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COVER STORY: GIANTS IN A LEAGUE OF THEIR OWN

Turf maintenance is very much a maledominated industry, but Sydney Showground grounds manager Terry O'Keeffe is doing his best to change that perception. For the past two years, O'Keeffe has had a couple of extra helping hands in the form of contracted GWS Giants AFLW players Pepa Randall and Aimee Schmidt on his team. Together with full-time horticulturist Sammy Butler and the addition of a third Giant this past season – assistant coach Krissie Steen – the Showground crew is certainly breaking the mould.

Cover photo: Sydney Showground crew members (from left) Pepa Randall, Aimee Schmidt and Sammy Butler. **Photo:** Gregg Porteous Photography.

ALSO IN THIS EDITION...

Foreword Thinking	4
Projects – Port Lincoln GC	58
Regional Profile – Yallourn GC	66
Around the Trade	72
Association Reports	74
Up the last	78



FEATURES

6

Peter McMaugh AM
Lake Karrinyup greens
2019 AGCSA FTMI
Agents of change
Around the grounds
Courses for horses
Problem patches
Beating the heat





COLUMNS PETER MCMAUGH – AUSTRALIA'S FOREMOST TURF EXPERT	40
GRASS-ROOTS WITH JOHN NEYLAN	44
COMPLIANCE CORNER WITH TERRY MUIR	60
ENVIRONMENTAL MANAGEMENT WITH KATE TORGERSEN	62
HR MANAGEMENT WITH VICKI CROWE	64



Contributors to Australian Turfgrass Management Journal Volume 21.1 (January-February 2019)

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A legacy of excellence

here do you begin to make comment on the contributions to the Australian turf industry by one Peter E. McMaugh? I'm sure many in the industry would have felt extremely proud when it was announced on Australia Day 2019 that Peter had received one of this country's highest honours – Member (AM) in the General Division of The Order of Australia.

One of 282 to be invested on the day, Peter's AM was given 'For significant service to horticulture through the development of Australian turf varieties'. In receiving the honour, Peter joined three other turf industry members to be bestowed such a mark of distinction – the late Rod Riley (breeder of Greenlees Park couchgrass), the late Charlie Smith (inventor of the level lawn, among other implements) and former Adelaide Oval curator Les Burdett. These three received the next tier down Medal of The Order of Australia (OAMs).

In this edition, two of Peter's long-time colleagues and friends – Gary Beehag and former AGCSA Board member and Royal Sydney Golf Club superintendent John Odell – pay tribute to his incredible career. It isn't until it's put down on paper that you begin to realise the exact breadth and depth of what Peter has achieved across an incredible 54 years and the legacy he has forged in the development of professional sports turf management in this country. What is more, even at the age of 83 you can bet there will still be plenty more to come.

The genesis of Peter's award came in 2016 when Gary and John, after an industry gettogether in Sydney, started discussing how important it was that Peter's contributions be formally recognised at a national level. So began the exhaustive and meticulous process of gathering together the necessary documentation, all of which of course had to be done without Peter's knowledge. Even Peter's wife Rae was in on the act and surreptitiously furnished Gary and John with important dates and details that formed part of the dossier required by the Governor General's office.

As part of that nomination, a 'principal' referee was also required. So at three o'clock one morning in mid-2016, Gary put in a phone call to College Station in Texas, home to the late great Dr James B. Beard asking if he would act in such a capacity. Gary explained to Jim the gravity of the honour his great friend was being put up for and his response was immediate – 'This is a big deal isn't it Gary, what do I need to do?" "I just want you to say 'yes' and send your resume through," Gary replied. The resume that came through weighed in at five full pages!

It was Dr Beard, who in one of his conference keynote visits to Australia in the 1980s – which, incidentally, Peter had orchestrated – said to the audience that in Peter the Australian industry had "the only man I know who knows the turf literature as well as I do." Coming from arguably the greatest turf mind ever, who sadly departed last May and as such didn't get the chance to see his mate bestowed his recent honour, such kudos speaks volumes of the respect that Peter carries.

To receive the AM is not about celebrating one's personal achievements. Sure, much of what Peter has achieved has no doubt fulfilled him immensely on a personal level, but the award isn't about that. It celebrates contribution to community and society and, in our case, an industry. As you will read in this edition, Peter's contributions are simply unrivalled and are more than deserving of such high recognition.

Peter's AM investiture is set to occur in the coming months and no doubt a few select reds will be consumed in the hours after to commemorate such a meritorious achievement. ATM salutes you Peter and we look forward to many more years of great intellect, insight and industry endeavour. Enjoy the read...

Brett Robinson, Editor

National turf seminars, AGCSA FTMI to kick-start busy 2019

Welcome to 2019 and a belated happy New Year to you all. I trust all members managed to steal some time away with family and that the new year has gotten off to a positive start. Also welcome to a new design for Australian Turfgrass Management which gives our industry-leading sports turf magazine a new look and feel thanks to the hard work of editor Brett Robinson and art director Jo Corne. I trust you will enjoy the tweaked design and, as always, we welcome your feedback.

STATE PRESIDENTS MEETING

In late November, the AGCSA caught up with the state presidents at the State Associations Meeting for a few days of discussions around current local and national challenges, opportunities and the future of the sports turf management industry. While these are a long few days, they are most worthwhile in understanding the unique situations prevailing in each state and those that are broader, such as employment and education, which are impacting the industry nationally.

A more robust plan for the AGCSA for the next 12-24 months is taking shape following these discussions, with further work to be undertaken by the team for presentation to the AGCSA Board in February, outlining the approach for the AGCSA to continue developing the industry.

TURF MANAGEMENT SEMINARS

An early deliverable on our plans is conducting a wider range of education events with the launch of the AGCSA Turf Management Seminar series to be held throughout March and April 2019. We have gathered together a good selection of industry experts aligned to the challenges discussed by the state presidents, to continue developing the skills and knowledge of turf managers in all areas of the industry. Seminar dates and venues are;

- Canberra (Manuka Oval): 6 March
- Adelaide (Adelaide Oval): 13 March
- Perth (Optus Stadium): 14 March
- Brisbane (Allan Border Field): 20 March
- Melbourne (MCG): 27 March
- Sydney (SCG): 3 April
- Hobart (Blundstone Arena): 10 April If you are interested in coming along to what promises to be a great day of education and networking opportunities, head to www. agcsa.com.au to find out more information on the sessions, including speakers and registration information.



AGCSA

EDUCATION

Through the efforts of AGCSA events and education manager Simone Staples, the AGCSA has spent many days locked in sessions with the National Turf Education Working Group over the last six months, alongside TAFE representatives, industry and local and state government bodies, to review of the Sports Turf Management Training Package.

Forming the basis of all education for the industry, this work is often undertaken without a great deal of fanfare, however, it is critical to the continued quality standard and delivery of education for the next generation of turf managers. Recent discussions have turned to validating the current delivery and assessment guides for the varying levels of qualification (e.g.: Cert II, III, IV and Diploma) currently delivered by registered training organisations (RTOs).

As part of this training package review, a series of workshops were conducted around the country, which led to discussions on feedback and opinions raised through these meetings which were then incorporated into the ongoing review, with new drafts of the Sports Turf Management Training Package and a second round of feedback scheduled for February 2019. In what promises to be a busy few months, at the same time as these sessions are being held in each state, the AGCSA is also hosting the 2019 Future Turf Managers' Initiative (FTMI) in conjunction with our good friends and Gold Partner Jacobsen. Twenty up and coming sports turf managers will descend on Melbourne in mid-March for what will be an intensive three days of learning in this innovative leadership program.

BRISBANE 2019

As you may have seen recently, the AGCSA has opened registrations for the 2019 Asia Pacific Turfgrass Conference and Trade Exhibition to be held at the Brisbane Convention and Exhibition Centre from 24-28 June. Initial announcements of speakers and the conference programme have been very well received, with a strong local and international line up of presenters, a detailed focus on current agronomic issues and a significant increase in the management and leadership areas.

Registrations are open through the AGCSA website – www.agcsa.com.au – with further announcements on topics and presenters to be made over the next few weeks, so make sure to follow the AGCSA social media platforms to stay up to date.

And speaking of social media, in the leadup to the conference and following on from the success of last year's launch, the AGCSA will again run the Thank a Superintendent Week' campaign in May. The 2018 campaign generated a lot of very positive feedback from both industry practitioners and the wider golf industry and we look forward to again providing an avenue for our members to get the recognition they deserve.

As always, I encourage you to discuss your thoughts on ideas for the industry with the AGCSA at any time and I look forward to seeing you at one of our upcoming events in the next few months. Ju





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Giants in a league of their own

Turf management is very much a male-dominated industry, but Sydney Showground manager Terry O'Keeffe is doing his best to change that perception. For the past two summers, O'Keeffe has had a couple of extra helping hands in the form of GWS Giants AFLW players Pepa Randall and Aimee Schmidt. Together with full-time horticulturist Sammy Butler and the addition of a third Giant this past season – assistant coach Krissie Steen – the Showground crew is breaking the mould.

> erry O'Keeffe is an ideas man. He's also a top bloke – just ask his crew – and always open to giving things a crack. So a few seasons ago, when he was having difficulty getting casuals to work the summer at Sydney Showground, he needed to think outside the box. The answer he eventually stumbled across was literally in his backyard.



ARENAS



Sydney Showground curator Terry O'Keeffe says Schmidt and Randall have been fantastic additions to the crew over the past two summers

Since the arrival of the Greater Western Sydney Giants in 2012, the Showground complex has had a new lease on life. The main arena playing surface and stadium was redeveloped to accommodate the new AFL franchise, while a new training facility – Tom Wills Oval – was also constructed. O'Keeffe was appointed grounds manager in late 2011, arriving after eight years at the SCG.

Back then the Showground's events calendar was minimal. It was the primary venue for the Royal Agricultural Society's huge annual Easter Show, hosted local sports carnivals as well as the likes of the Big Day Out and Soundwave music festivals. There was no summer sport at all.

Fast-forward seven years and how that has changed. The Showground is now a true multi-purpose arena and in addition to still hosting the country's longest-running agricultural show, it now regularly entertains AFL premiership games, Western Sydney Wanderers A-League matches and many other one-off events, such as Nitro Circus.

The biggest change, however, has come over the summer months with the arrival of Big Bash cricket. Having played the first four BBL seasons at the adjacent ANZ Stadium, at the end of the 2014/2015 season the Sydney Thunder franchise announced it had signed a 10-year deal to play all its home games at the Showground starting from 2015/2016. The ground has just finished hosting its fourth full season of BBL fixtures and next year will also be one of the primary venues for the Women's T20 World Cup.

Around the same time as BBL arrived, the Giants were also expanding. Women's football was on the rise and in mid-2016 the club was one of eight to be granted a licence to field a team in the inaugural 2017 AFLW competition. Despite a difficult first season, where they finished last, in 2018 they suprised many by narrowly missing the finals.

While their male counterparts are on lucrative, multi-year professional contracts, AFLW players are semi-professional and contracted season to season. The majority of the Giants list come from interstate – they call themselves 'the Misfits' – and for the six months they are in Sydney (October to March) many will find employment outside of the club to supplement their footy income.

Part of O'Keeffe's remit is maintaining the Giants training complex and over the past two years has struck up a good relationship with AFLW head coach Alan McConnell. It was during a casual conversation last preseason that the former Footscray footballer mentioned to O'Keeffe that a number of the girls were looking for jobs and whether he had anything going. It just so happened he did. Thanks to the additional workload over summer brought about by the BBL, he needed some extra hands and had been struggling to find suitable staff for that period.

'Supply' meet 'demand' – McConnell had the players, O'Keeffe had the coin and the positions to fill. As O'Keeffe quips, "Me being a good bloke and open to anything, I said to Alan, 'Let's have a go – how bad could they be?'" So one day soon after at Giants training, the players were asked who would be interested in a job at the Showground. Two put their hands up straight away.

GIANT BOOST

The journey that Pepa Randall and Aimee Schmidt have taken to reach the elite level of AFLW is typical of most female footballers. They played alongside the boys up until the age of 12, after which time they couldn't progress simply because there was no pathway. For Randall that meant turning her attention to soccer, athletics and tennis throughout high school, while Schmidt hit the basketball court. Both, however, would inexorably be drawn back into footy after school finished and never looked back.

Randall (22) hails from Melbourne and comes from solid Hawthorn Football Club stock, her grandfather Trevor and greatgrandfather Viv both wearing the brown and gold. Randall's first taste of senior football came with the St Kilda Sharks in 2015 and later that year she made the Big V. In 2016 she joined VFLW side Eastern Devils and with AFLW coming on line in 2017 was drafted to Melbourne. A broken ankle pre-season sidelined her for the inaugural season and she was eventually traded to GWS.

2018 proved to be a breakout year for Randall. She established a reputation as one of the competition's best defenders and made the initial AFLW All-Australian squad. After the season had finished, she then helped Hawthorn clinch the VFLW premiership.

Randall is guite the character and super competitive and since joining the Giants has developed somewhat of a cult following, not only for her hard-nosed brand of footy but her off-field antics as well. One of those became etched in club folklore last season after a post-match video interview. Resplendent with hair in a towel and chowing down on a burrito, Randall answered questions about the game in between mouthfuls. The clip went viral and was later immortalised on t-shirts (Google 'Pepa Randall burrito' for a laugh).

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Schmidt (25) also hails from interstate and grew up on a small farm on the northern outskirts of Perth. A guick forward with an eye for goal, she played for the Coastal Titans in the Women's WAFL and represented her state before being selected by the Giants in the inaugural AFLW draft at pick 17. She played five games last season, kicking two goals in the third round win against Collingwood, but the highlight came two rounds later when the Giants travelled west and defeated Fremantle in front of her family and friends.

Playing footy semi-professionally and juggling the demands of training, travelling and playing makes it difficult for players like Randall and Schmidt to hold down regular jobs. Schmidt is a qualified PE teacher, while Randall previously held a number of part-time jobs, including a role in the office of Cricket Australia. Finding something that is flexible and fits in around footy is rare, which is why both of them jumped at the chance to join the Showground crew. Having enjoyed their first season and slotting in with the existing crew perfectly, O'Keeffe had no hesitation in getting them back for a second stint last October.

"They're a couple of crackers," says O'Keeffe of his new charges. "They are great girls, terrific personalities and have added a real spark to the crew. They are so easy going and will do anything asked of them. They have been a perfect fit for us and adapted

that well that they really now do everything that our qualified guys are asked of.

"We roster our team around the girls' plaving and training commitments. I think it's only fair to be conscious of why they are here in the first place and that's to play footy. They are helping us out, so I try my best by rostering them on at times which suit them.

"With the strong attachment to the GWS training field which we maintain, they really do now appreciate what goes into preparing a surface for footy and the other sports we host here. That's one thing I've loved watching - they've really embraced what we do and they'll often come back from games and start talking about the grasses and the condition of the surface. Some of our Monday morning debriefs have been quite entertaining."

FEMALE FORCE

Such has been the success of having Randall and Schmidt on board, that this past season O'Keeffe has added a third Giant to the crew in the form of Krissie Steen. A highly accomplished coach from SA, Steen was brought across as an assistant coach for 2019 and like Randall and Schmidt has transitioned seamlessly into the crew. Together with the Showground's full-time horticulturist Sammy Butler, O'Keeffe now has four females on his team which is almost unheard of in such a male-dominated industry.





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Butler's story is fantastic in its own right. Joining the team in 2016, Butler makes the three-hour round trip to work from Ourimbah on the Central Coast every day. In addition to her hort role, Butler also assists O'Keeffe and 2IC Steven King with maintaining the playing surfaces thanks to her dual qualifications in both parks and gardens and sports turf.

Last year she took unpaid leave to travel to the UK and broaden her industry knowledge base, spending three months at Campey Turf Care Systems and a further three at Arsenal FC's training venue.

While more than adept to holding her own as the sole female member of the crew prior to the arrival of Randall and Schmidt, Butler says their addition has certainly helped to balance the ledger. "They have fitted in really well and it's good to have some others to help pick on the boys," laughs the 27-yearold. "We have a lot of laughs with Pepa and Aimee and they certainly give as good as they get. They're willing to get their hands dirty and have developed a genuine interest in what we do, which is great to see."

