

Turfgrass

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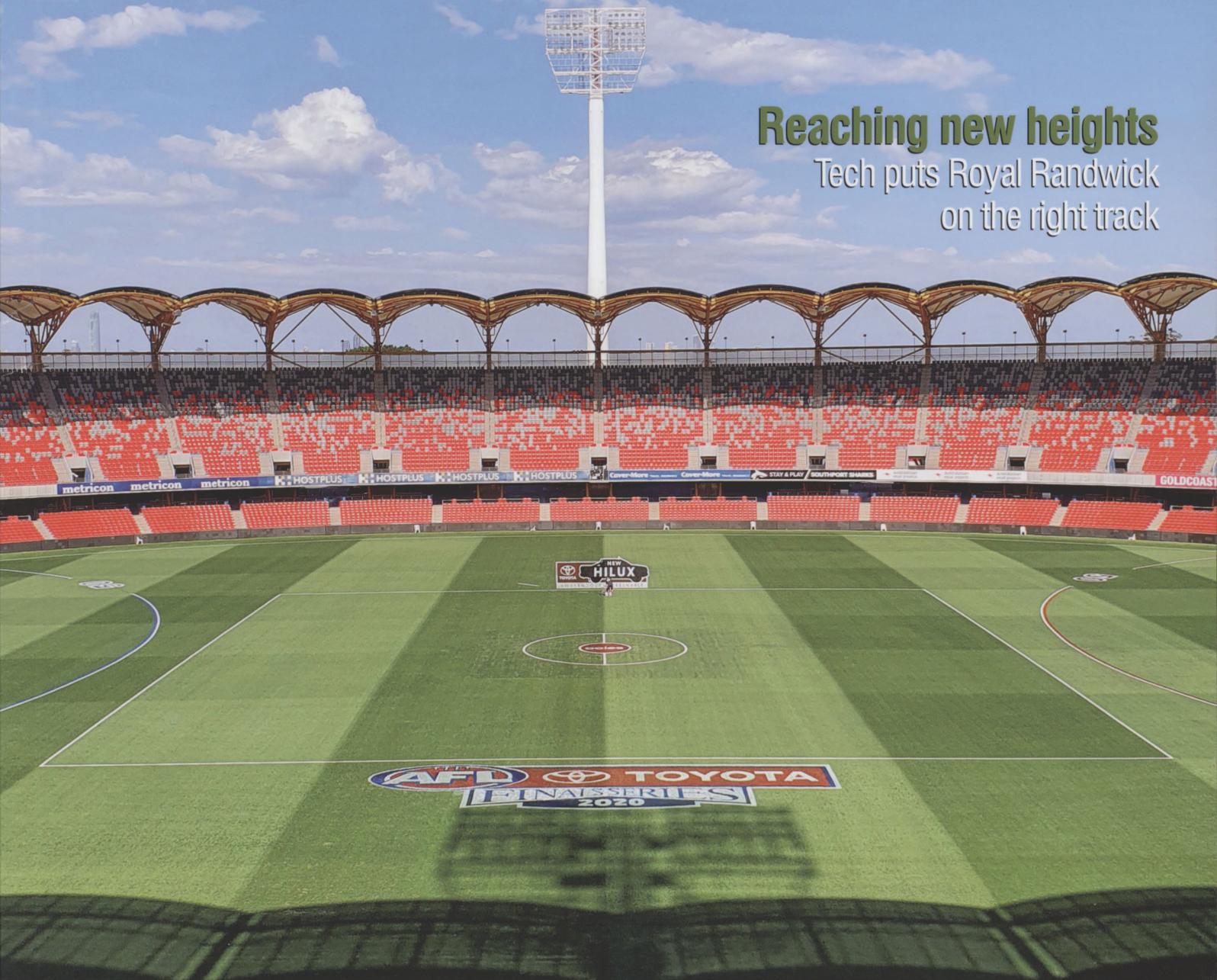
MANAGEMENT JOURNAL

Irrigation 101 – Back to basics

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Reaching new heights

Tech puts Royal Randwick on the right track



Metricon's COVID marvel

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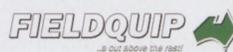
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The Australian Sports Turf Managers Association encourages all members to support these companies who support your association



**COVER STORY
SEASON SAVIOUR**

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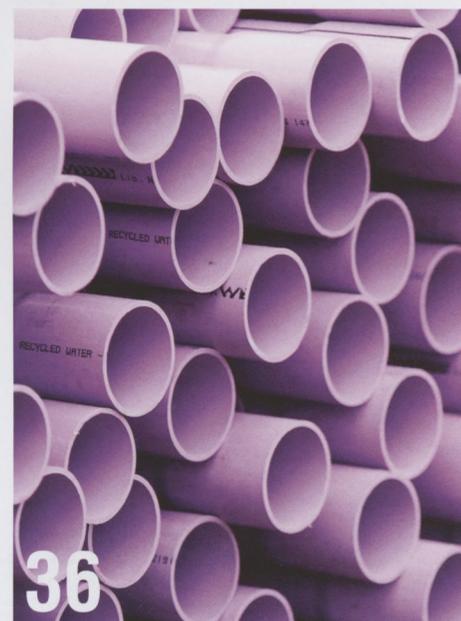
When the AFL announced in early July that it was moving the 2020 Premiership season interstate due to the escalating COVID-19 crisis in Victoria, it meant huge changes for every facet of the competition, in particular scheduling. After hosting 10 games in 2019, Metricon Stadium on the Gold Coast effectively became the competition's premier venue in 2020, hosting a remarkable 44 games. Together with The Gabba in Brisbane, the two venues bore the brunt of a hastily revised fixture and in doing so saved the AFL season. ATM editor Brett Robinson catches up with Metricon Stadium's Kerry Betihavas to look back on a season unlike any other and sees how the AFL's traditional venues – the MCG (Michael Salvatore) and Marvel Stadium (Gavin Darby) – weathered a torrid winter wrought by COVID-19.

Cover: Metricon Stadium ahead of the Richmond v St Kilda semi-final on 9 October 2020. **Photo:** Metricon Stadium/Gold Coast Suns Football Club



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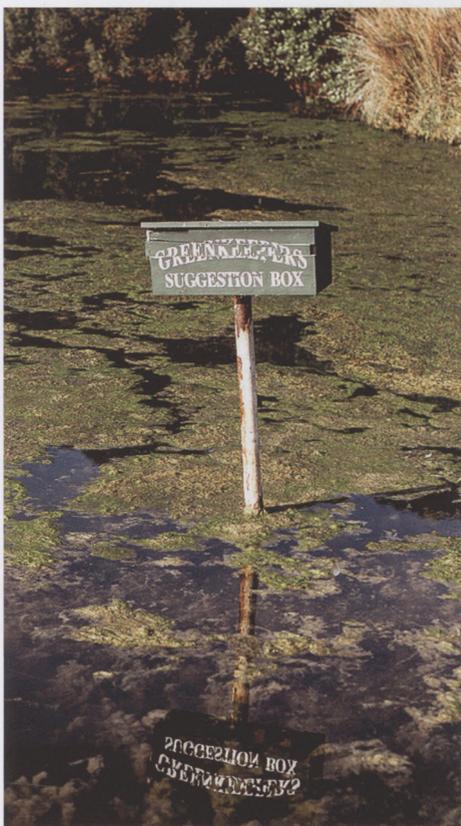
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Standing by her man

On 23 September, the Australian Sports Turf Managers Association teamed up with its fellow superintendent associations around the globe for the inaugural international 'Thank a Superintendent Day'. The social media campaign garnered huge traction, with those in the golf industry paying tribute to the men and women who unstintingly turn out their courses day after day.

The campaign took on greater significance this year for obvious reasons, one in which superintendents – and all turf managers for that matter – have been challenged like never before. Turf managers are adept at dealing with curve balls, but COVID-19 has truly tested the mettle of all. The pressure placed upon them has been immense, not only having to worry about their facilities but also their families, their own mental health and that of their entire staff.

In response, many have gone above and beyond to keep their facilities operational and deal with the never-ending challenges that have been thrown their way. They have had to juggle multiple requirements and in many instances have stepped up as true leaders at their club or facility. You only have to read this edition's lead story on the recently completed AFL season and the incredible manner in which Kerry Bethivas and his team at Metricon Stadium pulled out all stops to host a remarkable 44 premierships games – a season saviour indeed.

If ever there was a year where recognition has been more deserved it is 2020. It was therefore heartening to read the many posts that flooded our social media accounts during the #ThankASuper campaign. Of all the posts made on the day, there was one in particular that resonated with me and it didn't come from a club manager, greens chair, a supplier or a superintendent.

Amanda Lucas is the wife of Ben Lucas, who many ATM readers will know as the superintendent of the 36-hole Tocumwal Golf and Bowls Club on the Murray River. Ben has been superintendent there for the past five years, returning to the club after spending three years in his first superintendent gig at Young Golf Club. Prior to Young, Ben was assistant at Toc for four-and-a-half years.

Amanda, like any partner of a turf manager, only knows too well the sacrifices and stresses that come with the job, so just to make sure that her hubby knew he was appreciated for his amazing work, she put fingers to keyboard and hit 'post'. Accompanied by a photo of a very proud-looking Ben standing on one of Toc's perfectly presented greens, Amanda began...

"Today is international Thank a Superintendent Day. A big shoutout to this legend Ben Lucas for his efforts at the Tocumwal Golf & Bowls Club. Through the toughest of times this bloke has stepped up and consistently put this golf course at the forefront of his existence – I'm sure it's his mistress through and through! Our kids have been raised on course and all knew how to rake bunkers and hand water from a young age, it's the only way they saw dad in the warmer months!

"I would like to congratulate my husband, not only on his superior efforts as a super, but also mention his integrity and loyalty to this club when the shit has hit the fan lately with COVID. He has been bruised and battered but never gave in or gave up. I would also love to mention our boys, our extended family. Ben backs his staff 100 per cent because they are amazing people and we would be lost without them. Their efforts, along with his leadership, make the perfect dream team and it shows in our two Championship courses' surfaces. They are simply pristine.

"Greenkeeping is Ben's passion and it is reflected in the product that he and our team put out for our community. Our course is one of the best on the Murray River sandbelt and I am beyond proud of his accomplishments. It's not easy work and it's never ever been just a stress-free 38-hour week to achieve something of such high quality. It's sacrifice, blood, sweat and tears... it's his life. Thanks a tonne babe for being the incredible human you are and for being a top super, hard worker and all round great man."

Now that's true recognition. Enjoy the read...



Brett Robinson, Editor

Contributors to Australian Turfgrass Management Journal Volume 22.5 (September-October 2020): Mark Angel (Kingston SE GC); Shane Baker (CSTM, GCSAWA); Gary Beehag; Kerry Bethivas (Metricon Stadium); Martyn Black (Golf NSW); Gavin Darby (Marvel Stadium); John Forrest (Forrest and Forrest Horticultural Consultancy Services); John Geary (Cape Wickham); Monina Gilbey (Glenelg GC); Shane Greenhill (VGCSEA/Sorrento GC); Scott Johnstone (Hydroplan); Mick Kelly (Toowoomba GC); Matthew Lane (Scotch College, WA); Bruce Macphree (CSTM, ASTMA); Peter McMaugh AM (Turfgrass Scientific Services); Ashley Mead (OCM); Melbourne Cricket Club; Terry Muir (epar); John Neylan (SportEng); Mark Roberts; Kristian Robinson; Michael Salvatore (Melbourne Cricket Club/MCG); Kate Torgersen (Environmental Golf Solutions); Mark Unwin (ASTMA); Nick Wall (Airsing Media); William Watt (Caddie Productions); Michael Wood (Australian Turf Club/Royal Randwick).



Sports turf managers deliver remarkably despite difficult year

Golf Australia recently released a report titled 'Australian Golf Competition Rounds - Trends and the Impact of COVID-19'. The report highlighted that the golf industry is certainly enjoying a boom in rounds demand in many cohorts that are key to the industry's long-term health. The report highlighted that nationally all markets have enjoyed a material uplift in rounds played, with both male and female demand up by 21 per cent, metropolitan markets up 27 per cent and regional markets 17 per cent over 2019 results at the same point in time.

As noted by many internationally and locally, this increase in demand creates a tremendous opportunity for the industry and the challenge at the administrative and facility level is to ensure this demand continues to be an area of focus. Pleasingly for growth of the game longer-term, the report also indicates that the 25-45 age group is engaging at a greater level than in recent times, with rounds from this bracket up 22 per cent over 2019.

The report also notes that the exception to this is Victoria following extended periods of course closures due to lockdown restrictions. While not a position many clubs would want to face, it has provided an opportunity for superintendents and their teams to bring forward some renovation work and prepare courses in great shape for reopening (which for metropolitan Melbourne courses eventuated just as this edition of ATM was going to print).

Interestingly with summer approaching, thoughts around this time of year often centre on renovations and transitioning from winter sports to summer. This year has been quite unlike any other in that there are some clear distinctions between activities in various parts of the industry and various parts of the country.

On one hand, many facilities are in a position that they've rarely experienced before. Teams have been able to bring forward activities to manage, prepare and improve playing surfaces while their facilities are experiencing limited usage due to decrease in training and playing of community sport. The other group are experiencing the opposite – an increase in usage unheard of prior to this year and managing to work through rapid changes in requirements.

Broadly, community sport requirements for training and competition on sportsfields and grounds is considerably down, allowing for important renovations and reconstruction work



Australian Sports Turf Managers Association

to be undertaken, whereas other facilities have been required to accommodate up to 20 times the regular activity. You only have to look at the likes those venues hosting AFL, NRL and A-League matches as seasons were thrown into turmoil due to the pandemic.

Sports turf managers and their teams across all sectors have delivered remarkably in what has been a demanding year. Golf, as the abovementioned report highlights, has increased substantially year on year, creating additional challenges for these turf management teams in maintaining their courses through extended and sustained rounds played.

One such area that we have put a focus on over the past 12-24 months is memberships and ensuring we have the right structure in place and continue to offer significant and valuable benefits to members. In the recent September meeting with the ASTMA Board, a review of performance against our Strategic Plan highlighted that one area that continues to perform very strongly is membership growth. We have heard frequently from members over the past six months, in particular with such challenging times, that the assistance provided by the ASTMA on HR and employment support, promotion of the profession, coupled with government engagement and advocacy efforts, has been enormously appreciated.

Despite, or perhaps because of the challenging times we find ourselves in, over the past 24 months we have continued to see an increase, with association membership up by over 30 per cent in comparison to 2018 numbers. This growth allows us to continue pushing for increased levels of awareness and promotion of the industry in advocacy discussions and supports the approach that our industry is an essential operation to sport both at an elite and community level.

“Despite, or perhaps because of the challenging times we find ourselves in, over the past 24 months ASTMA membership has increased by over 30 per cent.” - Mark Unwin

This situation we face does, however, bring with it a level of complexity for some sports turf managers in relation to seasonal staff. For the most part, with extensive travel restrictions in place for international arrivals, the ability to engage seasonal and overseas staff to assist with turf preparation and management is extremely limited, which in turn presents a difficulty for facilities that utilise seasonal staff.

The ASTMA has engaged in discussions with a number of Federal Government departments on this topic and pressed the increasing need for access or exemptions to be reviewed and clarity provided. At the time of this edition going to print, the situation remains unchanged from current advice, however, discussions continue.

ON THE RISE

As a member-based association with a national footprint, there are many areas of focus for the team to continue driving to assist members and the industry.

As the second half of the year gets into a sense of 'COVID normal (whatever that may mean)', our attention at the association remains on working through the options and requirements for the turf industry's flagship event – the 2021 conference. We are hoping to have more clarity on the situation to communicate prior to the end of the year.

The warmer months have also brought about an increase in the request for the AGCSATech team to provide independent agronomic advice and testing services to support turf managers in decision making for their facility. Pending removal of travel restrictions across borders will allow the team to increase their support to members and the industry in the weeks and months ahead.

As we progress through a most challenging year, the ASTMA continues to actively work with members and the industry for ways we can assist. If there is anything you would like to discuss or provide feedback on, please don't hesitate to get in touch. 🙌

#ThankASuper goes global

Wednesday 23 September 2020 saw the inaugural International Thank a Superintendent Day, with the Australian Sports Turf Managers Association joining its global counterparts in the UK, Europe, US and Canada to recognise and celebrate the hard-working efforts of golf course superintendents and their teams. In past years the likes of the ASTMA, GCSAA, BIGGA and FEGGA have held separate 'Thank a Super' days with great success, but this year was the first time that the associations combined to spread the word globally.

On the Wednesday morning, all associations released a short 30-second 'Thank You' video through their social media channels which also appeared on the Golf Channel. Throughout the day golf clubs, organisations and golfers were encouraged to get active on social media using the #ThankASuper hashtag.

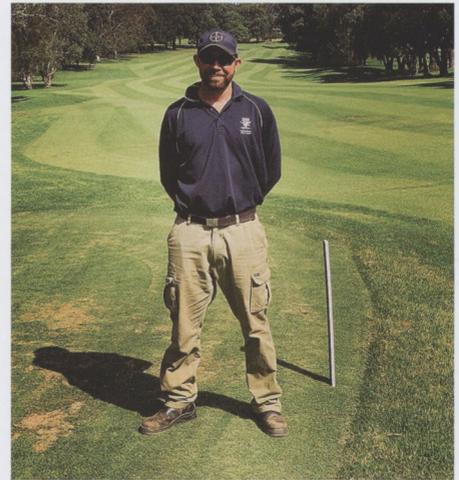
In a tremendous show of support across Australia and overseas, social media was flooded with images of superintendents and their crews, accompanied by posts thanking them for the tireless work they do week in, week out. Looking at the stats just across the ASTMA's social media channels, there were more than 14,000 views on the day, with some fantastic messages of support, as can be seen in the posts below.



Liked by gcsaa and others

mooreparkgolf Today is the inaugural International Superintendent Day!

We would like to give a shout out to our Superintendent Mal and his team for all the amazing work they do to keep our course looking tip top all year round. Thanks team!



Liked by eastlake_golf and others

carnarvongolfclub #ThankASuper International Thank a Superintendent Day 23 September 2020

moonahlinkgolf



Liked by mark_holmes7 and others

moonahlinkgolf Let's talk Golf Superintendents because ours is nothing shy of amazing. In the bitter cold winter to the scorching heat of summer, he and his team never cease to impress.

Managing two championship courses, the Open & Legends.. both are in immaculate condition 365 days a year. Kyle Wilson thank you and your team for your commitment and dedication that you have all done over the years. 🇺🇸🇺🇸🇺🇸🇺🇸

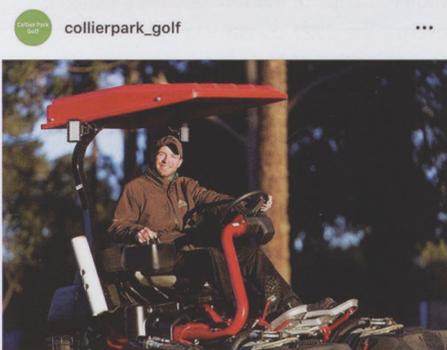
brookwatergolfcc Brookwater Golf & Country Club



Liked by turfirrigationservices and others

brookwatergolfcc THANK A SUPERINTENDENT DAY!

Our maintenance team led by Golf Course Superintendent, Matt Legge have been doing a great job over the past 12 months with the presentation and conditioning of our course. In particular during the past month the course has been superb for our Club Championships. We thank Matt and all his team, Ben, Alex, Andrew H, Andrew K, Brendan, Chris, Darren, Lance, Nicky, Nigel, Ramand and Steve for the great job they do as a team! Keep it up guys!



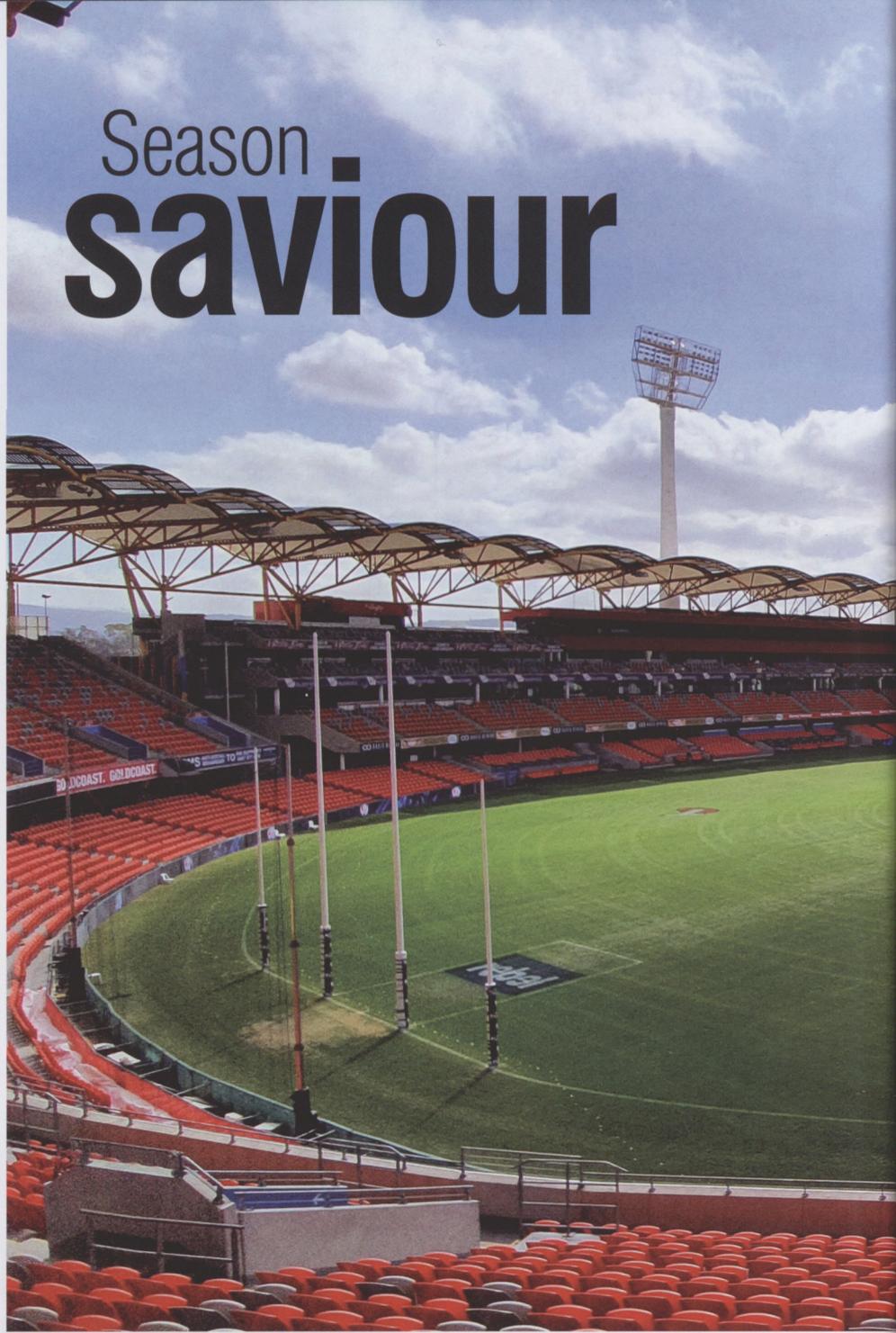
Liked by schtekipa and others

collierpark_golf #ThankASuper Day today. In recognition of the 5am starts and the passionate work that goes in to keeping our course in super condition all year round, we give a big shout out to our Super, Peter Beach and his hard working team. Well done and thank you!

Metricon Stadium would end up hosting a total of 44 games in the 2020 AFL Premiership season, 42 of those coming in a 14-week stretch between 13 June and 20 September. Pictured is the ground ahead of the semi-final between Richmond and St Kilda, its final match of the season

When the AFL announced in early July that it was moving the 2020 Premiership season interstate due to Melbourne's COVID-19 crisis, it necessitated huge change for all facets of the competition, in particular the scheduling of games. After hosting 10 games in 2019, Metricon Stadium on the Gold Coast became the competition's primary venue, hosting a remarkable 44 games by the season's end. Together with The Gabba, the two Queensland venues bore the brunt of a constantly evolving fixture and in doing so effectively saved the AFL season. ATM editor Brett Robinson catches up with Metricon's Kerry Betihavas to look back on an unforgettable season and sees how traditional venues, the MCG and Marvel Stadium, weathered a COVID-ravaged winter by comparison.

PHOTOS: KERRY BETIHAVAS/METRICON STADIUM/MCG/GAVIN DARBY



Season saviour

Adaptability. It's a hallmark that every professional sports turf manager must possess, one that inherently comes with the territory. Kerry Betihavas knows all about the importance of rolling with the punches, especially having just experienced what has without question been one of the most unique footy seasons in a turf management career that has spanned some 20 years.

It has been an eventful journey for the rugby-mad New South Welshman since landing on the Gold Coast from Sydney in November 2017. Having spent the previous 12 years working at the Sydney Cricket Ground under Tom Parker, Betihavas was primed to take the reins of his own facility.

He landed at Metricon just as the venue began its transformation for the 2018 Commonwealth Games and after that was part of the massive project to resurface the entire ground. Later that year Metricon welcomed cricket for the first time with the introduction of drop-in wickets to host Big Bash League (BBL) cricket. Add to that the often fickle nature of the Gold Coast climate and Betihavas has definitely earned his crust since taking over, but nothing could quite prepare him for what was about to transpire this football season.

When the COVID-19 pandemic hit Australia in March it forced irrevocable change in all facets of work and personal life, with the turf management and sports industries hit hard. For the country's major sporting competitions like the AFL and NRL, the upheaval of their



seasons was a dramatic manifestation of COVID-19's all-encompassing impact and non-discriminatory nature.

For the AFL, headquartered in Melbourne, it was particularly devastating. Having initially suspended the season for an 11-week period between March and June after just one round had been played, Melbourne's second COVID-19 wave and eventual Stage 4 lockdown forced the AFL to make the unprecedented call to move the season interstate.

It was a mammoth undertaking on so many levels and in a hastily revised and constantly evolving fixture, Brisbane's The Gabba and Metricon effectively became the Queensland equivalent of the MCG and Marvel Stadium. Between them, the two venues hosted 79 premiership games (73 home

and away games in 18 rounds and six finals, including the Grand Final), almost half of the season's 162 total games. And the majority of those were played in just a four month period.

Compare that to the MCG and Marvel. Last season the MCG notched up 50 games and Marvel 44. This season Melbourne's premier venues stood idle as COVID crippled the city, the MCG hosting just nine games and Marvel 11. From the 17 venues the AFL used across 2019, in 2020 that dropped to just 12. Continuing the theme of Queensland grounds stepping up in 2020, Cazaly's Stadium in Cairns also hosted four late-season games in the space of 18 days. By comparison, it took Cazaly's the four previous seasons (2015-2018) to record as many premiership matches. 2020 was indeed one for the record books.

TABLE 1: MATCHES AND VENUES

Ground	2020 ¹	2019 ²
Metricon Stadium	44 (1)	10
The Gabba	35 (5)	13 (2)
Adelaide Oval	22 (2)	22
Optus Stadium	17 (1)	23 (1)
Marvel Stadium	11	43
MCG	9	50 (5)
Giants Stadium	9	9 (1)
SCG	5	11
Cazaly's Stadium	4	0
GMHBA (Geelong)	3	9
TIO Stadium	2	1
Traeger Park	1	1

Key: Number in brackets indicates finals; ¹ 18 round home and away season; ² 23 round home and away season

THE START OF THINGS TO COME

Even before the AFL season landed on Metricon's doorstep, Betihavas and his team comprising assistant Ben Greenaway and Brandon Coles were already in the thick of it. As he jests, Metricon was probably the busiest stadium in the country in 2020 and he probably isn't too far off the truth.

After a second successful season of BBL, in which it hosted three games including a New Year's Day clash which drew its biggest cricket crowd of 20,135, Metricon hosted three 50-over Australia A v England A games in early February. England collected the first two games before the third was abandoned after the Gold Coast was hit by a deluge of rain. That rain – nearly 600mm over a couple of days – coincided with Betihavas needing to remove two wicket trays in order to get the ground up nine days later for its inaugural Suns AFLW match.

Seven days after the AFLW game, on 22 February the ground hosted a double-header – the first AFLW QClash and a Marsh Community Series AFL preseason match. As soon as the final whistle had blown, Betihavas and his crew dropped the posts in readiness for Queen on 29 February. That set up saw the entire arena surface (all 22,000m²) covered in flooring to accommodate what would be a sell out 42,000-strong crowd.

It was around this time that the looming threat of COVID-19 was well and truly spreading throughout the national consciousness. Australia had recorded its first case on 25 January and a few days later the World Health Organisation (WHO) had declared it a 'global health emergency of international concern'. By 11 March, with over 100 countries having registered infections, eight days out from the start of the 2020 AFL Premiership season, the WHO declared COVID-19 a 'pandemic'.

As major events in Australia started being called off, late that Friday (13 March) the AFL



Kerry Betihavas has been in charge of the turf at Metricon Stadium since late 2017

announced it intended to proceed with the start of the 2020 season, albeit with no crowds. Indeed, it was an eerie sight watching a vacant MCG hosting the traditional season opener between Richmond and Carlton.

