra copies of the genes involved in quenching, they increase the levels of the encoded proteins and speed up the rate of transition. This may be a very important key to improving the shade performance of turfgrasses in the future.

The big lesson here is that sometimes what seem to be huge advances in turfgrass science don't always come to fruition in the long-term. I never get tired of telling the story of seeing the magical lack of disease in trial plots at Michigan University in 1973 in a herbicide trial run by Joe Vargas. The bentgrass had been given genes for resistance

to a herbicide so as to be able to use the herbicide to selectively remove *Poa annua* from bentgrass. It did this very well with the added bonus of the plots being disease free from pythium, phytophthora and rhizoctonia.

Just why this work went nowhere is a mystery. Since it was seed industry funded there may have been problems with seed production or yield. But from a pure science viewpoint, seed isn't the only way of propagating creeping bentgrass. An opportunity missed? Maybe...

ACCURACY AND PRECISION

The International Turfgrass Research Conference held its delayed meeting (by a year) last July in Copenhagen, Denmark. Australia was well represented scientifically by Dr Chris Lambrides and Dr Don Loch, who both operate out of the University of Queensland in Brisbane.

Dr Loch presented a very important paper drawing attention to the very lax way that many of the scientific papers presented in journals and at conferences, especially by young scientists in the USA, report plant names, especially grasses used in turf. What Don was in particular saying is that science is about accuracy and precision and that this applies just as much to plant names as it does to how plants function.

Plant nomenclature is there to describe plants precisely so that if you want to know that you are dealing with precisely the same plant then you need to have its identity clearly defined. If we take the example of what we call couchgrasses and the Americans call 'bermudas', then you can see where things can very easily become confused and misleading. What we frequently call common couch or wild couch is also, especially in Queensland, described as green couch as distinct from Queensland blue couch which is an entirely different genus.

The Linnaean system of nomenclature, which plant science has adopted exclusively for naming plants, relies on genus description. Under that genus there may be one to several different species and then under that you may then have many different varieties. Where varieties are very important is in differentiating plants for plant patents.

In Australia, plant patents, which are a form of intellectual property (IP), are dealt with under Plant Breeders Rights (PBR). These were originally described as PVR or Plant Variety Rights until it was realised that the varieties were not the entities holding the IP. The PBR system operates under an international agreement called UPOV (Union for the Protection of New Varieties of Plants) and it looks at morphological characteristics which are different from plant to plant.

You only need a plant to be different in one characteristic to make it a different variety. If you think about tomatoes, you can see easily how many different varieties you can have for one species. PBR does not have any relationship directly to DNA. It can only be a tool to disclose plant differences.

Coming back to couchgrasses, we have two differing species which stand under the genus *Cynodon* which are important in turf. These are *C. dactylon* (green couch) and *C. transvaalensis* (South African couch). These have different growth characteristics and different chromosome numbers. The haploid or single number for all *Cynodon* grasses is nine (9) chromosomes. All plants have their chromosomes in pairs of the haploid number. *C. transvaalensis* has two sets of the single and is called a diploid (18 chromosomes); *C. dactylon* has four sets (36 chromosomes) and is called a tetraploid. We know from many years of plant breeding in turf that the great Dr Glen Burton recognised natural triploids in the *Cynodons*. These are described as interspecific hybrids and written as *C. dactylon* x *C. transvaalensis* (27 chromosomes).

Under USA patent laws, which are different from our PBR, the patent is a true full patent

AlphaFold's ability to accurately predict 3D models of protein structures effectively unlocks the ability to create and explore new chemical structures a lot quicker and more cheaply

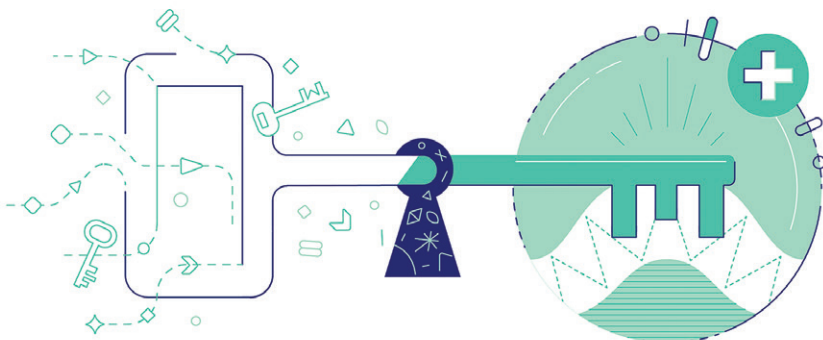


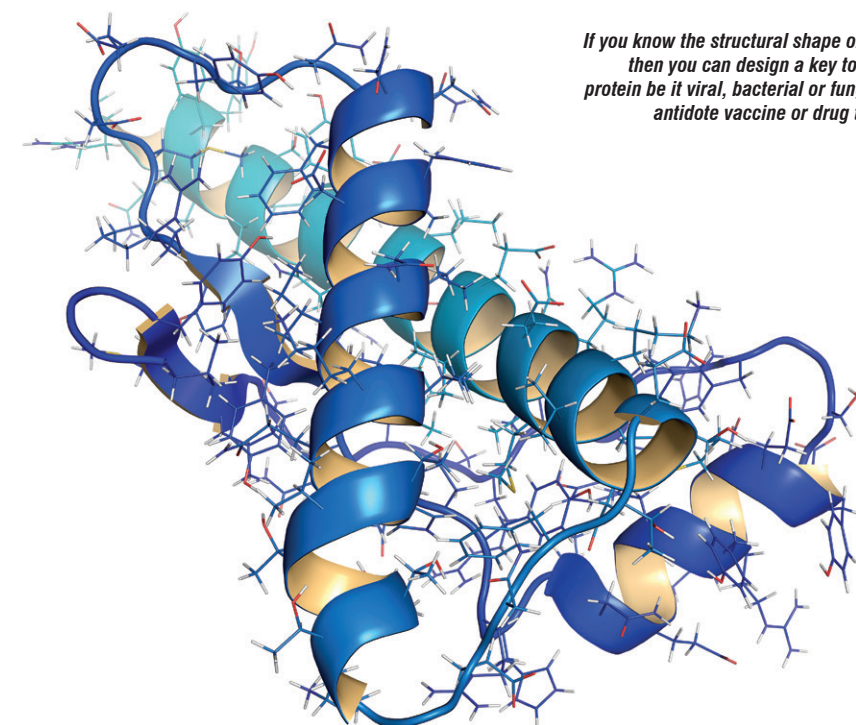
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not a special class of patents. Under the USA system, what has been patented for Tifway is *C. dactylon* x *C. transvaalensis* Tifton 419. The latter is its nursery identity number and is its true varietal name. Its registered trademark is Tifway. It is a very bad habit that many USA scientists have of using Tifway as a scientific name. It is not. It is a commercially useful identity which designates its place of origin.

You will often see tables in USA scientific journals with a mix of true scientific descriptions and trademarks used as if they are the correct identifiers. They are not. We see the same fundamental mistakes being made with zoysias and buffalos. This happens far less often with seed breeders in cool-season grasses, although you will quite frequently hear superintendents talk about Pennncross bentgrass as if it were a species and not just a F1 variety of creeping bentgrasses produced as an open polycross of three different varieties.

Under plant patents including PBR you cannot include a plant name, genus or species in a trademark and vice versa. They are, by law, different beasts and cannot be swapped at will. Some people deliberately flout these rules in commercial practice and by not applying for PBR think they are avoiding the consequences. They really leave themselves



If you know the structural shape of proteins then you can design a key to open the protein be it viral, bacterial or fungal, or an antidote vaccine or drug treatment

ILLUSTRATION: STOCK.ADOBE.COM/MOLEKUUL.BE

open to others using their genetic material under a different trademark.

This is a different thing from the correct identification for a scientific paper. Science, as mentioned, is about precision and consistent

accuracy. It is about comparing apples with apples. This is fundamental to science and just as important for the consumer as it is for them to know what they are buying is the same with precision and consistent repeatability. 𐀀




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JOHN FORREST

Taking root

PHOTOS: JOHN FORREST

All of Mount Lawley's new greens have roots coming out the bottom of the hole-changer, with a combination of many factors helping to create that successful outcome

Following on from last edition, John Forrest looks at the outstanding results being achieved at Mount Lawley Golf Club in Perth which is in the midst of a major greens replacement program.

In early February, Mount Lawley Golf Club in Perth opened four new greens as part of its current greens replacement program. As outlined in part one of this article in the last edition of Australian Turfgrass Management Journal ('Mount Lawley's green light' – ATM Vol 24.6, p54-55), last July the club embarked upon the first of a multi-stage project to reconstruct all greens. To be conducted over a three-year period, a total of 20 green complexes are being redesigned and reconstructed, along with works to some tees, the practice tee and clubhouse area.

Stage 1 involved the reconstruction of greens 1, 7, 8 and 11. They were closed for 28 weeks, with members playing on high quality temporary greens prepared by course superintendent Rod Tatt and his team as works progressed. The new 007 creeping bentgrass greens were opened for the first time on Saturday 4 February, 20 weeks after planting. Typical of a February summer day in Perth, temperatures peaked at 38.9°C that day, with 36°C recorded the day before. Evaporation rates were 14.4mm on the Saturday and 11.2mm on the Friday!

All of the new greens have roots coming out of the bottom of the hole-changer (see main photo opposite page) and a combination of factors has helped to create that outcome. As all turf managers know it is not one input but many that leads to such a good outcome, especially in the harsh summer conditions Western Australia experiences, and the Mount Lawley project to date is proof of that.

FAB FOUR

Design of the four new greens was completed by OCM who have come up with complexes which are not only challenging but very playable and can also accommodate a large number of rounds per year. As mentioned in part one of this article, Mount Lawley has a strong and active membership base with about 65,000 to 70,000 rounds played each year.

Consideration of moving players around the course while also ensuring the turf surfaces could be maintained to a high standard was a very important aspect of the design. The greens have slopes and variations, but there are no radical undulations which is an important factor given that water infiltration and retention are key in Perth's unique climate.