TURF MANAGERS IN THE MAKING

While footy is still the No.1 priority for both Randall and Schmidt, both are quick to admit they have a new-found appreciation for the fine art of sports turf management as a result of their time on the crew. After learning the basics in their first year, this second season has seen them take on more responsibilities. Shadowing King for much of last summer, they have graduated to playing a key role in looking after the arena's practice wickets, in addition to tending to the GWS training field. Randall in particular has taken a real shine to the profession and O'Keeffe is eagerly encouraging both to look at the possibility of undertaking some sort of formal training.

"The longer I have been here and the more I think about it, it's definitely something

As part of their role on the crew, Randall and Schmidt have developed a greater awareness and appreciation as to what goes into preparing surfaces for elite level sportsmen and women I could see myself doing," admits Randall. "It has been great to branch out and do something different. I had a lot of fun last season; everything was new and I think I asked about 2000 questions of everyone. I'm sure Steve was pretty sick of me after the first couple of days. I like the scientific side of turf management and I'm always asking Terry and Steve about chemicals, reading the labels and trying to figure out what each chemical does and how it works at a cellular level.

"I love the fact that I now know what goes on behind the scenes. You take it for granted – you play on turf all the time, but you never really appreciate what it takes to get it prepared. Now that I know what goes into preparing a ground, especially here where there are a lot of quick turnarounds between events, it gives you a different perspective."

Adds Schmidt: "It's quite funny. We'll go to training now and the rest of the girls will give us a hard time over any imperfections on the ground. We do get a little protective. We even find when we are reviewing training session videos, we will be commenting on how good the lines look or something about the ground, instead of watching what we are supposed to be watching!

"We enjoy maintaining the training ground because we are the ones actually getting the

Showground horticulturist Sammy Butler took unpaid leave to broaden her career last year, spending six months working at Arsenal Football Club and Campey Turf Care Systems in the UK

benefit of playing on it. I do find myself talking about turf a lot more than most things these days and sometimes I feel like the coach talks to me more about turf than footy!"

Regardless of whether a future career in turf management beckons, there is little doubting that their time at Sydney Showground has been rewarding. Both are extremely grateful for having a job which provides them flexibility, while at the same time working with a great group of people.

"He might not be able to kick a footy to save his life (O'Keeffe claims proficiency off both feet - Ed), but Terry's probably one of the best bosses I've ever had," claims Randall, a sentiment that is echoed by Schmidt. "He is mindful of our football commitments and working around those, which makes things so much easier. He never makes you feel guilty for putting footy first because he knew that in taking us on that is what we were here to do.

"The guys here do some mad hours and Aimee and I do sometimes feel a bit guilty if we have a day off because of footy. We cop our fair share of payouts when footy takes priority, but at the end of the day they're really supportive. It's such a bonus that we love working here and when we are here we put in and help out as much as we can.

"It's a bit like a footy team. We talk a lot of trash and the banter is pretty funny at times. It's a light-hearted, fun environment and I really do enjoy coming to work each day. You are always having a laugh and we all get along really well, but when you need to get stuck in you do. I think Aimee and I have lucked it big time and I know there are quite a few of our teammates who are pretty jealous of how good we have it." \pm



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A Meritorious honour Peter E. McMaugh AM, B.Sc, Agr, FAIAST

Australian turf industry icon Peter McMaugh received one of the country's highest honours on Australia Day – a Member of The Order of Australia. Gary Beehag and John Odell look back on the career of one of the great turf minds of our generation.

> n Australia Day 2019, Peter E. McMaugh (B.Sc. Agr. FAIAST) was awarded The Order of Australia at the level of Member of the Order (AM) for his services to the Australian turfgrass industry. The Order of Australia celebrates and recognises Australian citizens who have made outstanding and significant contributions to the Australian way of life. Peter has had an unequalled and dedicated career in the Australian amenity horticulture and turfgrass industry spanning over five decades and continues to do so.



The global turf industry brains trust pictured at the 2017 13th International Turfgrass Research Conference in New Jersey. From left the late Dr Jim Beard, Drs Paul Rieke, Dick Schmidt, Joe Vargas and Australia's own Peter McMaugh AM

LEGACY OF EXCELLENCE

Peter McMaugh has amassed a multitude of professional memberships

and awards during his five decades of dedication to the turf management profession. Among them are; **1970:** Member of the Weed Society of NSW:

1973: Joined the International Turfgrass Society (ITS), served on Board of Directors (1985-2000) and nominated President (1993-1997) for 8th ITS Conference (University of Sydney);

1981-83: Board member of the Musser Foundation (USA);

1983: Co-organised the Turf Growers Association of New South Wales and elected president in 1985;

2000: Recipient of the Australian Sports Medal; recipient of the AGCSA's highest honour, the Distinguished Service Award; 2002-2005: Foundation Board Member of Turf Producers Australia (TPA); 2003: Recipient of Life Member of Turf Growers Association of New South Wales: 2004: Recipient of Honorarv Member of Turf Producers International (TPI): 2005: Recipient of Life Member of New South Wales Golf Course Superintendents Association (NSWGCSA); Fellow of the Australian Institute of Agricultural Sciences and Technology; Recipient of Greening China Award (honoured at a state lunch in Western provinces in China for contributions for assistance during the 1990s to set up turf farms in Tianjin, China; 2009: Recipient of the Graham Gregory Award for excellence in horticulture (Horticulture Australia Limited). First person in the Australian turfgrass industry to be given this prestigious award;

2010: Initiated the Peter McMaugh Scholarship with the NSWGCSA to cover tuition and expenses during the first year for successful candidates enrolled in the Master of Agriculture (Turf Management) at the University of Sydney;

2013: Recipient of Medal of Excellence, Weed Society of NSW;

2014: Member of scientific panel – 3rd International Conference on Turfgrass Management and Science for Sports Fields (Brisbane);

2017: Awarded Turf Australia Hall of Fame membership (pictured above).

University of Sydney. His passion for botany and plant science enabled Peter to have the distinction of being the first person in Australia with an agricultural degree to be appointed on a permanent full-time basis as a consultant/ researcher in the turfgrass industry. In 1964 Peter was employed by the nowdefunct Grass Besearch Bureau/Australian

defunct Grass Research Bureau/Australian Turfgrass Research Institute and was its director from 1975-1978. His unrelenting quest for knowledge for all things turfgrass and his acute understanding and practical application of plant science and physiology of grasses became unequalled in Australia and later recognised overseas. In 1979, Peter established his consulting company Turfgrass Scientific Services Pty Limited.

Peter graduated with a Bachelor of

Science in Agriculture in 1964 from the

Peter is widely known throughout Australia and overseas as a turfgrass consultant, educator, researcher and turfgrass breeder. However, very few people are aware of his involvement in turfgrass technologies. Unquestionably recognised as Australia's foremost authority on turfgrass, Peter's life-long devotion of turfgrasses and their management has benefited so many people and organisations in the wider Australian turfgrass industry, not just cricket wicket curators, golf course superintendents and racecourse managers. For over 40 years, he has been a notable keynote speaker at numerous regional, state, national and international seminars and conferences.

AN EDUCATOR AND MOTIVATOR

One of Peter's single, greatest legacies as a turfgrass educator was the exposure of the Australian turfgrass industry to notable, overseas turfgrass researchers and scientists by interacting and inviting them to speak at the national conferences in Australia. The results were two-way. Australian turfgrass managers benefited from a wider knowledge base and overseas persons engaged in the turfgrass industry recognised the worth of the Australian industry.

The first person was the late Dr Jim Beard in 1973. Other eminent persons include Drs Richard Smiley, Jim Watson, Jeff Krans, Joe Vargas, Henry Indyk, Arden Baltensperger (USA) and John Escritt (UK). Numerous other overseas persons continue the legacy to this day. Of Peter's depth and breadth of the turfgrass literature, Dr Jim Beard in 1988 at the Perth conference made the comment "in Peter McMaugh you have here in Australia the only man I know who knows the turf literature as well as I do".

Understanding the importance of turfgrass education, Peter over many years has devoted time as a member of the advisory committees of the then Hawkesbury Agricultural College (now University of Western Sydney, Richmond) and Ryde School of Horticulture (now Ryde TAFE, Sydney). He made a significant contribution with Mike Clune to the reconstruction of the greenkeeping syllabus. Peter was also involved in the post-graduate Diploma/ Masters course taught by Professor Peter Martin of the University of Sydney for which he was the external examiner between 1994 and 2008. He has also been a guest speaker at the University of Queensland (Gatton).

In wanting to further empower Australians, Peter initiated the Peter McMaugh Scholarship in 2010 with New South Wales Golf Course Superintendents Association (NSWGCSA) to



In 2009 McMaugh became the first person from the turf industry to receive Australian horticulture's highest honour – the Graham Gregory Award

cover tuition and expenses during the first year for successful candidates enrolled in the Master of Agriculture (Turf Management) at the University of Sydney.

AN AGRONOMIST AND CONSULTANT

As the consummate turfgrass consultant, Peter has been commissioned to consult on existing and new golf course, sportsground and racecourse projects throughout Australia and South East Asia.

Over the years, he has been commissioned on numerous golf construction projects particularly during the boom decades of the 1980's and 1990s. Peter consulted directly to notable golf course architects such as Graham Marsh, Jack Nicklaus, Robert Trent Jones Jr, Pete Dye, Reece Jones, Peter Thomson and Michael Wolveridge, Watson International and Michael Coate on golf course projects in Australia and throughout South East Asia. Among some of his golf projects included Shah Alam (Malaysia 1990) for the Sultan of Selangor and Tuanku Jaafar Country Club (Malaysia 1990) for the King of Malaysia.

Outside golf, Peter has further been involved in numerous elite sports and cricket grounds, polo fields and racecourses around Australia and in Singapore. He consulted to Consolidated Press (the late Kerry Packer) on cricket wickets for the introduction of World Series Cricket at the then Sydney Showground (Sydney) in 1978. He originated the concept of drop-in wickets used everywhere today.

Peter has also consulted to the Melbourne Cricket Ground (MCG) in 1981/82, North Sydney No. 1 Oval in 1984 (the first sandbased oval construction in Australia), Western Australian Cricket Association (WACA) cricket wicket re-construction and Homebush Stadium (now branded ANZ Stadium, Sydney) in 1989 and the new Royal Agricultural Society Showground arena. Peter was also involved in the construction of Allianz and Parramatta stadiums which are currently being rebuilt. Peter also grassed seven polo fields for the late Kerry Packer at Ellerston. During recent years, Peter has been consulting on turf matters at the National Stadium in Singapore.

AN AUTHOR

Peter wrote two booklets – the first 'Bowling Green Construction' (33p, 1968) and the second co-authored with the late Vince Church 'Golf Green Construction' (36p 1970). Peter as an author is listed in Jim Beard's mammoth publication 'Turfgrass History and Literature' (2014). Over the decades, Peter has written a multitude of extension articles and scientific-based papers in Australian and overseas conference proceedings and journals including the International Turfgrass



McMaugh with his AGCSA Distinguished Service Award (bestowed 2000) and Greening China Award (bestowed 2005)

Society Research Journal. He was a long-time columnist for TurfCraft International magazine and since 2018 has continued to provide his unique insight through the pages of Australian Turfgrass Management Journal.

A TURFGRASS DEVELOPER AND BREEDER

One of Peter's greatest passions is improved turfgrass varieties in recognising the potential benefits of Australian ecotypes of buffalo grass and couchgrass. Among the notable examples of Peter's involvement in the selection and subsequent commercialisation of turfgrasses are Greenlees Park (early 1970s), Wintergreen (1981), Windsor Green (1993) and Sir Walter soft-leaf buffalo (1996). Collectively, these four varieties represent the most widely grown and successful turfgrasses on turf farms throughout Australia.

Windsor Green couchgrass was the first couchgrass cultivar in Australia to be developed and commercialised through Plant Breeders Rights (PBR). Peter has also been involved in assisting others in their development of other buffalo, couch and seashore paspalum varieties. He has been engaged since 1996 as a 'Qualified Person' for PBR applications and continues to develop improved couchgrass varieties. During the 1980s and 1990s large quantities of his turfgrasses were exported to South East Asia and the Middle East.

A TURFGRASS TECHNOLOGIST

Over the years Peter has been intimately involved in the design and development of several turfgrass industry technologies. It was during the early 1970s that Peter provided technical assistance to Frank Forrest of Melbourne, then owner of the Ron Kayedesigned ride-on motorised bowling green rollers. Today, the Australian multiple-roller technology of bowling and golf green rollers is exported worldwide. He also introduced the 'Verti-Drain' technology to the turf industry in Australia. Peter co-developed with the late Charles JP Smith the tractor-mounted 'Level Lawn'.

During the 1980s Peter independently developed a mechanical, row-planting unit and a horizontally-oriented, pressurised waterwashing unit to produce washed sod. Today, numerous turf growers around Australia continue to benefit from further improvements of such technology. Peter was also involved in the development of a eucalyptus/ leptospermum oil-based insecticide mixture. This mixture was subsequently registered as the first organic-based insecticide for turfgrass application in Australia.



McMaugh developed and commercialised some of the most widely grown and successful turfgrasses in Australia, including Wintergreen and Windsor Green couchgrass

A TURFGRASS PRODUCER AND CONTRACTOR

From 1974 to 2005 Peter owned and developed the 40-hectare Qualturf farm at Richmond, NSW which grew his own turfgrass varieties. He served as honorary secretary for the NSW Turf Growers Association for over 15 years and was primarily responsible from 1998 to 2001 in making submissions to NSW Water on behalf of the association, which ultimately saved the turf farmers' water extraction rights on the Hawkesbury River. The race course industry has also benefited from his expertise in building and supervising horse racing tracks in Sydney, country NSW and Perth.

A RESEARCHER

Peter's involvement in turfgrass research began way back in the late 1960's supervising research into plant-feeding nematodes in the Newcastle (NSW) region. In more recent years, Peter has been team leader in the investigation of the occurrence and taxonomy of turfgrass mites in warm-season turfgrasses funded by Horticulture Australia Limited (HAL). This project was the first of its kind ever conducted on turfgrass in Australia.

Peter's contributions to weed control saw him conduct efficacy trials for the introduction of the then new herbicides endothal (for wintergrass control) and siduron (for the control of couchgrass invasion into bentgrass putting greens). The ground breaking work on nut grass control earned him the NSW Weeds Society Medal of Excellence in 2013. Peter is currently engaged in developing new herbicide and insecticide mixtures to meet current industry needs.

EDITOR'S NOTE

Australian Turfgrass Management Journal and the AGCSA join with Gary Beehag and John Odell in congratulating Peter McMaugh on the receipt of his Member of The Order of Australia. Kudos also needs to be given to Messrs Beehag and Odell who were responsible for nominating Peter for this most prestigious honour.



McMaugh has had an unequalled and dedicated career in the Australian amenity horticulture and turfgrass industry spanning over five decades and continues to do so

THE SCIENTIST WHO GOT HIS HANDS DIRTY

rue to his character, Peter McMaugh was deeply humbled when news broke of his 2019 Australia Day honour. He penned the following letter and poem of thanks to an industry which he has helped to mould and develop over the past 54 years...

"I am both surprised and deeply grateful for the award of Member of the Order of Australia, granted to me by the Governor General in the Australia Day Honours List 2019. I see this award as recognition of the turfgrass industry and its special role in providing a safe, healthy environment for our survival into the future and of which I have been privileged to be a part.

"The citation for this award – 'For significant service to horticulture through the development of Australian Turf Varieties' – acknowledges a small, but very important, part of my career achievement. I have been fortunate to be the right person in the right place at the right time as a scientific pioneer in Australia. This has enabled me to have a major influence on the direction and development of the industry over 54 years.

"During these years as scientific researcher, consultant, turfgrass breeder, commercial turf producer, educator and specialist machinery developer, I am the scientist who got his hands dirty at the coal face and learned a great deal in the process.