For Betihavas and his team it was an equally strange way to kick off the season. The Suns entertained Port Adelaide in an empty stadium and under strict COVID protocols that the AFL had swiftly introduced. As they are employed by the Gold Coast Suns Football Club, the crew had to remain segregated from all Suns admin, coaching and playing staff, while PPE (masks and gloves) became mandatory. Temperature checks and COVID tests also became part of daily and weekly rituals (and would remain in place all season), while on game day they had to be off the ground much earlier and weren't allowed on to divot until all players were off the ground.



Then came the announcement that everyone had feared. Just minutes after the opening round Hawthorn v Brisbane match had wrapped up at the MCG, AFL chief executive Gillon McLachlan announced that the AFL Commission was suspending the competition until 31 May (that date would be later revised to 11 June). At the time McLachlan called it "the most serious threat to our game in 100 years" and in the days that followed the AFL and clubs would make drastic cuts as the game stared its worst financial crisis in the face.

Like many across the turf industry, Betihavas and his crew felt the full impact as the country plunged into its first lockdown a few days later. Seventy five percent of staff at the Suns were stood down or forced to take leave. Betihavas lost a casual staff member, while Greenaway and Coles dropped to two days a week, alternating their shifts between Monday and Thursday and taking annual leave the rest of the time. Betihavas himself already had four weeks' leave planned, so he effectively extended that to eight weeks until a season restart was confirmed. Budgets were also cut which necessitated some quick rethinking and how cultural practices would be managed.

"We have a total of 15 hectares that we look after here, so we had to prioritise," says Betihavas. "The stadium and the adjacent training field were only cut twice a week (18mm cutting heights were retained) and we only cut the wicket trays once a week. We normally aerate with solid tines every two weeks, but we dropped that back to every four weeks. Every four weeks we applied Primo to reduce clippings and in that tank mix we also included a light liquid fertiliser. We didn't want to overfeed the couchgrass too much and as there was no traffic on it the grass wasn't asking for much anyway."

"The big unknown was whether the season would come back at all and whether we would oversow. In a normal year we oversow with ryegrass in the first week of May, but because we didn't know what football we were having we were in two minds. We ended up biting the bullet and put out a real low rate (100kg/ha) on 14 May. In hindsight we probably should have put more out given all the games we ended up having, but at that point we just didn't know. Everything kept changing so quickly."

FROM ZERO TO A HUNDRED

The same week that Betihavas oversowed, the AFL announced that the season would resume on 11 June. Metricon's first game back was Saturday 13 June, but it was from the

Trying to remove drop-in wickets during a Gold Coast deluge of 600mm wasn't Betihavas's idea of a good time just nine days out from his first AFLW fixture

following weekend when things really ramped up as Victoria's second COVID-19 wave started to take hold. By this stage discussions had begun about Metricon's (and The Gabba's) ability to increase its number of games to accommodate the constantly changing fixture, but even looking back now Betihavas still shakes his head at the number.

Metricon would end up hosting a remarkable 42 premiership games in a 14-week stretch between 13 June (Round 2) and 20 September (Round 18). Thirty-four of those games involved teams other than the Suns, with North Melbourne, Western Bulldogs (eight) and Richmond (seven) playing the most games there after the home side. Seventeen out of 18 clubs played matches there, Collingwood the only team not to.

In Rounds 3, 4, 6 and 16 Metricon hosted five same-day double-headers. In Round 6, which was played just days after McLachlan announced that all Victorian clubs would be relocating to interstate hubs, Metricon held four games in two days – back-to-back double-headers on Saturday 11 and Sunday 12 July. The early games on each day began at 12.35pm and 1.05pm followed by night time games at either 6.35pm or 7.40pm, barely giving Betihavas and his crew enough time to tidy up the ground in between.

In the 10 days from 29 July to 7 August (Rounds 9 and 10) Metricon hosted seven games, while from 2 September (Round 15) to 20 September (Round 18) – a total of 19 days – the ground held 12 games. It would then host the Richmond v St Kilda semi-final, all up making it 44 games for the season, a more than four-fold increase on 2019 (10 games).

When it was first mooted that Metricon would be lumped with the lion's share of the revised fixtures, Betihavas knew it could be done but did have a few reservations. In past years the ground has held AFL U16s and U18s carnivals in conjunction with a Suns home game, which sees multiple games played across consecutive days. But they were kids, not grown men.

"At one point there was talk that we may get 70 games," reveals Betihavas. "Just to keep the competition running the AFL threw some options at us, but we had to be realistic and say no we couldn't do that amount. We used those U16 and U18 events as a bit of a model and knew we could handle the increase in fixtures. It was all a bit unknown as we have never had that volume of games before, but we wanted to do what we could to get the competition back up and running. It was challenging too because the AFL would only release the fixture in small blocks, so we were effectively on standby most of the time.

"From a turf perspective we had a few concerns, such as shade on the broadcast wing (western side in front of the player



After an 11-week layoff following the suspension of the season in late March, Metricon, like all other grounds, was looking pure for the resumption of play in early June

interchange). That area is always a challenge each season. The other concern was the high wear areas such as the centre square. We have portable trays in our centre square so we raised with the AFL the likelihood the turf would need to be replaced.

"We knew as the season drew on the ground would start to show signs of wear and tear and it did. The couchgrass can't cope with that volume of games without adequate recovery time. Sometimes we only had two days in between rounds and we had the bulk of our games in what is traditionally the coldest part of the year in Queensland."

Despite those challenges, Metricon would hold up incredibly well to the fixturing onslaught. To brace his turf, Betihavas increased his foliar feeds by around 60 per cent in addition to normal six-weekly granular



To set his turf up for the fixturing onslaught, Betihavas increased foliar feeds by around 60 per cent to try and promote as much leaf growth and recovery as possible

applications. He went out weekly in between games to try and promote as much leaf growth and recovery as possible.

Aeration practices increased from fortnightly to weekly, with holes being punched (12mm solid tines at a 90mm-100mm depth with a two per cent kick) in between games and sometimes even the morning before games. If bad weather was forecast, like the 100mm that fell before the Melbourne-Brisbane game in late July, the aerator got a run as well.

As Betihavas quips "greenkeepers don't like replacing turf", but with the volume of games it was inevitable he would need to in the end. Ahead of the back-to-back double-headers on 11 and 12 July and then again after the Round 14 game between the Suns and North Melbourne on 30 August, the crew replaced the centre square and areas behind the goals with turf trucked up from Evergreen in Sydney. Later on, during the two-day break in between rounds 16 and 17, an 800m² strip of 50mm Hero stabilised turf from HG Turf was laid on the broadcast wing.

"The ground handled the volume really well considering," says Betihavas, who gained the services of an AFLQ groundsman from Brisbane after the season resumed. "Obviously aesthetically sometimes it didn't look great on TV, which you had to expect, but if you walked the ground there was still some good couch even if the ryegrass was heavily worn. Throughout all the games we never had any issue with traction or player safety."

Somewhat fittingly, to cap off its season in the spotlight, Metricon hosted Richmond's semi-final win over St Kilda in week two of the finals. The Tigers, who had hubbed around the corner from the stadium at KDV Sports, made it well known their love of the Metricon surface during the season and chose it as their preferred venue for that final. Metricon will certainly hold a special place in the unlikely



In a cruel year for the iconic MCG, it not only lost the AFL season but also the ICC T20 Cricket World Cup

journey that led the Tigers claiming back-to-back titles, while for Betihavas he is just content that his team did their bit in a season that will be long remembered.

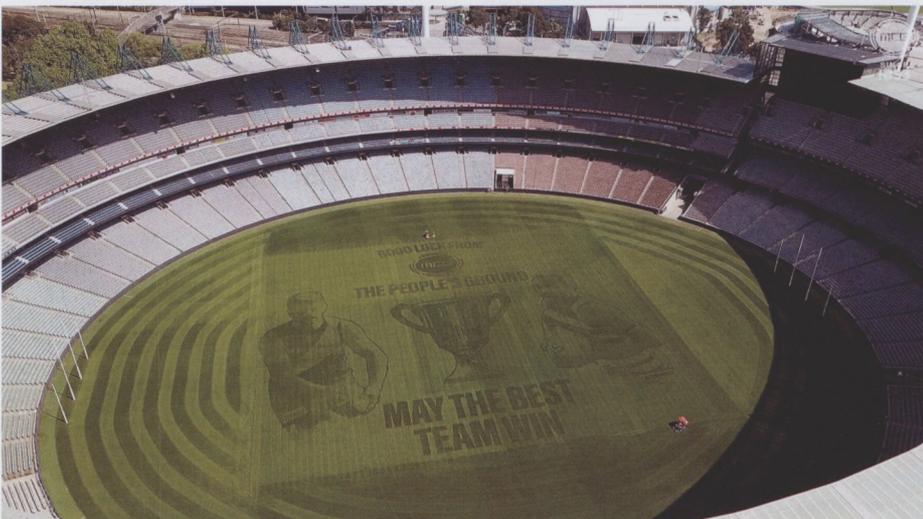
"It was certainly a unique one," reflects Betihavas. "We were just one of many who played a part. Everyone in Queensland – from the government to the hospitality industry – put their hand up to keep the competition running. When we were stood down from March through to June it was a pretty scary time. We didn't know whether we would be coming back, so we were rapt to be able to play our part when it did.

"It has shown that we can definitely host more games up here. If they can throw a season like this at us, why couldn't we host a Magic Round here for AFL like they do in the NRL – I reckon that would be a great initiative. Most of all I think it proved the importance of being adaptable. As greenkeepers we have to constantly adjust things and often very quickly. The boys adapted as the situation changed and stood up to the challenge and I was extremely proud of what we achieved."

INCREDIBLE HIGHS AND INCREDIBLE LOWS

While it was a challenging season for Betihavas and his Metricon team, for the likes of Michael Salvatore (MCG) and Gavin Darby (Melbourne Stadiums Limited) it was equally as demanding but for vastly different reasons. Normally it's their grounds that are front and centre every AFL season, but in 2020 they became bit players and could only watch on from afar.

For Salvatore, executive manager of turf at the MCG, the year had gotten off to a great start, headlined by Australia's commanding win in the final of the Women's T20 World Cup on 8 March. That match was played in front of more than 86,000 spectators, just shy of a world record for a women's sports event, with pop star Katy Perry also adding to the spectacle with a mini concert. That match signalled the end of the MCG's cricket schedule and once the tournament and concert had bumped out, Salvatore and his team got to work converting the ground back for AFL.



In what was one of the tighter turnarounds they've had to execute, in the space of three days they removed all six drop-in wickets over two nights (they only used six wickets last summer due to hosting less Sheffield Shield games), cored the entire ground, oversowed with ryegrass, topdressed with 30 tonnes of sand and then levelled and returned the centre. They then had a week in which to prep the ground for the opener between Richmond and Carlton.

Played in front of empty stands, it was one of the weirdest sensations Salvatore has had in his 13 years at the MCG – "It felt like a training run" – but come Sunday after the ground had hosted its second opening round match (Hawthorn-Brisbane), it was about to get a whole lot weirder as the season was officially suspended.

Once the reality hit, Salvatore's first priority was engaging with his staff given they were understandably worried about their jobs and families. Staff were put onto JobKeeper in varying degrees and most initially worked a staggered four-day week as the hallowed turf was put into a holding pattern.

Usual practices such as a liquid feed every week to stimulate growth in between games and aeration were reduced, while growth regulators, not normally used at that time of year, were put out to keep growth in check. The lighting rigs were still used but in a different configuration. Usually they would be set up in quarters on the northern side of the ground (City End the first part of the week, then Punt Road End the second half), but they were now being deployed where the shadow of the stand was. As Salvatore notes it was "a much more controlled approach" to keep the ground "ticking along" in the eventuality that the season would restart.

One benefit of the 11-week hiatus was how the ground came back from that small renovation after the T20 final. The lack of wear and tear meant the ground was pure, especially in areas that would typically show the effects of heavy traffic such as the interchange gates.

When the call was made to restart, Salvatore immediately went out with a granular fertiliser to kick the ground along. By that stage the turf was looking a little lean, with the growth regulator having done too good a job even though it was put out at a medium rate. With staff back in full-time and the ground looking mint, there was a real positive atmosphere for the first game back – the Round 2 draw between Richmond and Collingwood – and for the next three-and-a-

Despite only hosting nine games all season, the MCG did play a unique part in the Grand Final build up. Utilising HG Turf's new TurfPrint machine, the surface was turned into a giant canvas, displaying a good luck message to finalists Richmond and Geelong

half weeks (a total of seven matches) life was seemingly good again. It didn't last.

"We went into that period in really good condition," recalls Salvatore. "In fact, all the grounds looked sensational after that first break. I was working what would end up being our last game of the year (Melbourne-Richmond) and remember thinking, 'Gee, how good does the ground look for this time of year'. Obviously we try to have the ground at its best all the time, but I don't think I have ever seen it in that good a condition. It was amazing to see 100 per cent coverage in July.

"We had just started getting back into the swing of things and then it was all over again! We couldn't believe it was happening and there was a lot more apprehension about it than the first time. We had no idea when footy was going to come back and then as time progressed we started hearing talk of the season moving interstate and the prospect of no more games. All along we had planned that we would be having finals and at least the Grand Final, but the longer it went on it became more and more apparent that we were fighting a losing battle."

ONE MAN, ONE ARENA

Sure enough, on 2 September the AFL announced that for the first time in the game's history the Grand Final would be played outside of Victoria at The Gabba. It was the final twist of the knife, one that had already been wedged even deeper a few weeks earlier when the International Cricket Council postponed the Men's T20 World Cup. The MCG was due to host seven games during the month-long tournament across October and November, including the final.

With Melbourne under harsher restrictions than the first lockdown, staff cuts followed suit. Of the 14-strong MCC arenas team, 10 were stood down with only Salvatore and three others allowed to stay on to manage the facilities (the MCC also maintains Albert Cricket Ground, two bowls clubs in Hawthorn and Beaumaris Secondary College). For the best part of the next 16 weeks Salvatore cut a lone figure as the only member of staff allowed to come into the MCG, without doubt one of the weirdest experiences of his working life.

Like before, the ground went back into a holding pattern with a similar reduction of practices. Having held seven games, a renovation was carried out on the centre square. In a normal season Salvatore would often replace the centre due to wear and tear, but with plenty of time on his hands and no use, he opted to heavily scarify the area, seed and topdress it before putting the growth lights on. Within a month it had come back perfectly. Nutrition was backed right off and growth regulators again applied, albeit at lighter rates this time around.



Marvel Stadium was resurfaced in two stages in late 2019 and early 2020 (pictured) to provide a better surface for its wealth of 2020 sporting fixtures. Then COVID-19 hit...

One thing Salvatore didn't let up on during this time (and the earlier hiatus) was his fungicide programme. With the ground being a bit leaner in that first period, he did notice a few early warning signs of fusarium, something he hasn't seen in the arena for years. It certainly reinforced that their usual practices (going out every 28 days during winter or when there are other triggers such as temperature spikes) were working effectively.

"It has been a weird experience I can tell you," states Salvatore. "It is quite eerie being in there with no one else around, but at least we have been able to keep it ticking along. I've been jumping on a mower and doing a few jobs that I haven't done for a while which has been a nice change. All in all the ground is in good condition now and we will try and do a reno before summer and get the wickets in.

"A big focus for me during the lockdown has been keeping the staff informed and just being open and honest with them. We would chat weekly to see how everyone was getting on and as soon as any information was forthcoming, no matter how small, I would communicate that with the team. It could be something as simple as sending the guys a photo of the ground after I'd given it a cut. You underestimate how isolated people can feel by not being able to go into work.

"Keeping them involved and also keeping that motivation up has been very important. Yes, we were building up to have the Grand Final, but after we lost that it was about looking forward to the next thing we could build for and the announcement that the Boxing Day Test will be back was wonderful news."

Despite having no games, the MCG wasn't forgotten during Grand Final week with Salvatore involved in two rather unique projects. The first saw AFL partner Rebel pay for two 6m x 1m strips of turf from the City End goal square to be harvested and shipped to The Gabba where they were laid outside the player races ahead of the Grand Final.

The second involved turning the surface into a giant canvas to display a special 'good luck' message using HG Turf's new 'TurfPrint' technology. The image, which measured 80m wide and 90m high, took around six hours to complete and is believed to be the largest ever placed on a sports field.

A MARVEL-LESS SEASON

Dire. That's how Salvatore's cross-Melbourne counterpart Gavin Darby succinctly sums up 2020 in what has been the most inexplicable season he has experienced since arriving in Australia from New Zealand in 2003. For the head of arena management at Melbourne Stadiums Limited (MSL), which oversees not only Marvel Stadium but a number of other premier football grounds across the city, it has been a season where resilience has never been more important.

It all began midway through last year when the stadium had contracted a plethora of summer events, among them USA v Australia basketball, UFC 243, RnB Friday, U2, Metallica (later cancelled), a three-day Jehovah's Witness convention, motocross and the RMIT Graduation Ceremony which it has held every year since opening in 2000. Such is the nature of a multipurpose venue like Marvel, but it did raise concerns about the quality of surface that could be produced for its full fixture of sporting events in 2020.

The decision was made to replace the entire Marvel Stadium surface for the first time since opening. The new turf was planted in September and installed in two tranches, the first in December 2019 (comprising the outfield) and second in February 2020 (centre, pictured previous page) along with the replacement of the synthetic boundary. All existing turf and accumulated organic matter was removed and the profile cut 50mm below the design grade, with 50mm of a new rootzone imported before the top 100mm was blended and returned to design grade.

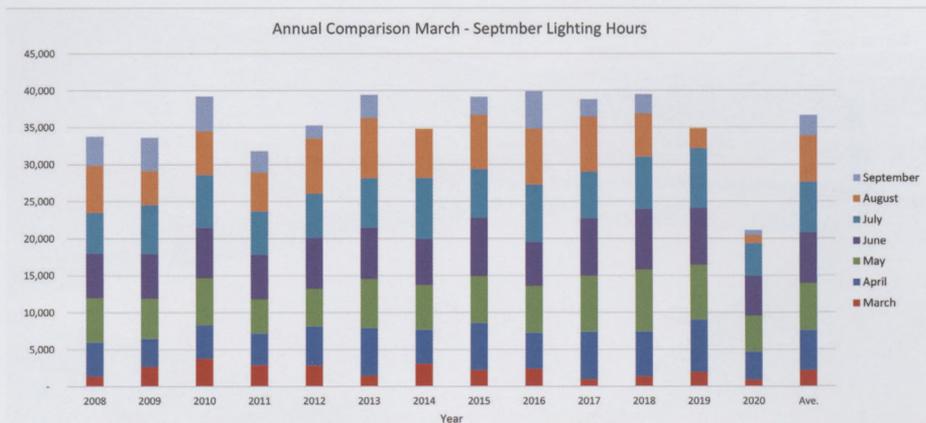


Figure 1. Marvel Stadium lighting hour trends since the introduction of rigs in 2008. 2020 has seen a reduction of around 30 per cent due to the lack of use

Due to the tight timeframes, the maturity of the turf wasn't ideal heading into the stadium's 2020 fixtures, but presented well for the likes of an AFL Marsh Community Series match, two Melbourne Victory A-League games, an AFLW game and the AFL State of Origin which were all held prior to a triple-header opening round of the AFL season.

"The ground came up pretty good for that first weekend," recalls Darby. "We had played on it every week from the day the new turf had been installed so it hadn't really had a chance to set. We did have a lot of grass, but it just needed some time to mature. Little did we know we were about to get a lot of it.

"It was certainly a different week with all the guidelines and processes implemented by the AFL that we had to adhere to. All the entry points to the stadium were locked and everyone had to enter via the service entrance. All staff had to have daily temperature checks and fill in an app-based questionnaire. Like most places we stopped working in teams and increased hygiene protocols.

"Everything happened so fast after that first round and it all became very real very quickly when staff begun being stood down across our entire stadium business. Looking back we certainly underestimated the longevity of the situation."

Thankfully, in that first week after the season was suspended, all staff were kept on. That enabled them to core (5/8" tines at 2.5" spacings), harvest and topdress Marvel Stadium, while on Friday Primo was applied at high rates to all the other surfaces the team manages – Whitten Oval, Ikon Park, Princess Park No.1 and North Port Oval.

By the following week, however, the changes had been rung, with an 80 per cent head count reduction and remaining staff taking a 20 per cent pay cut. Darby's turf management team was slashed to just himself (on normal hours) and Marvel Stadium arena manager Troy Jordan (four days a week), a reduction from 50 days labour a week to just nine. For the next four weeks the two of them

maintained the five grounds and assisted Brett Sullivan at St Kilda's RSEA Park with product applications on his two surfaces. This included deploying lighting rigs in the stadium weekly.

"It was a fairly manic period, but looking back now I'm amazed at what we achieved," says Darby. "No meetings, minimal emails, no reports, no use, no traffic on the roads and no line marking certainly helped. We pretty much kept everything on programme in terms of inputs, but we did increase our Primo rates.

"The lack of use obviously had a considerably positive impact on the surface at Marvel. We had the roof open and the Victorian climate is generally pretty good through April and May for ryegrass growth. Aside from that earlier coring and topdressing, we didn't do anything else as we were too flat out covering the essentials. All the grounds improved immensely due to no use and were in great shape when the players returned."

BITTER PILL TO SWALLOW

Between the season resuming and then Melbourne going into a second lockdown, Marvel hosted a further eight games (double-headers across four consecutive weekends), with its last game coming on 4 July. The ground presented and performed to a very high level, with Darby welcoming the positive feedback on the stadium surface as well as the training venues from the players.

Such comments made the announcement that the season was moving interstate a much more bitter pill to swallow. What also made it confronting for Darby was the knowledge that his team, which were all back on deck, would again be stood down and the impact that would have on them and their families.

Before that was implemented, Darby's team cored Ikon Park and Whitten Oval, even though it was July. When the cuts came, Darby and Jordan remained on similar terms as before, but this time they retained two staff on three days a week (30 per cent of pre-COVID levels) which enabled them to maintain as normal a programme as possible.

"There were no real changes, more just a reduced requirement for any overseeding, slightly lower nutrient inputs and reduced lighting hours," explains Darby. "We reduced our lighting rig hours by about 30 per cent due to no use (see Figure 1). Typically we use a combined shade/wear pattern deployment strategy, but with no wear and tear we just used a shade analysis which reduced lighting hours and our fertility requirements.

"We continued to maintain Marvel in match condition hoping that footy would return, but to no avail. Once it became apparent the season for Victorian venues was done, we cored all venues, this time being a little more aggressive with scarifying and including an oversow at 200kg/ha. At North Port Oval we were able to get in a month earlier than last year with some Group B herbicides to take out the ryegrass and start the transition to couch for the impending cricket season.

"It was amazing to see the benefit to the surfaces having no use. We got to consolidate what we had and made incremental improvements each week. We had no backwards steps – no triple-header weekends with the roof closed for three days, curtain-raisers, kids clinics or kick-to-kicks which in July can send you from travelling okay to being behind the eight ball all within 72 hours. The ground is in pretty good shape and it is a real shame no one can play on it."

As with all his fellow turf managers, Darby can point to plenty of lessons learnt from the past season – what can be achieved when backs are against the wall, the importance of your staff and their wellbeing, not to mention just how much wear and tear impacts a surface, especially one as heavily scrutinised as Marvel. Darby is under no illusions though that while Marvel now has a nice healthy mature sward, that will only last until the next concert comes along and the ground is covered and roof closed for a week. The biggest revelation for Darby this season, however, has been the importance of appreciating the simpler things in life.

"Being back on the tools full-time is something that I have really enjoyed to tell you the truth," says Darby. "I reckon I have cut more grass in the last six months than I have in the last 10 years! It has been quite refreshing and therapeutic actually. Personally, the lowest point was losing the Bledisloe Cup which I was really looking forward to and not being able to utilise season tickets at GMHBA Stadium watching the Cats. Hopefully I can sit in the stands next season and eat some meat pies at half-time with my son!"

Editor's Note: Understandably due to workload and time constraints, Dave Sandurski (*The Gabba*) was unable to contribute to this article. ATM hopes to have a story on *The Gabba's* immense role in a coming edition. 🙏

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Royal Randwick reaching new heights

The fourth instalment of the world's richest race on turf – The Everest – was recently held at Royal Randwick. Track manager Michael Wood, who took the reins at Sydney's premier racecourse last August, looks back at his first year in charge and how new technology is playing an emerging role in the management of this unique facility.

In the turf sector you don't start at the top and my story is no different. Beginning with an apprenticeship push-mowing and whipper-snipping rock-infested, barely grassed areas, it is quite difficult to see yourself progressing to maintaining the hallowed turf of Sydney's prestigious Royal Randwick racecourse or writing an article for the Australian Sports Turf Managers Association.

During the early days of my career with a contract maintenance company, I was able to develop and hone my skills within multiple disciplines in our industry. Along with attending Richmond TAFE, exposure to cricket wickets, tennis courts, croquet lawns and sporting fields enabled firm understanding of turfgrass principles and how they can be transferred between situations. This exposure has been the catalyst in trying to change the mindset of maintaining racing surfaces like a 'paddock' which has been the norm for so long.

My passion for racing definitely grew over time as my first recollections of the sport were listening to my uncle's radio and I couldn't stand it. However, the older I got the more interest I took in the 'Sport of Kings' and it pushed me into racecourse maintenance directly out of my apprenticeship to the Australian Jockey Club and Warwick Farm racecourse in Sydney. Two years there and I was drawn back into sports fields at Cabramatta Rugby League Club to manage

the playing surfaces and facilities as an opportunity to develop my leadership and management skills.

An involvement in racing continued to linger in my mind and fortuitously a role as an assistant racecourse manager at The Australian Turf Club, Canterbury Park arose. This was where I identified the different world of managing racing surfaces and its challenges. It really is a different beast all together from all other disciplines of turf management. Preparing a sports turf environment with the correct moisture content for both turf health and horse cushion while running those 550kg animals over it and an expectation the turf won't kick out is without question difficult.

Due to the improved practices of racecourse managers around the country, the expectation placed upon racing surfaces today is as high as any other sports turf situation and I for one am proud and looking forward to continued improvement and innovation in turf practices applied to racing.

A FINE STABLE

The Australian Turf Club (ATC) is made up of four key racing venues – Canterbury Park, Warwick Farm, Rosehill Gardens and Royal Randwick – and is the only racing jurisdiction in the Sydney area. All tracks are kikuyu based that are overseen with annual ryegrass through the winter months. All venues now have a Polytrack training surface made from sand, fibres and a wax component in its arsenal to reduce the load on our grass surfaces.

In total, ATC venues comprise 278 hectares, 27 tracks totalling 64 hectares of racing and training surface for 1700 stabled horses across our venues, each with their own character and elements that affect racing style and patterns.

Canterbury Park, managed by Greg Carmody, is a tight-turning 1550m circumference track that doesn't hold training and has excelled in the night racing space through the summer months. Greg has been at Canterbury for 34 years and was my initial

Left: Sydney's Royal Randwick racecourse will forever be linked to iconic mare Winx who won 20 races there during a storied career, among them three successive Longines Queen Elizabeth Stakes, four consecutive TAB Chipping Norton Stakes, three Colgate Optic White George Main Stakes, The Star Doncaster Mile in 2016 and the TAB Epsom in 2015

Right: Royal Randwick racecourse manager Michael Wood (centre) has a team of 25 staff that ensure the various tracks, gardens and lawns are maintained to world-class standards





mentor while I was his assistant. It is often referred to as the training ground for future managers as multiple former assistants have progressed to hold racecourse manager positions following their stints at Canterbury Park.

Warwick Farm, led by Mark Jones, also a former Canterbury assistant, is predominately a mid-week racing venue, however, holds the most amount of horses in training in NSW at 750. Rosehill Gardens manager Shaun Patterson has progressed from apprentice to racecourse manager at the home of the Golden Slipper and emerging races such as The Golden Eagle. With a Course Proper circumference of 2048m it is our other Saturday racing venue with 23 meetings and also home to 400 horses.

Royal Randwick 'headquarters' has the most tracks, races and carnivals within the ATC. With two racing surfaces – the Course Proper (9ha and 2224m circumference) and Kensington track (4ha and 2100m circumference) – we conduct 47 meetings per racing year. There are seven training surfaces open for use – the Polytrack (3.5ha), Steeple track (grass, 3ha), B track (grass, 2.8ha), Sand track (1.5ha), Jumps track (1.7ha), Sand Trotting track (1ha), Bullring (0.5ha) – along with an equine pool which ensures a high workload is ever present.

Thankfully I have a fantastic, skilled and highly motivated team of 25 staff that ensures our surfaces, gardens and lawns are maintained to the world-class standard that is expected. It is a seven-day-a-week, 365-day-a-year operation as we have 550 horses in training for the 16 trainers at Randwick, some of whom are the most famous trainers in the

Like all ATC tracks, Royal Randwick is kikuyu based and oversown with annual ryegrass through the winter months. With the extension of Royal Randwick's Spring Carnival and addition of The Everest, a new variety of ryegrass – Duraturf Bolta – was used this season

land – Gai Waterhouse and Adrian Bott, Peter and Paul Snowden, Anthony Cummings and John O'Shea to name a few.