Green size has been increased to enable more pin placements to better manage wear and tear, with the subtle green topography allowing for the majority of the green to be used. A large pinnable area helps to create distinct variations in how each hole plays. What follows are brief descriptions of the new-look



At 750m², the 7th green is the largest of the new greens. The depth of the green allows for a large array of pin placements which changes the length of the approach considerably

complexes (please note, these comments are purely observations made by the author):

Hole 1: A 369m par four from the men's tee, 324m par four from the women's tee. The 1st green is the smallest of the four reconstructed at 485m². Instead of bunkers, it has well-shaped mounds and swales creating challenging chips to test a player's short game. No bunkers allow multiple entry and exit points from the green to minimise wear on the turf.

Hole 7: A 360m par four from the men's tee, 343m par four from the women's tee – a dogleg right with bunkers on the corner. The



The new greens profile mix comprising sand, compost (which is visible in the hole above) and Mineral Magic was blended at the quarry before being imported into the new green sites

7th green measures 750m² with bunkering on the left-hand side and the exit to the next tee to the right. The depth of the green allows for a large array of pin placements which changes the length of the approach considerably.

Hole 8: A 185m par three from the men's tee, 145m par three from the women's tee. The green is 675m² with bunkering once again on the left-hand side and the 9th tee exit on the right-hand side. It also has a large bail out area on the right and as the majority of golfers tend to slice the ball it allows the higher handicapper and senior golfers to open the green up for their second without having to take on the bunkers. Low handicappers have the risk-reward option of being able to go for the green.

Hole 11: A 409m par four from the men's tee, 395m par five from the women's tee. A strong drive is required to get to the top of a ridge so that a view of the green is achieved for the second shot. The green measures 675m² and is large for a long hole where golfers will be playing into the green with longer irons, hybrids or, in some cases, woods. There is a bunker on the left-hand side of the green where the exit to the next tee is, but it is well positioned. It is at the left front of the green so that golfers will walk around the bunker and enter the green from the back where there is plenty of room. Only one bunker on the left also creates a position that those golfers who are not long enough to reach the green can head to without bringing the bunker on the right into play as it is a little intimidating.

All greens were hydroseeded with 007 bentgrass, with the seed germinating between five and seven days. Hydroseeding produced a thinner coverage through the middle of



The new bunker complex to the right-hand side of the 11th green. 200mm-thick Santa Ana couchgrass sod has been used to create a sharp revetted face next to the green or on the outside edge of the bunker

greens 1, 7 and 8. In September a pre-seeder fertiliser was used at 2kg/100m² (GTS), Stamina G wetter at 2.5kg/100m², Kieserite 2kg/100m², CalciPrill at 1.5kg/100m², ICL Pearl 1.5kg/100m² and Astron at 5ml/100m². There was some slight damping off, with Banol applied as a precautionary measure.

Mowing regimes from first cut through to the greens opening for play is presented in Table 1 below. Greens were given their first cut at 8mm between 28 and 33 days after seeding and heights of cut gradually brought down over the following weeks. By the start of December, the height of cut was 3.5mm and come opening day was 2.75mm.

Twelve new greenside bunkers and one fairway bunker were constructed as part of the works. Bunkers have a sharp revetted face

next to the green or on the outside edge where the closely mown Santa Ana fairway surface comes to the edge of the bunker. 200mm-thick Santa Ana couchgrass sod was cut from older fairways to create the revetted faces and meant there was a fair amount of organic material in the sod.

Often in WA due to the long dry summers, faces of bunkers that have a lot of sand in them can fall away when golfers stand on the edge or they are mowed. This can cause the edge of the bunker to roll over in time, to the point where it is difficult to mow without scalping the turf. Using the Santa Ana sod with greater organic matter content means a stronger and more stable face has been created. Elsewhere, about 6700m² of Santa Ana couchgrass was laid as fairway and



The green on the long par three 8th (185m) measures 675m². All the new greens are 007 creeping bentgrass

greens surrounds turf and is now presenting an excellent tight surface to complement the new greens.

MOISTURE MANAGEMENT

As part of the greens reconstruction, Rain Bird 751 and 752 Series sprinklers were used around the greens, with adjustments made to ensure uniform coverage, in particular on the 7th green. Initially there were a few coverage problems in the widest part of that green, but with some adjustments it was overcome.

One of the interesting outcomes of this first stage of works was that the greens were established during late spring and two months of summer with less moisture in the profile compared to the old greens. Using a POGO device, Rod and his staff took regular moisture readings during the grow-in, with the results outlined in Figures 1 and 2 (opposite page).

Figure 1 shows measurements taken from the old 1st green between January and April 2022 (left-hand side of the graph) and the new 1st green taken from November 2022 through to the start of February 2023 (right-hand side of graph). These were the minimum levels to keep the turf in healthy condition.

As the graph shows, the old green volumetric moisture content had to be in the low to high 20 per cent range, whereas in the



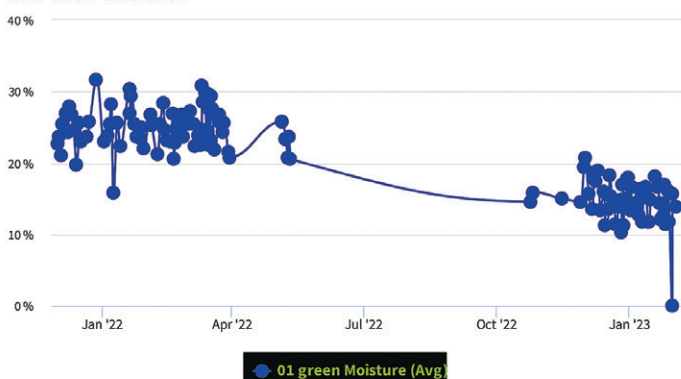
New green plug compared to an old green plug showing the significant difference in root structure

TABLE 1. NEW GREENS MOWING REGIME (OCTOBER-FEBRUARY)

DATE	OCTOBER	12 Nov 22	All greens 5mm
13 Oct 22	First mow 10mm greens 1 and 11, 28 days after seeding (DAS)	16 Nov 22	All greens 4mm
17 Oct 22	Second mow 8mm greens 1 and 11, 32 DAS. First mow 8mm 7th green, 32 DAS	17 Nov 22	All greens 4mm (63 DAS)
18 Oct 22	First mow 8mm 8th green 33 DAS	18 Nov 22	20mm rainfall
21 Oct 22	All greens 8mm	21 Nov 22	All greens 4mm
24 Oct 22	All greens 7mm	22 Nov 22	Leaf tissue and soil tests taken
26 Oct 22	All greens double cut 6mm	25 Nov 22	All greens 4mm
28 Oct 22	All greens 6mm	28 Nov 22	All greens 4mm
31 Oct 22	All greens 6mm	29 Nov 22	Second hand topdressing
	NOVEMBER		DECEMBER- FEBRUARY
2 Nov 22	All greens 5mm	5 Dec 22	HOC lowered to 3.5mm
4 Nov 22	All greens 5mm	22 Dec 22	Third hand topdressing
7 Nov 22	All greens 5mm. Root length measured at 220mm	30 Jan 23	Verti-mow -2mm, greens quite slow paced, lots of grass and grainy. Lowered HOC to 2.5mm and hand topdressing (dust)
8 Nov 22	First light hand topdressing (54 DAS)	4 Feb 23	Opening day (20 weeks after seeding). Double cut (up and back same pass) at 2.75mm and rolled
11 Nov 22	All greens 5mm		

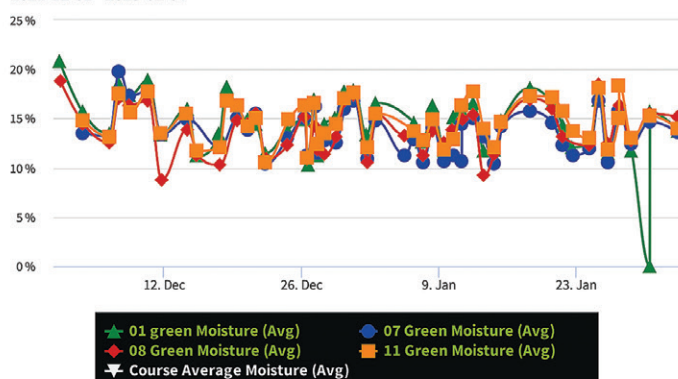
M.L.G.C

2021-12-01 - 2023-02-04



M.L.G.C

2022-12-01 - 2023-02-04



Figures 1 (left) and 2 (right) – Mount Lawley greens moisture measurements. Figure 1 – 1st green old (left) v 1st green new (right); Figure 2 – all new greens (1, 7, 8 and 11)

new green most of the readings were in the low to high teens, some 10 per cent lower than the old. The obvious reason for this is the size and number of roots that cover a larger area to pull moisture in, whereas the older greens had shorter root systems close to the surface and were exposed to evaporation and daily drying (see photo bottom of opposite page).

Rod has been able to move to less frequent irrigation events and deeper watering because he has roots at depth. While we could say that this is because they are new greens which haven't had a lot of traffic across them, organic matter accumulation or compaction, there is no doubt that the many inputs which have gone into the new greens have been the right ones and all played a part in achieving this reduction.

Figure 2 shows moisture levels taken from all four new greens. Like the 1st, moisture levels in the others can be seen to be consistently between 10-20 per cent. (Note: There is one outlier – a 0 per cent result – which was caused by the 'Read' button being pressed when the sensor was not completely inserted.)

HOLISTIC APPROACH

The presentation of the new greens on opening day was very well received by Mount

Lawley members and the surfaces have continued to play and present exceptionally well and are very healthy. As mentioned earlier, when a plug is removed using a hole-changer it stays totally intact, indicating excellent root structure which is a fantastic result.

The results to date have been outstanding and are a testament to taking a holistic approach and ensuring every part of the process is thoroughly investigated with nothing left to chance. While there are many who have supplied products who would no doubt like to claim the outcome as a result of using their products or procedures, it is more about the bigger picture and the term 'turf management' definitely springs to mind.

If moisture holding is the key, why are there better roots with less moisture in the profile? There is no doubt that the roots are certainly clinging to the compost and there is a good balance of moisture and nutrients in the soil and plant.

From my perspective, the following aspects have contributed to the successful outcomes that Mount Lawley has had with this project to date:

- Extensive sand testing – particle size distribution, total porosity (air filled and capillary), bulk density, particle shape and hydraulic conductivity;

- Testing with and without amendments and amendments at different percentages;
- Using a compost with a known make up (spec sheet);
- Mixing off site so that there were no layers;
- Fumigating the soil (using EDN) to remove plant parasitic nematodes, in particular Southern Sting nematode *Ibipora lolii*;
- Good design, with playability and sustainability being the key drivers;
- Close supervision and adjustment to grow-in practices and procedures;
- Working with and understanding the importance of knowing moisture;
- Soil and tissue testing to establish what is in the plant and the soil;
- Trialling and investigating the selection of bentgrass to be grown; and
- Seeding and planting undertaken earlier than normal in Perth so there was establishment before hot weather arrived.