"I would like to say thank you to the many collaborators with whom I have worked over the years. Among them are



As a scientific researcher, consultant, breeder, turf producer, educator and machinery developer, McMaugh has never been afraid to get his hands dirty and learn a great deal in the process

the greens keepers, farmers, scientists, secretaries and especially my wife Rae on whom I have relied for help and inspirations. Without them the body of work that was behind this award could not have been achieved. "This honour culminates and complements many others that I have received both in Australia and Internationally. It stimulates me to continue all aspects of my work, which gets more productive and better with time. My passion is just as great now at 83 as it was when I started aged 29 in 1964. I hope to deliver yet more goodies for many years to come.

Appreciation is a great thing to do Expressing gratitude is important too So to my friends (or are they foes) I thank you all who felt disposed To say nice things in songs of praise That have led others to appraise My fitness for a national honour This honour is a chance for me To look long back and see The sweat and tears that brought me here Not just my own but many others Whose help and insight gave us the gears To ride the race as bonded brothers Through many long and twisted years This honour also includes others For all who love the smell of grass We must not let this opportunity pass To recognise and praise this profession In which we share the fortunate obsession

Of keeping the environment safe Which makes the health and wealth of others

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PETER E. MCMAUGH AM, B.SC. AGR, FAIAST

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Greensup at Lake Karrinyup

Over the past two years Lake Karrinyup Country Club has reconstructed its greens from Penn G6 to 007 creeping bentgrass. Superintendent Fraser Brown gives ATM an insight into how the project unfolded.

Over two stages in 2017 and 2018 all 18 greens at Lake Karrinyup were converted from Penn G6 to 007 creeping bentgrass. Pictured is an aerial of the 10th green n mid-February, Lake Karrinyup Country Club hosted the tri-sanctioned World Super 6 Perth. The tournament capped off an extremely busy three-year period for the club with two separate nine-hole construction programmes while also hosting the two previous World Super 6 events and an Australian Amateur Championship amongst a number of other changes.

It has been an eventful three years in what has already been quite an eventful career that has spanned four different countries. I started my career in 2002 as a temporary summer labourer at a small course in the Highlands of Scotland, but with very few opportunities around I moved to Fife and enrolled in a full-time greenkeeping course at Elmwood College. Upon completion of the course I accepted a role at my home town course where I stayed for seven years, progressing from newly qualified greenkeeper to deputy head greenkeeper.

I have always been interested in progressing professionally but also traveling and experiencing new cultures. When a job was advertised to form part of a small experienced team to construct and grow in a new championship course in Kiev, Ukraine I was very interested. I was quickly offered a position and within two weeks of accepting the role I was on the ground in Eastern Europe. Due to the extreme weather in Ukraine, the construction was split into three phases. My role was largely to grow in phase one which had been seeded with creeping bentgrass (greens, tees and surrounds) and ryegrass (fairways). I worked closely under superintendent Steve Jones across the 18-hole construction and the other two nine hole courses on the same site, overseeing a staff of more than 60. Part of the role was to train local staff, many of whom had never seen a golf course or spoke English, so they could then take over maintenance once the course was grown in and opened.

After the course successfully opened in November 2010, I left Ukraine. I thoroughly enjoyed my time in Kiev and actually met my now wife Stanislava in the small country town where the course was located. Ironically, it was through contacts in Ukraine that I was then offered a position at the new Kalgoorlie Golf Course in Western Australia.

I delayed my start at Kalgoorlie to travel to The Royal Golf Club in Bahrain to assist superintendent Mark Hooker prepare his course for the inaugural 2011 Volvo Golf Champions which was the first European Tour Event to be held in the country. This was a fantastic experience – I was on fairway duty and mowed the newly-oversown ryegrass fairways at 8mm with boxes on for around 20 days in a row, often double cutting. Once the tournament was over I flew to Kalgoorlie to start my new role with McMahons. The course in Kalgoorlie was my second desert course but it was unique to anything I had seen before. In my opinion, it is possibly one of the most underrated courses in Australia. Within 18 months I was offered the superintendent's position and we set about improving conditions.

Kalgoorlie is an extremely challenging site due to climate, remoteness, lack of grass golf course maintenance experience in town and the difficult native red Kalgoorlie soil. We built a good team of trained local staff and overseas greenkeepers who wanted to experience life and work in Kalgoorlie. In June 2015 course maintenance was taken back in-house by the City of Kalgoorlie-Boulder and I was appointed the superintendent. After a continual improvement in course rankings and hosting five Western Australian PGA Championships, I was then offered a fantastic opportunity to be the superintendent at Lake Karrinyup Country Club.

GREENS FOCUS

Starting at Lake Karrinyup in November 2016, the course had fallen in the rankings and the club was looking to make some changes, particularly to the greens. The condition of the greens declined further and the decision to resurface was brought forward to June 2017.

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We set about using various consultants from around the world who are very strong in their field to advise on grass selection, profile, design, irrigation set-up, water quality and shade. Our aim was to take advantage of the situation, not just repair the greens without solving the contributing factors but to create the best growing environment possible to ensure long-term success.

We previously had Penn G6 bentgrass on the greens which had initially been chosen after a rigorous selection programme on course. For whatever reason, the G6 unfortunately did not quite live up to the expected standard out on course. This time with no on course trials we were reliant on a number of different trials, NTEP trials, advice from other superintendents, agronomists' advice and research scientists based in San Diego (which has a close climate match to Perth's). We narrowed the choice down to three grasses, with a visit from Dr Micah Woods helping confirm the choice of 007 for our new greens. 007 is a proven success at various projects around the world, but I was a little concerned as I had not seen it personally. Apart from forming part of the Dominant X-treme blend, it was not really used in Australia.

Density was an important factor that was considered as I wanted stronger coverage through the winter months and increased competition for *Poa annua*. 007 scored extremely well in many areas such as texture, density and disease resistance in the NTEP trials, plus it had a strong history of performing well in hot climates with a less than ideal water source. It was definitely a show of faith from the club to select this grass and in hindsight I am extremely happy with its performance and would select it again.



We engaged Sports Turf Technology in Perth to conduct an in-depth study into the existing greens, proposed materials, nematodes and irrigation consistency. This gave us a huge volume of information that allowed us to analyse deficiencies and assist us making informed decisions on the best construction process and materials.

We also asked Sports Turf Technology to study our water quality, with the results showing quite a common theme here in Perth. We had moderate levels of salts and a high level of bicarbonates present in our bore water. We decided that we wanted to aim for best practice, so we looked at ways to manipulate the water quality.

I had previously looked into a sulphur burner when in Kalgoorlie, so I spoke to Sweetwater in the US to produce a report based on our water tests that showed the improvements a sulphur burner would make. The promised results were extremely encouraging so the club agreed to purchase a unit. A year on the results are very impressive. We still have the salts at the same level, but we have dropped bicarbonate levels from 284ppm to <5ppm and the pH has dropped from 8.3 to 6-6.5.

Above: Consistency has been the basis of the ongoing maintenance of Lake Karrinyup's new greens. Superintendent Fraser Brown aims to dust them weekly, keep cutting heights between 3mm to 3.25mm and carefully managing moisture

Left: In addition to the greens conversion, greenside bunker complexes have also been tweaked, moving from an edged look to a more rugged appearance The club also engaged Dr Richard Hurley as course consultant. Richard formally taught the Rutgers University Turf Program and now consults to many courses around the world including Augusta National and Bayonne Golf Club. He also recently advised Wentworth on the reconstruction of their West Course. Richard has assisted me in a number of areas from construction through to everyday maintenance.

WORKS BEGIN

To minimise disruption to members and considering the scale of works at short notice, we decided to split the construction over two winters – front nine 2017 and back nine 2018. The scope of works for the green reconstruction included;

- Removing 100mm of material from the greens surface.
- Removing 300mm in a two-metre perimeter around the greens, where a 007 bentgrass collar would replace the couchgrass collar.
- Reinstating original depths over green and collar.
- Massaging the surface to within USGA tolerances to allow for more pins and increased run off areas.
- Seeding green and collar with 007 using a drop-seeder and dimple method then covered with Evergreen grow sheets

to encourage germination in winter temperatures.

As far as greens design was concerned, we asked course architects Ogilvy Clayton Cocking Mead (OCCM) to increase the amount of pinable areas, increase the number of walk offs, improve surface water movement, enhance transitions from green to surround and redesign the bunkers from an edged look to a more rugged look with rolled over turf. The members have been very happy with the new designs on the greens surfaces.

The front nine phase commenced in June 2017 for a November opening, with the back nine starting in April 2018 for an October opening. The 11th green received quite a bit of attention and was stripped back to the gravel layer and completely rebuilt. It was a green in the shape of a valley with too few pins and the ones we did have were in the low area which then thinned out through wet winter conditions. It is now a two-tier green with significantly more pins and more challenging pins close to contours and bunkers.

Both phases saw germination after 8-9 days which was good with soil temperatures down to around 13°C. We had a strong growin process using both a mix of high quality slow-release granular fertilisers and upfront liquids. In my experience, the use of the growth covers increases the humidity so I generally expect to see some disease activity early, but it is worth the germination results. We experienced minor outbreaks of damping off and take all which was anticipated and controlled.

The front nine greens opened at the end of November 2017 and had a real baptism of fire. Numerous club events were scheduled, we hosted the Australian Amateur Championship in January and then in February the World Super 6 returned. This saw a decline in turf quality after this period due to working the greens just a little too hard during a warm period, but once temperatures dropped the greens continued to improve and are now in a very strong position.

The challenge going into these events was having the front nine looking great but very immature and not knowing what they could handle, compared to the back nine which by now had some serious issues and needed to be nursed through these events.

Through the process of planning for new greens I asked what the members wanted from the new greens. Lake Karrinyup has traditionally been a club that pushes the greens for pace but the feedback I received was firmness and trueness. The feedback from the members has been fantastic, they are very happy with the condition of the greens and also the new subtle changes OCCM incorporated.



A timber boardwalk along the par three 8th signature hole has also been recently constructed

BRIGHTER FUTURE

Consistency has been the basis of our ongoing maintenance of the new greens. We aim to dust the greens weekly, keep the height of cut between 3mm to 3.25mm and carefully manage moisture. Nutrient applications are made through a range of high quality slow-release granular products and fortnightly foliar applications applied in low water volume.

As is the same at many clubs, *Poa annua* in the greens is one that is talked about and identified by members. Our previous longterm maintenance plan agreed that *Poa annua* must not exceed 5 per cent. On the new greens we are aiming to keep it down as close to zero as possible and this started by reducing *Poa* across the whole site.

We previously had significant areas of cool-season grasses between tees and fairways and also in the roughs. These have now been transitioned to Wintergreen couch which has allowed us to increase the area of herbicide applications so there is now significantly less *Poa*. In the greens themselves, both my team and volunteers regularly identify and remove 16mm plugs of *Poa* on the greens and 20 months after seeding it is difficult to identify a *Poa* plant in the new greens.

Lake Karrinyup is a heavily tree-lined course which, while attractive, does cause significant shade issues which was of particular concern. We engaged Perth-based ArborCarbon who devised a method of quantifying hours of light each green receives

An aerial survey by ArborCarbon identified trees to remove to negate shade issues with the new greens. Pictured is the 7th green each day of the year and displaying on a flyover image. We then picked the greens of concern and were able to select individual trees which they would remove from their programme then remodel to give a before and after.

On a course inspection I believed there may be close to 80 trees that needed removing, but using their programme we reduced that number to 24 trees. The decision was made to remove these trees subject to government approval, which was a difficult and drawn out process but one we were successful in. These trees have now been removed and new native trees have been planted in an out of play area. I would now expect to see an improvement through the winter months on these greens in regards to root development, disease reduction and firmer surfaces.

I have been fortunate that the general manager Damon Lonnie and the committee at Lake Karrinyup are ambitious. For many clubs the work to the greens and bunkers would be enough, but on top of the major project work and tournaments we have also extended the clubhouse to include a new modern dining area on top of the previous 1st championship tee. We have also installed exposed aggregate paths through the course for the first time in the club's history, built a timber boardwalk along our par three 8th signature hole, constructed several new tees and also custom-designed our range of furniture.

The 2019 World Super 6 was the first time all 18 new greens were in play. We headed into the tournament happy with our conditions, but also aware that we had the front nine greens which had a year to settle down compared to the back nine which were only open three months.

It has been a long and tough three years, but I am lucky to have an experienced team and we are now at a stage where the course is finally getting to where the members deserve it to be.



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Heath D'Altera from Kingston Heath Golf Club is one of 20 successful candidates chosen to participate in the 2019 Future Turf Managers' Initiative



Since 2016, the AGCSA Future Turf Managers' Initiative has helped to equip up and coming turf managers with the necessary skills required to take the next step in their careers. This March, the Class of 2019 will be hoping to garner those when they converge on Melbourne.

n June 2016, Rowan Daymond was one of 13 participants in the inaugural intake for the AGCSA Future Turf Managers' Initiative, presented in partnership with Jacobsen. At the time the assistant superintendent at The Grange Golf Club in Adelaide, Daymond was immersed in an intensive two days of seminars, many covering aspects of the industry he had not been exposed to before or only had a little grounding in.

Speaking after the FTMI, Daymond commented in Australian Turfgrass Management Journal: "The FTMI was a great networking exercise and a chance to cover topics you may not always encounter in your daily work activities. The sessions taught me how to embrace all differences when managing staff and I got a good handle on



areas for improvement or more involvement (e.g.: budgets).

"The HR side of the programme outlined my strengths and also highlighted weaknesses which you tend not to focus on so much. For me, communication has been an area I need to work on. Now I know how people may respond to my natural way of talking/acting which will help me address situations in a more positive way and help me connect with people/staff better and hopefully influence them in a positive way to achieve higher standards/efficiency for our club."

Just over a year after attending the FTMI, in August 2017 The Grange Golf Club announced that Daymond had been appointed as their new course superintendent. No doubt some of the skills he learnt during the FTMI have helped him to settle into the role over the past 18 months and now in 2019, as this edition goes to print, he finds himself leading his team as they prepare the West Course for the 2019 ISPS Handa Women's Australian Open.

Daymond is just one of the many success stories that the FTMI has produced over the past three years and with the 2019 FTMI looming he is set to make a return, but this time as a superintendent mentor. One of the unique features of the FTMI is the inclusion of four superintendent mentors who help to guide the participants and impart their experiences from the coalface.

Having been in the shoes of many of this year's candidates just a few years ago, Daymond will be able to provide some fascinating insights into his progression and what challenges he has faced since taking



the step up. Daymond is the newbie this year and joins returning mentors Travis Scott (Riversdale Golf Club, Vic), Leon Hennessy (Cromer Golf Club, NSW) and Leo Barber (Paraparaumu Golf Club).

"We are absolutely delighted that Rowan has agreed to be a mentor in 2019," says Karen Proctor, director of global marketing for Textron Specialized Vehicles, who will again attend this year's FTMI. "His knowledge of the industry, expertise in greenkeeping and his previous experience on the course make him an ideal mentor to help support the next generation of course superintendents. Rowan is a prime example of how the programme has played a part in FTMI graduates taking that next step in their career and this year's class will definitely benefit from his experience."

Twenty candidates will front up in Melbourne from 17-19 March, 16 from Australia and four from New Zealand. Looking through their respective dossiers, there is a considerable breadth of talent and mix of background and experiences. Martyna Synak, the current assistant superintendent at Oatlands Golf Club in Sydney, originally hails from Poland and worked in Sweden, the US and New Zealand before settling in Australia.

Synak is one of four candidates this year to have undertaken an internship through The Ohio Program, while a further four have had broad experiences working placements overseas in the UK, Canada and Mexico. A number of candidates are also exceptional golfers in their own right, some having played Division 1 pennants while one is a former professional. Here then is the FTMI Class of 2019...

JARED ARMITAGE

Emerald GC, Qld Armitage started his apprenticeship in January 2008 at Cootamundra Country Club, NSW working on golf and bowling greens under the guidance of Geoff Holt. After completing his studies through TAFE NSW Riverina and then CIT, Armitage took charge of the course from the retiring superintendent.

In January 2012 he shifted to the NSW south coast as assistant superintendent at Tura Beach Country Club before moving to Melbourne later that year. After four years working with a bowling green contract company, in 2017 he started as superintendent at Emerald Golf Club in Queensland. The highlight of his time there to date has been the large improvements made to the putting surfaces at Emerald and rectifying some major irrigation and pump issues.