In late 2017 I moved across from Canterbury Park to the assistant's role at Royal Randwick and during that time I thought I threw myself at all aspects and was well prepared to take that next step to become a racecourse manager. To an extent that was correct, however, the parts you don't see are the relationships and interaction with stakeholders (large and small) that are the key to succeeding in a role like this. Being able to be fluid and problem solve are things you learn on the run and interacting with trainers is a prime example of how important this is.

The Kensington track has been rebuilt two times in the past five years. Multiple issues were identified with the initial rebuild thus the second build was undertaken. A more traditional sandy loam profile with a male sterile kikuyu turf type has been used in the current track. I began at Randwick one week after completion of the track. It certainly has its challenges but show me a surface that doesn't.



Royal Randwick's spectacular Theatre of the Horse

As part of the ATC tracks master planning undertakings, there are plans to rebuild our major centres' Course Propers in due course to ensure we provide the best tracks possible, however, I believe with the correct maintenance processes we are now undertaking a marked improvement will be seen.

TAKING THE REINS

August 1, 2019 saw a changing of the guard of sorts at the ATC with Lindsay Murphy (former general manager of racecourses) moving on and Nevesh Ramdhani and myself assuming new roles as general manager of racecourses and Royal Randwick racecourse manager.

Lindsay was without doubt the racing man's racecourse manager. His racing knowledge was unparalleled and ability to walk into any racing centre and know a dozen people was uncanny. Lindsay moving on after such long service to the industry (42 years) was well earned and as it stands he is still the chairman of the Australian Racecourse Managers Association. He was a good sounding board when decisions needed to be made around race day preparation and this is something Nevesh is also very adept in.

In his new role, Nevesh (the former Royal Randwick racecourse manager) oversees all ATC tracks and 90 staff which is a challenge he has taken head on and from my perspective has been a great appointment. He has brought in a sense and focus on collaboration between managers which enables us all to share issues and discuss as a team.

The notion of tracks are treated like paddocks could not be further from the truth and I am thankful that Nevesh and I share the same view. Applications of white urea and potash as a balanced fertiliser programme no longer cuts it. The Randwick fertiliser programme has a continual base of controlled-



Sydney's Royal Randwick racecourse is the headquarters of The Australian Turf Club. It comprises two main racing surfaces – the Course Proper (9ha and 2224m circumference) and Kensington track (4ha and 2100m circumference)

release fertiliser backed up by foliar fertilisers around need, dependent upon upcoming racing fixtures. This balanced programme has seen a reduction in fungicides and more a proactive/preventative fungicide programme introduced. I also attribute this to the elimination of excess rolling of the track and increased frequency of mowing.

A typical week would see mowing occur three times at an average height of cut of 85mm with that height to decrease as we show participants that the kikuyu will provide a better quality surface at lower heights. Using three 72" deck zero turns this will take five hours to complete the Course Proper and is one area I am investigating efficiencies and quality of cut moving forward.

Cutting at such a high height presents its own challenges, namely around the

microclimate within that sward and also the ability to put product where you want it. Mite control and preventative insect pest control is a major focus of our IPM programme due to the high impact and damage to the turf following meetings and ensuring the ability to recover isn't inhibited.

Re-introduction of wetting agents proved invaluable for me through last year's brutal summer. Working with a 20-year-old Course Proper, perennial dry spots will quickly become evident, however, utilising Tricure last season I was very happy with the results. For a long time wetting agents held a certain stigma from either misuse or misinformation, but I have found it a useful component of my track management programme.

One blessing I have at Royal Randwick is the quality and availability of bore water

for irrigation. This can so often be the root of many turf issues and I'm lucky to have a very good water source. Irrigation cycles must be completed when conditions are most favourable due to the overwhelming need for consistency and constant use of the word 'bias' in racing. Thus the majority of irrigation takes place between 11pm and 4am when the wind is low before track work begins.

This season also saw a change in the ryegrass used at both Randwick and Rosehill. Traditionally an Italian ryegrass named Tetila was used, however, with the extension of our Spring Carnival and the eyes of the world on Randwick for Everest day, I needed a rye that would still be in good condition and not transitioning before this carnival. So far I am more than happy with the Duraturf Bolta which was seeded back in April.

OUT OF THE GATES

The Championships in Autumn and Everest Carnival in Spring are the major milestones that we work towards each year. In the autumn major races including the Doncaster Handicap (1600m), Australian Derby (2400m), Queen Elizabeth (2000m) and TJ Smith (1200m) make up the three week straight carnival. The Everest Carnival in the spring is fast becoming

Royal Randwick hosts 47 race meetings during the year with The Championships in autumn and Everest Carnival in spring the major milestones Wood and his team work towards



a strong competitor to the Melbourne carnival which I have always loved. Holding the richest race in the world on turf – The Everest – at Randwick is an immense thrill as the eyes of the world descend on your patch of turf. During these peak periods we are able to call on staff from other venues to aid in the maintenance of our facilities.

The beauty of having a fixed racing programme allows you to prepare your programmes and get your timings correct to have the track and surrounds at their peak for key dates. Each major carnival requires over 10,000 annual plants to fill spaces within our gardens and around the Theatre of the Horse.

While all carnivals are always in the back of your mind, the majority of my planning will commence on the back of the previous one. I find that early planning allows you to firstly learn from any mistakes or things you could have done better and make those changes within the plan in the present. It also allows you to manipulate and alter that plan with added time to reflect on what works. Dealing with a living thing, Mother Nature (who loves to throw a curve ball from time to time) and the odd pandemic to boot, certainly accentuates that need to be fluid in planning.

NEW HEIGHTS

One new tool we have used since February 2020 is the Double 4K Multispectral Sensor from Sentera. Brought to me by John Legge who is part of our AV team, it was something I knew about however never really gave it much thought. As the ATC had its own drone for other uses within the business, I purchased the sensor and it was easily fitted. Being someone who loves new techniques and trialling new products, I jumped at the opportunity to utilise this piece of kit as John could fly it upon request. To my knowledge no other racecourse in the world has been using this as part of its maintenance and who doesn't love being the first!

Without having used this software previously it was hard to set an exact scope for what data I was looking to extract and how it would help with my practices. However, the more we used it the more we take from it. Having the ability to view the surface using the NDVI (normalised difference vegetation index) filter allows me to identify turf health broken down significantly to see variances and what may be making that occur. It also educates my decisions on fertiliser practices, irrigation needs and potential disease related issues.

Traditionally racecourses were sprayed in their entirety if disease or other issues were found and while in some cases this practice remains, there have been several times already where we have identified exact areas and treated them alone, saving plenty of money in the process. NIR (near infra-red) and RGB



This past season has seen Wood using drone technology to assist with his track programmes. NDVI imagery can quickly pinpoint turf under stress

photos are also extremely useful in day-to-day observations and as a way of comparison from month to month and year to year.

As a rule, I will have it flown over the course on the Thursday prior to a race meeting and again on the Monday or Tuesday to break down the wear and damage from the meeting and ensure our efforts are concentrated where most required. The pre-race day flight identifies possible drainage or irrigation requirements that can be adjusted before the race meeting and ensures no significant sub-surface issues are arising that we may not see with the naked eye. It has also been useful in the justification of rail moves which are sometimes called into question by participants and this imagery is irrefutable.

I have heard plenty of chat about why don't you just walk the areas yourself and I can guarantee you that still happens. But to cover

20.5ha of grass surfaces and review it within minutes is an invaluable tool in my opinion and will continue to be rolled out to all ATC venues to help improve our tracks.

REACHING THE SUMMIT

Everest Day 2020 came around pretty quick this year and certainly had a much different feel than this year's Championship which was held under strict lockdown. Although, racing has been relatively COVID unaffected, apart from the impact of loss of crowds to our events, the racing and training component have been as hectic as ever.

Over the past season we actually picked up meetings from other venues who weren't as well equipped to adhere to COVID protocols which put added pressure on our racing surfaces that were already badly affected by an overly wet winter. I am happy with the current condition of my surface and our planning has it in as good a condition as possible considering our busy racing programme.

Post Everest, we then look forward to renovations in November after Melbourne Cup Day which is always a great time of the year. We will spray out our ryegrass eight days prior, scarify, one-inch hollow tine core, sweep then topdress with about 750 tonnes of sand. The requirement is to race on the Course Proper again on 12 December giving us a five-week turnaround start to finish.

Being the racecourse manager at Royal Randwick is, like all turf manager roles, rewarding and full of pressure. But pressure is privilege and being able to see your work as a platform for these elegant animals to perform upon is a pressure that I will gladly undertake. The best part of my role is talking to others about it and teaching them some of the idiosyncrasies within it; my door is always open.☘



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✓	✓	✓
Fully dissolved	2 L @ 20 g/L = 40	Turf (all turf species)

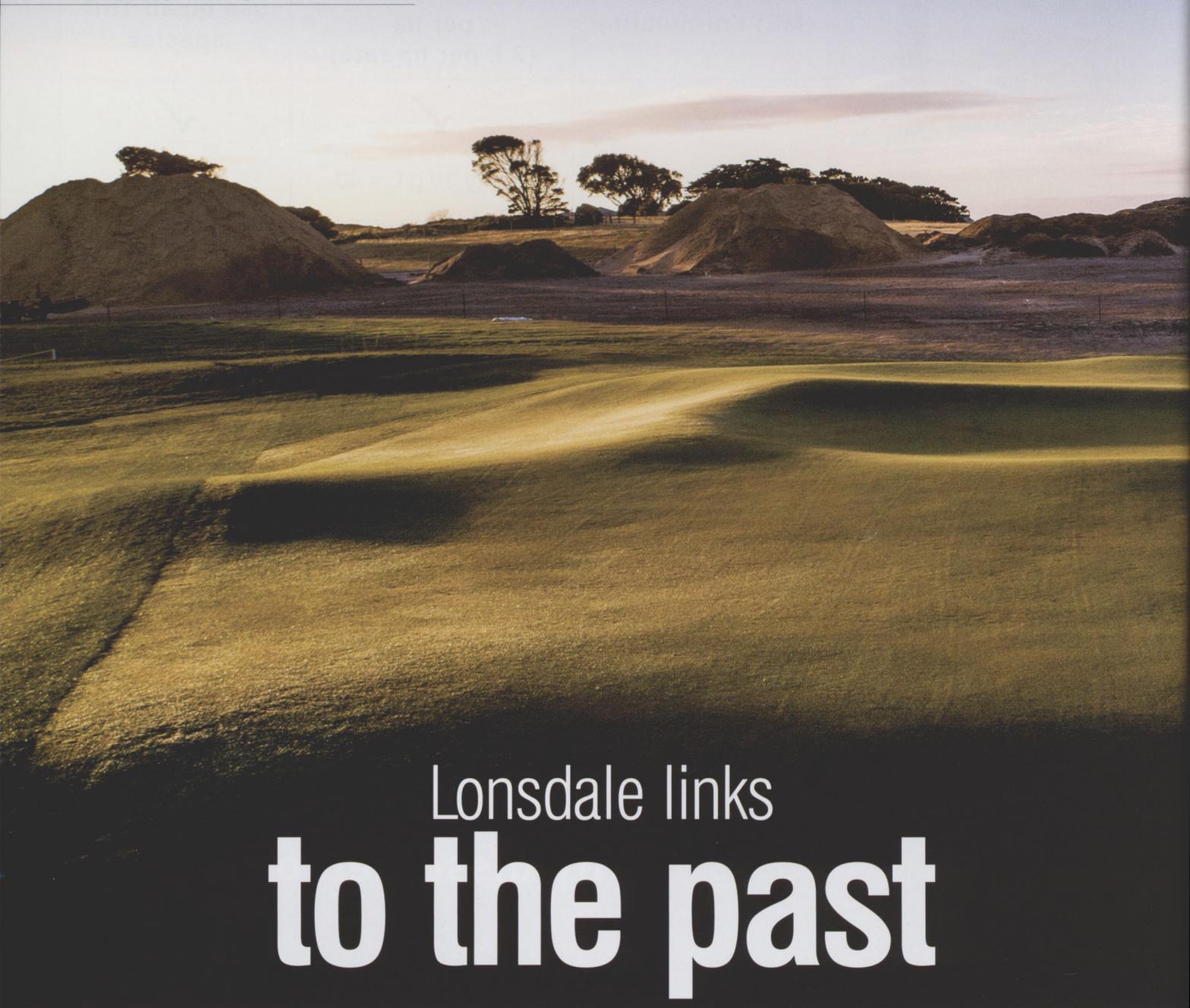
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Lonsdale links to the past

Point Lonsdale is a coastal township on Victoria's Bellarine Peninsula, about a 30 minute drive east of Geelong. Point Lonsdale is one of the headlands which, along with Point Nepean on the Mornington Peninsula side, frame the entrance to Port Phillip Bay.

A nine-hole course at Point Lonsdale was opened for play in 1922 after 30 acres of land was purchased between the coast and Lake Victoria. The land featured rolling sand dunes covered in scattered Moonah forests. Thousands of years ago the land would have been atop the primary sand dunes when Lake Victoria was linked directly to Bass Strait.

Originally called Point Lonsdale Golf Links, it employed its first 'greenskeeper' in 1932 for three pounds per week, which

would be equivalent to about \$400 in today's money. The greenskeeper was assisted by a nine-member volunteer team each given the responsibility of one green to tend for. The fairways were originally sown with a mix of Kentucky blue, Indian and common couches. It is unknown what the greens mix was, but can only assume it would have been similar to the blend seeded on the Melbourne Sandbelt at a similar time in history.

In 1937 the club purchased an additional 52 acres and added four new holes which were designed by the Morcom's (Mick and Vern of Royal Melbourne and Kingston Heath fame) and opened in 1939. The remaining holes to make up a full 18-hole layout came into play in 1954. It is interesting to note that Point Lonsdale Golf Links once had one of the largest memberships in the state (1250

members) and the largest membership outside of metropolitan Melbourne. Three quarters of the way through the current redevelopment the club is quickly approaching that original number.

A LONG ROAD

The original course at Lonsdale had changed numerous times throughout the 1980s and 1990s, mostly to do with safety problems associated with roads and some residential boundaries. The last major changes occurred when some holes down by Lake Victoria were added on land which was once mined for shell grit to use in bird cages. (As an aside, when we renovated these holes as part of the current redevelopment, many shells came to the surface. The shells are quite visible on these lake holes and will become a unique feature

OCM used the works of iconic golf course architects C.B. Macdonald and Seth Raynor as inspiration for their green and hole designs at Lonsdale Links. Pictured is the 12th 'thumbprint' green



Under construction over the past two years, Lonsdale Links (formerly Lonsdale Golf Club) has undergone a dramatic transformation by course architects OCM. Director Ashley Mead outlines some of the intriguing design elements which are a deliberate throwback to an earlier age of course design.

of the new course and something that ties the land back to the original industry that once occupied the ground.)

During this time the club had limited resources with low course staff numbers and limited machinery, but despite this the course was always maintained to a good standard. In terms of its playing surfaces, the course was relatively low maintenance. Being predominately on sand meant that fairway turf was often lean with a mix of different grasses which played almost links-like. A couple of holes had unfortunately been taken over by kikuyu which meant they didn't play as firm and linky. The finer dune sand of the Bellarine Peninsula is very conducive to being able to create firm conditions. The irrigation system was also quite basic and the club had no automatic irrigation in the fairways,

instead relying on quick coupling valves and travelling sprinklers. Over recent years couch encroachment had also become an issue in a few of the greens.

It was around 2000 when the club embarked on its current redevelopment path. The redevelopment involved subdividing some of the existing course to make way for a 102-lot residential subdivision and purchasing some additional land from a neighbouring farmer. We became involved around that time and originally looked at another parcel of land to replace the holes that had been earmarked for redevelopment. This land was very low lying and even though it had been mined for shell grit, a lot of indigenous vegetation had regrown. As part of the negotiations with the authorities it was deemed that this land would be difficult to get a permit for golf holes.

The permitting process to get to where we are now has been very long and challenging, with approvals required from local, state and federal governments. A large amount of the approvals were based around the orange-bellied parrot and its environment, hence almost 15 years in the development and planning phases. During that time the property boundaries changed along the way which forced us to look at alternate concepts and at one stage we even did a plan for a 12-hole course.

The new 18-hole golf course which has eventually come to life over the past two years is essentially a new course, with a new clubhouse designed by Wood Marsh Architecture. Due to COVID-19 and the restrictions imposed in Victoria, it has been a little difficult to plan for a grand opening, but

PHOTO: WILLIAM WATT/CADDIE PRODUCTIONS



Lonsdale's new 16th takes inspiration from St Andrew's famous 17th Road hole, with a post-and-rail fence behind the green and deep bunker at the front which is fed by the surrounding contours. Lake Victoria can be seen at the top of the photo

everything is scheduled to be completed by the end of 2020. As a part of the rebranding of the club, its name has been changed to something that closely reflects the original – Lonsdale Links.

A UNIQUE LAYOUT

The Bellarine Peninsula boasts some great courses and from the very early stages of this project we wanted to do something different. To create another course similar to those already nearby would have not only been challenging for the club and its long-term viability, but it also wouldn't assist the region in creating a golfing destination with varying golfing experiences. We had always discussed with the club the importance of trying to be unique from their competitors and to the Board's credit they have been really supportive of the concept we presented to them.

The works of iconic golf course architects C.B. Macdonald (founder and architect of the National Golf Links of America) and Seth Raynor have always been of interest to us at OCM. Their work was much different to that of the Sandbelt – a simpler looking design with straight lines, rolled in bunker faces and some quirky features. Using their work as

inspiration we have incorporated some of their famed templates – such as the Biarritz, Redan, thumbprint and cape style greens and holes – into the new Lonsdale Links as a deliberate throwback to an earlier age of course architecture.

Such an approach had been discussed at OCM prior to this project and in Lonsdale we finally found a site and a client that suited the concept perfectly. The site at Lonsdale has many similarities to National Golf Links of America, a course we visited and studied in 2012. Among them are;

- Sandy terrain;
- Close to the water – Lonsdale has expansive views across Lake Victoria, whereas National Golf Links looks over both Bulls Head and Peconic Bays;
- Minimal tall vegetation throughout the course and expanses of golden rough;
- Rises and falls in elevation – Lonsdale has a large elevation change allowing for expansive vistas across the course. The National Golf Links view from the Alps (3rd hole) or its famous windmill is also quite expansive.



PHOTO: NICK WALL/AIRSWING MEDIA

Much like C.B Macdonald's original sketch of Chicago Golf Club, OCM have gone with straight lines to define Lonsdale's fairway and green shapes and bunkering

Lonsdale's 'cape style' 15th (right of photo) plays around a large salt marsh to a square green measuring 520m²

- A mix of land forms – both have sections that are quite low and almost feel tidal and quite close to the water table.

When we discussed the design templates as a group, it was never the idea to try and replicate them, rather it was more about getting inspiration from them. For example, Lonsdale's new 16th hole – a drivable short par four tucked up against the boundary (see main photo left) – takes inspiration from St Andrew's famous 17th Road hole. At Lonsdale a post-and-rail fence has replaced the stonewall, while the Road hole bunker is more central on our green. The bunker carries similar characteristics – it is quite deep with a steep face – but it is all about the surrounding contours and making them feed the ball towards the bunker, thus making its influence much greater than the small section of sand.

The punchbowl green on Lonsdale's new 11th actually came about by the need to screen the irrigation dam. An approach to the 11th is played from the highest point on the property and you look towards the township of Ocean Grove in the distance. Unfortunately, being quite high also allowed you to see into the dam where the water levels will fluctuate with the seasons. The solution was to actually cut the green down lower, raise the bank of the storage facility to look more like a dune and nestle the green at its base. A couple of ridges have been built at the front that will be covered in fescue to enclose the punchbowl.

Lonsdale's 1st is based on the 'Alps' template. A tee shot high over the hill on the left will finish close to the green, whereas a tee shot to the lower shorter right section of



PHOTO: WILLIAM WATT/CADDIE PRODUCTIONS

fairway is then played over a large hazard. A Moonah tree in the middle of the fairway helped define our concept here as it wasn't permitted to be removed and now sits perfectly in the middle adjoining the ground hazard.

Other templates or distinctive features we have gained inspiration from include;

- A 'cape style' hole on the 15th which plays around a large salt marsh;
- A Biarritz green on the 2nd hole;
- North Berwick's 15th, known as the original 'Redan' hole, was used as the concept for the 14th;
- A 'Hell' bunker protects the approach to the par five 13th green;
- The 12th green is inspired by the 'thumbprint' greens of Chicago Golf Club's 10th or the 18th at The Greenbrier; and
- A 'principal's nose' bunker on the long par five 3rd.

Much like the original sketch of Chicago Golf Club, we have gone with straight lines to define the fairway and green shapes. This

was quite challenging given that we typically go with long flowing shapes that reflect the ground contours. Many of the shapes are marked out with a string line which is keeping the groundstaff on the ball when mowing!

OUT OF THE GROUND

The construction period for the new course was two years, roughly broken down to a year per nine which included grow-in. It has taken about six months longer due to some delays with permits, but at the time of writing (early October) we are on the home stretch now with construction just about completed, which should give us about two months to groom the course for opening.

As with all our national projects, we tend to build them ourselves with our own staff and equipment. Often this includes utilising some of the existing course staff during construction. We find this is a good learning experience for many who have never had the opportunity to work on a construction site.

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DELIVERING PUMPING SOLUTIONS

Some of the quirky bunkering elements incorporated into the new Lonsdale Links design

PHOTOS THIS PAGE: WILLIAM WATT/CADDIE PRODUCTIONS



The success of any project is always a result of the quality of the staff and we are lucky at Lonsdale to have a great team. Onsite the project has been led by Rob Swift who has acted as the grow-in superintendent/project manager/design sounding board and Heath D'Altera has been our superintendent who came across from Kingston Heath Golf Club mid-2019.

All the greens are constructed with an imported sand that varies in depth between 300-400mm depending on the base material. If we had a heavy base sand we installed 400mm of sand and included some sub-surface drainage, whereas if it was a free-draining base sand we installed 300mm of sand. The infiltration rate of the sand is between 250-300mm per hour and was sourced from a nearby quarry.

For our grassing strategies we worked with agronomist John Neylan who has continued to advise us throughout the construction process. After plenty of discussion, we have gone with the following varieties;

- **Greens:** An A1/A4 blend was chosen based on the success of those grasses on the Mornington Peninsula and that they require less intense maintenance than Pure Distinction. Also we like the mottled appearance a blend gives, especially in coastal locations.
- **Fairways:** Santa Ana couchgrass established from sprigs. The old fairways had large amounts of kikuyu which we have almost eliminated. Once this is under control we will look at oversowing the fairways with fine fescue.
- **Roughs:** Fine fescue and common couch.

Revegetation has also been a key part of the redevelopment with around 100,000 indigenous plants contract grown by Environmental Golf Solutions and installed.

With works split across nines in different years, we did make a few adjustments during the second stage. In the first stage we seeded the rolled down section of bunker lips with a fine fescue blend which established quite well through the cooler months but struggled in the fine sand during the warmer windier months.

For the second stage we had some Santa Ana oversown with the fine fescue contract grown and have solid turfed all the bunker edges. To keep the grassing consistent, we have gone back to our stage one bunkers

and re-turfed the faces and hopefully they will hold up better through the summer months approaching. Point Lonsdale is an incredibly windy site and this is something that has made the grow-in quite challenging.

COMMUNITY HUB

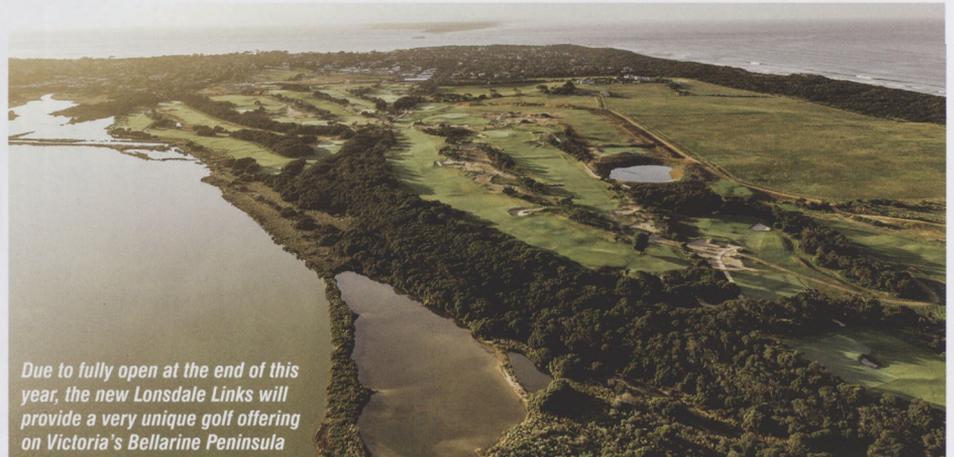
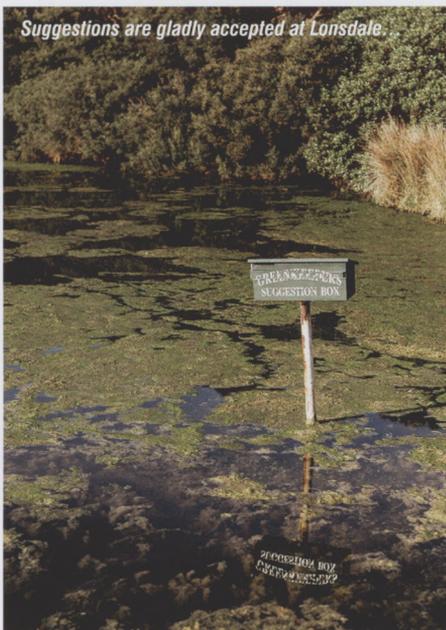
An important component of the redevelopment has been to instil a community feel to the facility. To this end a public park and walking track has been added adjacent to the clubhouse and a children's playground has been constructed next to a kiosk that will sell takeaway coffee and wood-fired pizzas. Multi-purpose spaces have also been created within the clubhouse which can be used for community activities such as yoga.

As part of the redevelopment we have also designed a short course within the new driving range. We have always thought driving ranges were a bit one dimensional given the space that they occupied, so we have built a six-hole par three course inside its boundaries. When the range is in play the greens will double as targets as they have been built to accept balls from multiple directions.

The par three course will be called 'Mulligans' (yes, you will be able to have one mulligan a round) with each hole measuring under 100m. The greens are quite undulating as we want people to have fun. The hope is during school holidays and daylight savings that this area becomes a hangout for families and local kids. Things like local food tasting station nights, food vans, music and movie nights are something we would like to see on Mulligans in the future.

Together with the unique design of the main course we hope the new Lonsdale Links facility adds another great golfing destination option for the Bellarine Peninsula. The greatest satisfaction ultimately will come from the project's success and to see a club that was once struggling turn into a vibrant sustainable facility. To steal a line from when the original course was opened in 1922, Lonsdale Links is "a place where the wild sea waves gives a zest for golf." 🌊

Suggestions are gladly accepted at Lonsdale.



Due to fully open at the end of this year, the new Lonsdale Links will provide a very unique golf offering on Victoria's Bellarine Peninsula

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IRRIGATION

The fact that annual rainfall is now well below the long-term average in many areas of Australia means there is an increasing demand for water to irrigate sports turf surfaces



Irrigation 101

Reconsidering the basics

After what has already been a difficult year for many turf facilities around the country, turf managers across all sectors are now gearing up for the warmer months and the many challenges that can present. Foremost in the minds of turf managers will be the irrigation season and managing their water resources to sustain their turf surfaces to acceptable levels.

The judicious use of water has without question become one of the industry's greatest modern challenges. Climate change is seeing an increase of the irrigation season across many states, while water availability and quality issues have forced many to undertake major reassessments of where they derive their water from and their irrigation strategies. Golf clubs and turf facilities continue to invest serious capital into improving irrigation infrastructure and safeguarding their future water sources, with water management planning now a critical step for all to ensure future viability.

As this and the following two articles were being penned, the Bureau of Meteorology (BOM) announced in September that Australia is entering a period of La Niña. A La Niña cycle typically results in an increase in the chance of above average rainfall across much of the country during spring and above average summer rainfall across eastern Australia, with the indicators suggesting the remainder of 2020 will be wetter than average.

Interestingly, in the same statement the Bureau highlighted the influence of climate change and that Australia's climate has warmed by around 1.4°C since 1910, while southern Australia has seen a 10-20 per cent reduction in cool-season rainfall (April–October) in recent decades. Reading between the lines it is a subtle reminder that while we may experience higher spring/summer rainfall this year, we are still in a drying climate.

At the 2018 Australasian Turfgrass Conference in New Zealand, John Neylan presented a paper that reviewed the possible effects of climate change on turf management. The literature on climate change consistently references the effects on rainfall and therefore water availability. That is, the changing climate will affect water demand and availability by;

- Rainfall being more spasmodic;
- Increased periods of drought;
- Increasing temperatures; and
- Increasing evaporation rate.

As part of that presentation he referenced the "State of the Climate 2016" report, a joint publication by the CSIRO and the Bureau. In it, Australia's climate was summarised as follows;

- The duration, frequency and intensity of extreme heat events have increased across large parts of Australia.
- May-July rainfall has reduced by 19 per cent since 1970 in southwest Australia.