With the first four holes successfully completed and in play, the Mount Lawley members now have a taste for what is to come with the remaining stages of the greens replacement program. Starting this July, a further eight greens (2, 3, 5, 6, 12, 13, 14 and 16) will form part of Stage 2 works, with the remaining eight greens to be completed as part of Stage 3 in 2024. 🌱

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The Sands switches on

ATM's environment columnist Kate Torgersen looks at an exciting new project underway at The Sands Torquay.

Imagine if your facility had the potential to provide power to your local community. Well, The Sands Torquay on Victoria's Bellarine Peninsula has just embarked on its journey to determine the potential of generating and storing clean energy. This is just one of many projects that are assisting the club in its mission to become Australia's first carbon-neutral golf facility.

Just an hour's drive from Melbourne, The Sands Torquay is a premium resort destination nestled in between the beach and the 18-hole championship golf course. A Pro Shop accompanies the 18-hole links-style course, Spike café, Shirley's restaurant and an array of premium facilities, including an indoor heated

pool, gymnasium, tennis court and recently refurbished luxury accommodation.

After an extended closure, Destination Leisure Holdings (DLH), a consortium of Surf Coast and Melbourne investors, acquired the land and its buildings at The Sands Torquay in early 2021. DLH has many assets in development, with The Sands Torquay its only operating asset. DHL's Jack Dahan says one of their missions is to acquire regional tourism assets for a number of reasons, not the least of which is to use the generally larger land and building footprint to generate and store power.

At The Sands Torquay, DLH aims to have:

- The facility generate and store more power than it requires;

- All operations (including golf and pool/gymnasium) conducted within a zero-carbon footprint, as a minimum;
- All dwellings, which form part of the Owners Corporation (OC), connected and having just one power bill (rather than the 700 currently);
- All golf carts, electric vehicles and freestanding batteries within the OC connected and centrally controlled;
- Excess power sold when power prices peak and purchased when power prices are low;
- Excess power used for community purposes (e.g., sporting ground lights, night driving range etc...); and



PHOTO: GARY LISBON

The Sands Torquay has just embarked on its journey to determine the potential of generating and storing clean energy to benefit not just the facility but the local community as well

and the hotel), the OC (which has 700 homes) and potentially even provide power to local sporting facilities. The Sands Community Battery project gained funding from the \$180 million local infrastructure and community services commitments funded in the Albanese Government's first Federal Budget.

As mentioned, not only is DLH aiming to produce and capture energy to lower their greenhouse gas emissions, they also have an extensive list of projects planned to lower their environmental footprint. Some of these include;

- A hothouse to provide a space to grow herbs, edible decorative flowers and vegetables for the facility's restaurants. Chefs also use some of the species found on the course (e.g., saltbush), which is dehydrated and used on the menu. This has reduced emissions as there is no longer a need to buy certain produce, eliminating transportation emissions, lowering production costs and providing a better-quality product.
- Introducing a 'Green Stay' program which allows guests to opt out of daily housekeeping during their stays, helping to reduce the resort's environmental footprint. Guests can book a 'Green Stay' at a lower rate and help save the planet.
- Locally-sourced products were used within the refurbished hotel rooms, with many products (e.g., bedside tables) being repainted to give a new lease on life and avoid too much going to landfill.

On the golf course itself, there is also a lot going on to mirror what is happening off course. Keegan Powell (CSTM), who has been at The Sands Torquay for just over seven years, including the past five as superintendent, has recently completed some course works and is also looking into other initiatives to improve the way the course is managed from an environmental perspective.

Recently, the crew combined two single tees into one larger tee on the par three 17th. This has not only allowed for a larger teeing area, but helped to reduce maintenance, chemicals and fertiliser requirements. Due to the success of the tee rebuild, Keegan is now planning similar construction projects on the remaining par threes.

Over the years, Keegan has also re-shaped various rough areas (tall fescue) to give excellent definition to the course. This has reduced rough mowing frequencies and costs (fuel and labour) by 20 per cent. Chemical applications have also been dramatically reduced, with Keegan opting to focus more on cultural practices to enhance turf conditioning. Other initiatives Keegan has implemented or is looking to implement include;

- Working alongside head chef Bevan Vahland to research different commercial composters that can convert food and green waste into a product suitable for use within the gardens and on turf surfaces.
- Water conservation is always high on the agenda, even if significant rainfall over the past 12 months has kept water storages full and seen minimal watering of turf areas. A common practice for the team is to conduct regular irrigation audits, with recent audits resulting in a 10 per cent saving of water use through re-adjusting sprinkler heads, fixing leaks and upgrading where needed. More hand watering is also done to ensure proper watering and less wastage from putting sprinklers on.
- Discussions are underway with Barwon Water to create a new water catchment on the course to help protect local flora and fauna occupying the Karaaf Wetlands.
- Out-of-play areas are extremely valuable as they provide critical habitat for many flora and fauna species, especially the critically endangered orange-bellied parrot. Weed management programs are undertaken by staff and a propagation schedule allows the team to regenerate endemic species and plant them back out onto the course.
- Keegan is hoping to introduce beehives on the course and apply to be part of the next round of Syngenta's Operation Pollinator project. This will see an area on the course turned into a pollinator plot, encouraging a variety of pollinators from native bees, butterflies and other insects. A common practice is for clubs to house beehives on course to collect, use and sell honey.

It is through projects like these that golf courses can provide a multitude of benefits to their local community, biodiversity and climate change. We look forward to seeing its progress in the months and years to come. 🌱



A 100kW solar panel system has been installed on the clubhouse roof at The Sands Torquay, along with a 50kWh battery to capture excess energy

- The Sands Torquay microgrid incorporated into a broader local network.

Although just at the start of this journey, Dahan says the OC, incorporating The Sands Torquay, will participate in the Active Energy Precinct (AEP) Project in partnership with Monash University and Birdwood Energy. The project's first component is to conduct a feasibility study detailing the benefits of being part of an aggregated (microgrid) solution.

As part of this process, the project team are deploying up to six batteries and monitoring equipment to act as hubs within the feasibility study. They will capture data to be analysed, test scenarios on the batteries and participate in stakeholder-designed workshops. The feasibility study will be submitted to national electricity regulator ARENA by the end of March 2023. Dahan says they expect to successfully secure a microgrid grant to fund what he calls "infinity energy" rather than the concept of carbon neutrality.

It has been all systems go at the club recently with the installation of a 100kW solar panel system on the clubhouse roof and a 50kWh battery to capture excess energy. The captured energy will be used to power the entire facility (including charging golf buggies, electric vehicle charging stations



MANAGEMENT

Even with 25 years' experience under the belt, Brendan Hansard continues to put himself out there. He was among a number of volunteers to journey to Royal Queensland last November for the Fortinet Australian PGA Championship to assist with course preparations



Leading by **example**

ATM columnist Ben Gibson catches up with Kew Country Club superintendent Brendan Hansard (CSTM) whose 25-year turf management career has taken him around the world.

There is a well-known adage that if you lead by example then others will follow. As I wrote in my book *People First*, leadership is not position or title, but action and example. Leadership is a skill and combination of personal experiences and attributes. You may know someone with the word 'leader' in their title, but that does not make them a leader per-se. Managers get titles and forced authority. Leaders build authority through influence, actions, character and the ability to inspire others.

Kew Country Club's Brendan Hansard (CSTM) is just one of the many quality course superintendents I have had the privilege to meet over the years and without question he is one who exemplifies that 'lead by example' mantra. With 25 years in the industry under his belt, Brendan has carved a successful career, one which has taken him from the Sunshine Coast to the US and Middle East and now, for the past seven-and-a-bit years, the beautiful Mid-North Coast of NSW.

In charge of a small crew at Kew, located about 40 kilometres south of Port Macquarie, Brendan's role is very hands-on. However, those who know the 45-year-old well will tell you that it's the hands-on aspect of the caper that Brendan excels at. As if to back that up, last November Brendan packed up the car and headed north to volunteer at Royal Queensland for the 2022 Fortinet Australian PGA Championship, cutting the 328 greens with a Flex 21 all week. Shortly after his return, I caught up with Brendan for this edition's leadership profile...

Tell us about your journey in turf management and how you came to be course superintendent at Kew Country Club? My first experience working on a golf course was at Caloundra Golf Club on the Sunshine Coast. I was on a traineeship and was lucky that the superintendent at the time, Wayne Andersen, was willing to give me a go and allowed me to do various jobs on the golf course. This experience gave me a taste for the job and I quickly realised it wasn't just about mowing grass.

I started my apprenticeship at Nambour Golf Club during which time my TAFE teacher suggested that I talk to the guys at Pelican Waters, which was managed by Troon Golf at the time. They were a worldwide management company looking to expand in Australia and were constructing the new Greg Norman-designed course there. I ended up completing the last year of my apprenticeship at Pelican Waters which gave me a fantastic insight into how golf courses were constructed.

It turned out to be a great move as Troon gave me many opportunities to work at some fantastic golf courses not only in Australia but overseas as well. Another great experience



Brendan Hansard with wife Joanne at Uluru on a family holiday last year

was doing The Ohio Program. I was posted at Pinehurst No.8 where I spent 12 months learning the trade at one of the top golf resorts in the world and making some lifelong friendships.

At the end of 2008 I moved to Abu Dhabi (United Arab Emirates) to start work on the new Gary Player-designed Saadiyat Beach Golf Club. For the first two months I worked at the Abu Dhabi Golf Club helping with preparations for the 2009 Abu Dhabi Golf Championships. After the tournament finished, I started as the assistant at Saadiyat Island which was quite the experience. The golf course and most parts of the island were built from a dredge that would suck up the ocean floor and pump it onto sections of the island. Extensions of the island would literally appear overnight!

With more than 100 staff involved in the whole project, busloads of workers would arrive for work each morning. This was a massive project which needed a lot of coordination between the construction company and the agronomy team. The maintenance team alone peaked at 48 made up of Filipinos, Pakistanis and Bangladeshis. With some careful and persistent training, our productivity increased and we were able to reduce numbers to 40.