GREG ASKEW

City of Newcastle, NSW For the past 18 years Askew has worked for the City of Newcastle,

rising from the apprentice ranks to his current role based at Newcastle's only regional facility – the No.1 and No.2 sportsgrounds.

In that role for the past 12 years, Askew manages all turf surfaces for local, state and international cricket, soccer, rugby, rugby league and AFL. The venue has hosted the likes of the Sydney Swans, Wallabies and British Lions, acted as a training venue for the Asia Cup and hosted Women's World Cup Cricket and state cricket.

In addition to his work with the City of Newcastle, for the past five years Askew has been involved in the development of soccer pitches and teaching turf management techniques in India, working with international consulting company Pro Pitch (Pro Leisure) for the Indian Super League and U17 World Cup. His career highlight to date came in late 2017 when he managed two stadiums and 14 training facilities for the Club World Cup in the UAE. The Lakes Golf Club assistant Aaron Taylor (second from right) played an integral role in delivering the course for last year's Emirates Australian Open



HARRY BRENNAN

Dubbo Regional Council, NSW Brennan started his greenkeeping journey as an apprentice with Dubbo City Council in 2012 after

completing a Bachelor of Sports Business through the Australian College of Physical Education. Since starting as an apprentice, Brennan has been involved in preparing for a wide variety of major events including City v Country NRL, national rugby championship games, state-wide Koori Knockout and other local cricket and league matches.

After early completion of his apprenticeship in 2015, Brennan was put on as a greenkeeper by the council and by the end of that year was elevated to a team leader role. That role sees him maintain 75 hectares of sporting fields, including the purpose-built, sand-based rugby league field Apex Oval, seven cricket wickets, two turf practice wickets and one synthetic athletics track with a team of three greenkeepers, two plant operators and two apprentices.

One of Brennan's main goals has been to improve the playing surface at Apex Oval and reduce the ERI that was present so that it could cope with the 150-plus games it hosts during the winter season. This required a lot of research and improvement of the field's maintenance programme through soil, tissue and disease testing, as well as selecting a more suitable ryegrass for the surface. More recently he has also been involved in the running of special projects, including the installation of a nine-station irrigation system at Kennard Park in Wellington.



2016 FTMI participant and now superintendent Rowan Daymond, returns in 2019 as one of four superintendent mentors



MARK BROOKS Riversdale GC, Vic

Originally from New Zealand, Brooks got into the game of golf at the age of 11. After playing

for several years and maintaining a scratch handicap, he followed his passion for the game and enrolled in a greenkeeping course at Otago Polytechnic. During the two year course he balanced his studies while playing representative golf for his province.

After three years working at the picturesque Queenstown Golf Club, Brooks then applied for The Ohio Program. Placed at Quail Hollow in North Carolina, during his time there he experienced three PGA tournaments. From there he worked a summer at Whistling Straits which hosted the 2010 US PGA Championship, a major career highlight for Brooks. From the US, Brooks headed to the UK and was based at Sunningdale Golf Club before moving back home to New Zealand and taking on the role of senior greenkeeper at NZ Open host venue The Hills for three years.

With no senior positions becoming available and the small industry in New Zealand, Brooks decided to broaden his horizons again and in 2015 moved to Melbourne. Landing on his feet, he secured a role as a turf tradesperson at Royal Melbourne Golf Club before shifting over to Riversdale Golf Club as foreman under FTMI superintendent mentor Travis Scott. He returned to competitive golf by playing Division 1 pennants for Victoria Golf Club in 2016 and 2017 and at the start of 2019 was elevated to the role of Riversdale assistant superintendent.



HEATH D'ALTERA

Kingston Heath GC, Vic One of a number of excellent golfers in this year's FTMI field, D'Altera is a former professional

who back in 2003 claimed the coveted Masters of the Amateurs 'Green Jacket'. To put that achievement in perspective, in 2006 Jason Day won the same event. Enamoured with the game of golf since the age of 10, D'Altera went on to win the Victorian and Tasmanian Junior Championships as well as represent Victoria a number of times in the Interstate Series where he played alongside Marc Leishman. He also played in a number of Victorian and Australian Opens, making the cut at Moonah Links in 2003 as an amateur.

While pursuing his dream to become a professional golfer, D'Altera worked as a casual at Geelong Golf Club. Despite turning pro in 2005, D'Altera eventually gave that away to focus on a career in turf management which combined the two things he was passionate about – fine turf and golf. Along the way he has been fortunate to work at



2019 FTMI participant Taylor Wills was among the course volunteers at the 2018 Emirates Australian Open at The Lakes

Metropolitan, Woodlands and Barwon Heads golf clubs and for the past eight years has been part of the crew at Kingston Heath. He has worked his way up to foreman under superintendent Hayden Mead and is currently in charge of running a number of projects, allocating tasks for staff and training up new staff and apprentices. D'Altera is currently studying a diploma in management and leadership.



After working in golf for a number of years, Scott Mortimer is now helping to improve the sports surfaces at the City of Kingston

DAVID EGAN Adelaide Oval, SA

Growing up in country Victoria, Egan dreamed of one day working at the Melbourne Cricket

Ground. His entry into the turf industry came via a horticulture apprenticeship at the local council before moving to the botanic gardens in Hamilton (Vic) where he completed his final two years. Moving from the Southern Grampians Council to the Northern Grampians Council, Egan worked on the sportsfield and wickets at St Arnaud before moving to Yarrawonga in 1999 where he got his first taste of golf course management.

In late 2002 Egan moved to Adelaide and worked for a turf contracting company before eventually finding himself as superintendent of the now-closed Belair National Park Golf Club. From there Egan obtained a senior groundsman role at AAMI Stadium in Adelaide and after three years became head groundsman, overseeing a small team for the final four seasons of AFL football. With the redevelopment of Adelaide Oval, Egan was appointed as turf manager under Damian Hough and has been an integral part of the team there for the past five years.



ROHAN FARROW

Mount Lawley GC, WA Farrow started out as an apprentice greenkeeper at Kalamunda Bowling Club in

the Perth Hills before finishing his training at Hartfield Country Club. From there he progressed into several roles within the grounds staff including irrigation technician, assistant superintendent and ultimately superintendent in 2010. In 2011 the club won the Golf Course of the Year Award at the WA Golf Industry Awards.

After three years in the top role, Farrow left the industry to pursue a career running a landscape design and construction business. However, in 2015 he was lured back into turf when the assistant superintendent role at Mount Lawley Golf Club was advertised. Soon after starting he became the acting superintendent, a position he held for a twoyear period, before returning to the assistant's role which he still holds currently.

Among the highlights of his time at Mount Lawley, Farrow project managed the installation of a new irrigation system, being involved from the conception stages of design through to overseeing the installation works. The club also successfully hosted the recent 2018 WA Open, where Farrow was tasked with planning, scheduling and programming an expanded staff to help prep the course.





MATTHEW JEWELL Warrnambool GC, Vic

After working in the pro shops and clubhouses of a number of golf clubs in regional Victoria, at

the age of 19 Jewell started an apprenticeship at Huntingdale Golf Club. After completing his apprenticeship, during which time the club hosted the Victorian PGA Championship, Jewell decided to gain some more experience overseas and was lucky enough to secure a position St Andrews Links in Scotland.

He would spend two years at St Andrews, eight months as a seasonal and then in a full-time position for the remainder of his visa. Highlights of working at the 'Home of Golf' included the 2015 Open Championship, two Alfred Dunhill European Tour events and The R&A Medal. Now back in Australia, Jewell currently works as the assistant superintendent at Warrnambool Golf Club under superintendent Dave Warnaar.



BRAYDAN MILLAR Rowes Bay GC, Qld

Growing up in a small country town in northeast Victoria, sport has always been a way of life for

Millar. He started playing golf at the age of 16 and that led him to ultimately becoming a greenkeeper. Having moved all around his home state of Victoria, then to the USA for a 12-month internship and now to Townsville, Millar has always been eager to learn as much as he can from each venue and also share his ideas from past experiences.

Career highlights for Millar include his Ohio Program internship where he was placed at the famed Pine Valley Golf Club. While there he also got to volunteer at two PGA Tour events – The Barclays at Plainfield and WGC Cadillac Championship at the Blue Monster Course at Trump National in Florida.

Millar ventured to Rowes Bay Golf Club in April last year and quickly became a great asset to course superintendent Jason Bushell. In just a short amount of time Millar has proven he has the ability and desire to be a future leader in the industry.



SCOTT MORTIMER City of Kingston, Vic

In his 11-year turf management career, Mortimer has been involved in various sectors of the

industry. He completed his apprenticeship at Holmesglen TAFE and throughout his studies was awarded Apprentice of the Year in all three years. During his apprenticeship he worked at various bowling greens around Melbourne, including the Melbourne Bowling Club which is one of the oldest in Australia.

Upon completing his apprenticeship, Mortimer then moved to the Commonwealth Golf Club as a senior greenkeeper, during



NZGCSA FTMI CANDIDATES

Remuera Golf Club, NZ

Life has certainly dealt Cameron a number of curve balls, but helping him

through some of the tough times has been his passion for greenkeeping and the wonderful people that are involved in the industry. A father at the age of just 21, at the time he was a greenkeeper at the public access Chamberlain Park course in Auckland's west. After five years there a change of job came about and for seven years he was a postie before deciding he wanted to return to working on a golf course which he missed.

Cameron joined Auckland's Remuera Golf Club in late 2014 with the goal of studying for his Level 4 qualifications. It was a bumpy start heading back into greenkeeping life and a week before he left NZ Post a close workmate died. Then in January 2015 his mother was diagnosed with motor neurone disease which she succumbed to that August. Having his son full time at that point, dealing with his mother's illness, not to mention study and full-time work, would have been enough to challenge the most hardened of individuals. but for Cameron he found solace in his work and his workmates. (As a tragic aside, Cameron and the Remuera crew also recently suffered the loss of crew member Jarryd Davidson following a car accident).

In 2016 Cameron was appointed irrigation technician and in October 2017

Originally from Poland, Martyna Synak, pictured here volunteering at the 2014 Emirates Australian Open, is now assistant superintendent at Oatlands Golf Club in Sydney

which time he completed his Diploma. While there he worked two weeks as a volunteer at Royal Melbourne Golf Club for the 2015 Women's Australian Open, a fantastic experience which gave him a great insight into tournament preparations.

In June 2018 Mortimer made the decision to join the City of Kingston sports ground maintenance crew, where he currently holds the position of 3IC/foreman. In his short time there, he has already learnt different aspects and working methods which are helping to develop his skillset further. A driven and level headed individual, Mortimer's attitude and work ethic has had a significant impact on the council's sports turf team and the level of presentation of Kingston's ovals has benefitted from his knowledge and attention to detail.



was elevated to the role of assistant under course superintendent Spencer Cooper where he helps to run a crew of 10. In addition to his senior role, during his time at Remuera Cameron has prepped the course for two NZPGA Championships (2015 and 2016) and final of the 2017 World Masters Games. He has also volunteered at the 2017 NZ Open LPGA at Windross Farm and the 99th NZ Open at Millbrook Resort.



HARRY MIDDLETON

Tauranga Golf Club, NZ Twenty-two-year-old Middleton originally hails from the UK but moved to New Zealand with

his family at the age of eight. Playing golf from a young age, he harboured dreams of becoming a professional but after realising that probably wasn't going to happen started volunteering at his local golf course Omokoroa, just north of Tauranga, during the school holidays. Discovering a love for turf, when he left school a part-time job became available at the club before he moved across to the larger Omanu Golf Club.

After completing his Level 3 and Level 4 qualifications, Middleton applied for work in the UK and was lucky enough to get a position on the Old Course at St Andrews for the summer of 2017. Middleton is currently the assistant at Tauranga Golf Club where he is enjoying learning how to maintain and establish couchgrass surfaces.



SCOTT REID

Country Club Tasmania, Tas Reid joined the greenkeeping team at Country Club Tasmania, just outside of Launceston, in

2004 and since then has gone on to achieve his Diploma. He also recently completed an associate degree in golf operations management through the Golf Management Institute of Canada.

During his time at Country Club Tasmania, Reid has helped prepare the course for two Tasmanian Opens and back in 2009 was a volunteer at the Australian Masters. These events gave Reid invaluable knowledge on how a tournament runs and the background and work that goes into creating a successful tournament.



RHYS SHORT

Shelly Beach GC, NSW After playing professional football with Parramatta Football Club, in 2003 Short was given

his first opportunity in the turf industry by Kenton Boyd at Fox Hills Golf Club where he completed his apprenticeship. With Fox Hills switching to contract maintenance, Short headed to Gosford Golf Club on the Central Coast as a tradesman and between 2007 and 2008 was involved in the club's major irrigation upgrade.

Wanting to take his career further, Short landed a role at Killara Golf Club in Sydney under Ryan Fury. As well as working at a prestigious club and developing his knowledge, Short also completed his Certificate IV before a phone call from Shelly Beach superintendent Andrew Banning saw him heading there as 3IC. In 2012 the assistant's role became available when Brett Woodward moved to Armidale Golf Club, with Banning having no hesitation in elevating Short.

Seven years on and Short has gone on to complete his Diploma as well as a Certificate III in Landscape Construction. His role at Shelly Beach encompasses many facets including overseeing the course and the clubhouse gardens and surrounds. He also oversees the irrigation system and installation and repairs. Short is in charge of the e-par environmental management system and the club's environmental land management practices.



RYAN STORES Royal Canberra GC, ACT

Stores has packed a lot into the first eight years of his turf management career. Undertaking

an apprenticeship at Yowani Country Club in Canberra in 2010, Stores was awarded ACT Apprentice of the Year in 2014. He then spent the next 13 months living and working in



During his time in the US, Ryan Stores volunteered at a number of major tournaments, including the 2017 Presidents Cup

America as part of The Ohio Program where he was placed at the prestigious Quail Hollow Club.

Returning to Australia, he had small stints at both The Australian and Royal Canberra golf clubs before travelling back to America for the 2017 PGA Championships at Quail Hollow. After a further eight months in the US he returned home last September to take on the assistant superintendent role at Royal Canberra, Australia's only wall-to-wall bentgrass course.

Stores considers his time at Quail Hollow as the defining moment of his career to date, both in 2015/16 as an intern and 2017/18 as an assistant in training. While there he was introduced to the highest calibre of greenkeeping in the world, learning the techniques and demands of professional golf tournaments and how to meet the high expectations of an exclusive membership. He also had the opportunity to work at five major professional golf tournaments, including the US PGA Championship, the 2017 President's Cup, The Wells Fargo Championship, The Wyndham Championship and The Barclays. The 2017 US PGA Championship at Quail Hollow was the standout event, with Stores pulling a 106-hour week!



MARTYNA SYNAK Oatlands GC, NSW

Synak studied horticulture in her native Poland and after working

for a short time on a golf course there decided to apply for The Ohio Program. Placed for 12 months at Harbour Town Golf Links in South Carolina, the opportunity to work on a high standard golf course and prepare for the PGA Tour's RBC Heritage event opened up her eyes to the possibilities the industry could offer. To that end, she also undertook a Golf Course Management Certificate and Advanced Golf Course Management Certificate through Ohio State University, achieving distinction level in both.

Despite being offered the 2IC role back at her old club in Poland, Synak felt she wasn't ready and instead took on a seasonal role at Ingaro Golf Club in Stockholm, Sweden. Her boss at Ingaro was Melbournian Craig Koch who encouraged her to look into the possibility of working Down Under. Arriving initially in New Zealand, Synak ended up getting a visa to work in Australia and took up a position at Riverside Oaks in Sydney's west.

After volunteering at the 2014 Emirates Australian Open at The Australian Golf Club, in 2015 the 3IC role came up at Oatlands Golf Club which she successfully applied for. Following Dominic Yates' elevation to superintendent in the latter half of 2016, Synak moved into the assistant's role where she has continued to excel.



AARON TAYLOR The Lakes GC, NSW

Taylor couldn't have asked for a better grounding in greenkeeping. New South Wales Golf Club

is one of Australia's best and after calling up then superintendent Gary Dempsey out of the blue to see if he had any positions available, he was given a start. Working at such a prestigious course under one of Australia's most experienced superintendents provided Taylor with a unique opportunity and he was involved in numerous projects and tournaments.