The efficient and effective management of water continues to be one of the most critical aspects facing all sectors of the Australian turf industry. Over the next three articles, ATM columnist John Neylan joins with AGCSATech's Bruce Macphee to look at the many ways turf managers can effectively utilise, enhance and secure their most precious resource.

- There has been a decline of around 11 per cent since the mid-1990s in the April-October growing season rainfall in the continental southeast.
- Rainfall has increased across parts of northern Australia since the 1970s.
- Soil moisture is projected to decrease and future runoff will decrease where rainfall is projected to decrease.

The purpose of this report was to provide the science to help inform a range of economic, environmental and social decision-making and local vulnerability assessments by government, industry and communities. The turf industry certainly fits within these interest areas and highlights the need for localised reviews of the impacts of climate change to be undertaken. Initiating a site specific water management plan will be a key undertaking by all turf water users to understand how much water is available and how best to use it.

The single biggest 'take home' message from the climate change reports is how the turf industry will manage the impacts of a changing climate on water management planning and conservation. This is particularly the case where there is increasing competition for the available water.



Use hand-held TDR moisture probes to identify and hand-water dry spots only rather than over-irrigate areas

On projects where water has been a limiting factor, they challenge conventional thinking about irrigation. On these projects it is all about "this is all the water that will be available". In reviewing the water requirements for such projects the key factors have been;

- Cost of water – this is probably the single most important influence on how much water will be available; and
- Security of supply – that is, in times of low rainfall will there be water available? It then becomes an exercise of determining;
- How much water do we actually require to achieve a desirable turf quality? It could be that some projects become unsustainable and should not be undertaken.
- How do we better programme our irrigation applications?
- What are the minimum water quality requirements?

Over this and the following two articles ATM looks at the topic of water management, providing a review of the fundamentals of irrigation, water quality and alternative water sources, as well as case studies that highlight the challenges that turf managers faced and how they have been addressed.

This information has been derived from the in-depth Irrigation Workshop which featured on the final day of the 2019 Australasian Turfgrass Conference in Brisbane. The authors thank those who participated in that session and for allowing this series of follow-up articles.

IRRIGATION SCHEDULING AND WATER REQUIREMENTS

At the core of effectively irrigating sports turf surfaces is the ability to calculate annual water requirements and having a thorough understanding of how much water they require on a monthly basis.

Turf managers are blessed with the range of technology available nowadays to assist them in the decision-making process on how much water to apply and when. Soil moisture sensors, hand-held moisture probes and weather stations linked to irrigation computers are just some of the tools at a turf manager's disposal. In addition to this, having a good

understanding of the local environment and weather conditions is critical.

There is a great deal of information available on the BOM website (www.bom.gov.au) in relation to historical weather data, annual rainfall and evaporation (or Epan) data. This information is the vital first step in calculating annual water requirements. Information on evapotranspiration results for your nearest weather station can be found at www.bom.gov.au/wat/eto/. Plant water use or evapotranspiration (ET) can be calculated using local climatic data from the BOM website and using a crop factor, based on soil types, turf species, management practices and desired level of turf quality.

The crop factor calculation will vary between warm- and cool-season grasses and the intended use of the surface. A couchgrass fairway may produce an acceptable surface with a crop factor as low as 0.4, whereas a bentgrass golf green will require a much higher crop factor (up to 0.8) to maintain an acceptable surface. Another way to describe this is that you would need to replace 40 per cent of the total water lost to evaporation (Epan) for couchgrass or 80 per cent for bentgrass to maintain an adequate surface. ET is calculated by the following equation;

$$\text{Evaporation (Epan) x Crop Factor (CF)} = \text{Evapotranspiration (ET)}$$

Rainfall data is also taken into account when determining monthly water requirements. The amount of rainfall that can actually be used by the plant is referred to as 'effective rainfall'. Unfortunately, rainfall does not always occur at the time of year or in the volumes and the frequency required. Heavy downpours that exceed the soil infiltration rate will often result in run off, whereas light rainfall in the peak of summer often evaporates before being taken up by the plant. Sandy profiles with limited storage capacity will often see water

pass beyond the rootzone through drainage. Based on the above factors, effective rainfall is generally considered at 50 per cent of the total recorded and needs to be taken into account when calculating irrigation requirements. Average monthly rainfall data, including long term averages, can be located on the BOM website.

SYSTEM EFFICIENCY

Inefficiencies in irrigation delivery, which will be discussed in the following articles, also need to be taken into account when calculating water requirements. Losses can be attributed to uneven application, wind, misting and evaporation. These factors all result in water not reaching the target area which needs to be factored in to water requirements. A minimum irrigation efficiency of 80 per cent is considered acceptable under ideal operating conditions, however, for the purpose of this exercise 75 per cent has been used as the minimum efficiency.

The table below has been set up using BOM data collected for Sydney Airport. Mean monthly rainfall and evaporation (Epan) totals are used to provide base data for monthly irrigation requirement calculations. These are multiplied by the desired crop factor to estimate the volume of water required per hectare to maintain turf at the desired standard. This figure can then be multiplied over the total area for each surface to give an estimate of the annual total water requirement.

FINE-TUNING SCHEDULING

Access to water for golf and sports turf irrigation will continue to be placed under greater scrutiny with a variable climate and a limited resource. Knowledge of annual water requirements and the ability to manage and monitor water use effectively will demonstrate responsible management practices and

environmental stewardship and may assist in negotiating access to this vital resource.

Estimating your water requirements using the method above is an excellent starting point to understand your monthly and annual needs. Regular monitoring and recording of water use using flow meters will allow adjustment of irrigation scheduling and keep water use on target. Using local weather station data or an onsite weather station linked to your system will allow fine-tuning of irrigation scheduling based on daily ET rates.

A key factor in fine-tuning the irrigation scheduling is regular monitoring of turf health and playing surface quality. Keep in mind the following points:

- Technology allows accurate monitoring of water use and should be encouraged;
- It is simply too easy to overwater at the push of a button;
- The introduction of in-ground soil moisture sensors will allow more effective monitoring of plant water requirements and irrigation efficiencies;
- Encourage staff to work in millimetres not minutes. Understanding ET and irrigation delivery in mm brings it all together.
- Use hand-held TDR moisture probes to identify and hand-water dry spots only rather than over-irrigating the entire area.
- Providing conditions where water can enter the profile without the barrier of excessive thatch or compaction.
- Apply wetting agents to assist even water movement through the profile.

The turf industry has been proactive in utilising alternate water sources and should continue to improve the efficient use of this precious resource. A big part of this is also education and getting clubs to change their perceptions of what is acceptable turf quality and what is an acceptable playing surface given the available resources. ☺

Sydney: Sample Water Budget - Average Year

Formula	Warm Season Turf CF = 0.4							Warm Season Turf CF = 0.5			Warm Season Turf CF = 0.6			Warm Season Turf CF = 0.7		
	Rain mm	Effective Rainfall	Evap Pan mm	Net Evap mm	Evap Crop	Irrigated Area	Irrigation Required	Evap Crop	Irrigated Area	Irrigation Required	Evap Crop	Irrigated Area	Irrigation Required	Evap Crop	Irrigated Area	Irrigation Required
	Sydney Airport	0.5	Sydney Airport Average	Evap - Effic Rain	Net Evap x CF (0.4) mm	Area Ha	Irr. Deficit / Irr. Effic x Area (ML)	Net Evap x CF (0.5) mm	Area Ha	Irr. Deficit / Irr. Effic x Area (ML)	Net Evap x CF (0.6) mm	Area Ha	Irr. Deficit / Irr. Effic x Area (ML)	Net Evap x CF (0.7) mm	Area Ha	Irr. Deficit / Irr. Effic x Area (ML)
January	94.1	47.1	226.4	179.4	71.7	1.0	0.96	89.7	1.0	1.20	107.6	1.0	1.43	125.5	1.0	1.67
February	114.2	57.1	206.8	149.7	59.9	1.0	0.80	74.9	1.0	1.00	89.8	1.0	1.20	104.8	1.0	1.40
March	118.1	59.1	181.8	122.8	49.1	1.0	0.65	61.4	1.0	0.82	73.7	1.0	0.98	85.9	1.0	1.15
April	106	53.0	123.4	70.4	28.2	1.0	0.38	35.2	1.0	0.47	42.2	1.0	0.56	49.3	1.0	0.66
May	95.3	47.7	123.8	76.2	30.5	1.0	0.41	38.1	1.0	0.51	45.7	1.0	0.61	53.3	1.0	0.71
June	124.8	62.4	70.1	7.7	3.1	1.0	0.04	3.9	1.0	0.05	4.6	1.0	0.06	5.4	1.0	0.07
July	69.2	34.6	103.4	68.8	27.5	1.0	0.37	34.4	1.0	0.46	41.3	1.0	0.55	48.2	1.0	0.64
August	75.5	37.8	137.0	99.3	39.7	1.0	0.53	49.6	1.0	0.66	59.6	1.0	0.79	69.5	1.0	0.93
September	59.7	29.9	155.0	125.2	50.1	1.0	0.67	62.6	1.0	0.83	75.1	1.0	1.00	87.6	1.0	1.17
October	70.1	35.1	213.4	178.4	71.3	1.0	0.95	89.2	1.0	1.19	107.0	1.0	1.43	124.8	1.0	1.66
November	79.9	40.0	268.4	228.5	91.4	1.0	1.22	114.2	1.0	1.52	137.1	1.0	1.83	159.9	1.0	2.13
December	72.8	36.4	241.6	205.2	82.1	1.0	1.09	102.6	1.0	1.37	123.1	1.0	1.64	143.6	1.0	1.92
Total	1079.7	539.9	2051.1	1511.3	604.5		8.06	755.6		10.08	906.8		12.09	1057.9		14.11



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PHOTO: Southern Pines Golf Course, USA



Turfgrass irrigation requirements on golf courses can vary greatly over the area of one irrigation station due to design and topography

Down to the last drop

In the second part of this edition's look at irrigation and water management, Bruce Macphee outlines ways turf managers can improve their irrigation system's efficiency.

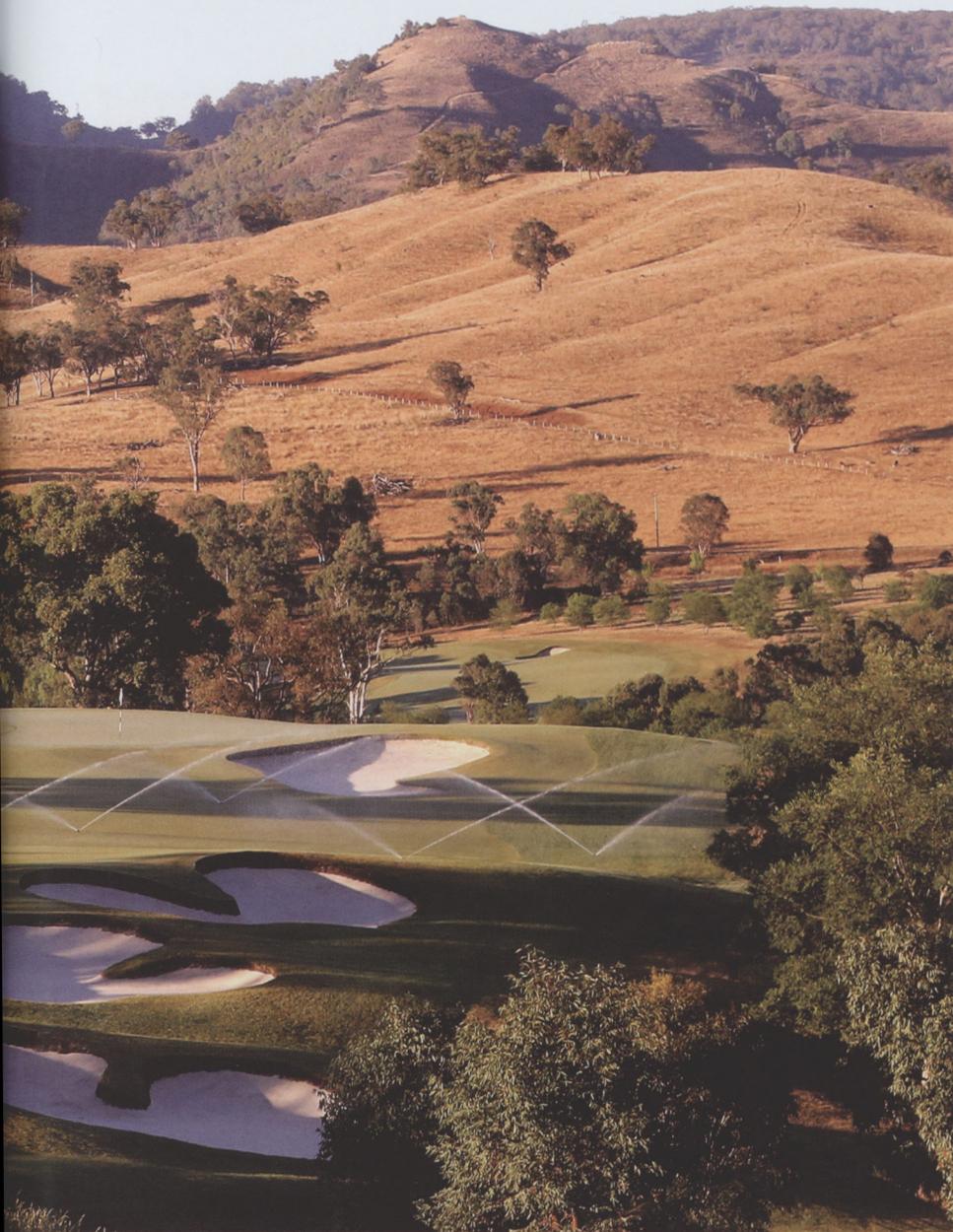
More than ever, turfgrass sporting surfaces are under greater scrutiny to be more environmentally responsible with the vital resources they have, in particular water. The common misconception, particularly during periods of drought, is that anything green is environmentally irresponsible, irrespective of the water source.

Improving water use efficiency must be a priority for all turf managers in this current

climate to ensure we can continue to maintain sports surfaces at the high standard user groups have come to enjoy. Maximising irrigation efficiency will reduce the volume of water required to maintain a quality sports turf surface.

The effective use of available water resources for irrigating all turf areas is a combination of the following;

- A good system design with a high degree of delivery uniformity;
- Flexible control (e.g.: valve in head);



- Regular maintenance and auditing of the irrigation system;
- A good understanding of plant water use; and
- Appropriate turf management.

While we can't always address all of the above points, significant improvements can be made without complete system replacement. In most situations turf managers are not dealing with the latest state-of-the-art system and have to deal with infrastructure which is often old, outdated and nursed through each season just to keep the turf alive.

Something that should not be underestimated is the level of stress this can place on the turf manager, with sleepless nights spent worrying if the system is going to make it through the evening irrigation cycle. Bores, transfer pumps, tank levels, old wiring, glue joints, stuck valves and broken sprinklers are just a sample of the possible failures.

Most turf managers get to know their system intimately and understand all the little

idiosyncrasies that need attention just to keep the system going. Replacement of an irrigation system, including pumps and controllers, can be a hard pill to swallow for many clubs and budgets don't often allow for major upgrades to be completed. While this problem won't be solved overnight, completing a full assessment of your system and its weaknesses can help you make significant adjustments for the time being and help build a case for replacement down the line.

HOW OLD IS YOUR SYSTEM?

A good starting point is to review the age of the various components of your irrigation system – sprinklers, pipes, valves, fittings pumps and controllers. As an irrigation system ages, more frequent breakdowns are experienced. Irrigation heads have many moving parts that can wear over time, gear rotors, impellers and nozzles also wear over time and rotation times can start to vary which greatly affects water distribution and uniformity.

Pipe work has a limited serviceable life with glue joints usually being the first to give way. Over time, leaks in the pipe network can become frustrating and time-consuming to repair. Valves and wiring also become less reliable over time, particularly if valve boxes become full of soil or water. The length of irrigation seasons also has an impact on the life expectancy of an irrigation system (i.e.: with a longer irrigation season there tends to be a shorter life expectancy).

With every irrigation system there comes a time when the cost of maintenance and down time lost to repairs outweigh the risk to the club of lost turf. Keeping detailed records of your maintenance costs in relation to repairs can also help build a case for system replacement. It is important to include system down time and costs for labour and components to provide the full picture.

The American Society of Golf Course Architects summarises the expected life cycle of an irrigation system as follows;

- Irrigation system – 10-30 years;
- Irrigation control system – 10-15 years;
- PVC pipe (under pressure) – 10-30 years;
- Pump station – 15-20 years.

SYSTEM ASSESSMENT

There are many variables that effect the efficiency and effectiveness of an irrigation system. Topography can vary considerably throughout irrigated sports turf surfaces, from uniform rectangular surfaces where sprinkler banks or stations are the most appropriate, through to golf courses where each individual sprinkler location can have multiple influences on water delivery and turf requirements. Understanding the requirements of your turf areas and the capabilities of your system will assist in improving irrigation efficiency and overall turf quality.

Turfgrass irrigation requirements on golf courses can vary greatly over the area of one irrigation station due to course design and topography. Exposed ridges, mounding and hollows will usually have very different water requirements, sprinkler throw aspect and exposure to wind and therefore delivery rates between sprinklers on one station can vary greatly on the ground. Understanding the various requirements for each station within the irrigation system, the influence of seasonal winds and the actual delivery rates of each sprinkler can assist in identifying areas requiring additional irrigation, providing the plant with adequate amounts of water when it is needed.

A system audit prior to the start of the irrigation season is essential to ensure a smooth-running system when it is required during peak times. Before an audit is undertaken, the system should be run through and checked which will often highlight issues



Simply checking and rectifying issues with sprinklers, such as leaking heads, incorrect height, alignment or rotation speed, can dramatically improve the efficiency of an irrigation system

that can be easily fixed. Simply checking and rectifying the following issues can, in some cases, dramatically improve the efficiency of an irrigation system;

- Heads with leaking seals or failing to retract into the body after operation;
- Sprinkler heights – are they at the appropriate height so the stream clears the turf during operation?
- Vertical alignment of the head;
- Correct alignment of the rotation so only the target areas are irrigated;
- Nozzles – are the correct nozzles fitted to each head?
- Sprinkler rotation speeds – are they even on each station?
- Any obvious leaks which need repairing;
- Valves – are they fully operational?

A QUICK FLYOVER

With access to satellite images via Google Earth or dedicated sites such as Nearmap, an overhead image of your turf facility is easily accessible. A lot can be gained from an aerial photograph or image, even if it is not in the peak of summer. Irrigation uniformity, drainage lines, traffic and wear patterns are just the start of what can be observed. While these images are great, they are not always available at the time of year you require or updated regularly enough to be current. This is where a drone can be a highly useful tool to quickly scout the turf area and provide up-to-the-minute visuals and data.

A drone fitted with an NDVI camera can quickly survey an entire facility and identify areas where irrigation distribution may be uneven or require further investigation. The NDVI camera can pick up turf stress well before it is visible to the naked eye and beyond what can be observed from an aerial

photograph. A drone, such as the one that AGCSATech utilises, can efficiently survey a sports oval in under 10 minutes with the results provided within hours, while an 18-hole golf course can be surveyed and the results provided in as little as 24 hours.

AUDITING YOUR SYSTEM

A full irrigation audit of an entire golf course is a time-consuming venture and it may not be essential to audit every sprinkler or station. However, it is a worthwhile process particularly if the system has never been audited previously. It can also be of great benefit to the staff involved in gaining a greater practical understanding of the principles behind irrigation and the relationships between soil, plant and water.

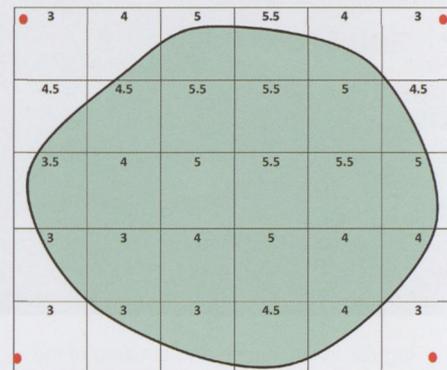
An irrigation audit is the process of assessing the precipitation rate (how many millimetres per hour) and the uniformity of water distribution (i.e.; how evenly water is being applied) over a particular area. Audits should be carried out under 'normal' system operating conditions and target those areas which have been identified as problematic. Irregular irrigation spacing, poor sprinkler uniformity due to pressure and noticeably dry areas should all be assessed. Below is a very brief outline of the audit process...

- Equipment you will need;
- Catch cans – 20 to 30 containers (available from the Irrigation Association or irrigation suppliers for around \$110 for 24 cans);
 - Measuring tape and flask (mL);
 - Pressure gauge and pitot tube;
 - Stopwatch;
 - Recording sheet for can readings.

While other containers can be used as catch cans, using purpose made cans makes it easier and reduces the number of calculations

required. Catch cans should be evenly set out in a grid pattern between the sprinkler heads being audited in each station or zone. The spacing will depend on the surface and the level of detail required. Typically, a sports ground or fairway could be spaced between 3-5m starting from around a metre from the first irrigation head. A golf green may require a spacing as close as 2m to identify issues of uniformity on greens with complex shapes or where bunkering influences the degrees of rotation.

Each station or zone being audited should be run for 20 minutes to allow enough time to collect a reasonable quantity of water for the required calculations. While the sprinklers are in operation, observe all sprinklers to see if they are operating correctly; rotation speed, arc and distribution should all appear even visually. The pressure at each head can also be assessed at this point using the pitot tube. The tube is placed in the stream exiting the head and the operating pressure can then be checked against manufacturer specifications. Once the cycle has finished, record the volume of water in each catch can. Setting out your recording sheet to mirror the set out of catch cans (like below) can assist in identifying any problem areas.



Once the audit is completed, an average for the precipitation rate can be calculated and these figures used to calculate the distribution uniformity (DU) using the 'lowest quarter method'. The DU is calculated using the average figure for the lowest quarter of readings and the precipitation rate. From the figure above we can work out the DU as follows...

Overall average = 4.2mm

Lowest quarter average = 3 (lowest seven numbers)

Equation: $(3 \times 100)/4.2 = \text{DU } 71.4\%$

20 minutes = 4.2mm or 12.6mm per hour
Using this method, a DU above 80 per cent is considered very good to excellent and as a minimum should be above 75 per cent. Anything less than 70 per cent generally requires attention.

Setting out audits as above can also provide a clear demonstration of areas

which do not receive adequate irrigation over an irrigation season which can lead to excessively dry areas or, conversely, overly wet areas. The auditing process can highlight areas or zones which receive more or less than the median amount. The results are also a good communication tool to highlight issues with irrigation systems to committees. Staff will also get the added benefit of a greater understanding of areas which require additional attention and this can be reinforced with the use of moisture probes to highlight moisture variations within a turf surface.

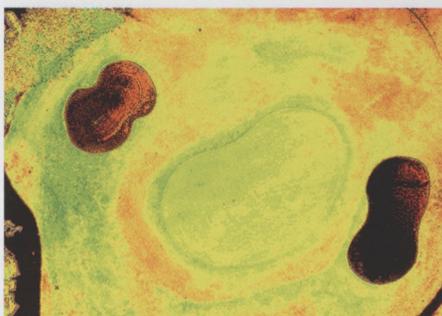
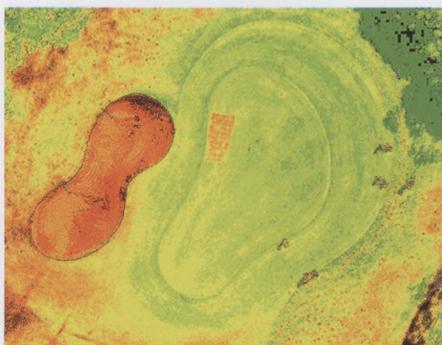
CASE STUDY TOOWOOMBA GC, QLD

The following case study was presented by Scott Johnstone (Hydroplan) and Toowoomba course superintendent Mick Kelly as part of the Irrigation Workshop conducted at the 2019 Brisbane conference. Toowoomba Golf Club is located about an hour and a half west of Brisbane on the crest of the Great Dividing Range. It receives annual average rainfall of around 940mm, with the warmest months and peak irrigation demand being between October and May.

After many years of struggling with a poor irrigation system, it was replaced in 2016.

Part of the process prior to its installation was to engage a qualified irrigation consultant to develop the most cost-effective and efficient system for the club. The primary issues identified were:

- The club had a limited water allocation of 80-100 megalitres p/a;
- Water was drawn from three bores on the property with limited capacity;
- There were two small dams on the property with a total storage capacity of 2ML; and



NDVI images (pictured left, taken by the AGCSATech drone), can highlight areas of irrigation stress (showing as yellow and red). Similarly, aerial photographs (Nearmap, right) can show up uniformity issues

- Unreliable rainfall and limited catchment area.

A thorough analysis of the course was undertaken to determine the pumping and design requirements for the system. Historical ET and rainfall data for the region was collected from the Bureau of Meteorology (BOM) which highlighted the peak requirement times for water and the volume required (monthly and annually).

With limited water available, the course was broken down into priority areas with greens, tees and approaches considered high, surrounds and fairway targets medium and secondary fairway areas low. A water budget was developed based on the limited

water allocation, with the level of detail going down to millimetres of water required on a weekly and monthly basis for each area. This budget took into account monthly ET rates, priority areas, turf species, soil types and water storage capacity of soils.

With the limitation of available water, the total area to be irrigated and with a course based in a region prone to drought, a highly efficient irrigation system that could deliver water accurately and efficiently was needed.

The new irrigation system utilised valve-in-head sprinklers with back-to-back heads around greens so greens, approaches and surrounds could all be irrigated separately according to their requirements. A detailed



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A catch can audit is an effective way of assessing precipitation rates and distribution uniformity of sprinklers. Such a test should be carried out under 'normal' system operating conditions

monitoring system was also developed to track water use against the budget allocation, forecast usage and actual water use figures. These figures are checked regularly and water budgets adjusted accordingly to ensure adequate allocation is available through the peak requirement times. The new irrigation system is run by a central computer/control system and has the flexibility of being controlled anywhere on course by hand-held remotes.

Some of the key take home points highlighted by Johnstone and Kelly in this case study include;

- Use technology to assist in the decision-making process – weather stations, BOM data, in-ground moisture sensors, flow meters can all assist in programming and monitoring the effectiveness of your system.
- Maximise the information programmed into your irrigation computer. Today's modern irrigation programmes are powerful tools which are only as good as the information provided to them.
- Standardisation of the data for flow and precipitation rates entered into the system will not provide the most accurate results in terms of actual delivery to each station.
- The more detail provided the more efficient a system can be, ultimately providing higher quality, more consistent surfaces.

The results of Toowoomba's new system have been dramatic with an increase in efficiency of water use and the standard of course presentation being raised year-round. This has not only reduced the superintendent's stress levels each summer but gone a long way to securing the club's future.

CHECK, ADJUST, MONITOR

The Toowoomba case study highlights a range of practices and adjustments that can be made

to improve efficiencies. Understanding what influences poor irrigation performance and distribution at your facility is vital.

Equally as important is understanding the various soil and turf types as well as cultural practices which may improve the delivery of water into the rootzone and the amount of irrigation required to effectively water each surface. These can be applied across all turf facilities, new or old, and will improve your irrigation efficiency and turf quality.

Here are some final points about irrigation efficiency to remember and consider...

Check sprinklers

- Audit system before irrigation season, check efficiency of coverage.
- Use catch cans to determine actual delivery rate in mm per hour.
- Identify those areas which receive more or less than the median amount.
- Check nozzle sizes against specifications, operating pressure, arc adjustments.
- Modify or adjust sprinklers to apply more even distribution across dry areas.
- Where possible, adjust run time for each head (wet and shaded areas will require less water than sunny or dry areas).

- Utilise surround sprinklers in particularly dry areas by adjusting degrees of rotation or adding back nozzles which apply additional water to drier areas on greens.

Programming

- Irrigation scheduling should be based on daily ET rates.
- Understand your system and use mm for all calculations, ET, water applied.
- Calculate run times to deliver desired irrigation in mm not minutes for all greens.
- A simple adjustment to water budget percentage is all that is required to increase the volume of water applied.
- Monitor actual water use against budget regularly.

Monitoring

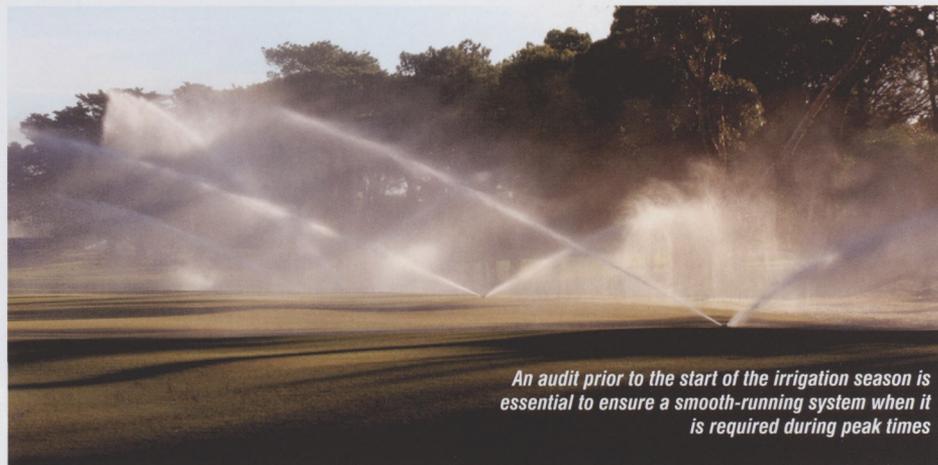
- Use moisture probes or in-ground moisture sensors to assess if adequate water has been applied.
- Assess infiltration rate of various surfaces and ensure delivery rate does not exceed infiltration or run off may occur.
- Split or soak cycles can apply irrigation over a longer period to match infiltration rate.