Returning to Australia, I joined the crew at Twin Creeks in Sydney under superintendent Phil Beal. The course was in the latter stages of construction and it was very interesting to see what was involved in starting up a new golf club and watching both the agronomy and clubhouse operations take shape. When Phil departed in the spring of 2010 to take over at The Australian, I was elevated to my first superintendent posting.

After eight years at Twin Creeks, including over five as superintendent, I decided to make a sea change and moved to Kew Country Club after hearing about the job through family connections. My wife Joanne has family in Port Macquarie and we had visited the area several times. It reminded me of the Sunshine Coast

where I grew up and a more relaxed lifestyle seemed very appealing. I hit the ground running here in December 2015 and haven't stopped since.

Who has influenced your career and why?

In the earlier days, Dave Lunardelli and Marcus Hartup from Troon helped me a lot. They both had a strong agronomic background and helped me with the soil science side of turf management. Phil Beal has also been a strong influence throughout my career, both professionally and on a personal level as well. I would also like to mention reps Ben Miller, Scott Riley and Andy Stankovic – these guys are always willing to listen to me whinge about work or not catching enough fish!

A new year has just ticked over. What is a big focus for you in 2023 from a course perspective at Kew CC? The first part of this year we are focusing on concreting cart paths as we were lucky enough to receive a government grant to complete some cart path extensions. We have focused our extensions in the wettest areas to try and get carts back on course as soon as possible during those wet/rainy times.

Another of our main focus areas for the year is tree work. Very minimal tree work has been done in the last seven years. Our focus will be trimming back a lot of branches that have encroached our fairways. Tee shots have become a lot tighter and we have lost sight of the direction of play. Shade is also a major problem during winter.

How do you balance the demands of turf management and your personal life? It's probably one of the hardest things to do. I can't help but think, 'Are the greens okay?' or 'Did the irrigation work?' I have a very supportive and understanding wife who knows the stresses of the golf course and will often come with me to quickly check the greens (or whatever is concerning me at the time) followed by either a bike ride or a quick fish!



What is at the top of your priority list as a superintendent? First and foremost, it is the wellbeing of my team. I make sure my staff and I are safe at all times. I have a big responsibility making sure the people I'm responsible for leave work without incident. I also consider my team's needs and try to provide opportunities to further develop their skills.

You have a relatively small crew for your property. How do you structure and delegate your work? How do you get it all done? To answer the last part of the question first, we often don't get it ALL done. It is a matter of prioritising and doing the best we can with being understaffed. We have been through a lot of staff changes over the years which has been hard to manage. Currently we have five full-time staff – superintendent, greenkeeper, apprentice and two groundsmen. Sometimes having a small crew has its advantages, such as you don't have to go around chasing everyone making sure they are doing the right thing.

At the moment we don't have an official assistant superintendent and we have decided to train our fourth-year apprentice Daniel Adelt into the position so that when he completes his apprenticeship he can move directly into the assistant role. Daniel has shown great skills, initiative and willingness to tackle anything that comes his way. He also has the full support of the other staff.

With 18 holes of golf plus two bowling greens (one turf and one synthetic), we have a lot of work to get through. Most of the time I feel like we can never get on top of everything; we can get close but you always see something that needs doing. We're lucky to have a handful of regular volunteers that look after our gardens, repair pitch marks and fill divots etc. During renovations we put a call



In addition to the golf course, Hansard and his crew also manage Kew's two bowling greens (one turf and one synthetic)

out to all members to help pick up cores. We usually get a good number of volunteers who come out which is a massive help to us.

As far as structuring and delegating work, we have morning briefings where everyone is informed of their duties for the day. This can be easily followed on the whiteboard. I try to give all my team members variety in their daily routines as well as playing to their strengths.

How would you describe your leadership style? I like to lead by example, demonstrating a strong work ethic. I try to give staff some room to make their own decisions and discuss what worked well and what needs improvement after the job has been carried out.

What do you feel are some of the biggest challenges facing the turf industry at the moment and what action is needed? I think the biggest challenges I'm seeing are staff retention and attracting new people to our industry. I've had two apprentices start their first year and within six months they resigned because of the pay. Most people know that apprentice wages are low and can accept that, but the pay as a qualified greenkeeper is below average for what we do. I know some golf clubs have offered good money and are still struggling to fill positions. It's not just our industry that's struggling with staff, it's most industries all over the country. We have a good relationship with the local high school with some Year 12 students doing work experience on a regular basis. Perhaps the industry can focus more on school leavers.

Are you currently looking for staff? If so, what is your pitch? I'm always suggesting to my GM we need more staff to improve the golf course and continue with our course improvement plan. Unfortunately, we are not looking for staff at the moment.

Any advice for younger staff in the turf industry looking for their next opportunity or building their careers? When I was volunteering at Royal Queensland for the Australian PGA last November, I met a few young apprentices who really impressed me. It was great to see some young guys getting into the industry who were keen to learn and had a passion for turf. I think for young guys who want to move up in their career, they have to make some sacrifices. That might mean moving to another state or doing something internationally. These can be short-term steps but will help improve your skill set and help build your confidence. 🙌



Installing new concrete cart paths is one of the major ongoing projects at Kew Country Club



With a small maintenance crew, Hansard is lucky to have a group of regular volunteers who he can call upon to assist with a range of course work, from repairing pitch marks, assisting with tree work and collecting cores

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GORDON MOIR
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Arriving at St Andrews in 1991 as Eden Course superintendent, in 2000 Gordon was elevated to Links superintendent which gave him responsibility for all courses, including the Old Course. He would oversee preparations for three Open Championships in 2005, 2010 and 2015.



DR JIM BROSANAN
UNIVERSITY OF TENNESSEE, US

Jim is a Professor in the Plant Sciences Department at the University of Tennessee (UT) and director of the UT Weed Diagnostics Center. In this role, he leads research, extension and diagnostic programs targeting the needs of Tennessee's \$US5.8 billion turfgrass industry.



DR NATHAN WALKER
OKLAHOMA STATE UNIVERSITY, US

Nathan is a Professor of Turfgrass Integrated Pest Management/Turfgrass Pathology at Oklahoma State University. He is currently co-operating with Australia's Dr. Percy Wong in the identification and taxonomy of several new-emergent turfgrass pathogens.

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Built in 1903, Flinders Golf Club on Victoria's Mornington Peninsula affords dramatic views of Bass Strait and Westernport Bay

Flinders GC, Vic

After 12 years on the opposite side of Port Phillip Bay, Tom Hogan ventured back across to the Mornington Peninsula in 2021 to take on his first superintendent posting at Flinders Golf Club.

Superintendent: Tom Hogan (38).

Family: Wife Airlie, children Lenny, Annie and Olive.

Social media: Instagram @t_hogan_

Period as a superintendent: 16 months.

Association involvement: ASTMA/VGCSA.

Turf management career: Moonah Links (apprentice/greenkeeper, six years); Sea Temple, Port Douglas (foreman, 12 months); The National GC (greenkeeper, two years); The Sands Torquay (foreman, two years); Barwon Heads GC (assistant, 10 years); Flinders GC (superintendent, 16 months).

Qualifications: Turf management apprenticeship and Diploma in Sports Turf Management.

Major hobbies/past-times: Golf, camping and mountain biking.

Where in Australia is Flinders GC? Flinders is a small town located on the Mornington Peninsula in Victoria, sitting on the point

of Bass Strait and Westernport Bay. The surrounding area is renowned for its scenic beaches, wineries and quality golf courses. It is a tourist hot spot, especially during the summer months. Being just over an hour from Melbourne, it is very easily accessible for a day trip or little getaway. From the golf club there are some fantastic views over Westernport Bay towards Phillip Island and along the Bass Strait cliff tops towards Cape Schanck.

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

I grew up on a beef cattle property in Cape Schanck that my parents managed. When I was 15, The National Golf Club purchased some of this land to build the Moonah and Ocean Courses, so I jumped the fence and started working weekends and school holidays with the construction crew. Even though there was a lot of hard work involved, it was a great crew to work with and half my

time was spent riding around on four-wheel motorbikes moving irrigation hoses. I was motorbike mad at the time so I thought it was the best job in the world! I eventually went with the construction crew to Moonah Links and when construction was completed and the club took over the maintenance, I began a turf management apprenticeship under superintendent Leigh Yanner.

Who were some of your early mentors?

During my apprenticeship at Moonah Links, I was lucky enough to work under Leigh as well as assistants Nathan Bennett (now Royal Adelaide) and Scott Calder (now The National – Old Course). Along with the fundamentals, the skills I picked up from these guys included the importance of having a strong work ethic, an eye for detail, a desire to progress my career and always presenting the golf course to the highest standard. I still call these guys for advice to this day.



The Flinders GC crew (from left) comprises Paul West, Jack Knott, Brad Moon, Paul Dangerfield (assistant superintendent), Lenny Moore, Tom Hogan (superintendent) and Danny Lang

Talk us through some of your earlier roles and any particular highlights? During my apprenticeship at Moonah Links we hosted the 2003 and 2005 Australian Opens. We had a great crew at the time including guys from Scotland, Ireland and England and plenty of volunteers from other clubs. After my apprenticeship I worked at Sea Temple in Port Douglas for 12 months and then moved back to the peninsula and The National Golf Club where I was based on the Old Course and involved in the construction of the new driving range.

After spending 18 months at The National, I was appointed foreman at The Sands Torquay on the other side of the bay. This was a good time to be at the club as it was hosting The Surf Coast Knockout and there was a lot of reconstruction work filling in and reshaping bunkers. After two years there, I was appointed assistant superintendent at The Barwon Heads Golf Club.

You would spend a decade as Barwon Heads assistant. What made it such a great place to work? Barwon Heads was a fantastic club to work at with a great crew led by then superintendent Adam Lamb. The biggest achievement during my 10 years there was implementing the course development plan working closely with architect Paul Mogford. Two greens were rebuilt each year along with tees, bunkers, extending some fairways and a lot of vegetation work. Most of this work was completed by course staff and was a fantastic project to be involved in.

Adam's professionalism, staff and course management and ability to find a way to get things done really prepared me to take the next step in my career. Working with a large team at Barwon Heads was a fantastic opportunity to develop my skills in staff management at a senior level. The playing surfaces at Barwon Heads were maintained to the highest quality and we were always looking for ways to improve. Being assistant at Barwon Heads for that length of time and working closely with Adam and the staff to present the best course we could, made for a seamless move into the superintendent role. I built many quality relationships and ended up with some great mates during that time.