Among those were the 2009 Australian Open, the conversion of greens from *Poa annua* to Mackenzie bentgrass, hole reconstruction and managing the installation of a new irrigation system. Taylor says his career there was able to progress thanks to the abilities of those around him and a drive to learn anything and everything about golf course management, both on and off the course.

A few months before the completion of the irrigation system at the end of 2015, The Lakes Golf Club advertised for an assistant superintendent, with Taylor getting the nod. The position has only increased Taylor's previous skills exponentially and most recently he played an integral role in helping superintendent Anthony Mills deliver the course for the 2018 Emirates Australian Open.

Since starting at The Lakes, Taylor has assisted Mills build a strong team through staff management, contributing to the development of programmes and managing all irrigation schedules and installations. A current club initiative sees both Taylor and fellow assistant Simon Blagg invited to board meetings on separate occasions to experience this level of club management.



TAYLOR WILLS The Kew GC, Vic

Wills moved to Melbourne from Darwin in 2009 to pursue a golfing career. While this didn't

eventuate, in the process he became a member at Victoria Golf Club and played Division 1 pennant for them. In 2013 he started working as a casual at Riversdale Golf Club and began an apprenticeship shortly after. The first 18 months of his apprenticeship didn't go smoothly, but after some gentle guidance and a few changes Wills realised that golf and turf management was for him.

During his time at Riversdale he took responsibility of the club's WH&S matters which involved him doing training courses as well as chairing meetings, contributing to meetings, implementing safety rules and handling safety concerns. He was also accepted as an apprentice volunteer for the 2016 World Cup of Golf at Kingston Heath.

Wills moved across to The Kew Golf Club as foreman in May 2018 under superintendent Cameron Hall and is enjoying the new challenges that have faced him since starting. Hall has been impressed with his new recruit's professional approach, knowledge of the trade and work ethic. In November Wills was part of the volunteer team at the 2018 Emirates Australian Open and is about to embark on his Diploma. ^{Ju}

NZGCSA FTMI CANDIDATES

PHIL MARRA

Shandon Golf Club, NZ Marra's entry into the golf industry in 2001 wasn't exactly conventional and came

after a period as a mechanic foreman at an automotive dealership. Although completely new to golf, Marra had always enjoyed horticulture and sport, so quickly transitioned while completing an apprenticeship and continuing his studies.

Shandon Golf Club has not only produced some great regional representative golfers but also well rounded greenkeepers and superintendents. Marra takes a holistic approach to course management. He values gaining a better understanding of the natural resources available, surrounding environment and utilising staff strengths. He strives to build on what already exists and aims to leave his work and play environments a little better each day.



BEN SIMONS

Cape Kidnappers, NZ

Growing up in nearby Havelock North, Simons applied for a job at the renowned Cape

Kidnappers as a summer casual after his final year at school. From there he fell in love with the lifestyle and opportunities the profession could offer, as well as living out his dream in working in the sports sector.

Four years on from his first day he became a qualified greenkeeper and decided to travel the world and challenge himself. He had stints working on the Old Course at St Andrews in Scotland, El Dorado Golf and Beach Club in Mexico and Big Win Island Golf Club in Canada. Working with different grass types, different cultures and different day-to-day golf course maintenance practices has given Simons a well-rounded outlook on what it takes to become a superintendent. Simons is currently back working at Cape Kidnappers.



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Agents of change

It has been another brutal summer for Australian turf managers, with many parts of the country in widespread drought. In the first of a two-part feature, ATM looks at the important role of wetting agents and some of the factors to consider when developing a programme for your facility.

here is a seemingly endless pipeline of new wetting agents available to help superintendents address various agronomic and playability challenges. Sifting through manufacturer claims to determine which products fit best in your wetting agent programme can be difficult to downright overwhelming.

Numerous agronomic and environmental factors influence wetting agent performance in turfgrass. Therefore, understanding how wetting agents interact with water and soils under different agronomic and environmental conditions is critical to developing an effective wetting agent programme.

WHAT ARE WETTING AGENTS?

Wetting agents are surfactants – **SURF**ace **ACT**ive Age**NTS** – that have been designed to improve moisture retention in hydrophobic (i.e., water repellent) soils and overall soil moisture uniformity (Zontek and Kostka, 2012). They accomplish this through their ability to reduce the surface tension of water and restore the polar bond between water and soil particles (Bauer et al. 2017). Most wetting agents used in golf course maintenance are designed to uniformly increase water availability to turfgrass, which can ultimately reduce the amount of water that must be applied to maintain healthy turfgrass.

Wetting agents have become a staple of golf course maintenance. In a 2013 survey funded by the USGA, more than 90 per cent of superintendents reported using wetting agents in their agronomic programmes. Numerous chemistries and products have been researched as wetting agents since the 1950s, but recommendations for specific products are difficult to ascertain because results from year to year and region to region are highly variable (Throssell, 2005 and Karnok, 2013). Furthermore, product claims, superintendent anecdotes and scientific research on wetting agents often contradict one another, which makes selecting a specific product difficult (Soldat, 2010, Karnok, 2013 and Bauer et al., 2017).

PRODUCT SELECTION

Despite a plethora of claims by manufacturers, many wetting agents provide very similar results on turfgrass. Differences among products may include the need to be watered in after application, tank-mix compatibility and duration of efficacy.

Most importantly, much of the variability in performance between products likely has little to do with the products themselves. Agronomic and environmental factors such as soil type, amount of organic matter present in the soil, application rate and soil moisture can play a more significant role in wetting agent performance than product formulation.

Additionally, variation in product use from region to region can have more to do with product pricing, marketing and local industry professionals' recommendations than actual differences in product performance. Maximising the performance of the wetting agent you select begins with knowing how agronomic and environmental factors impact wetting agent performance.

APPLICATION TIMING AND INTERVALS

It is best to treat hydrophobic soil conditions preventatively rather than curatively. Research has shown that applying wetting agents prior to the onset of hydrophobicity can result in fewer localised dry spots (LDS) and an increased ability to rewet soils if they become hydrophobic in the future (Song et al., 2014). Preventative wetting agent applications can also have a positive impact on turf performance during stressful conditions by increasing water and nutrient availability and promoting deep rooting.

Unfortunately, determining follow-up application rates and intervals is difficult. Recent research indicates that products with higher labelled rates maintain longer residual



effects from late autumn applications (Bauer et al., 2017). However, a national study in the US showed performance differences between these same products. This indicates that variables such as organic matter concentrations, soil type and application rates may play a significant role in determining the appropriate application intervals for a given product (Throssell, 2005).

DEGREE OF HYDROPHOBICITY

The degree of soil hydrophobicity plays a significant role in the performance of wetting agents. Soils become hydrophobic due to a coating of hydrophobic organic compounds on soil particles (Song et al., 2014). Furthermore, sand-based soils are more likely to be hydrophobic due to the small specific surface area of sand particles (Song et al., 2014). The severity of hydrophobic conditions is based on the time it takes a water droplet to penetrate the soil;



- Wettable (0-5 seconds)
- Slightly hydrophobic (6-60 seconds)
- Hydrophobic (60-600 seconds)
- Water repellent (> 600 seconds)

Increased application rates and postapplication irrigation are needed to rewet soils with high levels of hydrophobicity. Also, additional applications are likely needed for extremely hydrophobic soils to regain their ability to hold moisture.

PRE- AND POST-APPLICATION SOIL MOISTURE

The amount of irrigation applied after a wetting agent application plays a critical role in product performance. Superintendents report varying results with the same product by simply altering post-application irrigation amounts, timing and intervals. While there is no rule of thumb to guide irrigation after a wetting agent application, when doubt exists the product should be watered in.



Top: The surface tension of water is very difficult to break in hydrophobic soils without the use of wetting agents. Above: A water droplet test is a quick way to diagnose hydrophobic conditions

WETTING AGENTS



Sand has a high propensity for hydrophobic conditions, making putting greens most susceptible

Maintaining detailed notes on the irrigation procedures that follow a wetting agent application is critical to achieving and repeating the desirable results. It is important to take note of the rate at which irrigation was applied. Slow irrigation rates are likely to decrease surface runoff, resulting in more accurate delivery of the wetting agent to its intended target.

Regular soil moisture meter use is imperative to maximise and fine tune the benefits of wetting agents. Soil moisture readings should be taken before and after wetting agent applications to determine how much irrigation is needed to achieve the desired effects of a particular product. Nearly every wetting agent label indicates how much irrigation water should be applied post application. However, few, if any, take into effect the soil moisture prior to application because other variables such as organic matter content and soil type are at play.

ORGANIC MATTER

Organic matter concentrations play a considerable role in wetting agent performance because wetting agents can become strongly bound to organic matter particles in the soil. Putting greens containing elevated levels of organic matter may be less likely to experience the same benefits from some wetting agents as those with low organic matter concentrations (Soldat, 2010).

Wetting agent applications should never replace sound organic matter management practices. Adequate organic matter dilution in the upper portion of the rootzone is the foundation for a healthy, firm putting surface. Excess organic matter will hold more water than desired with or without wetting agent applications. This is not to say wetting agents are not useful, but they should only complement proper organic matter management, not replace it.

It is well known that soil moisture inversely affects surface firmness. A recent two-year

study examining the effects of 13 wetting agent products on surface firmness yielded conflicting year-to-year results with the same products (Bauer et al., 2017). Despite some product claims regarding increased firmness, organic matter management and weather are much more likely to influence surface firmness than wetting agents. Some wetting agents also make claims about increased putting green speed. This is something that is also difficult to ascertain under all conditions. If in doubt, ask to see the data.

SOIL TYPES

A majority of wetting agent research has been performed on sand-based putting greens because of sand's propensity for hydrophobicity (Song et al., 2014). Although fine-textured soils have a low inclination for hydrophobic conditions, they can still benefit from wetting agent applications even though the results may not be as significant. It is important to note that soils that have been heavily modified with sand – e.g., native soil putting greens, fairways and tees that have been topdressed with sand – are prone to similar hydrophobicity characteristics as sandbased soils.

TURF SPECIES

As mentioned earlier, the depth to which a wetting agent penetrates the soil varies based on organic matter content. Therefore, penetration depth can be controlled with proper organic matter management, wetting agent application rates and irrigation.

Anecdotal evidence suggests the depth to which a wetting agent penetrates the soil has considerable plant health implications depending on the depth of root growth. For example, *Poa annua*, with its shallow root system, will likely require lower wetting agent application rates and less post-application irrigation than bentgrass.

WEATHER AND SEASONALITY

Superintendents often report that some wetting agents produce unfavourable playing conditions by softening the putting surface, but these claims are not known to have been replicated in research. Seasonal weather could play a role in these observations – specifically hot, humid and wet conditions.

SPRAY VOLUME AND TANK-MIXING

When applying wetting agents, high spray volumes should be used so that the product is more easily moved into soil. When used as part of a tank mix with other products, wetting agents can sometimes enhance the efficacy of pesticides and fertilisers. Only tank mix products after determining compatibility.

Some pesticides may already contain adjuvants and surfactants to maximise their efficacy. Adding an adjuvant or surfactant to



The two dark areas of this hydrophobic soil core are less hydrophobic than the surrounding soil, which has allowed very limited infiltration

other pesticides could prevent the product from reaching its intended target or, even worse, result in a phytotoxic response. Always follow labelled instructions when making plant protectant applications.

FREQUENTLY ASKED QUESTIONS

Confused yet? Don't worry, you're not alone. Many superintendents find themselves asking why there is so much variability when evaluating wetting agents. The above factors help us understand why that variability exists. Answering the following common questions about wetting agent use with a combination of anecdotal findings and scientific research can help you develop a successful wetting agent programme.

Can wetting agents improve water use

efficiency? Yes. Research has shown that wetting agents improve water use efficiency on sand-based putting greens (Soldat et al., 2010). Plots treated with a wetting agent under deficit irrigation (i.e., irrigated to replace only 30 per cent of ET losses) yielded similar turf quality as plots irrigated to replace 100 per cent of ET losses. During the second year of this two-year study, the deficit-irrigated plots exhibited drought symptoms; however, plots treated with wetting agents recovered by the end of the season while untreated plots did not. • Wetting agent applications should never replace sound organic matter management practices. This is not to say wetting agents are not useful, but they should only complement proper organic matter management, not replace it.

-Jacobs and Barden

Can wetting agents help manage LDS? Yes. Wetting agents can correct LDS and prevent it from developing. Preventative applications are better because they can improve soil moisture uniformity at lower rates than curative applications. Also, LDS is a problem that is easier to prevent than it is to fix. When making wetting agent applications to large areas, products that persist in the soil for longer can help reduce reapplication frequency.

Should I use a wetting agent to help flush the upper profile? Wetting agents do not necessarily move salts, but they can help move water through the soil profile. This facilitates the flushing of salts, and possibly organic acids, that could contribute to LDS.

Are wetting agents effective on native, finetextured soils? Yes. While fine-textured soils are less prone to hydrophobic conditions, wetting agents can still be an effective tool to maintain healthy turf. As with all wetting agents, make sure to leave an untreated check area to determine if a product is performing as intended.

Can wetting agents help mitigate wet conditions resulting from inclement weather? Yes. Preventative wetting agent applications have been shown to help reduce soil moisture in the upper profile following heavy rain events (Soldat et al., 2010). However, soils with excess organic matter are less likely to experience this benefit as wetting agents tend to bind to organic matter. Managing organic matter and internal drainage are still the primary means for improving infiltration and surface firmness, but wetting agents can be a great supplement.



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WETTING AGENTS



These research plots show the benefits of wetting agents during drought conditions

Can wetting agents provide firmer playing conditions? Research has not shown wetting agents to provide firmer surfaces under similar irrigation regimes. However, there are two factors to consider when answering this question in a real-world scenario;

Moisture uniformity;

Using less water to maintain healthy turf

It is well documented that wetting agents improve soil moisture uniformity (Karcher et al., 2009). Maintaining uniform moisture in hydrophobic soils is nearly impossible. Oftentimes, turf adjacent to hydrophobic areas becomes overwatered because water applied to them does not penetrate; it moves laterally to the adjacent non-hydrophobic area.

Additionally, putting greens with LDS often receive extra irrigation as a result of overcompensation. Over-irrigating nonhydrophobic areas increases the potential for turf decline and inconsistent playing conditions. By improving soil moisture uniformity with wetting agents, a putting green can be irrigated more evenly and with less water. This can indirectly lead to a firmer surface by simply reducing the amount of soil moisture needed to maintain healthy turf.

Will a late-autumn application reduce the risk of winter injury on putting greens?

Some superintendents make autumn applications of wetting agents in an effort to minimise the risk of winter injury related to desiccation or saturated soils. Initial research shows that wetting agents can reduce the potential for winter injury on ultradwarf bermudagrass putting greens, but no research has been conducted on coolseason turf (DeBoer et al., 2017). Making a



Soil moisture readings should be taken before and after wetting agent applications to determine how much irrigation is needed to achieve the desired effects of a particular product

late-autumn application is not a sure-fire way to prevent winter injury but, given the potential benefits, limited risk and small area to treat, it may be worth it.

Can wetting agents cause a phytotoxic response? Yes. Some wetting agents have a phytotoxic effect on turf under certain conditions, mainly during hot weather and intense sunlight. Under these conditions, it is common practice to apply sufficient postapplication irrigation to move the wetting agent off turf leaf blades and into the soil.

TESTING PRODUCTS

When determining which wetting agent to purchase, keep in mind that many may provide similar results. As with all products, use an untreated test area when evaluating product performance. Maintain accurate and detailed notes regarding application timing, weather, pre- and post-application soil moisture, irrigation amounts, application rates and any other factors that may impact product performance. Lastly, it is advisable to seek the input of a third-party agronomist when selecting a wetting agent.

FUTURE OF WETTING AGENTS

Clearly, there is no one-size-fits-all approach to developing a wetting agent programme. Given the myriad of products available, inconsistent research results and numerous factors that influence their performance, providing a universal wetting agent programme is not possible. Ongoing research is investigating how certain wetting agents perform under very specific conditions. Hopefully this will help us better understand these products and their use.