Cultural practices

- Regular aeration to assist infiltration should be utilised throughout the irrigation season. Needle tines can be utilised regularly without interference to play.
- The use of wetting agents in combination with aeration can be quite effective.
- Wetting agents alone will not overcome physical barriers to infiltration.

While conducting an irrigation audit can be a time-consuming and daunting task, it can be very rewarding in terms of improving turf quality, utilising water resources in a more sustainable manner and improved efficiencies. Preparing your irrigation system well ahead of the summer period can provide the peace of mind that you will be ready when the time comes with a more effective system.

The savings in labour dedicated to hand-watering, time spent repairing broken components, not to mention the reduction of stress, make such a process truly worthwhile. 



An audit prior to the start of the irrigation season is essential to ensure a smooth-running system when it is required during peak times

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IRRIGATION



Fit for purpose

In the final article of this series on water management and irrigation, John Neylan looks at the issue of water quality and availability and assessing the suitability of alternative water sources.

There is little question that the lack of a constant, good quality water supply is the greatest threat to the long-term sustainability of turf areas. Having been involved with turf management and water quality for over 35 years, I have noted that the turf industry has had to increasingly find ways of using water of deteriorating quality.

The Australian Golf Industry Council water survey conducted in 2007 determined that reclaimed effluent is a major source of irrigation water and there were increasing issues identified with water quality including;

- Increasing salinity;
- High sodium resulting in increased soil sodium;
- Moderate to high bicarbonates that require water modification through the use of acidification;
- Increasing cost;
- Modifications to irrigation systems;
- Increased need for renovations; and
- Potential health issues.

It is not only the quality of reclaimed water but also the deteriorating quality of bore water supplies that is creating additional challenges in turfgrass management. Whether the water supply is reclaimed water, bore water or even storm water runoff, the main water quality parameters that are creating the greatest turf management challenges are total soluble salts (salinity), chloride (Cl), sodium (Na) and bicarbonate (HCO₃).

From my recent experience, the increasing chloride levels appear to be the single biggest change in water quality. As water quality deteriorates there are several factors to consider including the changes in soil chemistry, the direct impact on turfgrass health and the potential environmental impacts. Table 1 summarises the impacts of water quality and the potential treatment options.

As water quality deteriorates the intensity of turf management has to increase to

Left: As water quality deteriorates and becomes unusable or the volume of water available decreases, there is a need to source alternative water sources or to undertake treatments that improve water quality

counteract the adverse effects. At the top of the list is undertaking a water testing regime so as to understand the chemical constituents and then developing a water management plan to minimise the impacts of these constituents. The management techniques that can be implemented to create a sustainable system include;

Introducing more salt-tolerant grasses:

There are significant differences in the salinity tolerance of turfgrass species, with some differences between cultivars. The change to a more salinity-tolerant grass may come at the expense of reduced turf quality and presentation. This is particularly the case among the cool-season grasses.

In reviewing the available research, there has been some screening of bentgrass for improved salinity tolerance where Koch and Bonos (2011) identified several creeping bentgrasses as having improved salinity tolerance. In recent correspondence with these researchers there has been little salt tolerance work undertaken since.

In research undertaken by Neylan et al. (2009), they demonstrated that 27 local selections of bentgrass had better turfgrass quality than the commercially available bentgrass cultivars at the salinity regimes of 4dS/m and 8dS/m. In this research 'Mariner' creeping bentgrass had the best salinity tolerance and reflects the breeding of this grass which was bred as a salt-tolerant cultivar.

Warm-season grasses are inherently more salt-tolerant compared to the cool-season grasses and may be the only sustainable option in some situations (e.g. change from creeping bentgrass to a hybrid bermudagrass).

Constructing high permeability profiles:

Well-drained profiles provide the best opportunity to leach accumulated salts and sodium from the rootzone and to maintain it at a sustainable level. Fine-textured, poorly-drained soils are extremely difficult to manage where there is high salinity and sodium.

Subsoil drainage: Having a subsoil drainage system is critical in enabling the removal of salts and sodium as they are leached through the rootzone.

Irrigation leaching fraction: Applying a leaching fraction or water in excess of plant needs is a good management tool for managing high salinity water. It is a well-adopted technique in agriculture but there is often a reluctance to do this in turf management because surfaces may remain wetter and softer. Even using high salinity water will dilute the salts that will accumulate in the upper rootzone.

Application of gypsum and other amendments:

In two recent trials that assessed the effects of gypsum, surfactants and other amendments on the impacts of salinity, there were minimal improvements identified. Young (2020) determined that no cultivation practice or product combination

TABLE 1: IMPACT OF WATER QUALITY AND TREATMENT OPTIONS

Chemical parameter	Impact	Treatment options
Salinity	Stunted growth Wilting (wet wilt) Leaf burn Ion toxicity (Cl and Na)	Reverse osmosis (see Sorrento Golf Club case study next page)
Sodium	Affects soil structure Nutrient imbalance Na toxicity Growth reduction	Calcium (gypsum) injection
Chloride	Chloride toxicity Leaf burn	Reverse osmosis
Bicarbonate	Forms insoluble Ca compounds Affects soil structure Increased soil pH Nutrient imbalance	Acid injection Sulphur burner

was effective at moving salts without applying leaching fractions of irrigation.

Schiavon and Baird (2019) tested 30 commercial and experimental products for their ability to alleviate salinity stress on bermudagrass. These treatments included calcium-based products as well as wetting agents and supplemental nitrogen fertilisation and/or biostimulants. The most effective product consisted of a combination of carboxylic acids and foliar fertilisers. It was thought that the benefits were due to the positive effects on soil characteristics and the supplemental nutrition that the programme provided to the turf.

Soil cultivation to improve permeability: As noted above, soil cultivation is not particularly effective without a leaching fraction or high rainfall event to flush the salts.

Water treatment: Desalination or acidification may be the only option for improving quality.

As the irrigation season approaches, there are several important tasks to undertake as it relates to water quality:

- Testing of all water sources for at least salinity, sodium, chloride and bicarbonates.
- Take soil samples from representative turf areas to determine salinity and sodium concentrations. Adjust as required (e.g.: apply gypsum to counteract sodium accumulation).
- Maintain adequate soil permeability through subsoil aeration and thatch control.
- Irrigate at night to avoid salt burn.
- Ensure that irrigations are deep and beyond the rootzone to leach salts out of the rootzone and to prevent accumulation.
- Irrigate with freshwater whenever possible to aid leaching.

As water quality deteriorates and becomes unusable or the volume of water available decreases, there is a need to source alternative water sources or to undertake treatments that improve the water quality. During the Irrigation Workshop at the 2019 Brisbane conference, several case studies were provided that highlighted the planning required so as to understand the viability of the project, the costs associated with it and the implementation strategy. Two of these – Sorrento Golf Club, Vic (superintendent Shane Greenhill) and Cape Wickham, Tas (superintendent John Geary) – we will now look at in more detail.

CASE STUDY 1 – DESALINATION SORRENTO GOLF CLUB

As shown earlier in Table 1, reverse osmosis (RO, or desalination) is one method that can

Over the past decade, Sorrento Golf Club has worked through the process of developing a water improvement strategy based around increasing water storage capabilities and investing in desalination



Kingston Heath Golf Club uses a sulphur burner to treat its bore water which is used solely on greens

be used to improve water quality. Where water is high in total soluble salts the only realistic method of improving water quality is by removing the salts. Desalination has become more common in the turf industry though it does present several challenges, including;

- High capital and operating costs;
- Disposal of the highly concentrated saline waste; and
- Meeting EPA requirements by preventing leachates from moving into the subsoil and water table.

The following is a case study of how Sorrento Golf Club on Victoria's Mornington Peninsula worked through the process of developing a water improvement strategy and provides a good template for any organisation considering such a system.

As a background, over 10 years ago Sorrento completed what it called its 'Two Dams' project which saw the construction of two separate dams – one for fairway irrigation and a smaller one for greens. At the time, the

key assumptions were that the course's bores would supply a continuous amount of usable water with acceptable levels of salinity for the fairways, while water harvested off-course from local stormwater flows would supply high quality water for the greens.

In the years that followed, a number of issues arose that prompted the planning and installation of a desalination plant. They included;

- High salinity bore water feeding the fairway irrigation dam would deteriorate rapidly when called upon to supply large volumes of water.
 - Where rainfall was less than 600mm for the year, stormwater supply for the greens dam would be depleted by the end of January and then potable water (town water) had to be purchased.
 - With less low salinity water being harvested through the stormwater harvesting system, this resulted in less low salinity water for the fairway dam to dilute the salts from the bore water.
 - Fairway dam water analysis in 2016 returned salinity results between 3600-5200mg/L.
 - Water testing of stormwater indicated elevated E.coli levels after rainfall events.
 - Fairway soil testing indicated a cyclical rise in soil salinity over the summer months (2-3 times greater than the optimum range) which returned to normal levels after leaching winter rains.
 - In December 2016 new bunker and fairway works on the 9th hole suffered significant turf deterioration during turf establishment due to highly saline irrigation water.
- With future construction works planned on the golf course the need for change was obvious. In January 2017 a water sub-committee was formed with key members of the general committee and staff and chaired by the club's treasurer. As part of the process the golf club commissioned various reviews and opinions from Andrew Peart (then AGCSATech), John Neylan (now SPORTENG)



and Bruce Macphee (AGCSATech). Several alternative water supplies were considered including:

- Grey water from South East Water's Boneo Treatment Plant (but no return pipes exist to Sorrento).
- Treated effluent from the Gunnamatta outfall (as above).
- New deeper bores, but advice was that even higher salinity was likely (e.g: Portsea at 5000 mg/L at 20m depth).
- Potable (town) water – very expensive at \$3240 per megalitre. The potential cost for the club's annual water usage (about 50ML) would equate to \$162,000 per annum and would be subject to water restrictions.

In March 2017 the decision was made to construct a water treatment plant to solve both the salinity and E.coli issues. Contact was made with prospective desalination plant manufacturers who were provided with a brief of the issues. In June 2017 the club appointed Desal Systems as the preferred company to begin work on the water treatment plant. Over the next six months details and scope of the project took shape which included;

- Council requirements for permit approval;
- Tour of other golf club RO plants – Barwon Heads, Huntingdale and Royal Melbourne;
- Water treatment plant location (electricity availability, bore water access);
- Shed and tank sizing and engagement with builder;
- Brine discharge options;
- GPS survey of the site to be constructed;
- On-course connecting pipework design;
- Council permit application. The club's submission for a permit to the Mornington Shire Council was aided by a club member who was a town planner.

The council permit was approved in July 2018, however, no works could commence until \$3031 in brokered vegetation offset costs were paid. It is important to note that the planning process and compliance requirements for a project of this scale and cost can be quite lengthy and long-term planning is an essential component.

THE SORRENTO SYSTEM

With 101 megalitres of storage available, a low-yield, 365-days-a-year production plant was chosen (i.e.: no winter shutdown). The plant currently produces 211,000 litres of permeate (treated water) per day (77 megalitres per year) and is designed to treat both bore water and harvested stormwater. Bore water is brought into the plant and undertakes several processes including;



The impact that using high salinity irrigation water can have on couchgrass turf during establishment

- Injection with sodium hypochlorite, which oxidises the water enabling the glass media filters to extract iron and manganese from the water. Sodium hypochlorite has a chlorine base which sanitises the water and kills the E.coli.
- Water then passes through glass filters and then through activated carbon filters to remove the chlorine.
- Before the water enters the RO membranes, it is injected with an antiscalant which prevents deposition of particles which can block the membranes.
- Discharged water is then treated with caustic soda to raise the pH.
- Brine waste is produced in this process in roughly the same volumes as permeate.
- A mobile phone app enables the plant to be monitored remotely, but still requires twice weekly visits to top up chemicals.



The planning and compliance requirements for a project like installing a reverse osmosis plant can be quite lengthy. Long-term planning is essential

The cost of producing the treated water is around \$850/megalitre (ex GST) which is the running costs only (power and chemical use). Other costs include;

- Membrane replacement (about \$1100 each with a lifespan up to five years each);
- Pre-filter cartridges (\$20 each with a total of 10 in the system, changed every four months);
- Membrane clean (\$1500, twice per year);
- Glass media filters (\$50,000 for media refresh for the four units, lifespan 15 years).
- Activated carbon filters (\$10,000 to \$15,000 to refresh the two units, lifespan four years).

CASE STUDY 2 – WATER MANAGEMENT PLANNING CAPE WICKHAM LINKS

King Island, situated in Bass Strait between Tasmania and Victoria, is a unique location for a golf course. Cape Wickham was designed by Mike DeVries and Darius Oliver with construction of the course completed in late 2015. Greens, tees and fairways are all seeded with fine fescue, following in the footsteps of the old traditional links courses in Scotland and Ireland.

King Island has a maritime climate which is cooler in summer and warmer in winter compared to Melbourne and with an average rainfall of 773mm is not particularly wet. The soils consist of calcareous yellow dune sand to varying depths over limestone and granite and dark sandy loams, with the pH in the high 8s to low 9s.

All turf areas at Cape Wickham are seeded fine fescue with slender creeping red fescue and Chewings fescue on the greens and slender creeping red fescue, Chewings fescue, creeping red fescue and hard fescue on the fairways and roughs.



Irrigation of the golf course relies on storage in a 7ML dam which is fed by a series of springs/wells located on the golf course. The water supply is limited and considerable efforts have been made to determine the water requirements for the golf course.

When superintendent John Geary was first employed at the golf course the immediate priority was to better understand water requirements and the amount of water available. This involved a three-step process;

- **Step 1:** Determine how much water is being harvested onsite. It was estimated that around 300,000 to 400,000 litres per day (9.3-12.4ML/month) was being harvested from the onsite springs/wells.
- **Step 2:** This step is the critical requirement as outlined by Bruce Macphee in the earlier article in this series on estimating total water requirements for the golf course. This was based on theoretical water budget calculations using local weather data. The estimated water use assumes that the grass is well established and it was noted that the water requirements were even higher for a grow-in scenario. Based on the water budget calculations, it was estimated that between 7.9-9ML/ha/irrigation season was required.

There is 25 hectares of irrigated area and the water requirement works out to 200ML/irrigation season (33.3ML/month).

- **Step 3:** This final step compared the calculated demand with the amount of water available. This was... Estimated total water requirements (33.3ML/month) – volume of water harvested (9.3ML/month) = 33.3 – 9.3 = -24ML/month (shortfall).

Clearly there is a significant lack of water available to maintain the golf course in its optimum condition and presentation and therefore some detailed water management planning was required to optimise the use of the available water. Turf areas were prioritised according to the importance of the playing surface (e.g: newly-seeded areas and greens have the highest priority) with the golf course separated into zones according to the priority order as follows:

- **Zone 1:** Recently seeded areas;
- **Zone 2:** Greens and green surrounds and practice area;
- **Zone 3:** Tees;
- **Zones 4 and 5:** Fairways;
- **Zone 6:** Practice fairway.

This process of prioritising areas is a critical step in the process of water management to make the best use of the

Where golf course watering requirements exceed available water, priority zones for irrigation may be necessary. Cape Wickham uses priority zones, with recently seeded areas, greens and greens surrounds at the top of the list and fairways lower down

available water. In the Toowoomba Golf Club case study highlighted in the previous article (pages 33-34) the same process of prioritising turf areas was also undertaken. In addition, each zone or priority needs to have some key turf parameters associated with it in terms of presentation, playability of surface and turf health as descriptors. This becomes an important document when dealing with club management and where expectation can potentially exceed practicality.

POTENTIAL WATER SOURCES

Given the current shortfall in water, ideally a new source of water needs to be developed. As part of longer term planning for the golf course and to guarantee a secure water supply, Geary has undertaken an extensive analysis of the water supply options for the golf course. The three best options identified were;

- A spring located 4km away;
- Pump water out of the ocean; and
- Pump out of Lake Flannigan (freshwater lake, about 5km away).

Each option has its pros and cons and they are detailed in Table 2 (below). As can be seen, all water sources have significant challenges to overcome whether it is the distance water has to be piped, capital and running costs and government approvals. Geary has identified that the most viable option is desalination and that detailed planning is required to get such a scheme off the ground, similar to the experience at Sorrento.

The Cape Wickham experience provides an excellent study of the processes required to understand the water requirements for a golf course, the balance between incoming water versus outgoing water, how to prioritise the use of the limited water supply and the investigative process to find additional water supplies. ۞

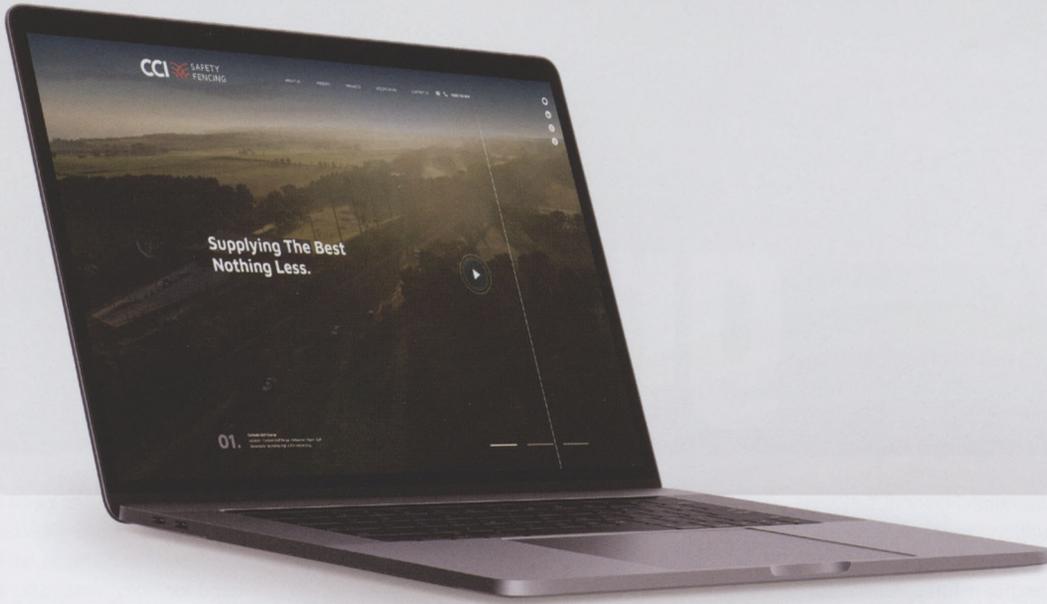
TABLE 2: CAPE WICKHAM WATER SUPPLY OPTIONS

Option	Pros	Cons	Verdict
A - Spring	Good water flow Water quality is expected to be good	Need to liaise with landowners Long pumping distance Cost Time to implementation	Worth further consideration Need to work with landowners
B – Ocean water	Unlimited water supply	Requires reverse osmosis plant Need government approvals High running costs Time to implementation	Potentially best long-term option Needs government support Requires detailed planning
C – Lake Flannigan	Marginal/poor water quality	Requires reverse osmosis plant Need government approvals High running costs Overall cost Time to implementation	Unlikely to be viable due to the money spent by the Island/DPI to recently fill the lake

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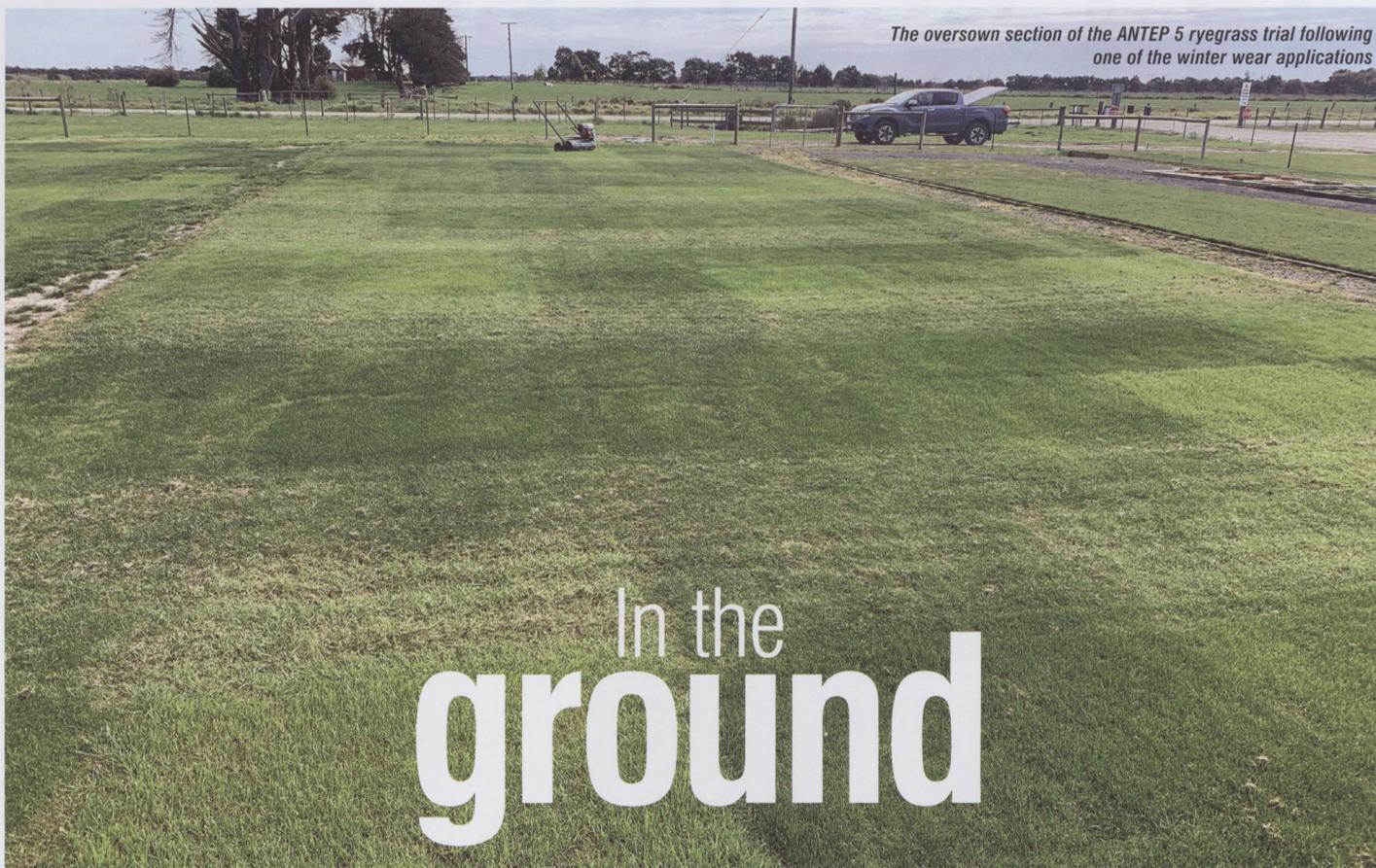
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The oversown section of the ANTEP 5 ryegrass trial following one of the winter wear applications

In the ground

The Australian National Turfgrass Evaluation Program ryegrass trial (ANTEP 5) is well underway at Evergreen Turf's Pakenham location in Victoria. Despite the restrictions imposed by Melbourne's COVID-19 lockdown as well as some significant rain periods, the trial has progressed well throughout the winter period.

As mentioned in the May-June 2020 edition of Australian Turfgrass Management Journal (*Volume 22.3 – 'ANTEP 5 gets green light', p36-37*), the trial consists of an oversown section, where ryegrasses have been oversown into an existing stand of Santa Ana couchgrass, and a permanent section where varieties have been sown into bare soil. Wear has been applied to the trial plots using AGCSATech's wear machine which consists of 15mm football stops on a rotating drum (see photo opposite page).

All varieties have been assessed for;

- Rate of establishment;
- Seedling vigour;
- Colour;
- Quality;
- Density;
- Texture;
- Cutability;
- Winter growth;
- Wear tolerance;
- Winter recovery from wear; and
- Presence of diseases.

AGCSATech senior agronomist Bruce Macphee (CSTM) provides an update on the ANTEP 5 and STA Victoria ryegrass trials and flags a new two-year couchgrass variety trial set to start in November.



Wear will continue to be applied to all plots throughout the spring and summer period, while half of each ryegrass plot in the oversown section will be sprayed out and the other half allowed to transition out naturally over the summer. This will allow us to assess the influence the presence of ryegrass has on the ability for couchgrass to persist under a range of conditions, including wear.

Running concurrently to the ANTEP trial is a ryegrass transitional trial being conducted on behalf of the Sports Turf Association (Victoria). This trial is assessing the efficacy of the range of chemicals available to remove perennial

ryegrass which has been oversown into an existing couchgrass surface.

Sporting surfaces which are commonly used for both winter and summer sporting seasons are often oversown with perennial ryegrass in Victoria to provide a surface capable of tolerating wear and providing recovery throughout the winter period. The cool-season grass is then removed in spring to allow the surface to transition to a more drought-tolerant warm-season surface.

The purpose of the trial is to assess the various chemicals available and the most appropriate timing of application to assist the transition back to a warm-season surface. The application for each treatment has been split into two separate applications, one in early spring when soil temperatures are cooler and a later application when soil temperatures have increased, allowing warm-season grasses to start moving.

Throughout the duration of the trial, half of each plot is also being subjected to wear to assess the influence this may have on the transition back to a warm-season grass surface. Both treatments have been applied and an update on progress will be included in an upcoming edition of ATM.

COUCHGRASS VARIETY TRIAL

In addition to the ryegrass trials, in recent weeks a trial site has been developed at Sorrento Golf Club on Victoria's Mornington



The STA Victoria trial site showing initial treatment of oversown plots with herbicides

Peninsula by course superintendent and VGCSA president Shane Greenhill and his staff. The club have generously provided an area on the practice fairway for an important couchgrass variety trial to be undertaken in Melbourne's climate. The trial will run for a period of two years with establishment assessed in the first growing season and drought tolerance the following year.

In recent years there have been a number of new couchgrass varieties released onto the Australian market and it has been some years since an independent trial has been undertaken to assess any of these new varieties side by side. The trial will be planted in the first week of November and consist of a range of older and new varieties including Tahoma 31, Santa Ana, TifTuf, Grand Prix,



Wear has been applied to the ANTEP 5 trial plots using AGCSATech's wear machine which consists of 15mm football stops on a rotating drum

Legend, along with several new varieties from both Peter McMaugh and Don Loch.

A total of 10 varieties will be trialled, with the new varieties to be assessed against each



The new couch variety trial site at Sorrento Golf Club

other and with well-known industry standard varieties such as Santa Ana. This is an exciting new trial which will provide benefit for both golf course superintendents and sports turf managers alike, with assessments to include;

- Rate of establishment by sprigs;
- Colour, quality and density;
- Wear tolerance and recovery;
- Winter colour retention;
- Disease resistance;
- Drought tolerance (2nd summer);
- Recovery from drought.

Along with the couchgrass plots, a number of single zoysia plots will also be established for observation in Melbourne's climate. Regular updates will be provided in ATM as the trial progresses. ☺

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Harmony in data-taking is very important. All too frequently we are presented with data sets which are simply not comparable because they were not collected in the same standard way



A data-driven world

I took the time to sit down and listen to the recent ASTMA webinar with Cornell University's Dr Frank Rossi. I didn't take notes from it the first time so I watched it again and made a few jottings. He rambled over quite a few areas and towards the end of his discourse he made one supremely important point – you can't compare apples with oranges. His call for harmony in data-taking was a very good one, because all too frequently we are presented with data sets which are simply not comparable because they were not collected in the same standard way.

For data to mean anything scientifically it has to have a defined starting or 'reference' point. Any data for a treatment has to have a measured control set of numbers to which all of the others are compared. This is even more critical when you move into using any data set as a reference base for an industry standard.

Let us take a look at what he had to say about nutrient testing and its interpretation. He

A famous statistician once noted that without data you are just another person with an opinion. As Peter McMaugh AM writes, data is important but it is how you interpret it and apply it that really matters.

had a big shotgun out and his very clear aim was the dubious way that soil nutrient analysis has been used for decades not primarily as an information tool but more as a sales tool to encourage the purchase and application of excess levels of fertilisers to turf.

We all know that, especially in the US, the EPA has long been worried about the excess nutrient contained in crop runoff water. This

has led to nitrogen and especially phosphorus pollution of the rivers and ground water sources. Turf has been a big target crop for the EPA, so much so that the USGA has funded or co-funded many studies into leaching rates from greens and total runoff from golf courses.