How did the Flinders role come about and what attracted you to the role? Flinders was advertised in August 2021 during a COVID lockdown. It was an exciting role and a good time for the family to move as both my wife and I are originally from the Mornington Peninsula, even though we were happy in Barwon Heads. After interviewing for the position and looking around the course, I was really excited for the potential it offered and the future plans the club had in place. The course is already in a fantastic setting. The opportunity to finetune the playing surfaces and with some talk of a masterplan and reconstruction during the interview process, the role was very attractive. I was extremely happy to be offered the superintendent's position.

How did you find the transition from assistant to superintendent? Flinders is a very similar club to Barwon Heads, albeit on a slightly smaller scale. The transition has been relatively easy with a similar membership base and very similar grass types. The main difference is the soil types – a lot more drainage is required at Flinders! The most challenging aspect of the role so far has been finding and retaining staff and managing time with a smaller crew than I'd become accustomed to at Barwon Heads. The club and membership have been extremely supportive and welcoming and I couldn't be happier in the position.

What advice would you give assistants looking to make the move up into a superintendent role? Lean on your mentors and peers for advice and guidance when needed. Work hard and continue to gain knowledge and experience wherever you can. Participate in any training programs available.

Give us a quick overview of the Flinders course and some of its unique characteristics. Flinders is an old course built in 1903. A public road winds through the first six holes and there is a Navy base located on the point beside the 3rd tee that shoots live canon rounds out into the ocean! The course is still situated on the original land with some hole changes suggested by Alister MacKenzie in 1926 and implemented by Vern Morcom in the 1950s.

Is it an easy or hard facility to manage? From a maintenance point of view our turf surfaces are reasonably small in area, although we do have a large amount of rough to mow. Having these smaller areas means we can get most of our morning tasks completed quickly which helps, especially during summer when the course can be full of golfers from 6.30am until dark! Although we try to manage all greens the same, this can become a challenge with different profiles, thatch levels



Switching to walk-behind mowers has made a big difference to the presentation standard of the Flinders greens

and some original greens with no drainage. One of our biggest challenges is fitting in time to spray between busy golf timesheets and it being quite a windy site.

Since taking over as superintendent, what key changes have you implemented?

Agronomically we are running everything quite lean and using less water on greens. Having higher staff numbers now than when I started means we can hand water as often as we need too. With most staff now having two summers under their belts they are able to identify some common hot spots. Bunker maintenance has been high on the agenda with a lot of sand leveling required and new sand added where needed. Other than that, we are adjusting some mowing lines and working on turf quality between greens and tees. We have started using hand mowers on greens which looks fantastic and dropped mowing heights on tees, fairways and surrounds. Purchasing backpack blowers and a tow-behind blower has allowed us to tidy up the course better as well.

Outline any significant projects you have recently completed or coming up. During my time at Flinders, we have rebuilt the 3rd green and 9th tee complex. The 3rd green, which

had been identified as one of the older push-up greens on course and got very wet through winter, was rebuilt in February 2022. New drainage was installed and new sand brought in, with the original turf reused on the green and surrounds and Santa Ana oversown with fescue on the wider surrounds.

The 9th tee was rebuilt last October. The tee was lowered and linked to the 8th green surrounds providing about twice the original teeing area which was well overdue with increased play on the course. Vegetation which was blocking some of the best views on the course was also removed from the 3rd green and 9th tee areas. Course staff completed most of these works following a design by Michael Henderson (from Holes in the Ground), with local excavator operator John Kirby helping with earthworks and shaping.

Following good feedback from the members on these projects, the club has commissioned a course masterplan by Michael Henderson. Works are set to start with the reconstruction of the 16th green this February. This is a very exciting time for the club with the masterplan helping to improve year-round playability, remedy some inconsistencies in the current design and maximise views from the course.



Last November we also installed a new irrigation pump station. My first summer at Flinders was a long one with countless pump issues and blowouts, resulting in many extra trips to check the pumps and worrying about whether any water had been put out at night. The original pump station was very old and well past its 'use by' date. Luckily the club approved a new pump station which was installed by A&M Watering and AKS. This project was held up by council permits, shipping issues with the pumps and wet weather, but eventually the pumps were installed and ready for the irrigation season. The new pumps have been faultless, making for a much less stressful summer.

Any special environmental considerations you have to incorporate into the management of the course?

Being close to the ocean and having a public road running through the course with heavy pedestrian traffic, we must be careful and make sure we are always following best practice with all our chemical and fertiliser applications. Half of the land the course is built on (the ocean side) is managed by the Bass Park Trust which means we have to liaise closely with them regarding any vegetation works we need to do on that side of the course.

You started at Flinders towards the end of the COVID pandemic restrictions in Victoria. How did the pandemic impact your operations and the club?

Metropolitan Victoria was in lockdown when I started at Flinders, which ultimately made the move over a bit more difficult as we were moving from an area classed as 'regional' where there was no lockdown at the time. In terms of starting work and getting to know the course, this was made a lot easier by not having golfers out there and I think I had about three weeks before local golf could return in groups of two.

Flinders fared well through COVID like most clubs. Golf numbers were up when they could play and continue to be strong. Membership is steady and members are happy to be playing uninterrupted golf. Key lessons to come out of COVID included the need to be flexible, realise that things can change at the drop of a hat and we must be able to adapt and work around them.

How is Flinders GC faring in the water management stakes?

The current stormwater harvesting system is very efficient and with two wet winters since I have been at Flinders we have had no issues with filling the irrigation dams. Luckily our fairways don't require much water being on heavy ground so most of our irrigation is focused on greens, surrounds

The 3rd green, one of the older push-up greens which got very wet through winter, was rebuilt last February

and tees. In saying this, we are aware that we may not always get the rainfall we have had recently and have engaged a consultant to help investigate ways of sourcing more water or enlarging our current storage capacity. We are continually looking at ways to make our irrigation system more efficient and have been changing quite a few greens heads to part circle to reduce water wastage. We have a 30-year-old irrigation system, so will be looking into upgrading this in the near future which will help to improve irrigation efficiency and reduce breaks and leaks.

How has Mother nature treated the course during your tenure?

Just like everyone else we have had our fair share of rain over the past 12 months, with our total rainfall for 2022 1025mm which is more than double our annual average. We had a major windstorm in October 2021 and some flash flooding during last spring when the course received 90mm overnight. That caused a lot of damage to cart paths and bunkers as well as some slight flooding to the machinery shed. Overall, though, we got through this period reasonably well compared to a lot of other clubs and count ourselves extremely lucky.

Do you use volunteers to assist with the management of the course?

Volunteers are very important and a huge help in the maintenance of the course here at Flinders. We have very dedicated Dads Army and Green Girls groups helping once a month with course maintenance and the clubhouse gardens. The Dads Army group complete tasks from divotting, whipper-snipping, rough mowing, vegetation works, filling up ball washers and anything else that needs doing. They are also on call for any extra works required such as lifting and laying turf and storm clean up. Special thanks go to all members who volunteer in these groups and a particular mention to members Tim Dyer and Lorna



The new 9th tee complex, rebuilt last October, was lowered and linked to the 8th green surrounds

Conboy who organise all the working bees and John Montgomery who empties all the course rubbish bins three days per week, every week. We also have a local high-profile course superintendent as a member at Flinders, but I'm still yet to see him among the Dads Army contingent!

What have you got in your shed? 3 x Toro 3400 Triflex, Toro 3100 Sidewinder, Toro Multi Pro sprayer, Toro ProCore, John Deere 1570 rough mower, Toro 7200 Z-turn rough mower, 2 x Jacobsen fairway mowers, 3 x Kubota/John Deere tractors and Toro/Kubota utilities. New equipment includes a Dakota 412 topdresser, 3 x Toro Flex 21 walk-behinds, Toro tow-behind blower, Graden swing wing and walk-behind scarifiers.

Favourite piece of machinery is currently the Flex 21 hand mowers which have made a big difference in how we can present the greens. Items we couldn't live without are the Multi Pro spray unit and ProCore. We have two new Toro 5510 fairway mowers on order and a Tru-Turf roller. The one item we have on the wish list is an excavator; we have a fair amount



All Wintergreen fairways were scarified this season, with Hogan hoping to scarify the remaining fairways (Santa Ana and common couch) later this year

of course works coming up and it would also be great for drainage and bunker works.

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

So far for me it has been finding and attracting staff. The club has been very supportive of these issues and we are looking after our current staff. We have an excellent crew now who are working together and getting behind everything we are trying to achieve on the golf course. Finding new staff to add to the team



Flinders Golf Club has very dedicated Dads Army and Green Girls groups helping once a month with various course maintenance activities and maintaining the clubhouse gardens



A new irrigation pump station (top) was installed last November, replacing the old system (above)



*Along with greens renovations, regular verti-mowing and dusting is giving excellent results in tightening up the *Poa annua*/bentgrass greens surfaces and reducing thatch*

is still proving to be a struggle. Most clubs are having similar experiences, however, with Flinders being quite geographically isolated it is adding an extra layer to this challenge.

Best advice you have received about being a superintendent/greenkeeper... “There is no substitute for hard work” – Leigh Yanner.

What have you worked on personally to improve your skills as a superintendent? I have put a lot of work into my management style. I read and listen to podcasts on professional and personal development and gained a wealth of knowledge. The biggest

thing I have learned from this is how to manage and direct staff in an effective and fair way, while building respect with all those that I work with. The superintendent role at Flinders is extremely hands on which has allowed me to lead by example. I want the staff to see that I won't ask them to do anything that I wouldn't. I like to set the bar high and I appreciate hard work and effort. I try to make sure this is recognised and rewarded in the staff when I see them rising to the challenge.

What gives you the most job satisfaction and what has been the most pleasing moment during your time at Flinders?

Seeing the course continually evolve and improve has been very rewarding, along with employing quite a few new inexperienced staff members and having them develop, come up with ideas and show a huge amount of pride in the way that they present the course.

Being a golf course superintendent can be an unforgiving role but one that is ultimately rewarding. What keeps you coming back every day? I enjoy the challenge of constantly trying to improve the course and working with a team. Having everything completed on a Friday afternoon ready for the weekend is very satisfying. I really enjoy undertaking any course construction works and seeing the finished product. Flinders is also a beautiful setting and a pretty nice place to come to work each day. 🌳



Greenkeepers in the making... Hogan's daughters Olive (left) and Annie help dad out during the holidays

AT A GLANCE – FLINDERS GC, VIC

Course specs: Par 69, 5307m. One-and-a-half hectares of *Poa annua*/bentgrass mix greens and surrounds, 0.7ha Santa Ana couchgrass tees and 8ha of Wintergreen/Santa Ana/common couch mix fairways.