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Editor's Note: In the second part of this feature which will appear in ATM Volume 21.2 (March-April 2019), Australian superintendents and turf managers discuss their wetting agent programmes and what they have found works best in their situations.
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Above: Great Barrier Reef Arena in Mackay will entertain the Gold Coast and Western Bulldogs in the JLT Community Series

Right: North Hobart Oval is one of seven new venues being used for the AFLW and JLT Community Series matches

s this edition of ATM hits the streets, the 2019 AFLW season has begun in earnest and the twoweek JLT Community Series AFL pre-season competition looms at the start of March. All up there will be a total of 53 games (excluding finals) played across 28 regional and metropolitan venues, in addition to AFLX which will be hosted at the rebadged Marvel Stadium on 22 February.

This year sees a number of venues hosting AFLW and/or JLT matches for the first time, including North Hobart Oval (Tas), Victoria Park (Melbourne), Hickey Park (Brisbane), Unley Oval (Adelaide), Avalon Airport Oval, Memorial Oval (Port Pirie, SA) and Oakes Oval (Lismore, NSW).

As part of its ongoing work with the AFL, AGCSATech undertakes regular inspections of all venues hosting games to ensure they meet the AFL's rigorous standards. These visits started as far back as late November 2018 with agronomists Bruce Macphee and Tim Fankhauser measuring a range of parameters including turf coverage, surface hardness and traction, as well as any other issues relating to player safety. They may make up to 3-4 visits to some venues ahead their scheduled fixtures, making recommendations for any remedial works and working with the local curators to ensure the best possible surface is presented come game day.

ATM checks out some of the grounds hosting games over the coming month, kicking off with one of the newest facilities, Memorial



The AFLW and JLT Community Series provide a great lead-in to the AFL Premiership season proper. The comps also enable many of the wonderful smaller regional and metropolitan sports grounds and their curators the opportunity to showcase their venues.

Around the

grounds

Oval which resides in Port Pirie, a 2.5-hour

drive north of Adelaide.

PORT PIRIE SPORTS PRECINCT – MEMORIAL OVAL Location: Port Pirie, SA.

JLT Fixture: Adelaide v Port Adelaide, 2 Mar. **Crew:** Curator Philippa Woolforde; Alan Henderson (parks and gardens supervisor), Justin Mertins (irrigation), Scott Smith (field marking), Garry Taylor and Kevin Dunning (curator assistants) and Jeff Adams (sports precinct project manager)

Turf: Kikuyu outfield, Santa Ana wicket table (four wickets – two on either side of the centre circle)

Events/comps: Memorial Oval hosts a range of local sport including baseball, cricket and football; Events coming up in 2019 include the JLT fixture, SA Masters Games (April),



SANFL Adelaide v Port Adelaide (July), State Country Football Championships (July) and State Junior Soccer Country Championship (September).

Recent works: The Memorial Oval is just 15 months old and completely new from sub base to rootzone to all new turf covering 20,000m². Daryl Sellar (Turfwise Consulting/ Living Turf) has been the consultant from the beginning of the project and continues to do regular inspections and provides updated maintenance programs as required. Les Burdett is the designer and provides consultancy for the cricket pitch square and also provides training and maintenance schedules.

The oval received a second 300-tonne top-dress in late November 2017. Irrigation programming has been continually monitored and changed to minimise the stress on the turf from the recent extreme heat waves Port Pirie has been experiencing – a top of 48.6 degrees was recorded on 23 January!

Planned preparations in JLT lead-up: Minor topdressing of sprinkler head depressions and wicket edges; increased mowing from twice a week to three times a week; installation of shock padding and synthetic turf to the top of QC valve boxes and large

Memorial Oval in Port Pirie, SA is just 15 months old and will host a JLT game on 2 March



cricket pitch sprinkler heads. The extreme heat has hardened the surface of the oval, taking it slightly higher than the preferred AFL standards. This will be checked again two weeks prior to the game with possible Vertidrain if required. Additional nutrition every week incorporating a mixture of liquid and granular fertilisers.

GREAT BARRIER REEF ARENA

Location: Mackay, Qld.

JLT Fixture: Gold Coast v Western Bulldogs (3 March).

Crew: Curator Kenji Steele, who arrived at the venue mid-2018, heads a team of five that includes Bruce Bridger, Michael Richmond, David Smith and Jerry Kingston.

Turf: Legend couchgrass outfield and wicket block comprising five wickets.

Events/comps: Ground is the primary venue for Mackay Cricket Association; WBBL matches Brisbane Heat v Adelaide Strikers (5 Jan 2019) and Melbourne Renegades (6 Jan 2019); Cricket Australia U17 Championships; North Queensland Championships; Bulls Master's Challenge. All-age state school championships, veterans cricket (over 40s and 60s carnivals) and local AFL.

Recent works: Scarifying outfield (November) to get to within acceptable levels for AFL (preferred surface hardness range of 55-75 gravities) been a main focus.

Planned preparations in JLT lead-up: Scarify oval with Wiedenmann Super 500 and fertiliser programme in the lead-up – 500kg 2 Spec Endurance, 500kg 2 Spec Elevate, 60L Special FeX.

AVALON AIRPORT OVAL

Location: Chirnside Park, Werribee, Vic. AFLW/JLT Fixtures: AFLW (North Melbourne v Adelaide, 3 Mar); JLT (North Melbourne v St Kilda, 2 Mar)

Crew: Curator Marc Carson (Wyndham City Council). Wyndham employs seven fulltime staff in the sports fields department. Throughout the summer months when cricket is being played at the venue, one staff member is based at the venue who works between 28-32 hours each week. During the winter months, this drops back to 10-12 hours. **Turf:** Santa Ana couchgrass base oversown approximately three times a year with Striker Regenerator which is a blend of three different ryegrasses (Striker Gold, Derby Xtreme and RPR).

Events/comps: Chirnside Park is the home base of both the Werribee Tigers Football Club (VFL) and the Werribee Tigers Cricket Club. Alongside these two host clubs, Chirnside Park also hosts VFL matches for Geelong and North Melbourne, TAC Cup games for the Geelong Falcons and Western Jets, Western Region Football League finals matches as well as a

host of Craig Shield games for the Werribee Cricket Club. Wyndham City also uses the venue to host other community events. Recent works: Key maintenance practices include an annual maintenance programme where the surface is aerated every 6-8 weeks and fertiliser applied every eight weeks. The surface goes through a major renovation in September each year which includes herbicide application for the control of Poa annua, scarifying, oversowing and dusting. The surface is oversown and dusted again in March (albeit in February this year due to JLT and AFLW games being held at the venue) and then another oversow is completed in May/ June depending upon surface condition and football fixtures.

Planned preparations in AFLW/JLT lead-up: Some turf replacement to host the JLT/AFLW games and the turf wicket table may need some turf replacement. Instant play turf will be replaced in front of the cricket nets to ensure the surface is in optimal condition for the AFL weekend in March. The surface is currently in really good condition and surface will be aerated early in the week of the game. Will also look to apply a Special FeX liquid fertiliser for colour purposes on the Tuesday before. #

MORETON BAY CENTRAL SPORTS COMPLEX

Location: Burpengary, Qld AFLW/JLT Fixtures: AFLW (Brisbane v GWS, 2 Feb; Brisbane v Geelong, 2 Mar); JLT (Brisbane Lions v Hawthorn, 3 Mar). Crew: Curator Scott Howes. Mowing currently contracted to Landscape Solutions Maintenance with Harley Moore (site team leader) and Thomas Watson and Kurt Piddock (trade assistants). All other maintenance practices completed by contractors through Moreton Bay Regional Council's preferred suppliers as directed by council's Turf & Irrigation Technical Officers. Turf: Wintergreen couchgrass.

Events/comps: JLT/AFLW, Moreton Bay Lions AFSC senior and junior men's/ladies teams.

Recent works: Seasonal field renovation and fields oversown with rye during the winter months.

Planned preparations in AFLW/JLT leadup: Five weeks prior to the first AFLW game, field scarified in two directions at a depth of -5. Topdressed with 10mm and aerated with 19mm tines. Week after first game field groomed at depth of -2 with a light dust and needle-tine in preparation for the second AFLW game and JLT fixture.



Courses for horses

As course superintendent Phil Hill writes, the recent addition of a polo field to the Barnbougle stable is paying dividends for the Tasmanian golfing mecca.



t has now been five years since a fairly useless five hectare paddock was sprayed and planted out with the aim of holding a couple of social polo events on the fringes of the Barnbougle Lost Farm golf course. Since converting this area to Legend couchgrass, which is not widely used in the Apple Isle because of our cool climate in winter, we have held five very successful polo tournaments, with the most recent held on 19 January 2019 which proved to be another resounding success.

Having only ever dealt with cool-season grasses in my 39 years of turf management, it has been a very rewarding and learning experience to prepare a different surface to a high level and also observing and managing a completely different beast than the fescue surfaces we generally maintain across both Barnbougle Dunes and Barnbougle Lost Farm.

The pitch was initially row-planted back in January 2014 with Legend sprigs sourced from StrathAyr's Richmond (Tas) farm. Despite being told to expect just 50 per cent coverage by winter, we were amazed that come May coverage was around 90 per cent. We successful hosted our first polo event the following January and it has since become a regular event on the Tasmanian sporting calendar.

With the pitch now well established, maintenance for each year's event generally starts after we have had a couple of frosts in late April/early May. As we start to see the Legend going into dormancy, it is sprayed with glyphosate at 600ml/ha which provides very effective knockdown of all undesirable plants in the coming weeks.

As winter comes and goes and the Legend starts to show some sort of life as it comes out of dormancy in early October, we watch with anticipation that there has been no phytotoxicity. Thus far we have been fortunate enough to come through unscathed each season. As soil temperatures rise above 14 degrees we make one application of Monument for a final clean-up of any undesirable grasses.

The mowing regime then begins with some assistance from other nearby turf establishments requiring our clippings for turf wickets etc. Mowing intensity is fairly relaxed until about month out from the event which



social and sporting event on the Tasmanian calendar each January, with the 5ha Legend couchgrass pitch providing a perfect surface for 'the sport of kings'

is always mid-late January. Immediately after Christmas we really ramp up mowing to tighten up the surface and this continues up until two weeks before the event after which time the mowing frequency goes to the next level. For the week of the event we will cut the pitch two times a day with Toro fairway units set at 13mm HOC.

The amazing thing that we have found from day one is that apart from the initial heavy irrigation and nutrition programme to get it established, we have not fertilised or irrigated the polo pitch since. Despite this, the turf quality according to the players is as good as anywhere they play in the world. It must be something in the air or soil





down here at Bridport as we have a similar minimalistic approach on the Links courses. The Legend is a fantastic grass and it would be interesting to see how it would go on our fairways!

The only additional maintenance requirement we have as a result of having couchgrass is with the mowers themselves. Normally used to cutting fescue, the harsher couch means we backlap the reels straight after each cut.

As well as preparing the field for the daylong event, the crew erect yards to house the polo ponies – riders will often change mounts after each 'chukka' – and the 300mm-high timber boards which are placed around the perimeter of the pitch to keep the ball in play (the polo pitch is approx 275m long x 145m wide). The crew is also responsible for marking up the field (centre lines and the 60-, 40- and 30-yard lines) and erecting the goal posts which are 3m high and set 7.3m apart. While the main event is on the Saturday, the players and horses arrive earlier in the week with two practice matches held on the Thursday.

Polo is often referred to as 'the sport of kings' and is well known for attracting the rich and famous and celebrities alike. The recent Barnbougle Polo event had numerous wellknown personalities participating including AFL chief executive Gillon McLachlan who is a very capable polo player. He was joined by the likes of leading international players including Sam Hopkinson (captain of the New Zealand polo team), Ruki Baillieu (captain of the Australian men's team) and Alessia Russo (captain of the Australian ladies polo team). The matches were umpired by national chief umpire Anto White. Former Collingwood footballer Craig 'Ned' Kelly was also present, but enjoying the festivities on the other side of the fence.

Barnbougle developers the Sattler Family pull this event together each year and it continues to gain momentum each year. It is now a major social event in Tasmania's north east and coupled with Lach Mackinnon and his stud of 70 polo ponies near Launceston, the event attracts plenty of big names and big crowds. These events don't go ahead without a lot of support and sponsorship and Barnbougle is gracious for the continued support of Stella Artois, Spirit of Tasmania and Tassal.

Around 3200 people attended this year's event, with the large Stella Artois marquee being the centre of the action for many. On the opposite side of the field it was a picnic type atmosphere with some 65 car boot spaces enjoying the festivities. Together with 'fashions on the field', the traditional sprints for men and women, a tug-o-war competition and stomping of the divots (in between breaks), it all made for a memorable day and something that the Barnbougle course maintenance crew were proud to help bring to fruition. Bring on 2020!







Bubble buzz

Newly-anointed Order of Australia recipient and ATM columnist Peter McMaugh discusses the importance of oxygen and some new technology which could change the face of turf management in a big way.

ithout oxygen we would not have life as we know it'. That simple statement has been made many times previously and by scientists much more eminent than me. It is a simple truth as also is this statement – 'Without water we would not have life as we know it'. This is equally true.

When you couple these statements with the knowledge that all the chemistry of the building blocks of living things is based on carbon compounds, then the significance and importance of a very few elements of the Periodic Table becomes extremely clear as far as our life forms are concerned

If you look through the literature of agriculture/horticulture and turfgrasses you will be sadly disappointed if you are searching for the word 'oxygen', for it is rarely mentioned. Even if you look at texts on plant physiology or plant biochemistry, you won't find a lot of mention of oxygen as such. Sure, in chemistry you will see the words 'oxidation' and 'redox' mentioned quite frequently, but you won't see any development of links back to oxygen.

All living things respire because this is the process which liberates energy to drive the metabolic processes that all living things use to build biological tissues. In the process of respiration we 'burn' carbon to produce carbon dioxide (using up oxygen) which then becomes a waste material that reacts with water to form a weak acid, which in turn breaks down rocky minerals to help form soil. But when too much of it occurs it becomes a pollutant, a greenhouse gas, an invisible thermal blanket, with environmental affects which can be bad when levels in the atmosphere rise too high.

When we talk about fitness we talk about 'aerobic' fitness; we don't talk about oxygen fitness. But if we develop emphysema we don't give the patient an air cylinder, we give them oxygen. When we talk about soils and healthy soils, we talk about 'air to water ratios'; we don't talk about oxygen levels.

When we talk about anaerobic processes we are really talking about processes which occur with exclusion of oxygen. We only call these anoxic when the lack of oxygen creates processes which are toxic, such as the development of black layer in turf which starts to use sulphur instead of oxygen as its electron transfer carrier, producing hydrogen sulphide and eventually sulphuric acid.

We all know that if you try to grow plants in a water-logged situation that, with a few special exceptions such as rice and lotus which are specially adapted to cope, that most plants die from lack of oxygen. We know that this is because the total pore space of the growing medium becomes filled with water which is not the normal situation. When a growing medium drains after being filled with water, only the capillary pores continue to hold water under the balance of surface tension vs gravity. The larger pores then fill with air.

If the growing medium has been so compacted or is ageing to the extent that there are very few open pores of the macro variety, then there will be very little air in the growing medium and, to use the usual terminology, it will have a very poor air to water ratio. This then raises the question of whether there is enough dissolved oxygen in a water supply to keep the plants happy. The answer is certainly at least a qualified 'no'.

It is also the reason why when we try to grow plants hydroponically we keep a continuous supply of air bubbling into the nutrient supply solution. The aim of this exercise is to replace the oxygen taken out of the solution by plant roots on a continuous basis. This type of treatment generally results in about 8 per cent dissolved oxygen in the water supply and this is typically the level found in most town water supplies.





Above: Otterbines are a very familiar sight on the water bodies on most golf courses

Left: Over the past eight years there has been ever-increasing attention to using ultra-fine oxygen bubbles (UFOBs) in biological situations where the overall lack of oxygen creates environmental or health problems

Is this enough to supply the oxygen needs of a plant? The short answer is no because unless there is a continuous exchange of oxygen from the air to supply the depletion from the plant extraction, the supply cannot be kept up. So if the air space is small the exchange is going to be very limited.