One such study in Texas conducted over three years and reported in the USGA Green Section Record in July-August 2006 (p20-25) shows very clearly the true nature of the problem and how far back it goes. One has to wonder why it has taken 14 years for that Texas trial data to work its way into the collective consciousness of the USGA turf scene.

Dr Rossi then takes aim at the SLAN way (sufficiency levels of available nutrients) of interpreting soil test results. I have no problem with that because that interpretation base in the US is based on 'ideas' of the perfect soil ratios which came to 'Dr' Reems after a period of fasting and prayer. The often-quoted Dr Albrecht, who picked up and ran with those

divinely inspired ratios, cemented these into the psyche of US soil testers.

That they do not make any rational sense is not surprising. When you look at the US literature's recommendations for the levels of nitrogen required for turf, you find extremely high levels recommended. These are based on multiple university studies where the guide is the turf 'beauty contest' between varieties based on visual scoring. Despite this system, in use prior to but accepted more widely in the 1930s, being comprehensively debunked in 1984 in an excellent paper by Drs Horst, Engelke and Meyers (Agronomy J. July-August 1984, p619-622), it is still the main system used in US universities and NTEP trials.

Let us go back to SLAN. Yes, Dr Rossi is quite right, it does have a flawed base. It has no truly definable starting point for turf. It probably has a well-defined one in US agriculture where objective crop yields for various soil types are well related to some defined testing methods for different agricultural crop areas. This is exactly the same as in Australian agriculture where soil testing is well correlated back to specific crops on specific soils.

Now enter the Mehlich III extraction solution used almost universally in the US laboratories for soil nutrient testing in turf. It has now been taken up by commercial labs in Australia specialising in turf. I have never seen any correlation data with Mehlich III for Australian soils or turf growing media. When you question the laboratories using it, you

Soil Nutrient Analysis

Client: ABC Golf Club
Date: 1/09/2020

Units	Optimum Range	GRN 12	GRN 18	GRN 20	GRN 25	GRN 30
ppm	8 - 7	7.5	7.4	7.1	7.1	6.7
mg/kg	15 - 3	1.36	1.29	1.25	1.25	1.17
mg/kg	2 - 80	267	265	252	252	230
mg/kg	12 - 20	41	39	37	37	34
mesh/100g	-	4.43	4.35	4.38	4.32	4.06
mesh/100g	-	1.36	1.29	1.25	1.25	1.17
mesh/100g	-	0.41	0.39	0.37	0.37	0.34
mesh/100g	-	0.13	0.09	0.13	0.11	0
mesh/100g	2 - 5	3.3	3.5	3.5	3.5	3.4
% of cations	65 - 70	70	72	69	72	
% of cations	15 - 20	22	23	20	20	
% of cations	< 3	7	6	6	6	
% of cations	5 - 10	2	1	2	2	
mg/kg	> 0.4	0.41	0.47	0.48	0.52	0.52
mg/kg	> 5	48	54	48	52	52
mg/kg	> 2	0.9	1.9	1.1	1.1	1.1
mg/kg	> 2	3.0	3.6	3.4	3.4	3
mg/kg	> 1	BG	BG	BG	BG	BG
		GRN	GRN	GRN	GRN	GRN

For data to mean anything scientifically it has to have a defined starting or 'reference' point. Any data for a treatment has to have a measured control set of numbers to which all of the others are compared

find varying times of extraction being used. There doesn't seem to be a standard. This is obviously because no seminal data has been developed to support its use. Every change in proportion of chemicals or extraction time using the 'Mehlich' system means you have multiple Mehlichs, not a single one. This means you can't compare lab to lab data. The harmony that Dr Rossi wants to see is simply not there.

By now you probably think I'm being rather boring and petty, but that is what real science is. It is the minutiae that matter.

So, Dr Rossi blames SLAN for the excesses of fertiliser. I see it a bit differently, because I see the fundamental flaw as the 'beauty contest mentality' that determines the way grass quality is assessed. It simply encourages use of excess fertiliser to mask the true quality of a turfgrass.

But now let us come back to the alternative interpretation that Dr Rossi enthusiastically embraces, MLSN and its main proponent Dr Micah Woods. Let us look at the words, because the words matter. MLSN – minimum level of sustainable nutrient. Two words need careful examination here – 'minimum' and 'sustainable'.

When I was an ag science student, we studied the growth curves of many crops, both grain and fodder. In these studies you were looking for the maximum economically-predictable yield. Most of the field trial work looked at was where the nutrient level of each nutrient intersected to produce the maximum yield. You then look at the cost of getting to that maximum and often the maximum yield did not equal the optimum yield. The maximum yield was the luxury product, not the best return on investment. So it is very important for us to get our heads around where we are in maintenance turf as opposed to production turf.

In both production turf and maintenance turf it is important to keep the establishment phase as short as possible. To do this in production turf of warm-season grasses, the use of a line-planting machine for broad areas is one of the best investments you can make. Used properly to get a really good plant means cutting irrigation needs by probably 80 per cent. This in turn means less fertiliser leaching. In maintenance turf, this technology allows easy changeover of the total grass sward. On sites where any form of erosion is a problem



PHOTO: PENINSULA KINGSWOOD GGC

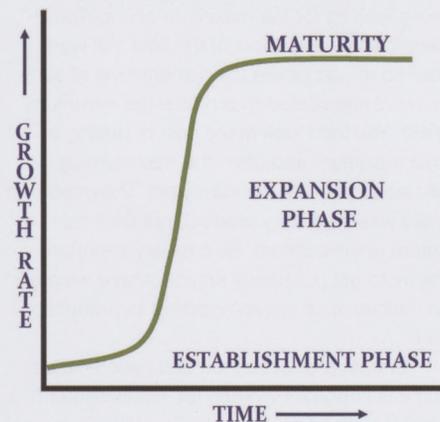
When you are selecting grass types it is very important that you see the data about their various qualities, especially their establishment rate and their maximum density. We typically use much higher rates of fertiliser at establishment than we do once the plant is mature, but do we really need to do this?



this can be a big advantage. The same can be said for using vegetative establishment techniques at greens establishment.

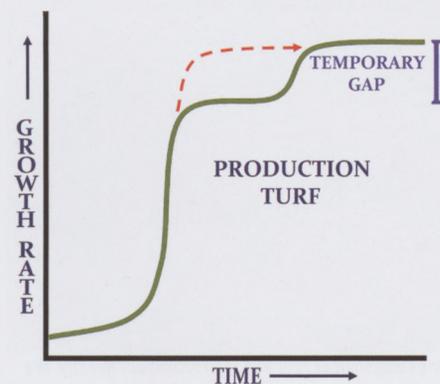
When you are selecting grass types it is very important that you see the data about their various qualities, especially their establishment rate and their maximum density. We typically use much higher rates of fertiliser at establishment than we do once the plant is mature. Do we really need to do this? Take the following typical growth curve for any crop...

ILLUSTRATIONS THIS PAGE: MARK ROBERTS



Both production turf and maintenance turf want to see an explosion of growth in the establishment phase, but there is a sleeping danger here. Too much water applied means ideal disease conditions and also maximum leaching. When you are pushing plants you get long growth but with thin cell walls. This is prime disease territory especially at new greens establishment, where care is needed to get the balance right between adequate fertiliser and optimum water. The new plant can't use the fertiliser until it has the roots to do so but only if it is still there.

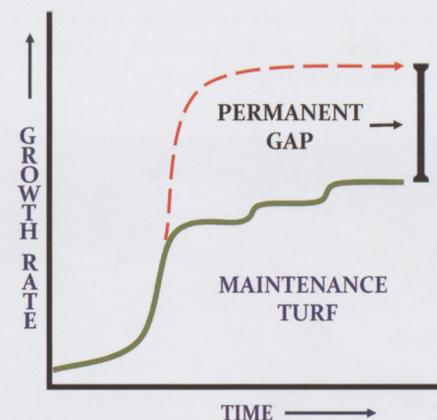
Commercial growers want to control the rate of the expansion phase to meet their market demands. They hope that the market demand will be such that they keep the expansion phase going as fast as possible, but reality controls that and sometimes if the market slows they need to put their crop into a holding pattern. They will keep the crop at say 85 per cent of complete cover by controlling fertiliser and moisture inputs. As such the production curve will look more like this...



The main problem with this is that if you have mature or near mature turf sitting in the paddock for too long then its harvest quality starts to decline.

Maintenance turf on the other hand needs to be held at a stage where it is readily able to expand quickly on demand – but at what rate? Herein lies a conundrum because what the rate is for greens differs from tees and both differ from fairways. You can add into this that the growing medium is probably going to be different for all three. Their CEC is going to be different and it is possible that there could be different grass types for each group. Also add to that the vagaries of shade, wind and drainage and you are very quickly getting to see any golf venue as a jigsaw puzzle.

Then comes the biggest impact factor – wear. What is the greatest need here? A quick growth recovery response. Where will that come from? Quickly available nutrient and sufficient levels of it. So either you have to have a very quickly accessible bank of slow-release energy (e.g. rhizomes) or you have to supply a quickly available source of soluble elements that are going to stay in solution in the soil and be quickly available to the plant to make more feed. Both the commercial turf producer and the greens manager are trying to keep their turf in a juvenile state from which they can get the quickest and easiest growth response to a stimulus based on a new demand.



Enter the would be superhero, 'leaf feeding' not spoon feeding – foliar feeding. Are you pulling my leg!? One prominent contender in this market segment claims to have a 90 per cent absorption rate of applied nutrient into the tissue of the leaf. I'd love to see not only the data but the ability to replicate the experimental results under controlled conditions.

Of course foliar is an option and has been traditionally used as a short-term treatment when desperation calls. But for foliar feeding the generally accepted maximum found in leaf tissue from well controlled trials has been 30 per cent. Technologies do change and there is recent work indicating that you can successfully move DNA attached to nano particle carbon through the leaf epidermis

barrier into the leaf tissue, but not into the nucleus – yet.

I don't think humble fertiliser, however soluble (as ions), can yet get through the epidermis in the mass flow needed to get a 90 per cent penetration. I know that surfactant technology has dramatically changed in recent times but I don't think it yet has magical qualities.

Another aspect of foliar feeding is of course that the initial levels of nutrient are very small and a 30 per cent level of these is even smaller. The results are consequentially very short-lived. You also need deep pockets and a luxury staff level to turn this into any kind of programme. You wouldn't want me on your committee if you were putting up such a programme in your budget!

The traditional way of fertilising in the home of golf is the 'spoon feeding' approach. This is highly successful and inexpensive. However, in climates different from the 'home' country where annual renovations of organic manures formed the 'bank' of reserve nutrients, some alternative thinking along with new technology came up with slow-release fertilisers. Along with the new technology came a steep learning curve and the integration of these into management programmes often produced some painful experiences.

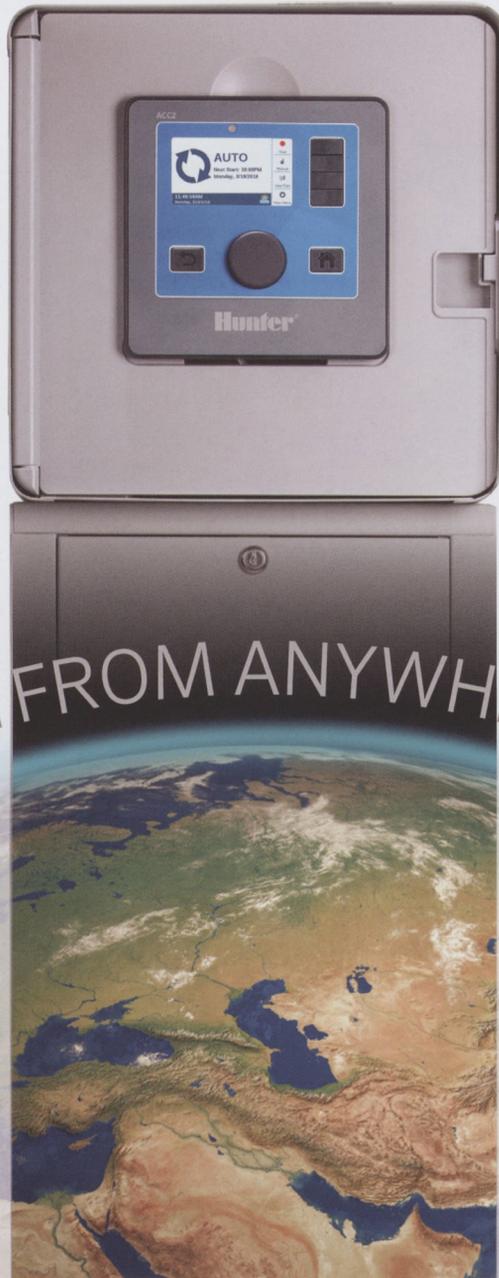
What these do give you is a management tool which works in what I would label 'ALSN' with the word 'adequate' replacing 'minimum'. At least with 'adequate' you have a buffer when any stress over and above the norm comes along. With a MLSN mental approach you are living on the knife-edge. Not a good place to be mentally or practically.

MLSN is based on experimental data of more than 16,000 soil samples taken from golf courses and analysed in laboratories in the US. These samples were selected as 'good looking turf', whatever that means. It excluded diseased or obviously nutrient-deficient turf. This ad hoc approach may seem common sense, but it is not a sound scientific approach. It is obvious that any sand profile (and MLSN applies itself there) is not going to have a large 'bank' on its CEC. But as I have said, this can be there from either natural or synthetic slow-release approaches.

And finally a word to the turf world in the US. In Australia, our fertiliser practices on golf courses have never approached the luxury levels that have given the US EPA cause for concern. And we have been doing it for over 50 years. The same might not be able to be said for the turf production industry, but I'll leave it at that.

Editor's Note: If you have a particular question or a topic of interest that you would like Peter McMaugh AM to address in his ATM column, please send through to ATM editor Brett Robinson brett@agcsa.com.au

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Matthew Lane joined Perth's Scotch College as head wicket curator in 2014, before taking over as the school's facilities grounds coordinator in mid-2017

Lane cuts his own path

After learning the ropes at the iconic WACA ground, Matthew Lane is now in charge of the impressive playing surfaces at one of Perth's pre-eminent private schools.

The turf industry can appear a difficult road for young turf managers with ambitions to take the reins and run their own turf facility. The path may depend on a bit of luck and being in the right place at the right time, but more than anything it is about being a good decision maker. There is always plenty of advice, but it is about choosing what suits and what does not.

At the age of 27, Western Australian turf manager Matthew Lane feels he has been in the industry for a while, but 10 years is not long to move from work experience at a local golf course to be the facilities grounds coordinator at one of Perth's leading private schools, Scotch College.

Playing cricket and an interest in greenkeeping steered Lane to a work experience job at Marri Park Golf Course under course superintendent Steve Smees.

Then an opportunity arose as a casual at the WACA before being offered an apprenticeship in 2010 under well-known WACA curator Cam Sutherland.

The position saw him as a bit of a swing man between the WACA and the Murdoch Campus oval which had two centre wickets and was also used as a WACA training facility. Rohan Mathews was the curator at Murdoch, who also had experience overseeing the WACA. Working under two such experienced curators and seeing the different ways they approached their management roles with both people and wickets provided a great grounding for Lane.

The third head curator Lane worked under was Matthew Page, the current wicket curator at the MCG, who took the reins at the WACA after Sutherland moved to Perth Racing. From these experiences Lane was exposed to another style of leadership to learn from

and assist in the development of his own approaches and methodologies.

While at the WACA, Lane experienced many highlights, among them five Test matches (four men's and one women's), all of which confirmed to him that producing high quality sports turf surfaces was a goal that had not changed. His first Ashes Test came when he was a casual before the start of his apprenticeship in 2010 under Sutherland.

That match at the WACA was the only bright spot in a otherwise dismal summer for Australia who would go down 3-1 to England. Mitchell Johnston put in a man-of-the-match performance at the WACA, with an impressive 6/38 off 17.3 overs in the first innings which included the prized top-order scalps of Cook, Trott, Pietersen (for a duck) and Collingwood. His nine wicket haul for the match saw Australia win their only match of that series by 267 runs.

Once an apprentice the Tests continued. India was next during their 2011-2012 Tour, followed by South Africa in the summer of 2012-2013, both under Sutherland. A second Ashes Test followed in 2013 under Page when Australia won back the Ashes for the first time since 2006/2007 with a 150-run win. That was followed by a women's Test match between England and Australia.

While under Sutherland, Lane attended three Australian Turfgrass Conferences and during each they spent a day visiting top facilities and talking to turf managers at each venue. It was an educating experience that increased his desire to manage his own high-profile facility.

ON THE MOVE

In 2014 things started to change rapidly for Lane when he was offered the role of head wicket curator at the highly respected Scotch College in Perth, a private school known for its sporting endeavours. It was also the year he was to finish his TAFE studies and apprenticeship, which turned into a life-changer when he was bestowed the 2014 WA Sports Turf Apprentice of the Year Award.

Winning the state award was another opportunity to challenge himself with a presentation as a finalist for the national award, one hour after he arrived in the Hunter Valley for the 2015 Australian Turfgrass Conference. While he did not win the national award, Lane says it was a great experience to be a part of, especially getting the chance to talk to Graeme Logan (ANZ Stadium) one-on-one.

The attraction of the Scotch College role was pretty obvious and Lane took the opportunity with both hands. Scotch is one



Scotch College boasts three wicket blocks and 11 practice wickets

of Australia's elite private schools with quality sports grounds that often host visiting high profile teams looking for a training facility when staying in Perth. Lane's initial position as wicket curator in 2014 saw him tending to the school's three wicket blocks and 11 practice wickets.

It was not long until the next opportunity arose, with Lane eager to manage his own facility and entertaining the possibility of moving in order to find that. Lane was highly valued by the school who wanted him to stay, so in a generous move his boss Rob Fenwick stood aside (but stayed on the staff) as he could see the benefit of giving Lane the facilities grounds coordinator role.

Lane also wanted to improve his management skills and knowledge and duly completed the Certificate IV in Sports Turf

Management at South Metropolitan TAFE. Looking for more of a science-based skill set, it was fitting that there was a Diploma research unit as part of the Certificate IV programme. The next step was then moving from mate to manager and developing his man management skills while turning Scotch into the number one school as far as sporting grounds go.

Scotch has eight hectares of predominantly kikuyu sporting grounds accommodating rugby union, AFL, hockey, tennis (couchgrass courts) and cricket. Cricket wickets are an important part of the school grounds and Lane was lucky to get Lewis Dienelt, an apprentice at the WACA the same time he was but a year ahead, to come on board as Scotch's curator of wickets. Dienelt brought with him a wealth of knowledge and



Scotch has eight hectares of predominantly kikuyu sporting grounds accommodating rugby union, AFL, hockey, tennis (couchgrass courts) and cricket



skill and it gave Lane the chance to focus on making the changes and adjustments he saw necessary.

Over time the grounds had built up an accumulation of organic matter creating soft surfaces due to moisture retention during winter. The other problem was salt levels in the bore water and the sodium in particular building up during the irrigation season. Organic accumulation under kikuyu on a sand base is common in WA.

To explain to the school what was required to improve the surfaces, or at the very least prevent them from going backwards, a comprehensive report was needed to explain what renovations were required and the frequency. The report paved the way for real change in management practices. A larger tractor was essential and equipment that could remove a hollow tine to 300mm and get through the organic layer critical. It was important to get sand intermingled into the organic matter to increase the levels of oxygen to help break down black layer forming in the organic layer and encourage microbial activity to assist.

A Kubota M9540 was purchased with plenty of power to drive the Vertidrain and Peruzzo flail. In addition, mowers have been updated and a new spreader and sprayer added to the equipment list. With more efficient equipment comes better productivity and improved safety and operator comfort, all integral ingredients to producing high quality surfaces.

WATER QUALITY AND RENOVATION PRACTICES

Normally salt levels in the soil reduce over winter on sand-based surfaces due to no salt being applied through irrigation and the flushing occurring from rainfall. The concern



The Scotch College brains trust – Mathew Lane (right) and head wicket curator Lewis Dienelt (left). The duo served their apprenticeships together at the WACA

for Scotch at the moment is the bore water measurements of electrical conductivity, sodium and chloride in September 2020 are similar to the end of the irrigation season in 2017 and 2018.

- Sodium 240-250ppm;
- Chloride 415ppm;
- EC dS/m 2.3;
- Bicarbonates 419 ppm (which is close to severe for irrigation water).

On the positive, to counteract this the renovation programme consists of:

- 12mm solids at 65mm spacings;
- 19mm solids at 130mm spacings;

- 19mm hollows at 130mm spacings;
- Depths with the larger tines are 250mm to 300mm.

Larger diameter tines are not used as they lift the surface slightly. Hollow-tining is done in the Christmas school holidays after a low mow and vertimow, usually with a 5mm sand topdress which is rubbed in. A Peruzzo flail is used continually to reduce thatch on an as required basis and during winter sand dusting is a regular process with high wear areas targeted.

Lane uses a product called Solu-Cal, a calcium/gypsum product to help flush sodium, which is applied post renovations in conjunction with Terraplex. Sodium levels dropped during winter 2020 from 468ppm in February to 85ppm in September demonstrating the practices are working.

Part of the overall programming at Scotch includes close attention to nutrient management. The alkaline pH at Scotch creates an environment where micronutrients such as iron and manganese become less soluble. The pH is close to 8 at the end of winter when it would be expected to reduce slightly from winter rainfall. Foliar applications are applied approximately 10 days before any granular NPK fertilisers to ensure there are no deficiencies of micronutrients that may inhibit the nitrogen response.

As a young turf manager Matthew Lane is producing high quality turf sporting surfaces and has developed his man management and communication skills since becoming the boss. Communicating with the school about wear management and them coming on board has been another positive in the ground's maintenance. In the future Lane is looking to increase his science-based skills and incorporate them with furthering his business management. 🌱



Due to the alkaline pH of the soils, foliar applications are applied 10 days before any granular fertilisers to ensure there are no deficiencies of micronutrients that may inhibit nitrogen response



A key focus for Lane has been remedying organic matter accumulation in playing surface profiles

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ROLLING

The Australian-made Scott Bonnar 30" Queen electric-driven bowling green mower, developed in the late 1950s, heralded not only the era of precision mowing but also significant width of downward force or pressure on bowling green surfaces



Rolling with it

In the first of a two-part article, Peter McMaugh AM and Gary Beehag discuss the use of mechanised rolling as a key cultural practice long used on bowling greens and cricket wickets but only in recent years on golf greens.

Mechanised rolling of golf greens using lightweight, multiple-head small diameter rollers is a practice which has developed in the current era of golf course management. In this article we discuss its origins in Australia and look at the engineering and turfgrass industry personalities behind widespread adoption of the modern turfgrass roller.

Our hypothesis for this examination is that rolling of putting greens has always been a de facto result of mowing with walk-behind greens mowers having a 'fixed' front and rear roller until the advent of triplex greens mowers, which deprived greens mowed in this way of the rolling factor inherent in walk-behind mowing. This was detrimental to the quality of golf green surfaces in terms of ball roll in relation to both distance, firmness and smoothness.

PRE-DATING MOWING

The developmental history of the designs of rollers used on turfgrass begins a long way back with the use of horse drawn rollers, mostly brought across from agriculture, to smooth fairways for golf and to prepare cricket wicket squares for play. In the case of golf fairways, much of the damage in the 'home of golf' came from frost heave during freezing winters. This also occurred on golf greens but was mostly repaired there by tamping with wooden beaters.

The following quote from James B. Beard in "Turfgrass History and Literature" (2014 p65) sums up the history of rolling... *"Smoothing and Rolling: Mechanical smoothing by rolling is one of the earliest cultural practices, dating back to the 1700s. It predates even mowing. The heavy manually pushed rollers were hand-carved from stone. Just when rolling was first practiced on putting greens is unclear. Rolling with manually pushed, lightweight, wooden rollers was being used on putting greens by the mid-1880s, and metal, water-ballast rollers were in use by the late 1890s. Larger horse-drawn rollers also were used during the late 1800s on fairways. The main function was to smooth out surfaces after sand patching of filling of rabbit burrows and scrapes as potential problems with soil compaction were recognised."* As we shall discuss later, Beard wrote and promoted the virtues of so-called lightweight rollers for putting greens.

As golf courses themselves changed with the times, the horse-drawn, helical spiral mowers (derived from the carpet industry) were replaced by mechanical, self-propelled tractors. Having a relatively heavy roller inbuilt into the mowing unit for stability, and a stable source of power to drive the cylinder, took greens mower design in a direction different from fairway mowers where the drive function

was transferred to wheels for ground traction, with a much lighter rear roller for stability and to control evenness of cut.

As more sophisticated tractors and small engine technology developed, so did the design of mowers change greatly down the years. When you look at company brochures of years gone by, there are huge differences in size between single cylinder machines, with engines powerful enough to tow a seated driver, and the machines of today. The exceptionally large diameter of the rollers under the operator seat are not something we see today, except for certain wicket rollers.

CRICKET WICKET ROLLERS

Rolling of cricket wickets has long been practiced to gain bounce of the ball by compacting the underlying clay-based soil. For cricket, the heavy mechanised rollers used for developed Macadam road surfaces (bitumen) were widely adopted and, in essence, the basic design principles have barely changed over many decades. There may be more sophisticated drive mechanisms today (see photo below), but the essential nature of the large diameter drum (generally a split dual drum on the rear with a smaller drum of lesser width under the steering arms) is still the same. Tractor-drawn, large-diameter rollers are routinely used on racecourses.

GREENS AND COURT ROLLERS

Bowling greens, cricket wickets, golf greens and tennis courts require frequent close mowing, (judicious) controlled nutrition and irrigation to present high quality playing surfaces. Frequent rolling has always played a large part in the final preparation of bowls, cricket and tennis surfaces but less so in golf until the current era.

In the absence of any authoritative standard or specification for bowling and golf green rollers, the dimensions, weights and configurations of their drive and steering rollers between manufacturers vary widely, largely based on engineering rather than science-based criteria. Whether these machines are as fully fit for purpose is the question we want to engage within this article.



Example of an Australian-designed wicket roller

The choice of drum diameter is directly related to the nature of the material being rolled. The more plastic the material (e.g.: cricket wicket clays), the more likely a 'bow wave' effect will develop directly in front and behind the roller's direction of travel. Research conducted in the UK investigating the relationship between rolling on cricket wicket soil over time, has shown the soil will attain maximum density, depending on soil moisture at a certain time, after which no advantage of rolling is gained.

The very comprehensive research published in the 2008 PhD thesis of Peter Shipton from Cranfield University was conducted on Marl soils. These are relatively high level but silty clays which are mostly single lattice clays (smectites). In Australia we mostly use double lattice clays which are much stronger. The UK research needs to be repeated on Australian soils with a range of moisture content to find the optimum point for rolling these soils.

To avoid the bow wave effect, small diameter rollers need to be used in multiple racks with an overall spread of load to an increased surface area rather than having their full load on a single roller. Back in the 1930s, the Toro Company (USA) manufactured a petrol-driven, ride-on roller machine having two chain-driven 30cm diameter steel rollers specifically for tennis courts.

The aim of rolling bowling and golf greens is controlled consolidation or firming of the surface, not soil compaction. Rollers attain consolidation by pressure. Pressure is quite different from weight and the weight of the roller is just one component of pressure. Turfgrass leaf stiffness, whether bentgrass, fescue, couchgrass, seashore paspalum or cotula, and the physical architecture and moisture content of the thatch-mat region all impact on degree and time period of applied pressure; thus ball roll.

Judgement about the time spent rolling greens is largely one of the unique skills a competent greenskeeper needs, related to his/her understanding of what research is available. On bowling greens, the long time often spent rolling achieves more in the public relations area than in green speed. Periodic use of a jack before and after rolling is a worthwhile practice to test green speed.

Cast iron, large diameter rollers, often referred to as 'heavy rollers' especially on bowling greens, were often made heavier by filling them with water. These water ballast rollers date back to the 1800s. They were very cumbersome to use and by the early 1970s were sitting in the corner behind the shed much more often than being seen on the green.

Also in common use by turf farmers in the 1960s were large diameter vibrating rollers

brought in from road base consolidation. They were generally used prior to harvesting to compact the surface soil so that poor quality turf could be lifted with less breakage. This practice caused serious compaction far deeper into the profile than non-vibrating rollers. This generally ruined the next turfgrass crop and the practice is rarely seen today.

Electrical-powered rollers of varying designs and number of individual rollers have long been used on bowling greens throughout Australia and New Zealand. In contrast, routine adoption of mechanised rolling on golf greens only became worldwide more recently following development of so-called lightweight, multiple roller units. However, most people associated in the turfgrass industry are unaware design and construction of lightweight turfgrass rollers having multiple diameter drive and steering rollers was conceived by an Australian engineer, Ron Kaye.

WALK-BEHIND, FIXED DRUM CYLINDER MOWERS: PRECISION CUTTING AND ROLLING

Let's go back in time and set the scene for turfgrass rollers. Widespread adoption throughout Australia of the Australian-made Scott Bonnar 30" Queen electric-driven bowling green mower developed in the late 1950s heralded not only the era of precision mowing but also significant width of downward force or pressure on bowling green surfaces.