Members/rounds: 1100/38,000.

Major tournaments/events: Summer Open 36-hole amateur event, Easter Tournament – first held in 1905 – and Club Championships.

Staff structure: Tom Hogan (superintendent), Paul Dangerfield (assistant), Brad Moon (qualified greenkeeper), Jack Knott (second year apprentice), Danny Lang (groundsman), Paul West (groundsman – four days/week) and Lenny Moore (school-based apprentice).

Climate/annual rainfall: Annual average rainfall for Flinders is 500mm, but over the past two years we have received 833mm (2021) and 1025mm (2022).

Terrain/soil types: Overall, the course is reasonably flat but is set on two levels with a big rise from the 6th tee to the 6th fairway before coming back down from the 13th tee. Flinders is built on heavy clay. Some greens have been rebuilt over the years using different sands, so there is a bit of variety on course. The 13th is the only hole built on clean sand. On the plus side, we have some of the best clay for building irrigation dams!

Water sources/irrigation system: The club has a stormwater harvesting system which pumps stormwater from the nearby Flinders township into two irrigation dams on the course which together hold 38 megalitres. There has been no issue filling these dams over the last two winters, with the stormwater harvesting system pumping any summer rainfall in to top up the dams during the irrigation season. Toro Lynx central control running a hydraulic OSMAC satellite system with single row Toro 690s in the fairways and Rain Bird 700/750s in greens.

Cutting heights/regimes: Greens mown at 2.7mm and cut or rolled as required. Tees/surrounds 7mm and fairways 8mm.

Renovations: Greens and surrounds are renovated in spring and autumn with a mixture of coring, AIR2G2 and scarifying. Contractors assist with the coring and clean up, with a staff member on the club's ProCore. Scarifying is done in-house and the AIR2G2 by Adam Robertson. After coring or scarifying, any required amendments are applied and then a heavy sand topdress (around 50 tonnes of sand). Along with greens renovations, regular verti-mowing and dusting is giving us excellent results in tightening up the greens surfaces and

reducing thatch. All Wintergreen fairways were scarified this summer and later this year we will scarify more fairways and hopefully tees as well.

Major disease pressures: The greens have been reasonably healthy with the main disease seen so far being rhizoctonia along with a small amount of anthracnose this summer. Focusing on improving plant and root health, along with preventative fungicide programs, we have seen very little disease so far. Reducing thatch and keeping nitrogen levels as low as possible helps and we also target pythium prevention as part of our fungicide program.

Nutrition management: Nutrition is based on regular soil tests; we plan for minimum levels of fertiliser and work from there as required. Greens receive a granular fertiliser at renovation time and liquid fertilisers during the year. In general, we try to treat all greens the same, but with some different profiles and different ages of greens, occasionally we need to adjust this and give certain greens a bit extra. The couch surfaces require very little fertiliser. So far, we have just applied light liquid fertilisers mixed with Primo, with granular applications on some weaker areas to help them improve.



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JAKE LAUNCHES FIRST LITHIUM-POWERED SUPER LIGHT FIVE-REEL MOWER

Users get up to seven hours of operation per charge with Jacobsen's new lithium-powered SLF1 ELITE



ASTMA Silver Partner Jacobsen has staked its claim as a leader of lithium mowers in the golf market with the release of the new SLF1 ELITE. Sixty million hours of ELITE Lithium use on fine turf facilities has helped create a five-reel mower that makes no compromises on performance.

Users get up to seven hours of operation per charge with Jake's 500-plus amp-hour Li-ion battery, which is powered by Samsung SDI lithium technology. This run-time ensures no lithium mower can cover more of a golf course on a single charge. The machine offers convenient on-board overnight charging that fits with existing universal electrical infrastructure, making it as simple as plugging it in at the end of the day ready for the next.

Practical convenience is at the forefront of the SLF1 ELITE with virtually maintenance-free next-gen components, and the introduction of an advanced on-board and remote-ready monitoring system. With this in place, machine diagnostics can be analysed quickly.

The control centre, located on an adjustable swing out console arm, features lockable speed and Jacobsen's frequency of clip controls to guarantee a consistent finish every time on fairways, large trim and surround areas or terrain with undulations.

Lithium power provides silent cutting with minimal vibration which reduces operator fatigue and increases productivity. Silence means turf managers can cut when and where they want to.

The SLF1 ELITE was tested in wet conditions and challenging slopes to ensure the power goes where it is needed. The specialised agile cutting units allow the SLF1 to cut in undulations where other machines can't. The hydraulic-free design rounds off a proven machine that is leading the way for lithium mowers in range and cut quality.

For more information on the SLF1 ELITE, visit www.jacobsen.com.

UNDERHILL'S HOSE CADDIE



Lifting heavy hoses in and out of utility vehicles is a thing of the past with Underhill's new hose caddy trailer (pictured above) now available from ASTMA Bronze Partner David Turf. The hose caddy trailer is designed with strength and function in mind for professional turf managers. Every detail has been considered, from the high flow hose caddy reel mounted securely to the trailer to the full-size golf cart tires and hubs for a smooth and quiet ride.

The strongest, most durable hose trailer on the market comes in 19mm or 25mm versions with a three-metre UltraMax Blue leader hose included. The reel holds over 30m of 25mm hose or 45m of 19mm hose and includes a convenient quick coupler key mount. The trailer connects to any flat bar hitch, with replacement parts readily available.

For more information on the Underhill hose caddy trailer or to place an order, visit www.davidturf.com.au, email sales@davidgolf.com.au or call 1300 790 890.

PARTRIDGE TAKES FLIGHT



After five-and-a-half years as superintendent at Manly Golf Club in Sydney, **Luke Partridge** (pictured) has departed to take up a new role with ASTMA Bronze Partner Nuturf in Adelaide. Partridge has been appointed as Technical Sales Lead – Export & South Australia and started in early February.

Partridge joins Nuturf with a proven track record in the turf industry and brings over 21 years of experience in the management of high-end golf courses and sports turf facilities. Prior to his time at Manly he held senior positions at elite sporting facilities and golf courses across the United Kingdom, United States, United Arab Emirates, New Zealand and China. Nuturf says Partridge's 12 years of experience in international turf management and working with stakeholders across various backgrounds will be an invaluable asset to their business.

Posting on Facebook shortly after the announcement, Partridge noted: "It is with mixed emotions that I have handed in my notice as superintendent at Manly Golf Club. It has been a challenging, yet extremely rewarding experience to manage the golf course maintenance operation for this proud club. I am extremely excited to join the Nuturf team... and assist in growing the company's capabilities in these key markets."

NEW APPOINTMENTS AT TURFCARE AUSTRALIA



Turfcare Australia kicked off 2023 with the announcement that **Glenn Gibson-Smith** (pictured right)

and **Darryl Mison** (pictured left) have joined the company's Queensland team. Gold Coast-based Gibson-Smith has been appointed as Queensland state manager/international sales, while Mison has been appointed Queensland area manager.

Gibson-Smith joins Turfcare with an extensive 19-year sports turf management career behind him. For the past six years he was superintendent at the well-renowned Glades Golf Club on the Gold Coast and prior to that was superintendent at Riverside Oaks in NSW and assistant superintendent at Sanctuary Cove Country Club on the Gold Coast. He has also worked and studied in America, New Zealand and Singapore.

Mison joins Turfcare with over five years' experience working with turf customers and industry partners providing advice, support and product supply. Mison's career in the industry spans over 20 years, first working in bowling green management before transitioning to golf courses where he worked at Royal Pines Resort and as an assistant superintendent at Sea Temple, Port Douglas. He also spent time working in turf installation where he was a manager.

Gibson-Smith and Mison join Turfcare's existing team members Scott Lee (Queensland sales support and operations manager – South) and Glen Edwards (Northern region). Gibson-Smith can be contacted on 0413 263 325 and Mison on 0459 925 902. 📞