All this raises some very interesting questions. Since Otterbines are a very familiar sight on the water bodies on most golf courses I visit, I can only assume that at last a very big percentage of turf managers are aware of the need to keep the dissolved oxygen level in their water supply at its peak level. Or am I being optimistic and that they are really there to ensure any iron in the water supply is oxidised and precipitated out before it gets to the pump. Or is it simply to keep the algae bloom at bay in nutrient rich effluent supply. It probably doesn't matter either way because both needs are almost as important as the overall level of oxygen in any case.

Now there are many different sizes and shapes for water storage needs on golf courses; some are narrow and deep, some are broad and shallow and there are plenty of variables from large to small in between. But each shape influences oxygen retention.

The narrower and deeper it is the colder it will be at depth and this helps to hold what oxygen it does have in it at a stable level. But the deeper it is, the less oxygen exchange happens with the surface and the deep level can be as low as 2 per cent. This will be made even worse if the dam is situated so that it collects a lot of organic debris, placing a real strain on its BOD (biological oxygen demand) to deal with the continuous microflora breakdown of this material.





Shallow bodies heat up quickly and once the water temperature goes over 20°C the loss of dissolved oxygen becomes exponential. All of these variables play an enormous part in the complexities of managing the consistent delivery of the high quality water supply that producing fine turf surfaces demands.

Historically we have been well aware of these issues at the practical every day level because we have spent more and more time and energy developing 'aeration' machines for turf than probably any other implement than mowers. And what have we ended up with at the end of the day? Mostly a lot of well 'aerated' core holes but not very well aerated greens. I have written about that issue many times and I will undoubtedly return to it again in the future.

But is there a better way of approaching this problem? The late Dr Bill Daniel of Purdue University in the 1960s developed the PAT (Prescription Athletic Turf) system which included a pump system to pull excess water out and push excess air in. This today is generally referred to as the Motz system and the Sub Air concepts are derivatives of this.

You see these mostly installed on the east coast of the USA in conjunction with large cooling fans (ugly as they are) to try to mitigate the horrid stress of the 40°C/95 per cent humidity summer climate where you are trying to grow bentgrass.

The traditional cooling methods of syringe cycling the irrigation system works poorly in these circumstances because every time you put water on you push air out and the end result is almost inevitably black layer.

Perhaps the answer lies in water itself. I previously used the word 'dissolved' to describe the oxygen content of water. The technology of very small bubbles developed in liquids by applying a shear force to it in conjunction with a gas has been around for at least 40 years and has been used extensively as 'micro bubble' flotation techniques in separation of solids from liquids in the sewage

Avondale Golf Club has undertaken a lot of trials with Nanobubble Technologies and became the first club to install one of their injection units and mining industries for a long time. The micro bubbles float and rise to the surface pushing the solids up with them. They have quite a short shelf life.

In recent years the bubble technology business has developed rapidly to produce a much wider range of bubbles and from our point of view the most important of these are ultra-fine bubbles. These are often wrongly called 'nano bubbles' and it has become hard to shake off this terminology, but that needs to happen.

Why ultra-fine bubbles? Because they don't float, they stay suspended in Brownian motion in the solution. Using this method, the total oxygen content of water can be relatively easily raised to as high as 40 per cent. Does that mean that it is 'dissolved' oxygen? Theoretically the answer is no but practically it behaves as if it is.

Over the past eight years there has been ever-increasing attention to using ultrafine oxygen bubbles (UFOBs) in biological situations where the overall lack of oxygen creates environmental or health problems. The busiest sector has probably been hydroponics where increases of yields of more than 30 per cent in leaf vegetable production have been common place. There have also been a lot of claims made in the cleaning and sanitising areas of food production.

Turf has been a latecomer but is getting increasing amounts of attention. Oxygen alone is not the only gas receiving attention. Ozone is also in the mix, particularly in the hygiene side of things. Combined with oxygen it offers big gains in hydroponics. There the nutrient solution can now be put through endless cycles (topped up of course) because it is sterilised by ozone. This makes for

There are many different sizes and shapes for water storage needs on golf courses, with each shape influencing how much oxygen it retains

huge savings in disease control chemicals, no disposal of waste nutrient and a quicker crop turnaround; it is also much more environmentally friendly, lowering energy costs into the bargain.

There are two aspects of UFOBs that especially fit turf;

- Their long-term stability remaining in suspension for a minimum of 7-10 days if undisturbed and kept below 20°C;
- The change they make to the surface tension properties of the water – making it appear to be wetter.

Together with ozone treatments to uplift the disease suppression characteristics, these affects seem to be yielding much healthier turf, especially under stress conditions

Physiologists are now starting to look a lot more closely at the role of oxygen at the root-soil interface. Just exactly how oxygen interacts with the root surface and enters the plant is as yet unresolved, but UFOBs have been found in the xylem of the plant. Whether they are manufactured in there or are transported from the soil water into the plant is again unresolved.

There is still a lot of work to do, but it is increasingly looking as if this new technology has the potential to change the face of turf management in a big way. But as always it pays to be very careful.

As always it is buyer beware. One very useful test for ultra-fine bubbles is the shelf life of the product. If it is truly UFOBs in the water, then the dissolved oxygen (DO) level should be no more than 3-5 per cent less after a 10-day storage. If it drops by 3-5 per cent per day then it is not based on UFOBs. The most common instruments used to check DO levels do not measure UFOBs. This needs to be done by more expensive and technically superior equipment.

If you are looking at buying equipment to produce UFOBs don't buy it if the manufacturer can't give you a performance specification including the flow rates and operating pressures for the various inputs in a welldocumented tabular form.

So look into the crystal ball and see if you can count the UFOBs. You can't because you can't see them. Just don't call them nanos!



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Gospel according to John

ATM columnist John Neylan looks back at the recent whistle-stop visit by Penn State University turfgrass expert Dr John Kaminski and reflects on some of the advancements in the turf industry over the past three decades.

n early January, Nadeem Zreikat (Colin Campbell Chemicals) and K&B Adams, together with the support of the AGCSA, organised a morning with Dr John Kaminski at Royal Melbourne Golf Club. John is an associate professor of turfgrass science at the Pennsylvania State University (Penn State) and director of the Golf Course Turfgrass Management Program.

John has extensive experience in the area of golf course turfgrass management and specifically in the management of turfgrass diseases. He has been responsible for, or associated with, the discovery of four new turfgrass diseases on golf courses. His research focuses on the identification of pathogens and the cultural and chemical management of their associated diseases. Among his body of research, he has studied the organism associated with thatch collapse which is a disease that we have battled in Australia. (There is a good presentation on the topic at https://www. slideshare.net/johnkaminski/thatch-collapse). John and his colleagues have also studied the effects of high iron and low nitrogen in bentgrass greens management.

DISEASE MANAGEMENT

During his presentation, John spoke on turfgrass diseases and disease management research. Some of the key points were;

Importance of plant health: A key to disease management is implementing cultural practices that maintain plant health. A healthy

plant is also going to be more responsive to the application of fungicides. Mowing height, aerification, regular dusting, good fertility and the use of PGR's are all important factors in sustaining plant health.

Correct diagnosis: Pythium and brown patch diseases were discussed and it raises the point as to which variant are we dealing with. In Australia the occurrence of these diseases is often in the roots rather than in the leaves. If these diseases are suspected, a sample needs to be submitted for diagnosis so as to;

- Make an accurate identification;
- To determine where the disease is occurring; and
- Formulate an appropriate control strategy.

Understanding where the fungal pathogen is present (e.g. in the foliage, stem/crown or roots) dictates the control strategy in terms of fungicide selection and application method.

Understanding the disease life-cycle: The point was made that preventative fungicide programmes are not desirable from an environmental point of view. By understanding the disease life-cycle and the environmental factors that favour a particular fungal pathogen, allows for a more targeted control strategy to be implemented.

Correct application: John has undertaken extensive research into the effects of different nozzles and droplet size on the control of diseases. His research has shown that the most effective control is achieved through the use of air induction nozzles. His research has also suggested that better control is achieved with higher water volumes (e.g.: 800-1000L/ha) at application rather than irrigating after application. This aspect raised several questions regarding the practicalities of such a programme in golf course operations.

How much water? The question of how much water should be applied after applying a fungicide was discussed and Kaminski suggested the following;



Kaminski has extensive experience in the area of golf course turfgrass management and specifically in the management of turfgrass diseases

- Off the leaf: 1-2 turns of the sprinkler;
- Crown and thatch: 7mm irrigation; and
- Soil drench: Wetting agent with the fungicide and then 12mm of irrigation.

Chlorothalonil review: In the US, the fungicide chlorothalonil is being reviewed due to environmental impacts and may be lost to the turf industry. Chlorothalonil has been a 'go-to' fungicide in Australia for many years

and would be a big loss if the same review is undertaken here.

Biological controls: The use of biological control products was raised and John's response was one of scepticism. He noted that there is often a lack of knowledge as to what is in the product and the effect on the soil micro-flora. He also felt that introducing biologicals into an established turf system

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During his presentation, Kaminski spoke on turfgrass diseases and disease management research, as well as research into turf nutrition as a method of controlling Poa annua

was unlikely to be effective. As all good agronomists do, he provided the rider that if it works for you...

Importance of research: On the subject of research, John briefly mentioned the importance of understanding data and statistics. In an article titled 'Understanding the research – Sifting through the data' (Fall 2012 - Pennsylvania Turfgrass), Kaminski emphasised the importance of not relying on anecdotal observations or testimonials, but looking for results from replicated/ comparative trials.

TURF NUTRITION AND POA ANNUA

John also spoke briefly on his research evaluating the 'Greenway Program' for managing bentgrass greens and as a method of *Poa annua* control. The 'Greenway Program' was developed by Australian expat golf course superintendent Marc Logan (previously at Mount Lawley Golf Club in Perth, WA) and at Penn State they have been running the program for nine years.

The research is published in various articles by Kyung and Kaminski (2012) and Kyung et.al. (2016), however, there have been some interesting conclusions;

- Nitrogen and iron applied in sulphate form.
- The least percent Poa annua (6%) was observed within plots receiving 24kg N/ ha/year + flurprimidol + 49kg Fe/ha/ application every three weeks.
- The greatest percent Poa annua occurred within plots receiving 24kg N/ha/year + trinexapac-ethyl (57%). This is interesting given the amount of trinexapac-ethyl used on bentgrass greens. The results are consistent with the results of Neylan et.al. (1997).
- Turf treated with flurprimidol, trinexapacethyl and no plant growth regulators

had 15%, 44% and 45% *Poa annua* respectively. Flurprimidol was effective in reducing the *Poa annua* population. Indications were that paclobutrazol would have a similar effect and is consistent with my observations.

- In the 3rd year of the program the turf quality dropped off dramatically and then eventually recovered. The theory is that in the first few years the bentgrass is using the nitrogen from the mineralisation of the thatch which eventually becomes exhausted.
- The long-term impact of these programmes on species composition and overall turfgrass quality remains unknown.
- It is important to note that this programme is quite controversial and will not suit all situations. It is important to read the research papers (refer to the Turfgrass

Information File – AGCSA members can access this free of charge by logging into the AGCSA website).

All in all, it was a very thought-provoking workshop that John conducted and I look forward to him returning Down Under again later this year as a keynote presenter at 2019 Asia Pacific Turfgrass Conference in Brisbane (24-28 June).

INDUSTRY ADVANCEMENTS

While recently reading an article in the USGA Greens Section titled 'Looking back while looking forward' by agronomist Larry Gilhuly (December 2018), it caused me to reflect on the advancements that I have observed in the turf industry over the past 36 years.

These are my few thoughts and I have based my opinions around those things that have been or made dramatic changes at the time of their introduction. I am sure they will be argued and contradicted, however, here we go;

Profiles: Adoption of the principles of perched water table profiles and in particular the USGA putting green construction method as a substitute for 'push up' profiles. This provided a more scientific and consistent method of construction. Interestingly, the pendulum has swung back somewhat as the search goes on for a profile using finer sands that will drain adequately but provides a firmer surface.

Introduction of couchgrass: In southern Australia the introduction of couch into golf course fairways and many years later into sportsfields. The use of couch has provided

A MENTOR TO MANY - PETER MCMAUGH, AM

t was wonderful to see in the Australia Day Honours that Peter McMaugh was made a Member (AM) in the General Division of the Order of Australia. It is a welldeserved and overdue honour for a person that has had such a significant influence on the Australian turf industry. As a turfgrass breeder, consulting agronomist, researcher and turf farmer, he has been an innovator and undoubtedly shaped our thinking about turfgrass management.

Peter has been a mentor to many, myself included, where his incredible knowledge and forthright manner has provided valuable guidance. Experiencing Peter's delivery style at the 1984 AGCSA conference in Melbourne was an eye-opener to a young agronomist, but there was no doubting his knowledge and passion for turf. Over the years I have personally appreciated the discussions with Peter and benefited from his years of experience. Peter was the first Australian turfgrass scientist to travel overseas and he introduced us to a group of turf scientists such as James Beard, Jim Watson, Paul Rieke and Bob Carrow who were pioneers in the world of turfgrass research.

Peter's passion for turfgrass and turfgrass breeding is legendary and his couch cultivars Wintergreen and Windsor Green have provided the benchmark for several decades. Being on field trips with Peter is an experience in itself where he is constantly picking up pieces of grass and examining their characteristics and, if it has merit, sticking it in his pocket for later planting.

Peter's broader scientific knowledge is quite incredible and his enquiring mind is an example to all of us as to how we should question and challenge convention. Congratulations Peter, your honour is very well deserved. considerably better and more consistent playing surfaces and significant water savings.

New grasses (bentgrass): There have been dramatic improvements in turfgrasses over the past 35 years. When I started in turf, Penncross was the 'new' bentgrass being used with Seaside and Highland still being used. Since that time there have been dramatic improvements in the bentgrasses with SR1020 and 1019 being the first significant change.

That was followed by the Penn A and G series bents and MacKenzie and now through to the ultrafine and very dense newcomers such as Pure Distinction and T1. These grasses have provided the basis of very high quality putting surfaces.

New grasses (Cynodon spp.): In Australia we arguably have some of the best *Cynodon* spp. cultivars with Wintergreen and Windsor Green (both developed by Peter McMaugh) setting the standard back in the 1980s and 90s for use on golf course fairways and sportsfields. Santa Ana was also a very early introduction in the 1970s and while it wasn't selected or bred in Australia, still remains a standard for sportsfields and fairways in



The advent of GPS guided machinery has revolutionised the way turf surfaces are now constructed

southern Victoria. In more recent times Grand Prix (bred by David Nickson) has provided yet a further advancement in *Cynodon* development.

Vertidrain: The Vertidrain was a revelation in deep tine aeration for numerous applications. This machine provided a new tool for breaking up deep compacted layers with minimal surface disturbance.



The arrival of the Vertidrain in the 1980s changed the face of turf aeration



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Laser grading: The introduction of laser controlled levelling equipment for levelling bowling greens and golf tees provided yet another leap in technology in the 1980s. This technology was developed from equipment used for developing broad-acre flood irrigation bays and was then further developed for grading sportsfields with a sloping surface.

3-D surveying and grading: In the 1990's Yellow Box Computing founder Gary Thomas pioneered the use of CAD and engineering software in the Australian sports turf industry by developing a computer system that automated the use of construction machinery based on a computer-generated model of the project. This technology has provided many



Turf industry practitioners are now blessed with a range of assessment tools at their disposal

benefits in the construction area, particularly where golf greens are reconstructed and need to retain the same shape. *Irrigation:* Automated irrigation systems and improvements in water management software have improved water use efficiency and turf quality. It could be argued that as an industry we have become too reliant on water for aesthetics purposes and modern irrigation systems have allowed water to be too easily applied. We need to use the technology to optimise water use efficiency.

Assessment tools: The turf industry has a range of tools available such as the Clegg hammer, soil moisture probes, soil penetrometers and NDVI meters that allow turf systems to be assessed objectively. This is now taking another leap forward with the use of drones and ground-based sensing equipment. \underline{w}

COUCHGRASS RECOVERY ON SPORTSFIELDS AFTER WINTER SPORT

C ouchgrass is an essential component in providing a high quality year-round playing surface and is particularly important in improving the wearability of sportsfield surfaces used for winter sports. It has been demonstrated by the research of Neylan and Nickson (2018) that a strong couch cover going into the autumn/winter period is key to maintaining a stable and safe playing surface throughout the winter sports season (about a 26-week period).