Exceptionally low height of precision cutting (less than 2.0mm bench setting) combined with a total machine weight (around 160kg) resulted in significant downward force or rolling factor across a 76cm width. The Scott Bonnar 30" Queen electric mower (pictured page 52 and above) and later variant models became so well-known they were exported worldwide where lawn bowls is played, even to the United States. Variant Australian designs of this mower are still manufactured today.

The point here about electrical-driven, bowling green mowers is the rolling factor contributed by their fixed front and rear rollers. After all, the 'alternative striping' effect attained on bowling greens results from the rollers, not the cutting cylinder. The same holds true for golf greens and other closely-mown surfaces.

Green speed, or more correctly ball rolling distance, remains a contentious issue among bowlers and golfers alike. Several studies have indicated bowlers and golfers have different perceptions about differences in green speed and the actual ball rolling distance. Nonetheless, the distance attained by a rolling bowl or ball is related to the frictional effects of the ball/surface interface.

Investigations of the effects of mowing and rolling on ball rolling distance on bowling greens was first conducted in Australia by the senior author in Sydney during the 1960s. Ball



In addition to frequent close mowing, frequent rolling has always played a large part in the final preparation of bowls, cricket and tennis surfaces

rolling distance was measured using a bowls jack on an inclined plane. Sounds familiar to the modern stimpmeter used on golf greens.

Importantly, while several mathematical formulae of rolling factor have been published, the authors are unaware of any applied research correlating rolling factor formulae and actual degree of consolidation on bowling or golf green surfaces. Surface factors contributing to ball roll distance and retention period are shoot density, leaf stiffness and rate of leaf regrowth and degree of initial surface consolidation as affected by thatch-mat accumulation and moisture content. All vary over time.

INTRODUCTION OF RIDE-ON TRIPLEX GREENS MOWERS

Initial adoption of 'floating-head' single-cylinder mowers later followed by universal adoption of triple-cylinder mowing heads (or triplex mowers) for golf greens reduced mowing time on individual greens, but not without some controversy and debate.

Debate centred on the independent 'floating head' separating cylinders and rollers from the weight of the mower, as attested by the number of American articles subsequently published. Mind you, walk-behind triplex mowers called the 'Overgreen' for golf greens

were introduced in the 1930s by Worthington (USA) then Ransomes (UK). These machines comprised three, friction drive design cylinder mowers attached to a two-wheeled tractor-type unit.

The concept of a ride-on triplex greens mower was realised in 1968 with release of the Jacobsen Greens King triplex. Other mower manufacturers, such as Toro, Ransomes and Hahn West Point, soon developed ride-on triplex mowers. The first ride-on triplex greens mower (Greens King) sold in Australia (see photo below) was purchased by Royal Canberra Golf Club, ACT. Other golf clubs throughout Australia soon followed suit.

Like their predecessors, ride-on triplex mowers had an independent system of 'floating head' cylinder and front and rear rollers. In other words, the cylinders moved independently from the machine. Considerable discussion among American turfgrass consultants and superintendents ensued around the pluses and minuses of floating head design of triplex mowers as opposed to the fixed head design on walk-behind mowers.

Main criticisms of long-term exclusive use of triplex mowers has been lack of concise, precision mowing, a propensity of greater thatch-mat accumulation and surface tyre impression. Tournament preparation on golf greens has seen utilisation of walk-behind mowers to gain more precise mowing and rolling factor. Adoption of dedicated roller head and scarification cassettes for triplex mowers is a relatively recent development to gain a rolling factor and manage thatch accumulation.

Editor's Note: In part two of this article, the authors will discuss the science in the development of lightweight, multiple bowling and golf rollers and discuss how this has been applied by the main personalities involved.



Royal Canberra purchased the first ride-on triplex greens mower in Australia – a Jacobsen Greens King

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Sentosa Golf Club in Singapore is continuing to add to its impressive sustainability record after being awarded an R&A Golf Sustainability Fund Grant



From gastronomy to agronomy

Kate Torgersen looks at the lengths Sentosa Golf Club in Singapore is going to improve its green agenda and highlights the novel approach one club is taking to promote the importance of its indigenous vegetation.

Sentosa Golf Club in Singapore is without question one of Asia's pre-eminent golfing facilities. Set on Sentosa Island, with Singapore's iconic cityscape as a backdrop, the club is home to two championship golf courses – Serapong and Tanjong – which between them since 2018 have hosted six globally-televised golf events.

The Serapong course has been home to the SMBC Singapore Open on a record 11 occasions, while the new Tanjong course hosts the LPGA's HSBC Women's World Championship. Tanjong was also the chosen venue for the 10th edition of the Asia-Pacific Amateur Championship and the inaugural Women's Amateur Asia-Pacific in 2018.

Overseeing this massive operation is Andrew Johnston, Sentosa's general manager and director of agronomy. Johnston will be familiar to readers of ATM having been a regular visitor Down Under in recent years, including being a keynote presenter at the 2018 Australasian Turfgrass Conference.

In addition to building the club's impressive tournament credentials, during his time in charge Johnston has also instilled an

ethos of putting environmental management and sustainability at the forefront of how the facility is operated. As testament to that, in 2019 the club received two of Singapore's high-profile sustainability awards – the RHT Environmental Sustainability Game Changer and Sustainability Innovator and was also voted 'Singapore's Best Golf Course' and the 'World's Best Golf Club' at the World Golf Awards.

Continuing to add to its impressive sustainability record, this September The R&A had further good news for the club when it announced that Sentosa had been awarded a Golf Sustainability Fund Grant for a very unique project. The grant will be used to install two digesters that will make it the first club in Asia with the ability to grind down food and horticultural waste to reuse as fertiliser on the golf courses. Sentosa will reuse around 40 kilograms of food waste generated each day along with the one tonne of horticultural waste produced every month.

The grant is part of a project that will help bring sustainable organic waste management practices to golf courses in Asia, with Sentosa estimating cost savings of up to 30 per cent

on monthly waste disposal over a one-year period. The project comes hot on the heels of Sentosa also being announced as the world's first golf club to sign the UN's Sports for Climate Action Initiative.

Embarking on a two-stage process, the first will see Sentosa using a food waste biogas digester to process and grind down waste from its three food and beverage outlets on site. Once microbes are added to the waste, it is ready for use as organic fertiliser on the golf courses. The second stage of the project will introduce a heavy-duty woodchipper and biogas digester shredder to grind an estimated one tonne of horticulture waste that is generated per month at the club. The club does not currently purchase and apply compost material on the golf course, but foresees that a suitable compost by-product can be derived from this project and used to improve the golf course, including the retention of vital moisture across fairways, thereby reducing the need for irrigation.

"It is very humbling for Sentosa Golf Club to be chosen by The R&A to be part of its Golf Sustainability Fund," says Johnston. "Personally, I'm very proud of what the

club has achieved in recent years with its environmental efforts. The entire team at the club can be recognised for their hard work and dedication towards creating an environmentally sustainable environment – it has become a way of life at the club.

“This grant will help us go a long way towards further achieving our goals and the waste recycling project, along with all the other initiatives we have implemented here at the club, will hopefully inspire other clubs around the world to play their part in becoming more sustainable.”

On the importance of such an initiative, Johnston adds: “Most horticultural and golf course waste is currently disposed through the process of waste incineration or burial administered by the local authorities. This adds to air pollution and applies pressure to landfill sites, which is particularly pertinent to land-starved Singapore.”

Both The R&A and leadership team at Sentosa envision achieving a major leap in golf course specific waste recycling and fertiliser use across the fairways of courses all over the world, along with a major change in the consideration of how golf clubs approach their waste management strategies. The club’s



Sentosa will become the first golf club in Asia to break down food and horticultural waste into fertiliser

initiative will also help with the research and development of by-product fertilisers that can be used on primary roughs and fairways and shared with other golf clubs.

“Sentosa Golf Club has introduced many environmental-friendly practices over the last few years and The R&A is excited to work with them on this project,” says The R&A’s Asia director Dominic Wall. “Not only will it allow them to further a more sustainable environment at the club, but will also provide the vital research needed for other clubs to use as best practice.”

Sentosa’s green agenda was initially brought to the attention of the golfing world with the launch of its #KeepItGreen campaign at the SMBC Singapore Open in January 2018. It saw a number of key environmental features implemented at the club, including;

- Creation of their own bee colonies and sustainable herb garden;
- Using rechargeable lithium batteries in their golf carts;
- Banning single use plastics from the golf course and replacing them with water stations; and
- Installing electric vehicle charging sockets.

The club also unveiled a new global campaign, GAME ON, at the start of the year, which is designed to unite the global golf community in addressing the growing concerns of climate change. The aim is to educate and inspire the global golfing community, helping golf clubs around the world to better prepare by introducing modern sustainability practices.

The campaign is closely aligned with The R&A’s 2030 Golf Course Initiative that considers the impacts of the changing climate, resource constraints and regulation on course condition and playability. 🌱

GRAZING THE GOLF COURSE AT GLENELG

In my work with golf clubs, I often make recommendations when it comes to setting up food produce areas that can be used in the clubhouse restaurant, sold to members or even the local community. These days there are increasing examples around the world of clubs incorporating urban farms onto their course, supplying vegetables, fruit, herbs, eggs and even hives for honey.

It is not very often that you walk around a golf course thinking ‘I wonder which of these plants I can eat?’, but this November Glenelg Golf Club in Adelaide is offering an exciting evening showcasing its indigenous flora in a very unique way. In what the club’s biodiversity manager Monina Gilbey believes to be an Australian first – and possibly a world first – the club is hosting a ‘Grazing the Course’ dinner where diners will learn about edible indigenous plants grown on site as they ‘eat their way around the course’.

The wild food dinner is the brainchild of Adelaide chef and Glenelg member Andrew Fielke, who has recently released a cookbook called Australia’s Native Creative Cuisine. The planned one-of-a-kind five-course degustation will be a unique dining experience for members and an opportunity for the club to promote the importance of its indigenous vegetation.

“Andrew started planning the menu with a list of our edible plants,” explains Gilbey. “Andrew, our clubhouse chef and I recently walked around the course on a food forage

and from our 11th hole, which is definitely our most productive hole, we can source a variety of berries, seeds, edible leaves and leaves for flavouring.”

The menu is set to include climbing saltbush (*Einadia nutans*) – berries for decoration; coastal daisy bush (*Olearia axillaris*) – leaves for flavouring; dianella (*Dianella revoluta*) – flowers; golden wattle (*Acacia pycnantha*) – seeds; lemon-scented grass (*Cymbopogon ambiguus*) – leaves for flavouring; muntries (*Kunzea pomifera*) – berries; round-leave pigface or Karkalla



One of the items on Glenelg’s Graze the Course menu – roast pumpkin and saltbush lasagne

(*Disphyma crassifolium*) – leaves; and ruby saltbush (*Enchylaena tomentosa*) – berries for decoration.

There are five samphire areas on the course. The samphire is edible, along with seablite (*Sueada australis*) which also grows in samphire areas. Due to flowering and fruiting times, it will not be possible to source the majority of ingredients from the course. Some ingredients on the menu are Australian natives, rather than indigenous plants, which will come from Fielke’s native foods business.

“Andrew believes that we need to embrace our native foods,” says Gilbey. “He thinks they have the potential to create sustainable agriculture and a form of edible reconciliation with our indigenous people. He says our First Nation people have an intimate knowledge and understanding of the amazing ingredients that formed part of their diet and culture for many thousands of years. Their knowledge and connection to the land and its bounty are awe-inspiring and we are indeed lucky to tap into this knowledge and the raw ingredients.

“Andrew has inspired us to add indigenous food to our clubhouse menu and we are planning to grow edible indigenous plants in our nursery and our new kitchen garden. A recently installed beehive, donated by a member, may also be another future addition to our menu. We’re all looking forward to the dinner and celebrating the bounty of our golf course.” – **Kate Torgersen**



There are many sports turf facilities now linking sound safety processes with their green sustainability efforts

As compliance expert Terry Muir writes, turf managers need to get into the mindset that operational sustainability is about more than just being green.



Safety a sustainability essential

At the most basic level, sustainability, whether it be environmental or safety, is really about the same thing – protecting and conserving resources. The environmental resources are typically thought of as natural resources. In the case of health and safety, the resources are human. Despite this common ground, discussions of sports turf sustainability are incomplete if not paying attention to people and their health and safety.

Including health and safety in any sustainability equation captures the industry's most precious resource – its people. Here are some simple examples;

- When reusing sewage effluent to reduce water consumption, are the hazards and risks to staff and site users formally considered ahead of the environmental gains?
- Do golf course architects and engineers design slopes with slip and fall hazard control front of mind, or is that an afterthought for the superintendent and course maintenance team to deal with?
- What is going to impact more on your sustainability profile – a pollution incident or a workplace death or serious injury?

There are many sports turf facilities linking sound safety processes with their green sustainability efforts. The e-par team has been mapping sustainability features of sports turf

facilities and we have mapped a range of vegetation zones, sensitive environmental receptors, flora and fauna, recycling initiatives, water bodies, riparian zones, habitat, alternative energy sources, chemical use and so on.

We have also been mapping safety sustainability items like rooftop anchor points when working at heights, 'no go' hazardous zones, first aid kits and officer details on the map, defibrillator locations, PPE cupboard locations, emergency showers, steep slopes and their hazards, emergency assembly points, spill kit locations, chemical and fertiliser stores. A clear link of sound safety processes with sustainability becomes evident. It is easy to see how it all comes together, and when combined, the environmental and safety features provide a powerful image of a sustainable facility.

Embracing safety and health as a cornerstone of sustainability is good for workers and good for business. A stronger commitment to safety and health can benefit workers by;

- Decreasing the number of illnesses, injuries and fatalities;
- Increasing their engagement and satisfaction; and
- Enabling them to be productive participants in the organisation and their communities.

When emphasising the safety, health and welfare of workers, businesses also see benefits in decreased costs associated with workers' compensation payments, training and recruitment; and improved reputational and financial performance.

As one business owner commented, "We try to manage our business for forever – not for today, not for this quarter. Worker safety and well-being are crucial elements of any sustainability effort. You cannot claim to be a sustainable, ethical, values-based organisation if you're hurting people and changing the lives of families and communities."

The importance of health and safety in the sustainability efforts at every sports turf facility cannot be over-estimated. If played right, the industry can leverage the fact that the world is saying environment, health and safety matters to the sports turf sector. A focus on EHS sustainability also presents the opportunity to attract and support competent and productive workers to the industry. In a Pricewaterhouse study, the top three reasons workers were attracted to a workplace were:

- Trusted by society – an organisation that's trusted by society, its customers and its employees (91 per cent);
- Human skills – an organisation that highly valued, developed and rewarded 'human' skills (87 per cent);
- Well-being – an organisation that has initiatives and policies in place that are successful in ensuring positive physical and mental wellbeing among its workers (82 per cent).

As stakeholders begin paying attention to the sector's sustainability claims, and sports turf professionals push to achieve even more ambitious sustainability goals, don't lose sight of a simple sports turf sustainability equation – No harm to people and no damage to the environment. ♣

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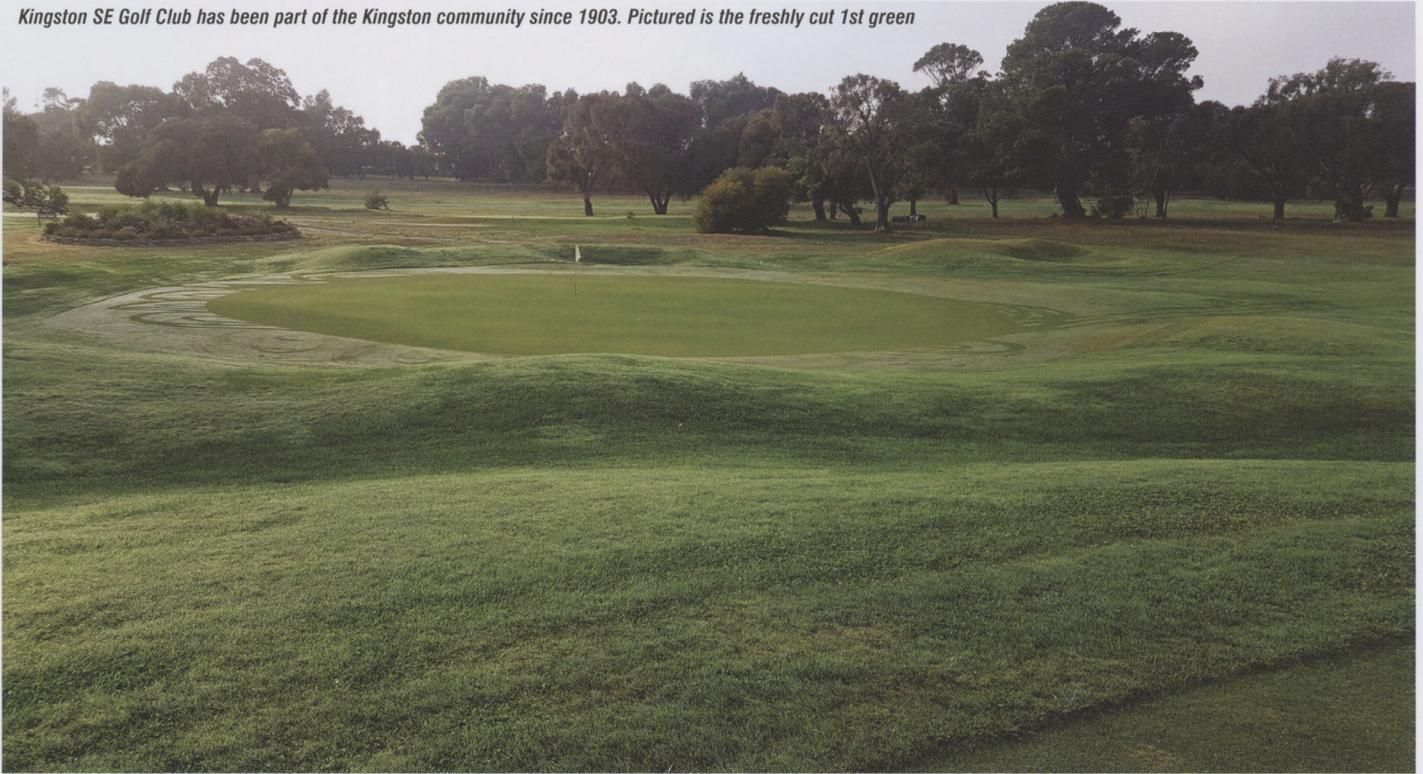
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Kingston SE Golf Club has been part of the Kingston community since 1903. Pictured is the freshly cut 1st green



Kingston SE Golf Club, SA

*For the past 23 years Mark Angel has been the sole greenkeeper at
Kingston SE Golf Club on the South Australian coast.*

Superintendent: Mark Angel (58).

Family: Wife Megan (49), daughters Joella (30) and Maylie (13), son Mitchell (15) and three grandchildren.

Social media: www.facebook.com/greenkeeper.mark, www.instagram.com/greenkeeper.mark.

Years as superintendent: 23.

Turf management career: Kooyonga Golf Club 13.5 years (including two years as 3IC); superintendent at Kingston SE since 1996.

Qualifications: Cert IV Horticulture & Turf.

Major hobbies/past-times: Collecting golf course score cards. I have cards from over 50 countries and swap with other collectors in Australia, Europe and America. I'm not sure how many I have in total, but members help me out by collecting cards when they travel.

Where in Australia is Kingston SE Golf Club and what is the club/township famous for?

Kingston SE is on the coast, 300 kilometres south of Adelaide and 160km north of Mount Gambier. The golf course is about 3km south of the township. Kingston's main industries are lobster fishing, the Mount Benson wine-

making region, sheep and cattle farming and recreation. The district receives a large influx of tourists during holiday periods throughout the year. The northern entrance to the town is dominated by the 'Big Lobster' named 'Larry' by people in Kingston. Cape Jaffa lighthouse also sits on Marine Parade where you can get a great view of the whole town.

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

It just fell into my arms I guess. I was always an outdoor person and relocated to Adelaide for more work options. I got a job laying turf for three days and was asked to stay on for a three month trial. I started at Kooyonga Golf Club at the age of 21 years and worked my way up to 3IC, helping to prepare the course for many South Australian Opens. Watching Greg Norman winning two SA Opens 10 years apart was pretty special.

You have now been at Kingston SE GC for about 23 years. How did you originally arrive at the role there and why have you stayed? After many years at Kooyonga I had

worked my way up as far as I could go, so I wanted to branch out and take the chance on looking after a course in the country. I applied for many jobs, but Kingston decided to give me a go. I was raised in the country until I was 21 years old, so getting back to the country was very appealing. Kingston is a very friendly town and relaxing.

You are the sole greenkeeper at Kingston SE GC. Has that always been the case?

Yes this has always been the case and we are like many small country golf clubs who have just one paid course employee. Some of the bigger towns nearby have a superintendent and apprentice, but here I rely on volunteers to assist with jobs around the course.

How challenging is it being the sole greenkeeper – what are the pros and cons?

The big 'pro' is that after a busy day I can always look back and think how proud I am of what has been achieved. The 'cons'... well, we all have those days where things don't always go right, whether it's breakdowns or weather impacting daily routines.

Give us an overview of Kingston SE GC and some of its unique characteristics from a course perspective? Our whole course has been redesigned in the last 16 years, with bigger greens, more dogleg fairways and a new automatic watering system. The major thing here at Kingston is we have no sand bunkers and rough just a few metres around all greens which requires constant mowing. We need the rough to keep a good course rating. There were originally six bunkers on the old course but they were too hard to maintain and wind was always a problem. We now have a lot of grassy hills and hollows around the course to try and trick some golfers. A lone gum tree, which sits proudly in the middle of the 18th fairway, can undo many good scores.

Is it an easy/hard facility to manage? What's the most challenging aspect? Mostly the course is easy to manage due to it mainly being flat to mow. Grassy hollows are the hardest to manage, with cutting needing to be done the correct way or one can get stuck. Machines don't have much clearance and when mowing it is easy to bottom out the mower and get stranded with no wheel grip.

How has COVID-19 impacted your operations there – what changes have you had to make? We have been lucky in our area and I have been able to work all the way through COVID. We did stop green fee players and competition for a few months.

How have your turf management operations changed over your time as superintendent at Kingston SE. What have been some of the bigger changes? With the redesign of the course, complete holes have been made and all greens are larger, taking longer to maintain. Going from travelling irrigators to fixed sprinklers and then to automatics has been a major change. Originally we had two tractors with gang mowers and now we use the latest mowers. In the coming years we are hoping to make a better hitting area on the practice fairway.

What are some of the major challenges facing Kingston SE GC both from a turf management and general club management perspective? Lack of money is one of the main challenges, but we just work together and do the best we can. Lots of fundraising is carried out at our club with raffles and events.

For a course that has just one greenkeeper, you cannot fault the level of presentation that Angel and his team of hard-working volunteers consistently present for the Kingston membership



Kingston SE GC superintendent Mark Angel (second from right) with key volunteers (from left) Patrick Ryan (rough mowing), Brian Prosser (fairways mowing) and Bruce Stillwell (greens mowing)

Outline any major course improvement works recently completed and/or highlight any ongoing or future works that the club is undertaking. The biggest project that the club has undertaken in recent years was the course redesign. After the club purchased additional land, we completed five new holes in 2003. Over the next 10 years we replaced every green and added new tees and mounds. Two or three new greens were done each year, with members playing a mix of old and new holes during that time. We stayed with the same turf variety we had on the greens (Seaside bentgrass) with common couch and ryegrass mounds. The last green to be replaced was in 2014. During this time we installed new irrigation on every hole and lots of large pine trees were removed and replaced with mounds and native trees and shrubs. The new course was officially opened last year.

With the redesign, many hours were put in by local contractors with machinery. Also, the local Kingston District Council was a great

help supplying trucks and loaders, shifting lots of soil in building the course the way it is now. After many years spraying out kikuyu, the course now only has one per cent. Latest improvements include reducing couchgrass encroachment onto the greens. We sprayed with Roundup and re-turfed around many greens to keep it away.

The one product I couldn't manage my course without is... wetting agents. With our sandy soils, wetting agents are a must here.

What are some pros and cons of being a regional superintendent? 'Pros' are definitely the lifestyle. 'Cons' would be dealing with limited resources and lack of money. I just try my best to prepare the course to a good standard each week.

Do you use volunteers to assist with the management of the course? Being the sole greenkeeper I do rely on volunteers. Brian



AT A GLANCE – KINGSTON SE GOLF CLUB, SA

Course specs: Kingston SE Golf Club is a professionally designed course, a collaboration between Allan Telford (PGA member) and Darrell Vearing (life member). Par 72, course length is 6066 metres for men and 5255m for ladies. Most holes are doglegs with lots of grassy hills and hollows and no sand bunkers. The old course was 55 hectares, but after more land was bought for the new course it is now a total of about 70ha. Push-up greens (Seaside creeping bentgrass, 0.8ha), fairways and tees common couchgrass and Santa Ana.

Members/rounds: 110/7000.

Major tournaments/events: 3-Day Ambrose Experience (January), Southern Ports Golf Week (Feb/March), Greenkeeper's Revenge Day, Greenkeeper's Golf Day (a Saturday competition I have sponsored for over 20 years), Udder and Rams Ball Day (player must have a total score of 12 on all par 3 holes in one round to enter). This year was our first Greenkeeper's Revenge Day and I was very well represented. It took a few hours to set up with two others helping me. Placing holes close to slopes was funny watching members trying to get the ball in the hole or navigate their way around obstacles. It was a great success and has now been added to our yearly events schedule.

Annual course budget: \$75,000.

Staff structure: Mark Angel (superintendent). I rely on members to volunteer on course doing many tasks. Over the years many members have gone or passed. Currently I have Bruce Stillwell (club secretary) mowing greens every Wednesday, Brian Prosser loves to mow fairways and Pat Ryan on the rough inside the trees. Other members help with storm clean up, filling sand bins, rubbish bins and odd little jobs.

Climate/rainfall: Climate daily can be up to 40°C in summer and 8°C in winter. South and southwest winds can play havoc with course and play. Annual rainfall is around 500 mm.

Terrain/soil types: Undulating coastal sandy rises with tree-lined fairways. Soil comprises mainly coastal sand.

Water sources/irrigation: Three bores servicing six holes each. Irrigation system comprises Pentair submersible pumps, Hunter Advance Commercial Controllers (ACC) running a two-wire decoder system and Hunter sprinklers ranging from PGPs on tee blocks and A21s on fairways and greens. We always had trouble with sand filling up filters on



The Kingston SE course boasts a number of grassy hills and hollows around the layout to challenge golfers should they stray off line. Pictured is the 13th

sprinklers from our bores, so we installed sand filters on each pump which have remedied the problem. Was well worth the cost.

Cutting heights/regimes: Greens 2.8mm mowed three times a week, collars and tees 7mm mowed once a week, fairways 15mm (winter) and 17mm (summer), first cut of rough 25mm and other rough 75mm.

Renovations: Renovations are always done early March and late September. We did use contractors to core and Vertidrain in the past. We core and sand once a year and six months later heavy scarify and sand, dethatch during summer. Nowadays we try to do these jobs ourselves due to cost.

Major disease pressures: I always try and spray a preventive spray when I know conditions are going to be bad. Dollar spot, brown patch, winter fusarium, dry patch is always a problem in the summer. Other major problems are redheaded cockchafer and



Sand filters are attached to each pump

galahs. We have been using moth balls to deter galahs over the last few years.

Nutrition management: I use Baileys Brilliance fertiliser (mini prill) on greens. Neutrog's Blade Runner is swept into core holes before sanding. Liquid fertiliser and iron sulphate are also used during the year. Fairways are fertilised with a mix twice a year from the local farm store.



This year saw Angel set up Kingston SE's first Greenkeeper's Revenge Day which proved a very popular addition to the events calendar



Kingston SE's 0.8 hectares of push-up greens are Seaside creeping bentgrass

Prosser and Jerry Read come out with their front end loaders when work is needed to be done. Jeff Nitschke has a scarifier and chainsaw and does many jobs on course. He also helps with coring and topdressing greens. My son Mitchell has started to come out with me and helps on the course when he can and enjoys it. He has been a single-figure golfer for a while now and just last month he made the Men's Open club championship final, going down 3/2.

If you could change one thing about your job as a regional superintendent what would it be and why? I would like to have another employee to help out with daily jobs.

How important are the relationships you have with other course supers/trade reps as well as the local community? I keep in contact with many superintendents in our

Kingston volunteer Jeff Nitschke uses his scarifier to dethatch greens. In addition, greens are cored and topdressed once a year

area and discuss what they and I are doing to maintain our courses. Shane Symes from K&B Adams is also a great help with products and knowledge. We had two local contract sprayers who are members and they volunteer their machinery and time to help spray fairways on the course. We also have other members who use their own machinery (tractor and chainsaws) on course.



What are some of the more unusual requests/things you have had to do as a superintendent of a regional course? When the new course was being built I made all the new tee block signs. I have also had to relocate bees around the course after discovering a hive underneath an irrigation control box cover. I also manage and run the golf club's Facebook and Instagram pages. I have been the admin for both for four and two years respectively. Facebook is good for competition results nowadays as we don't have a local newspaper anymore.