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	Matthew Oliver Suncorp Stadium, Qld
Dean Bailey Rosanna GC, Vic	Jake Gibbs Elanora GC, ACT	Shaun Page Southern GC, Vic
Shane Baker Mosman Park GC, WA	Danny Hack Wellington Shire, Vic	Luke Partridge Nuturf, SA
Brett Balloch Anglesea GC, Vic	Cameron Hall Kew GC, Vic	Mick Pascoe Noosa GC, Qld
Ed Barraclough Cardinia Beacons Hills GC, Vic	Gareth Hammond Terrey Hills GC, NSW	Ben Payne Peninsula-Kingswood CGC, Vic
Mark Bateman Koorringal GC, Vic	Brendan Hansard Kew CC, NSW	Michael Pearce RACV Torquay GC, Vic
Tim Bayard Evergreen Turf, Vic	Dean Hardman Indooroopilly GC, Qld	Jeff Powell Ballarat GC, Vic
Duncan Begley Horizons Golf Resort, NSW	Nick Harris Wentworth Club, UK	Keegan Powell The Sands Torquay, Vic
Nathan Bennett The Royal Adelaide GC, SA	Marcus Hartup Vattanac Golf, Cambodia	Luke Primus Deakin University, Vic
John Berthon St Georges Basin CC, NSW	Mitch Hayes Living Turf, Qld	Scott Prince Manningham City Council, Vic
Paul Bevan GTS, Qld	Martyn Hedley Landscape Solutions, Qld	Shaun Pritchard PEGS, Vic
Shane Bissek Tablelands Council, Qld	Matthew Heeps Evergreen Turf, Vic	Justin Rankin Kooindah Waters GC, NSW
Robert Bloom Pelican Waters, Qld	Luke Helm Meadowbrook GC, Qld	Peter Rasmussen STRI, Hong Kong
Andrew Boyle GTS, Vic	Tony Hemming Optus Stadium, WA	Marc Raymond Waterford Valley GC, Vic
Justin Bradbury Camden GC, NSW	Kirsty Herring Mackay Regional Council, Qld	Scott Reid Launceston GC, Tas
Nathan Bradbury Nuturf, NSW	Tim Hoskinson Green Options, Qld	Lachlan Ridgewell Blacktown ISP, NSW
Harry Brennan Dubbo City Council, NSW	Ian Howell Bonnie Doon GC, NSW	Brent Robinson New South Wales
Brendan Brown East Geelong GC	Rhys Hunichen Atlas Golf Services Vic	Chris Rogers Portsea GC, Vic
Fraser Brown Lake Karingup CC, WA	Jay Infanti Eastern GC, Vic	Brett Saggus BRG Legend Hill, Vietnam
Ben Bruzgulis Cronulla GC, NSW	Nick Jeffrey St Joseph's College, Qld	Wesley Saunders Dunblane New GC, UK
Hamish Buckingham C'wealth GC, Vic	Mark Jennings Racing Victoria, Vic	Robert Savedra Wesley College, Vic
Chris Burgess Yarrawonga Mulwala GC, Vic	Steven Johnson Al Mouj Golf, Oman	Travis Scott Riversdale GC, Vic
Greg Burgess K&B Adams, Vic	Jason Kelly Royal Fremantle GC, WA	Bill Shuck Evergreen Turf, Vic
Jason Bushell Rowes Bay GC, Qld	Nick Kinley Hartfield CC, WA	Cameron Smith Bonnie Doon GC, NSW
Aaron Cachia Toronto CC, NSW	Blaine Knox Palm Meadows GC, Qld	Gary Smith Wodonga TAFE, NSW
Malcolm Caddies Kai Tak, Hong Kong	Lance Knox Busselton GC, WA	Jacob Smith The Coast GC, NS
Stuart Campbell Maroochy River GC, Qld	Steve Lalor Townsville GC, Qld	Thomas Smith STRI Australia
Brad Carey Riversdale GC, Vic	Kane Latham The Australian GC, NSW	Mathew Soles Roseville GC, NSW
Patrick Casey Royal Perth GC, WA	Nick Launer Keysborough GC, Vic	Liam Somers Hamersley GC, WA
David Cassidy The Cut, WA	Ben Lavender Newington College, NSW	Clinton Southorn Troon International
Brian Cattell Wagga Wagga CC, NSW	Jason Lavender Beenleigh RSL & GC, Qld	John Spraggs Royal Wellington GC, NZ
Peter Cawsey Eastwood GC, Vic	Dean Lenertz North Ryde GC, NSW	Daniel Stack Windaroo Lakes GC, Qld
Paul Chalmers Tamworth JC, NSW	Dean Lewis Thurgoona CC, NSW	Kenji Steele Riverway Stadium, Qld
Brenton Clarke Warrnambool GC, Vic	Josh Leyland Box Hill GC, Vic	David Sutherland The Ridge GC, NSW
Jeremy Collier Mars Stadium, Vic	Nathan Lindsay Marrickville GSCC, NSW	Lee Sutherland St Michael's GC, NSW
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Mick Cornish Cazaly's Stadium, Qld	Stephen Mallyon Renworx, NSW	Shaun Taylor Southern GC, Vic
Shaun Cross Byron Bay GC, NSW	Dave Mason Brisbane GC, Qld	James Thomas Bayview GC, NSW
Joshua Cunningham All Outside, NSW	Garry McClymont Twin Waters GC, Qld	David Thomson Bermagui CC, NSW
Luke Diserens Roseville GC, NSW	Mick McCombe Maleny GC, Qld	Colin Thorsborne Parkwood Village, Qld
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Patrick Fraser Green Options, NSW	Damien Murrell Merewether GC, NSW	Tim Wright K&B Adams, Vic
Peter Fraser Hervey Bay G&CC, Qld	James Newell Magenta Shores G&CC, NSW	Matthew Young Moonee Valley CC, Vic
Adam Fry Kooyonga GC, SA	Kelvin Nicholson Palmer Coolum Resort, Qld	

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

NSWGCSA

The last couple of years we've dealt with droughts, lockdowns and floods and the one thing we know for sure is that 2023 will bring with it a new set of challenges. We face the year with a focus on the skills development and well-being of our members and their teams.

The NSWGCSA continues its association with RU OK? and Prime Effect (**David Shillington**) who attend our 'Walk & Talk' and education days and provide tips and updates on mental health and well-being; we thank them for their support. From an industry learning perspective, our trade partnerships and our course superintendents give their time to upskill our teams and we look forward to learning more with them in 2023.

This year we will be adding online lectures to our education sessions which will allow more of our greens teams to be involved in what's happening in our industry. Our two new Board directors – **James Newell** (superintendent Magenta Shores) and **Jake Gibbs** (director of grounds Elanora CC) – will

ON THE MOVE...

SCOTT BARNETT: From superintendent Marri Park GC, WA to superintendent Margaret River GC, WA.

LEON BLACKER: From assistant superintendent to superintendent Manly GC, NSW where he replaces the outgoing Luke Partridge who is moving back to Adelaide to take on a role with Nuturf.

SYE BRENNAN: Promoted to superintendent Penfield GC, SA replacing Nicholas Hall who has moved to The Grange GC, SA.

BRENDAN BROWN: From assistant superintendent The Sands Torquay, Vic to superintendent East Geelong GC, Vic.

ROD FENTON: The former inaugural winner of the ASTMA Claude Crockford Sustainability and Environment Award back in 1996 has retired as superintendent of Queenscliff GC, Vic.

PETER FLEMING: From superintendent Kwinana GC, WA to superintendent Hamersley GC, WA.

JACKSON JOSEPH: From 3IC to assistant superintendent Manly GC, NSW.

DEAN LENERTZ: From assistant superintendent St Michael's GC, NSW to superintendent North Ryde GC, NSW where he replaces the retiring Ron Duffy.

RYAN THOMPSON: From assistant superintendent Sentosa GC, Singapore to assistant superintendent Latrobe GC, Vic.

DAVID WARNAAR: From assistant superintendent Yarrowonga Mulwala Golf Resort, NSW to superintendent Commercial Club Albury, NSW.



NSWGCSA Superintendent of the Year Brent Hull (right) with Paul Delaney from sponsor Australian Turf Projects

be developing and running these and we will send details as they become available.

Our social media channels – Facebook, Instagram and Twitter – also provide us with the forum to keep connected with all of our members, sponsors and course staff and we continue to develop these connections for information, education and sometimes just for some fun facts and pictures.

Each year we hold two major events, the first being the Land HQ-John Deere Ambrose Day which will be held at Magenta Shores on 23 May. At this event we provide a forum for our sponsors to showcase their products and we also get the chance to play golf and socialise over dinner. It's always a great day/evening and we look forward to visiting Magenta Shores.

The second major event will be our annual Rube Walkerden Day which will be held later in the year. During this day we hold our AGM and annual awards celebration recognising outstanding achievements in greenkeeping.

The 2022 Rube Walkerden Day was held at Killara Golf Club last November. At the AGM we welcomed newly-named association life members **Mark Parker** and **Gary Beehag** and welcomed new Board directors James Newell, Jake Gibbs and **Gareth Hammond**. We also celebrated the success of our award winners, including:

- **Superintendent of the Year (sponsored by Australian Turf Projects):** Brent Hull (Moruya GC);
- **Outstanding Achievement Award (sponsored by Living Turf):** Paul Gumbleton (Teven Valley GC);
- **Outstanding Performance and Dedication Award (sponsored by Water Wise):** Mark Ward (Elanora CC).

On the golf course, Federal Golf Club superintendent **Peter Dunn** won the Rube

Walkerden Trophy, finishing with 38 points and one ahead of host superintendent **Ryan Fury**. **Scott Hauer** from sponsors Elite Sand & Soil enjoyed a day out, collecting the Pat Ingram Trophy (trade best stableford – 43 points) and teaming with colleague **Luke Bryan** to win the GTS Cup (4BBB stableford). Terrey Hills' **Matt Vile** collected the President's Trophy (greenkeepers scratch stableford) with 34 points.

The NSWGCSA would like to thank all sponsors of this event and our awards – Elite Sand & Soil, Dad & Dave's Turf, Envu, GTS, Water Wise Consulting, Living Turf, Toro, Adama, Australian Turf Projects, JT Turf, Syngenta and Australian Hammer Supplies – we value your support.

LEON HENNESSY PRESIDENT, NSWGCSA



Rube Walkerden Trophy winner Peter Dunn

GCSAWA

It has been a fairly routine summer in Perth so far. We had 34mm in mid-November and not a drop since and as of the end of January we are up to 70 days without rain. Temperature-wise it has been pretty manageable. We haven't had a 40-degree day yet which is very welcome after having 15 days over 40 last year. The strong, consistent overnight easterlies that make irrigation tough and keeping the course tidy have come and gone.

Around the courses it has been a busy summer for some clubs. Melville Glades replaced six greens and installed a new irrigation system, while Mount Lawley and Cottesloe are continuing their masterplans and rebuilt several new greens each (see *John Forrest's column earlier this edition for more on the Mount Lawley project* – Ed). Kwinana, Sea View, Hillview, Hartfield and Mosman Park also got into the action of greens construction,

while Royal Perth, Hamersley and Margaret River all welcomed new superintendents (see *the 'On the move' breakout opposite* – Ed).

Speaking of Margaret River, plans are well underway for this year's GCSAWA conference in August. There will be about 15 presentations and as always plenty of socialising, education, food and drink. Please reach out if you are interested in coming over and attending. We will release all the info in the next month or so.

In other event news, the TAFE Awards Night is booked in for 28 March at the Swan Yacht Club, followed closely by the WA Golf Industry Awards Night a few days later on 31 March at the Crown Ballroom. The Trade Challenge, which is the most attended GCSAWA event each year, is booked in for 17 May at Secret Harbour.

SHANE BAKER PRESIDENT, GCSAWA

ACTSTMA

I hope everyone around the trade had a great Christmas and New Year break. Unfortunately for me personally that wasn't the case as here at Gold Creek Country Club we hosted the Jack Newton Week of Golf from 2-6 January. This event saw 112 of the country's best up and coming junior male and female golfers taking part across the week (read *more about the event in our tournament wrap earlier this edition* – Ed).

On behalf of the ACTSTMA I would like to congratulate **Lachlan Deep** (Garangula Polo Fields) and **Riley Willcox** (Gold Creek CC) as winners of this year's Living Turf Graduate of the Year Awards. The boys interviewed exceptionally well and are a credit to their workplace and will now represent the association at this year's Australian Sports Turf Management Conference in Adelaide. A big thank you to Living Turf for again sponsoring the award.