What have you got in your shed? John Deere 7700 fairway mower, John Deere 3245C Terrain Cut mower, John Deere 2500A greens mower, John Deere 2500B greens mower, 72-inch front deck Toro 328B Groundsmaster, Toyota ute, Hardi spray unit, Palmer multi-corer, TurfCo Mete-R-Matic topdresser and Ryan sod cutter. The favourite piece of equipment is the John Deere 7700 fairway mower – it is so easy to use and the



and more ...

FoliMAX - from ammonium stabilised formulations to high potassium replenishment tools, iron combinations that deliver beautiful colour and presentation to seaweeds and kelps, silica and trace element options they are all here. The FoliMAX range is generous and high quality produced with modern turf management methods front of mind.

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One interesting piece of kit in the Kingston SE shed is an old Toro greens mower which is used for rubbing in topdressing sand on greens. Three frames were manufactured with broom heads attached

quality of cut is fantastic. Our next major purchase will be a Toro terrain mower to replace our old 2004 John Deere terrain mower and maybe a greens mower also to replace older equipment.

One interesting piece of kit we have is an old modified Toro greens mower (pictured above). We manufactured three frames with broom heads attached where the cutting units would normally sit and use it to rub in topdressing sand on greens.

Do you think regional/country superintendents have a better work-life balance than their metro counterparts?

All members know myself and my family; you don't get that in the city. The lifestyle is more relaxing and out on the course it is so peaceful with not much traffic noise.

Favourite spot on your course? Back of the 8th green looking over the 1st and 10th greens.

Best advice you have received about being a course superintendent/greenkeeper? Just try and do your best and the rewards will come your way.

You have notched up nearly four decades in the industry. Looking back over that time, what have been some of the more significant changes you have seen in the industry. How much machinery has changed for the better over the years and going

from quick coupling valves and plugging in sprinklers to pop-up sprinklers have been the major changes I have witnessed. I do miss treating and mowing smaller greens. When I first started greens where about 0.44ha, nowadays they are more than double that.

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

Working with low finance is always a challenge. Looking at new projects that I would love to do, but so hard being a sole greenkeeper. Wanting to do so much more and unable to due to time – we can't work every day of the week, but sometimes I do.

What have you worked on personally in recent years to improve your skills as a



Relocating bees from underneath an irrigation box lid... just one of the many tasks Angel has had to perform as Kingston's sole greenkeeper

superintendent? Working on the automatic watering system has been the latest project, learning how to wire up and programme everything.

What gives you the most job satisfaction?

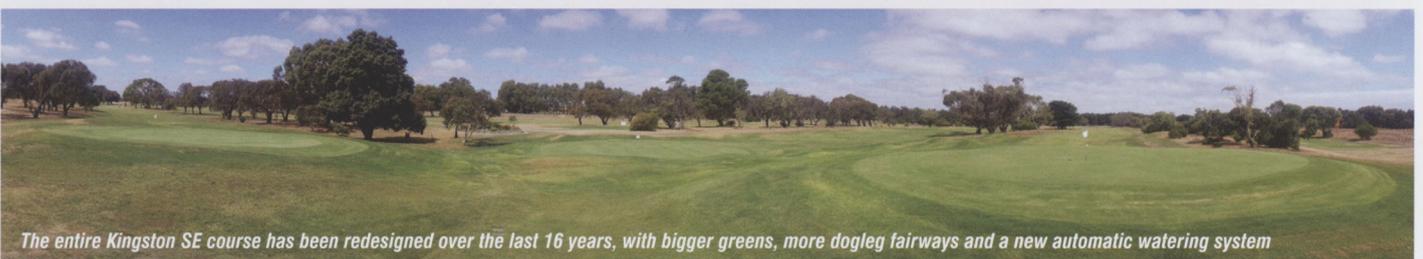
Visitors coming up to you on course congratulating you on the condition of the course. Then you tell them you're the only greenkeeper and they can't believe it!

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

In 2000 I was voted Kingston's best employee by the public. Winning four Keep South Australia Beautiful awards on presentation of the course and roadside. 🌱



Angel's 15-year-old son Mitchell, a promising SA junior golfer, lends a hand on course from time to time



The entire Kingston SE course has been redesigned over the last 16 years, with bigger greens, more dogleg fairways and a new automatic watering system

ASTMA CERTIFICATION PROGRAM

Formally recognising the professionalism of sports turf managers and encouraging their investment in continual education and professional development

Launched in May 2020, the Australian Sports Turf Managers Association Certification Program aims to formally recognise the skills of its professionals and the critical role they play in the sports and recreation industry. The ASTMA congratulates the first 100 sports turf managers who have achieved certification and can proudly use the **'Certified Sports Turf Manager' (CSTM)** designation after their names...

Dean Bailey Rosanna GC, Vic	Ryan Fury Killara GC, NSW	Ben Mills Hawks Nest GC, NSW
Shane Baker Mosman Park GC, WA	Jake Gibbs Royal Canberra GC, ACT	Craig Molloy Cypress Lakes Resort, NSW
Brett Balloch Anglesea GC, Vic	Danny Hack Wellington Shire, Vic	Colin Morrison Flinders GC, Vic
Ed Barraclough Cardinia Beaconhills GC, Vic	Cameron Hall Kew GC, Vic	Damien Murrell Easts Leisure & GC, NSW
Tim Bayard Evergreen Turf, Vic	Gareth Hammond Terrey Hills GC, NSW	John Nelson Grafton District GC, NSW
Nathan Bennett The Royal Adelaide GC, SA	Mitch Hayes Brisbane GC, Qld	Kelvin Nicholson Palmer Cooloolum Resort, Qld
Paul Bevan GTS, Qld	Luke Helm Meadowbrook GC, Qld	Matthew Oliver QSAC, Qld
Andrew Boyle GTS, Vic	Tony Hemming Optus Stadium, WA	Shaun Page Southern GC, Vic
Justin Bradbury Camden GC, NSW	Kirsty Herring Katherine CC, NT	Luke Partridge Manly GC, NSW
Nathan Bradbury Eastlake GC, NSW	Tim Hoskinson Cairns GC, Qld	Ben Payne Peninsula-Kingswood CGC, Vic
Harry Brennan Dubbo City Council, NSW	Ian Howell , Bonnie Doon GC, NSW	Michael Pearce RACV Torquay GC, Vic
Mark Brooks Riversdale GC, Vic	Jay Infanti Eastern GC, Vic	Keegan Powell The Sands Torquay, Vic
Fraser Brown Lake Karrynup CC, WA	Nick Jeffrey Racing Queensland, Qld	Shaun Pritchard PEGS, Vic
Ben Bruzgulis Cronulla GC, NSW	Steven Johnson Al Mouj Golf, Oman	Justin Rankin Kooindah Waters GC, NSW
Chris Burgess Yarrawonga Mulwala GC, Vic	Nick Kinley Hartfield CC, WA	Marc Raymond Patterson River GC, Vic
Greg Burgess Northern GC, Vic	Dylan Knight Axedale GC, Vic	Scott Reid Launceston GC, Tas
Jacob Burrige Victoria GC, Vic	Blaine Knox Beenleigh RSL & GC, Qld	Brett Saggus BRG Legend Hill, Vietnam
Jason Bushell Rowes Bay GC, Qld	Lance Knox Busselton GC, WA	Wesley Saunders Dunblane New GC, UK
Aaron Cachia Bayer, NSW	Steve Lalor Natadola Bay GC, Fiji	Robert Savedra Wesley College, Vic
Patrick Casey Kalgoorlie GC, WA	Kane Latham Elanora CC, NSW	Travis Scott Riversdale GC, Vic
David Cassidy The Cut, WA	Nick Launer Metropolitan GC, Vic	Bill Shuck Evergreen Turf, Vic
Brian Cattell Wagga Wagga CC, NSW	Ben Lavender Newington College, NSW	Cameron Smith Bonnie Doon GC, NSW
Paul Chalmers St Aloysius College, NSW	Jason Lavender Riverlakes GC, Qld	Gary Smith Commercial Albury GC, NSW
Brenton Clarke Kooyonga GC, SA	Dean Lenertz St Michael's GC, NSW	Thomas Smith Waterford Valley GC, Vic
Dan Cook Elanora CC, NSW	Dean Lewis Thurgoona CC, NSW	Mathew Soles The Australian GC, NSW
Lincoln Coombes RACV Royal Pines, Qld	Josh Leyland Box Hill GC, Vic	Clinton Southorn Abu Dhabi GC, UAE
Phillip Cooper GTS, NSW	Nathan Lindsay Hamilton Island GC, Qld	John Spraggs Royal Wellington GC, NZ
Kevin Davis St Margaret's-Berwick GS, Vic	Peter Lonergan Coolangatta-Tweed Heads GC, NSW	Daniel Stack Windaroo Lakes GC, Qld
Nicholas Douglas Spring Valley GC, Vic	Toby Lumsden ICC Academy, UAE	Lee Sutherland St Michael's GC, NSW
Cameron Dunn Woolooware GC, NSW	Bruce Macphee ASTMA, Vic	Aaron Taylor The Lakes GC, NSW
Peter Dunn Federal GC, ACT	Dave Mason Metropolitan GC, Vic	Shaun Taylor Southern GC, Vic
Ben Evans Ryde TAFE, NSW	Garry McClymont Twin Waters GC, Qld	David Thomson Bermagui CC, NSW
Tim Fankhauser ASTMA, Vic	Tony McFadyean Nedlands GC, WA	Ben Tilley Headland GC, Qld
Peter Fitzgerald Toronto CC, NSW	Michael McMahon GTS, Qld	Steve Tuckett ASTMA, Vic
Aaron Fluke NSWGC, NSW	Peter McNamara Brisbane GC, Qld	Lee Veal Mt Derrimut G&CC, Vic
Jason Foulis StrathAyr Group, Vic	Keith McPhee Maitland City Council, NSW	Earl Warmington Newcastle GC, NSW
Patrick Fraser Landscape Solutions, NSW	Brett Merrell Ras Al Hamra GC, Oman	Rob Weiks Hoiana Shores GC, Vietnam
Peter Fraser Hervey Bay G&CC, Qld	Jack Micans Manly GC, NSW	George Widdowson Geelong GC, Vic
Adam Fry Kooyonga GC, SA		Darren Wilson Wembley GC, WA

"Earning and retaining the CSTM designation proves to my employer and the rest of the industry a high level of commitment to our profession. After going through the process, I am honoured to share this designation with my fellow colleagues and would encourage all ASTMA members to take part in the programme."

– Luke Partridge, CSTM (Manly Golf Club, NSW)

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



The RC Mowers range of remote-controlled mowers can handle embankments and slopes of up to 50 degrees. Pictured is the mid-range TK-52XP model

LEADING EDGE RC MOWERS CUT A NEW SWATHE

Colbrook Industries has announced that it has added RC Mowers to its range of land-clearing machinery in Australia and New Zealand.

As all-terrain, all-weather machines, these powerful remote-controlled mowers can handle steep inclines of up to 50 degrees, all while the operator stands 300 feet (90m) away.

The new design powers through hard-to-reach places at the same time as minimising the risk of injury to the user. These mowers are a perfect solution for the maintenance of embankments, roadside vegetation and for keeping turf in premium condition. The remote-controlled solutions can also handle wet and boggy swamp land, so are ideal for land clearing and landscaping in areas where contractors, municipalities, utility authorities and landowners often struggle to maintain.

Colbrook Industries offers three different RC Mowers models – the TK-48P, TK-52XP and top-of-the range TK-60XP. The TK-48P is ideal for small to mid-sized areas where tight manoeuvrability is needed. It is great for finished delicate turf applications and boasts a five acre (two hectare) per hour rate on slopes up to 45 degrees. The TK-52XP (pictured) is the mid-sized variant and has the versatility to cover more ground while still being manoeuvrable. Low ground pressure means

it is great for finished delicate turf applications and can operate on multiple terrain types and slopes up to 50 degrees.

The largest and most powerful model is the TK-60XP. Suited to covering large areas of grass and brush, be it on flat ground, undulating, aggressive slopes or wet swampy land, the TK-60XP is designed to handle an average of 2.5 acres (1ha) an hour and has the ability to mow tall and thick grass, as well as brush and saplings of up to 2.5cm in diameter. As the model number suggests, the TK-60XP has a cutting width of 60 inches (1.525m) and a cut height range of 63mm-165mm. The impressive range of RC Mowers have low ground pressure for wet terrain, which enables them to be used in all conditions.

All models are powered by Kawasaki engines, with the TK-60XP housing a 35hp air-cooled FX1000V engine which reaches a top speed of 8.5kph, supported by a fuel tank with a capacity of 50 litres. Featuring a push bar, chain guard, front and rear lights, ROPS, as well as a transport lock and track tension gauge, RC Mowers are accessorised with safety in mind. The deck is fabricated using 7Ga steel with quarter-inch spindle reinforcements, making RC Mowers designed for both efficiency and durability.

For more information on the RC Mowers range, visit www.colbrookindustries.com.au.

IPSWICH TO BECOME JACOBSEN MANUFACTURING CENTRE



Textron Specialized Vehicles is moving all Jacobsen equipment manufacturing to Ipswich in the UK

Textron Specialized Vehicles Inc. announced in late August that it will be relocating all manufacturing of Jacobsen professional turf equipment to its Ipswich facility in the UK. The move, which will be completed in stages over several months, will enable the company to focus its investments, skill and improvements in production on a single facility and leverage existing resources and expertise at Ipswich.

The UK plant, which currently builds Jacobsen and Ransomes mowers, is the oldest manufacturer of motorised lawn mowers in the world, in operation for more than 187 years. The UK facility will now produce mowers for all regions, including North America.

“We are excited to establish our Ipswich, UK facility as the worldwide manufacturing centre for Jacobsen equipment,” says Textron

Specialized Vehicles vice president for turf Simon Rainger. "This will enable us to operate more efficiently and expand on the legacy of innovation and quality that our Ipswich plant has built over its long history."

ASTMA Gold Partner Jacobsen continues to develop new products to serve its customers around the globe. The brand will launch a robust slate of new mowers this year, including the quiet, highly efficient Eclipse 360 ELITE electric greens mower powered by Samsung SDI lithium-battery technology and the new AR530 and AR730 contour rotary mowers, designed to be safer, easier and more cost-effective to maintain and operate.

LIVING TURF TEAMS UP WITH FOUNTAINLINE

ASTMA Silver Partner Living Turf continues to expand its product offerings by teaming up with FountainLine, an Australian manufacturer of line marking machines, grass line marking paints and accessories.

Living Turf's southern regional manager Scott Fogg says the company is very excited to be working with FountainLine moving forward. "Our clients all recognise the pedigree of FountainLine products and I believe our sales force is well placed to advocate for their use, from local playing fields right through to major stadiums and everything in between,"



FountainLine grass line marking machines, paints and various accessories are now available through Living Turf

says Fogg. "With warehouses in every capital city, and Far North Queensland, our sales team is able to service customers with line marking products all over the country."

Adds FountainLine's national sales manager Joel Baker: "Our core skills are manufacturing, supplying and supporting our distribution partners. It makes sense to place our products with Living Turf's highly respected sales and support team in the turf market."

To learn more about Living Turf, FountainLine or to obtain product information, contact 1300 556 116.

COLIN CAMPBELL (CHEMICALS) EXPANDS PORTFOLIO

Despite a challenging year, Colin Campbell (Chemicals) has taken the opportunity to push on with its product development. Recently added to its diverse turf management portfolio are:

- Sceptre fungicide (a higher strength fludioxonil which allows for lower use rate);
- Moxam insecticide (liquid thiamethoxam);
- Paclo 200 PGR (turf-specific paclobutrazol);
- Shadow Ultra PGR (trinexapac-ethyl).

SYNGENTA'S TURF REWARDS HELPS THOSE DOING IT TOUGH

In 2016, long-time ASTMA Gold Partner Syngenta launched its Turf Rewards programme as a way to support customers with educational opportunities and partnering with the ASTMA to collectively provide additional benefits to the industry as a whole. As part of the programme, turf managers gain points for purchasing certain Syngenta products, with those points then used towards a range of industry benefits such as discounted registration to the annual turf conference.

With the cancellation of many industry events this year due to COVID-19, in particular the annual conference scheduled for Melbourne, Syngenta, together with the ASTMA, has worked to modify the 2020 Turf Rewards programme.

A key component of this adjustment was the ability for sports turf managers to donate their unused points to assist those within the industry that due to circumstances, such as COVID-19, extended drought and bushfires, were unable to renew their ASTMA membership or subscriptions.



Many clubs and facilities elected to choose this 'pay it forward' option and in doing so have greatly assisted those doing it tough. As a result, the ASTMA has been able to offer memberships and subscriptions worth in excess of \$9000 to industry practitioners, ensuring many who have had a difficult 2020 remain connected.

The 2021 Turf Rewards programme was launched in early October and will run through until April 2021. The new programme features a few changes, including;

- **A new reward:** The ASTMA Certification Program. An initiative from the ASTMA aimed at encouraging turf managers to

invest in their continued professional development and recognise the value and skills of turf managers to the Australian sports and recreation industry.

- **An extra month:** Because it has been a tough year, and could potentially still be, the programme has been extended from six months to seven months.
- **A new country:** The programme is now open to turf managers in New Zealand! Syngenta is excited to include both sides of the 'Ditch', with plans for some New Zealand-specific rewards.
- **A different look:** In the spirit of continuing development, Syngenta have updated the points logging system. It will look a bit different, but has all the functionality of last year and returning customers will be able to use the same login details.

For more information regarding Syngenta Turf Rewards, contact your local Syngenta Turf & Landscape manager or visit the Syngenta ANZ Turf and Landscape website www.syngentaturf.com.au.

"We have been working to strengthen some aspects of our portfolio and these additions really help us give more solutions to common problems," says Campbell's marketing development manager Nadeem Zreikat. "As well as adding Paclo and Shadow it gives us an overall programme to manage and eliminate *Poa*."

For more information on the updated range visit www.campbellchemicals.com.au.

SIGN OF THE 'TINES'

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BY
DINT GOLF
SOLUTIONS

Brothers and co-owners of ASTMA Bronze Partner Dint Golf Solutions, Adam and Jonathan Dinte, are taking the next step in growing their fourth generation family business with the launch of a new arm of the business – Tines Direct.

"We have been supplying and experimenting with coring tines for the past three years," explains managing director Adam Dinte. "When speaking and listening to turf managers we realised that there is an appetite in the market for quality, premium tines. We have partnered with Europe's largest manufacturer KBV and can now exclusively offer a range of these premium German tines to the Australian market.

"For over 25 years KBV have been producing tines for Europe's most prestigious golf clubs and German Bundesliga soccer stadiums. As well as these premium tines, we will be offering our own range of coring tines that are positioned at a more affordable price, allowing us to cater to all ends of the market."

Tines Direct is an interactive website that features a live 24/7 chat service, live videos and images. The website has a range of tines that can be used at golf courses, race tracks and sports grounds. All existing Dint Golf Solutions customers have automatically been set up with an account which will allow them to order simply online. A quick and easy way for new customers to set up an account has also been created.

For further information on tines available, visit www.tinesdirect.com.au.

TORO'S NEW SUSTAINABILITY ENDURES PLATFORM

ASTMA Platinum Partner Toro recently announced the launch of its Sustainability Endures platform, which is aiming to strengthen its strategic focus on

sustainability and long-standing commitment to making a positive impact financially, socially and environmentally worldwide.

Sustainability Endures introduces four strategic pillars – people, products, process and planning – that help define and guide Toro's sustainability strategies and execution of those strategies. Through these pillars, Toro is focusing on environmental, social and governance areas that it believes are most material to the company and where it can make a meaningful impact, including health and safety, diversity, equity and inclusion, water conservation, product innovation and operational efficiency.

"Sustainability is not a new concept for Toro," says chairman and chief executive Richard Olson. "It is deeply rooted in our purpose and is the foundation of our strategic business priorities of accelerating profitable growth, driving productivity and operational excellence, and empowering our people. We believe sustainability practices and guiding principles rest at the core of creating long-term value and positive change in the markets we support and in the communities we serve around the world." To learn more, visit www.thetorocompany.com/sustainability/sustainability-endures.

SILVAN LAUNCHES 2020 SPRING RANGE

Spray specialist Silvan recently launched 15 new products to coincide with its 24-page Spring Time Spray Time catalogue which came out in September. The new products include backpack sprayers, utility vehicle sprayers and fire-fighting tanks. Among the new products are;

- **300L 12V Squatpak professional sprayer:** Ideal for fitting in utilities or UTV type vehicles and trailers, this sprayer is fitted with a 20L/min 12 volt high-capacity aquatic pump. A pressure regulator and

gauge is fitted to allow operators to adjust pressure when spot spraying or with a boom or boom-less nozzle. The sprayer is rated for continuous duty for pressure up to 40psi. It is suitable for booms covering up to a 9.2m swath and boom-less nozzles covering up to a 15.2m. It comes with a 30m hose reel and 10mm agricultural delivery hose and atomiser spray gun.

- **200L professional Trukpak sprayer:** The 200L UV-stabilised, polytuff, Trukpak has been upgraded with a factory-fitted pressure regulator that allows operators to adjust the pressure for spot or optional boom spraying applications. The sprayer is ideally suited to fit in either utilities, trailers, carryalls, UTV or side-by-sides and can be permanently mounted by using the brass inserts in the bottom of the tank. The sprayer is equipped with a 12V Aquatec premium quality pump delivering up to 14L/min open flow or max 4bar/60psi. A three-stage filtration system with a strainer basket under the lid, a clear view external suction filter and strainer under the nozzle is included. Other features include a 6m x 10mm agricultural hose with a PA spray gun, 3m wiring harness for 12v connection and a drain outlet to easily clean after use.

To find your local dealer, visit www.silvan.com.au or call 1300 SILVAN (1300 745 826).



The new Silvan 300L 12V Squatpak professional sprayer (above) and 200L professional Trukpak sprayer (left)



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GCSAWA

Busy times here in Western Australia with renovation season in full swing. In what was a busier-than-normal winter, it was straight into spring time with irrigation systems being fired up and turf surfaces getting aerated. Perth had a further 142mm over August and September which brings us up to a total of 560mm for the year.

Following last year's successful road trip to Kalgoorlie Golf Course, we have decided to run another regional 'walk 'n' talk' event in November, this time heading south to Denmark Country Club and Albany Golf Club. It will be two days of walking golf courses, playing golf and socialising before the busy summer months kick in.

Other events planned for November include the TAFE awards night. Thirty apprentices are graduating this year which is the biggest number in recent memory and great to see. The GCSAWA Christmas Party will once again be at the Gloucester Park trots on 27 November for all members and their families.

In mid-September we held the 30th instalment of the GCSAWA Management Trophy. Each club's management and committee form a team in a combined stableford event. It wouldn't be a golf day without **Darren Wilson, CSTM** (Wembley Golf Complex) among the prizes and once again he 'carried' his team to victory. Royal Perth Golf Club (superintendent **Michael Dennis**) and Nedlands Golf Club (**Tony McFadyean, CSTM**) finished in the places. Thanks to **Rod Tatt** at Mt Lawley Golf Club for hosting the 15 clubs that played the day.

Mid-October saw Kalgoorlie Golf Course host the WA PGA Championships. It has been a tough year for superintendent **Pat Casey (CSTM)** with just 130mm of rain for the year heading into the tournament, with close to a quarter of that falling on one day back in



PHOTOS: TONY MCFADYEAN

Kalgoorlie Golf Course was in terrific condition as tournament golf made a welcome return to the West with the WA PGA Championship in the second week of October

February! Myself and Tony McFadyean went up to volunteer for the week and the course was as usual in great condition. On the eve of this year's event came the announcement that the tournament will continue to reside in Kalgoorlie for the next three years which is fantastic news for Pat and his crew and recognition of the excellent conditions they always produce.

The following week Royal Fremantle Golf Club and superintendent **Jason Kelly** hosted the WA Open. Following the tournament Jason and his staff went straight into rebuilding two greens as part of their replacement programme.

Association-wise, we try and limit education and event days over the summer

for obvious reasons, but the new committee recently had their first meeting together and one of the main topics of discussion was getting a more formal schedule set up for the year ahead. Along with our regular teams event golf days and the continual support of the trade hosting education days, we also have the Margaret River Conference scheduled for August 2021. Fingers crossed the borders are open by then and we can get some good numbers from interstate to attend. We hope to have the dates and the first of our main guest speakers booked in by Christmas.

SHANE BAKER, CSTM PRESIDENT, GCSAWA

ON THE MOVE...

DOUG BAYLEY: From superintendent at Collie GC, WA to assistant superintendent at Mandurah CC, WA.

SIMON BOURNE: Departed as superintendent Cottesloe GC, WA after 24 years at the club, including 13 as superintendent.

BRENTON CLARKE: From foreman Kooyonga GC, SA to superintendent Warrnambool GC, Vic.

IAN 'CHOP' ELPHICK: Departed as superintendent at Gunnedah GC, NSW to

focus on developing his turf and irrigation business.

MICHAEL ERVIN: Appointed assistant superintendent Kooindah Waters, NSW.

JASON JOHNSON: From assistant superintendent Margaret River GC, WA to superintendent at Broome GC, WA.

BRAD LOVELL: From superintendent Broome GC, WA to assistant superintendent Mosman Park GC, WA.

AARON MILLER: Departed as superintendent Tura Beach CC, NSW.

MATT VROOM: From assistant

superintendent Kalgoorlie GC, WA to assistant superintendent The Cut, WA.

DAN WILKINSON: Departed as superintendent Newcastle GC, NSW.



VGCSA

On Sunday 2 August, the Victorian Government announced that Victoria would enter a State of Disaster due to sharp increases in COVID-19 cases. It was also announced that regional Victoria, including Mitchell Shire, would return to Stage 3 restrictions and that Metropolitan Melbourne, including the Mornington Peninsula, would enter Stage 4 restrictions.

Regional Victoria's Stage 3 restrictions included rules such as golfing groups limited to two people, no competitions and clubhouses closed except for takeaway services. Metropolitan Melbourne's Stage 4 restrictions were tougher, with golf courses and clubhouses closed and only 'essential maintenance' allowed by ground staff working under a 'Permitted Worker Scheme'. All clubs had to complete and implement a 'COVID Safe Plan' and record daily workplace attendance for all employees.

Fast forward three months and these conditions have only just been eased in Victoria. It is fair to say that the effects of these restrictions has been felt differently by clubs. Some have taken advantage of no golf and



With metropolitan Melbourne in Stage 4 lockdown since August, the VGCSA committee has stayed connected with members via monthly online catch ups

fast-tracked renovations or improvements, while others have withdrawn from major works and simply concentrated on maintenance.

Staffing structures have varied from full staff and full-time, to others working a few days per week and supplemented with annual leave or leave without pay. The Job Keeper government assistance has been instrumental in keeping ground staff employed.

The VGCSA committee has stayed connected with its members via monthly online catch ups, with obviously no possibility of

outdoor meetings this year. The committee will be meeting in November to facilitate part two of our strategic planning, with the goal to redevelop next year's event calendar along with setting COVID-19 restriction contingencies. Obviously this will delay the launch of the 2021 event programme and we truly hope that next year will be more 'COVID normal'.

SHANE GREENHILL PRESIDENT, VGCSA

The SAGCSA is reviewing its member events programme for the balance of this year and early 2021 and looks forward to being able to offer a full and varied offering in the near future.

We wish all superintendents, staff and clubs nationally all the best in managing a still fluid COVID-19 situation and look forward to a return of past 'normality'.

NATHAN BENNETT, CSTM PRESIDENT, SAGCSA

SAGCSA

South Australia has remained largely unaffected by COVID-19 contagions and social restrictions within golf clubs are predominantly limited to clubhouse hospitality operations. After a drier than normal winter, those who undertook turf renovations early in September were rewarded with good weather which has been followed by a return of cool, windy conditions accompanied by some of the absent winter rain.

The SAGCSA AGM was held at West Lakes Golf Club on Thursday 27 August and

was well attended. Of particular note was the strong trade representation who have remained supportive of our association during some COVID-19 induced tight economic times. All of the incumbent office holders and committee were re-elected;

- **President:** Nathan Bennett (RAGC)
- **Treasurer:** Richard James (Kooyonga)
- **Secretary:** Rowan Daymond (Grange)
- **Committee:** Stuart Gillespie (West Lakes), Sam Smith (Willunga) and Barry Bryant (Mount Osmond).

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It's not easy being green



Ask any course superintendent some of the things they have found inside golf cups and they'll regale you with tales of the downright disgusting to the downright dangerous. A member of the crew at Melbourne's Heidelberg Golf Club came across a curled up tiger snake underneath a cup while changing holes a few years back,

but more recently at Gloucester Country Club in regional NSW a much friendlier and cuter critter was stumbled upon.

Former Castle Hill Country Club superintendent of 26 years and NSWGCSA life member Martyn Black snapped this photo while visiting (read: playing) Gloucester in his role as a consultant agronomist with Golf NSW's Club Support Service.

A green tree frog had taken temporary refuge in the cup on Gloucester's 180m par three 4th hole, with Black only discovering it by chance after holing out! "The poor bugger, I must have hit it on the head! Just goes to show how good golf courses are for the environment." Perhaps in this 'COVID normal' era he was just social distancing from his mates... 🍷



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