The ACTSTMA Golf Day will be held at Royal Canberra Golf Club on 1 May with further details to be sent out shortly. We thank superintendent **Ryan Stores** and the club for allowing us to use their course. Hopefully we can get as many entries as possible and have a great day of networking.

The Canberra Racing Club will celebrate the 50th anniversary of its greatest race, the Group 3 John McGrath Auto Group Black Opal Stakes, this Canberra Day long weekend (12-13 March). The 2023 Canberra Racing Carnival is made up of the Black Opal Stakes Race Day on the Sunday and the family-focused TAB Canberra Cup Race Day on the Monday, featuring the Hartley Hall Markets. The ACTSTMA wishes **Adam Ayre** and his staff at Thoroughbred Park all the best for this event.

SIMON SNEDDEN COMMITTEE, ACTSTMA

TMSA

Since TMSA was formally incorporated and operational in October 2022, the committee has had a very busy time. Before turning to membership and sponsorship, the association's administrative structure needed to be established to ensure proper governance practices.

A number of new members have recently joined and all current members will join the newly created TMSA in the upcoming fiscal year. The great amount of interest already is exciting to see. The sponsorship programme has exploded and we have welcomed back past sponsors from the STA SA and the SAGCSA, as well as a number of new ones who have jumped on board. The committee is eager to collaborate with our partners in order to suit their sponsorship needs.

Kooyonga Golf Club will host our first event – the official launch of the new association – on 23 February. We are excited to welcome **Wayne Phillips**, a former Australian Test cricketer, as a guest speaker. The committee are eager to welcome members, sponsors and industry colleagues to what should be a fantastic networking event. The regular program offered previously by the former STA SA will continue with the annual Drop-in Pitch event held by Adelaide Oval head curator **Damian Hough** taking place on 27 February.

The new association website and TMSA social media platforms have been created. The website is www.turfmanagementsa.au and we encourage all in the industry to follow us on Facebook (@TurfManagementSA) and Instagram (@turfmanagementsa).

The committee would like to express its gratitude to **Marie Cunningham**, our recently appointed executive officer, for the tremendous amount of work she has contributed; without her expertise and assistance the amalgamation would not be where it is today.

NATHAN BENNETT ACTING CHAIR, TMSA

TRIO RECEIVE JOHN HOOD AGFR MEMORIAL SCHOLARSHIPS

Three young Australian greenkeepers were named recipients of the John Hood Memorial Scholarship by the Australian Golfing Fellowship of Rotarians (AGFR). Each year the AGFR awards a greenkeeping scholarship to the value of \$5000, but with COVID wreaking havoc in recent years it decided to name three recipients in 2023. In early January, **Sam McGaffin** (Sorrento GC, Vic), **Will Stratford** (Kooyonga GC, SA) and **Jonty Mullins** (Barnbougle Dunes, Tas) were all confirmed as scholarship recipients and will now undertake an internship in the US through The Ohio Program (TOP).



Scholarship winners Mullins, McGaffin and Stratford

Stratford has been placed at Muirfield Village GC, the home course of Jack Nicklaus, in Columbus Ohio, while Mullins will be down the road at the Donald Ross-designed Scioto Country Club. McGaffin has been placed at Chevy Chase GC in

Washington DC which is home to ex-pat Australian Stephen Britton who is the club's director of agronomy and a past TOP intern.

Originally from Tumby Bay north of Port Lincoln, Stratford moved to Adelaide in December 2018 to take on apprenticeship at Kooyonga Golf Club under superintendent Richard James. Mullins has been employed at Barnbougle for the past seven years and has risen to be one of superintendent Phil Hill's leading spray technicians. McGaffin started his apprenticeship at Sorrento in March 2015 and has become a key part of superintendent Shane Greenhill's crew.

ST ANDREWS: THE GREENKEEPER'S TALE

Author: Gordon Moir

Published by: Golf and Grass 247

Paperback, 408 pages

RRP: \$39.50 (Booktopia, Feb 2023)

Being custodian of the famed courses at the Home of Golf, St Andrews, is considered by most to be pinnacle of sports turf management. For 27 years, Gordon Moir was part of the inner sanctum at St Andrews and for 18 of those was Links superintendent, a position he held until his retirement in 2018.

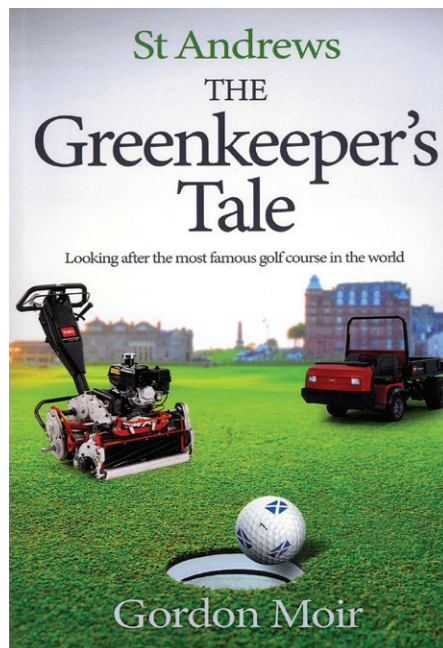
It's the sort of tenure and experience that screams for a book to be written and Moir had every intention of doing so, however, life just got in the way. Then came a global pandemic and all of a sudden Moir had no excuse not to put pen to paper. The end result is the impressive 408-page 'St Andrews: The Greenkeeper's Tale' in which Moir presents "a selection of stories, factual and sometimes irrelevant or downright bizarre, of 27 years working at St Andrews Links".

Moir began his golf course management career as an apprentice at Fraserburgh Golf Club just before turning 17. Fraserburgh is a links course in the northeast of Scotland and is the seventh oldest golf club in the world, formed in 1777. After finishing his apprenticeship there in 1980, Moir was given the position of head greenkeeper on a trial basis which was eventually made permanent after just a few months.

In 1991 Moir moved to St Andrews to be head greenkeeper on the Eden Course under the direction of then Links supervisor Walter Woods. At the time, the Eden Course was one of four managed by the St Andrews Links Trust, the others being the Old Course, New Course and Jubilee Course. A further 27 holes – the Strathtyrum and Balgove courses – had just been completed, opening for play in 1993.

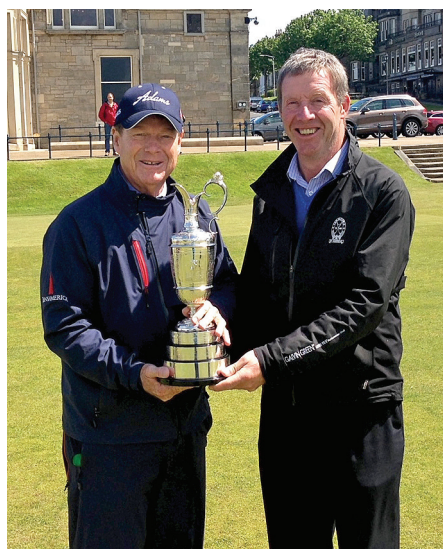
In October 2000, Moir was promoted to the position of Links superintendent which gave him responsibility for all turf matters across the six courses along with the workshop and equipment and gardening team. Having been part of the Links crew for the 1995 and 2000 Open Championships, Moir would oversee preparations for the next three Opens that St Andrews's famed Old Course would host in 2005, 2010 and 2015. He also added the 2007 and 2013 Women's British Opens, the 2004 Amateur Championship, the 2008 Curtis Cup and the 2018 Senior Open to a very impressive and extensive tournament CV.

The book begins on the last Sunday in July, 1991, when a young Moir arrives in St Andrews to be interviewed for the role of head greenkeeper of the Eden Course. At that point the superintendent of Fraserburgh, Moir had



finished preparing the course for a tournament that morning and had driven the three hours to St Andrews for the interview. Although he had no great expectations of getting the job, he obviously impressed as just a few weeks later he and his young family were moving south, beginning a near three-decade involvement with the most famous turf in world golf.

Moir goes on to chart his early days at St Andrews and doesn't mince words when describing the turf and workshop conditions which greeted him upon arrival. He describes the complexity of the Links Trust set up and its many committees of management, what it was like working underneath Woods, who at the time was one of the most well-known figures in greenkeeping, and some of the staffing challenges he confronted. He touches upon the 1995 and Millennium Opens before



Gordon Moir with five-time Open winner Tom Watson

devoting a chapter to landing the top position in greenkeeping and some of the changes he would institute as a result.

A chapter is fittingly devoted to his first Open in charge (2005) which was also the first for then Old Course superintendent Euan Grant (ATM readers will remember Grant spoke at the 2010 Australian Turfgrass Conference on the Gold Coast). At the same time, Moir was heavily involved in the planning and then the eventual construction of the Castle Course, the seventh of the St Andrews Links courses and what he describes as one of the largest projects he was involved with during his time there.

While he admits the environment was the furthest thing from his mind when he started out in greenkeeping, in the chapter 'Working with Nature' Moir details his awakening to the importance of being an environmental custodian, outlining several initiatives he oversaw at St Andrews. During his 18 years in charge, Moir became ever increasingly involved in the proactive environmental management of the Links and surrounding areas and was the main driver behind its push to be more sustainable and environmentally friendly. Under his watch, St Andrews Links became the first course on the rota of Open venues to gain Golf Environment Organisation certification in 2011.

Other chapters are dedicated to the 2010 and 2015 Opens, other tournaments he had the privilege of hosting, as well as some of the many famous people that a man in his position is fortunate enough to meet, among them golfing greats Jack Nicklaus, Tom Watson, Gary Player and Tiger Woods. He also outlines the controversial changes made to the Old Course starting in 2011 and the backlash received from some sectors of the local and international golfing communities.

A member of BIGGA (and its predecessor SIGGA) since 1980, Moir has at times held various Board positions and in 2022 was elected the association's president. Towards the end of the book, he devotes a chapter to his involvement with BIGGA, its importance throughout his career and the many wonderful education and networking opportunities it afforded him with industry colleagues.

As current day BIGGA president, in early January the Australian Sports Turf Managers Association announced that Moir would be heading to Adelaide as one of the international keynote speakers for this year's Australian Sports Turf Management Conference in June. No doubt many of the stories and experiences which Moir writes about in his book will be shared with delegates during the education sessions and maybe over a whiskey or two in the afterhours... 🍷

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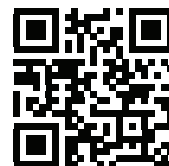


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