From this research it is apparent that the quality of the winter surface is a function of the winter damage and the recovery of the couch during the spring/summer period. The maintenance work undertaken in the spring and early summer is an absolute key to preparing a high quality year round playing surface. If there is a lack of couch recovery through the spring and summer the damage will then be compounded through the following winter which further degrades the quality of the couch and the playing surface. The photos below provide an example of where there has been poor recovery of the couch due to insufficient spring/summer maintenance.

During the past five months I have been observing the recovery of couch on several grounds and the following factors are the main impediments to strong recovery;



- Cooler springs over the past two years have delayed recovery of the couch.
- Very high mite populations compound the damage and impede recovery.
- Lack of appropriate renovation and, in particular, compaction control restricts the ability of the couch to recover.
- Inadequate fertility restricts growth.
- The persistence of *Poa annua* and ryegrass (where fields are overseeded) inhibits strong recovery.

OBSERVATIONS

From my observations the key management activities in the recovery of the couch are as follows;

- Apply a selective herbicide to remove *Poa annua* and ryegrass where overseeded in the first week of September (temperature needs to be considered with the use of SU herbicides).
- Vertidrain and hollow core at the end of the winter sports season.
- Apply fertiliser, such as a 20:0:16, at about 250kg/ha. Once the couch starts to respond to the aeration and increasing temperatures, follow up every four weeks with additional applications until recovery is achieved. Target the high wear areas – you don't have to fertilise the entire field.



- Apply miticide multiple applications will be necessary in high wear areas.
- Take care with topdressing high wear areas. The topdressing sand is best applied once the couch is showing strong growth. Topdressing too early appears to inhibit growth due to damage to the new shoots. Early topdressing also appears to seal the surface which inhibits couch growth.
- While the weather remains warm, it is the perfect time to set the couch up for the rigours of pre-season training and the winter season ahead. It is not too late to aerate the field, to control mites and apply fertiliser. Attention to providing extra irrigation to the weakest areas is also important.

REFERENCE

Neylan, J. and Nickson, D. 2018. 'Compare hours of use for different sports field construction types and maintenance inputs' research project. 'Part 2: Turf composition and wear'. ATM Volume 20.4.

The photos below show an example of where there has been poor recovery of the couch due to insufficient spring/summer maintenance. Photos (from left) taken November 2018, December 2018 and January 2019





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Problem **patches**

Turfgrass disease expert Dr Percy Wong outlines some of the new ERI diseases present in Australia, the fungal pathogens that cause them and possible strategies to manage them in various turf situations.

> n the last 20 years, there has been an upsurge in the prevalence and severity of patch diseases in warm-season grasses such as couch, kikuyu and buffalo, as well as cool-season grasses such as bentgrass and wintergrass.

> These patch diseases, often called ERI diseases, have been very worrying for turf managers because they have not always responded to chemical control. The most likely reason for this is that the diseases have been misdiagnosed and, therefore, the chemicals used would have been ineffective. My research has shown that the majority of these diseases are new and some of the fungal pathogens that cause them do not even have scientific names at present.

WHAT EXACTLY ARE ERI DISEASES?

We hear a lot about 'ERI fungi' these days but what exactly does the term mean? 'ERI fungi' stands for 'ectotrophic root-infecting fungi'





(Clarke and Gould 1993) and is a catch-all name given to fungi which cause a number of root diseases in turf.

These soil-borne fungi produce black mycelium (fungal threads) on the surface of roots and underground stems, before invading the plant tissues and causing death of roots and underground stems (see photo left). They include;

- Such diverse fungi and well-known pathogens as the take-all fungus (*Gaeumannomyces graminis var. avenae*), spring dead patch fungus (*Ophiosphaerella namari*) and, in the USA, the summer patch fungus (*Magnaporthiopsis poae*) (Smiley et al. 2005);
- Several newly discovered fungal species in Australia, such as the fairway patch pathogen (*Phialocephala bamuru*) (*Wong et al. 2015*), the summer decline pathogen (*Wongia griffinii*) and the 'Adelaide patch' pathogen (*Wongia garrettii*) (Wong et al. 2012; Khemmuk et al. 2016).

All these pathogens are ERI fungi, but, as their scientific names indicate, they are very different and unrelated fungi because they come from different fungal genera (the first part of the binomial name). As such, it would not be possible to specifically control ERI fungi as a group with certain chemicals

Dark fungal threads (mycelium) of a typical ERI fungus on the surface of a root. These threads then invade the plant tissue, causing death of roots and underground stems



without first identifying the exact pathogen or pathogens present, since the control measures are different for different pathogens. For example, Bayfidan works well against take-all patch but not against spring dead patch.

Therefore, more research needs to be carried out to devise management strategies for the control of each of the ERI fungi. Chemical companies would also need to test their new chemicals against each of these pathogens in order to make useful and effective recommendations. To have a label saying a chemical is effective against 'ERI fungi' is meaningless because, as we have noted above, the pathogens are so varied.

What follows is a summary of some of the ERI patch diseases currently present in warmseason grasses and cool-season grasses in Australia, the fungal pathogens that cause them and notes on possible management strategies.

FAIRWAY PATCH

Fairway patch is a serious disease that occurs on couch and kikuyu fairways of at least 20 golf clubs in Queensland, New South Wales, Victoria and Western Australia, but may have a wider distribution. The disease begins as tan-coloured irregular-shaped patches (5-10cm in diameter) that progress to larger brown rings on predominantly Wintergreen couch fairways, but has been found in all the commonly grown couch cultivars.

The rings enlarge over several years to measure 50cm or more in diameter and can coalesce to form an ugly patchwork of dead and dying grass (see main photo above). The disease resembles take-all patch (*Wong et al. 2000*) or brown patch caused by *Rhizoctonia solani*, but all the common fungicides that have been used against these diseases have been ineffective.

The disease is caused by a 'black sterile ERI fungus'. A 'sterile fungus' simply means that it has not produced spores in culture or in the field. Traditionally, we require fungal spores or other distinctive fungal structures to identify the fungus, but these days DNA techniques are increasingly used to identify fungi. By this means, the pathogen was found to be a new fungal species, which was named *Phialocephala bamuru* (Wong et al. 2015). The species name 'bamuru' is the word for 'grass' in the Aboriginal language of the Sydney region.

There are, at present, no satisfactory control measures for this disease. Three golf clubs in Sydney (Royal Sydney, New South Wales and Bonnie Doon) have invested in part-time research into this disease because it had become a serious disease by around Fairway patch is a serious disease that occurs on couch and kikuyu fairways of at least 20 golf clubs in Queensland, New South Wales, Victoria and Western Australia, but may have a wider distribution

2007/8. Chemical control was found to be ineffective. The research has led to the discovery of the cause of the disease as well as some management strategies to reduce the disfiguring impact of the disease. However, a major injection of research funds is required to employ a full-time research worker to study this and other ERI diseases for at least three years, if we are to manage these problematic diseases successfully.

SUMMER DECLINE

For over 20 years, a patch disease called 'summer decline' has occurred on predominantly 328 couch greens and been plaguing golf superintendents in southern Queensland (Stirling 2001) and northern New South Wales. It now appears to be more widespread, having been found in New South Wales, Victoria and Western Australia. The disease also occurs on bowling greens.

It starts as small brown patches which enlarge and coalesce with other patches to form weakened and unsightly turf (see photo page 52). This is most severe in the summer months when high temperatures exacerbate the symptoms, probably because the weakened root systems are unable to supply enough water to the grass and the grass dies back.

Over several years, the debilitating effect of the root disease produces a noticeable decline in turf quality, especially in summer, hence the name 'summer decline'. Chemical control has been variable at best and it remains a difficult disease to manage.

A number of fungi were isolated consistently from the blackened diseased roots of the diseased turf (Stirling 2001), but only one of these fungi has been shown to be pathogenic to couch (Wong et al. 2012). The fungus was described as a new species, *Magnaporthe griffinii*, as it resembled *Magnaporthe poae*, the cause of 'summer patch' in the USA.

It is important to note that the latter pathogen has not been scientifically documented in Australia and, therefore, we do not have 'summer patch' in this country. Further taxonomic research in the USA has shown that *Magnaporthe poae* was not a true *Magnaporthe* species and was renamed *Magnaporthiopsis poae* (Luo & Zhang 2013). Two years ago, taxonomists in Brisbane also determined that the summer decline pathogen was not a *Magnaporthe* species and created a new genus, *Wongia*, in my honour (Khemmuk et al. 2016). So, the pathogen is now called *Wongia griffinii*.

DISEASES

ADELAIDE PATCH

Another disease causing couchgrass to decline was first found on bowling greens in Adelaide by Michelle Dickinson (see photo opposite page). I isolated an ERI fungus, which caused root rotting in couchgrass in glasshouse tests. As it also resembled a *Magnaporthe* species, I described and named it *Magnaporthe garrettii* (Wong et al. 2012). However, its correct name now is *Wongia garrettii*, as explained in the previous paragraph.

I have called the disease 'Adelaide patch' because the disease was first found in Adelaide. It has a limited occurrence in Australia, having only been documented in couchgrass in Adelaide and Sydney. It is a serious disease which shows up in late spring every year and over several years causes the turf to thin badly and decline in quality. The patches have not responded to all chemical treatments that have been tried.

WONGOONOO PATCH

This patch disease of buffalo and couch is caused by an ERI fungus called *Gaeumannomyces wongoonoo* (Wong 2002). The specific name of the fungus 'wongoonoo' is a Central Australian Aboriginal word for 'grass'. So far it has only been documented in Perth, Brisbane and Griffith (NSW) but it is likely to be more widespread. The fungal pathogen may be indigenous to Australia as it has not been found overseas.

The pathogen is a close relative of the take-all pathogen (*Gaeumannomyces graminis var. avenae*), therefore it is not surprising that the disease symptoms (see photo top right page 54) are similar to those of take-all patch. There are no recommended control measures for this disease but it is likely that chemicals that control take-all patch might be effective against this disease.



Summer decline on a couchgrass golf green

DENILIQUIN PATCH

This is a serious disease of couch on golf courses (see photo top left page 54) and bowling greens. It was first observed at Deniliquin Golf Club, NSW, hence its name. It is caused by another black ERI fungus, which has been shown by DNA techniques to be a new genus. It has been named Budhanggurabania cynodonticola (Crous, Wingfield, Guarro et al. 2015). The name 'Budhanggurabania' describes a 'black fungus or mushroom' in the Wiradiuri language. It has also been found to cause severe disease on bowling greens in Dubbo (NSW), Townsville (Qld) and Darwin (NT). Again, no chemicals have successfully controlled the disease.

DEMPSEY'S PATCH

This patch disease was first seen by former NSW Golf Club superintendent Gary Dempsey on his bentgrass nursery and greens. The patch symptoms begin as a purplish discolouration of the leaves. The affected area increases in size and can measure 30-50cm across. The patches are roughly circular (see photo bottom page 54). The plants in the patches tend to wilt and become yellow and unthrifty because the roots are diseased. However, the patches recover when the turf is adequately watered and fertilised. Therefore, by comparison with the other patch diseases, Dempsey's patch is not such a serious disease.

The diseased plants showed typical root rotting symptoms caused by ERI fungi. I isolated a fungus from the diseased roots and it has turned out to be a new species of *Magnaporthiopsis*, which has been named *Magnaporthiopsis agrostidis* (Crous, Wingfield, Roux et al. 2015). Therefore, this fungus is related to the summer patch pathogen (*Magnaporthiopsis poae*) but was found to be different to it from DNA studies.

OTHER POORLY DOCUMENTED PATCH DISEASES

In the last few years, other unnamed *Magnaporthiopsis* species have been recovered from the diseased roots of *Poa annua* in wintergrass-dominant bentgrass greens. The disease occurs in summer as small tan-coloured patches (10-20cm in diameter) which can coalesce into larger patches. It was thought that the disease was 'summer patch' but it has not responded to all the available chemicals.

Similar fungi from various localities and hosts (Chewing's fescue, couch, etc.) have been shown to be several new species of *Magnaporthiopsis* using DNA techniques (Wong et al. unpublished). What is clear, however, is that these species are not the same as the summer patch pathogen that occurs in the USA. Besides *Magnaporthiopsis*, there have been other dark coloured fungi isolated from diseased roots that have not been sufficiently studied to know their identity or if they are pathogens.

CONCLUSIONS

The diseases discussed above and their known hosts are summarised in Tables 1 and 2 below. It is obvious that much more

TABLE 1. PATCH DISEASES IN SOME WARM-SEASON GRASSES IN AUSTRALIA

Disease	Pathogen	Couch	Kikuyu	Buffalo
Take-all patch	Gaeumannomyces graminis var. avenae			
Spring dead patch	Ophiosphaerella namari			
Fairway patch	Phialocephala bamuru			
Summer decline	Wongia griffinii			
Adelaide patch	Wongia garrettii			
Deniliquin patch	Budhanggurabania cynodonticola			
Wongoonoo patch	Gaeumannomyces wongoonoo			

TABLE 2. PATCH DISEASES IN SOME COOL-SEASON GRASSES IN AUSTRALIA

Disease	Pathogen	Bentgrass	Wintergrass	Fescue
Take-all patch	Gaeumannomyces graminis var. avenae			
Dempsey's patch	Magnaporthiopsis agrostidis			
Undocumented	Unnamed Magnaporthiopsis			
patch diseases	species and others			

Key: Red = susceptible, Green = not susceptible; Orange = unknown status

research is required to fully investigate the identity of unnamed pathogens and, more importantly, the management of these new and problematic patch diseases.

The majority of ERI fungi have not produced spores and therefore cannot be easily identified taxonomically by traditional means. Most of these fungi appear as dark fungal threads without distinctive characteristics when viewed on diseased roots or underground stems under a dissecting microscope. As such, it would be virtually impossible to accurately identify the ERI pathogens without first isolating the pathogen(s) from the diseased tissues and studying them further in culture or using DNA techniques.

It becomes obvious that it will be difficult to rationally recommend fungicides for their control if the exact pathogen is not known. These diseases have been flagrantly misdiagnosed in the past by only examining disease specimens under a dissecting microscope. Without accurate diagnoses, we will continue to have difficulty managing these diseases.

In the last two decades, there has been a decline in technical expertise in turf disease diagnosis in Australia. The turf industry has to invest in better qualified personnel to provide a high quality diagnostic service. After all, applying an inappropriate fungicide to control



Adelaide patch on a couchgrass bowling green

a wrongly diagnosed disease is an expensive and futile exercise. It is also environmentally irresponsible.

There is also a need for research capability in the study of turf diseases at universities and research institutions to be scaled up. In the absence of local research, there has been too much reliance on overseas research, especially from the United States, for information on turf diseases. Unfortunately, many of our ERI pathogens do not occur overseas. For example, fairway patch has not been found in the USA and as such it is debatable whether we should use their management recommendations on patch diseases that visually resemble our ERI diseases.

The successful management of these diseases may lie in an integrated approach that does not rely entirely on chemical control. There are indications that biological control agents, judicious fertiliser use and cultural practices such as de-thatching and higher mowing heights (where possible) may be important in reducing the devastating impacts of the diseases. The main management focus should be to keep turf root systems as healthy as possible by providing adequate nutrition, well aerated soil conditions and a lower pathogen load by regular de-thatching.

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DISEASES



Deniliquin patch on a golf fairway (left) and Wongoonoo patch on a buffalo lawn in winter (right)

Where fungal biological agents are used, turf manager should be mindful of pesticide usage that is compatible with those agents; otherwise, the populations of the fungal antagonists would not be high enough to effectively suppress the pathogens.

Since the spread of these diseases appears to be mainly due to the transfer of infected propagating material, the development of a turf quality assurance accreditation scheme may reduce their spread from turf farms to disease-free areas. This is important for all the diseases discussed above. In the longer term, disease resistance may be the only effective way of combating these diseases but it also requires a major research effort.

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Dempsey's patch on a bentgrass nursery

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PITCHING IN

Golf clubs that have had difficulty in the past in identifying ERI diseases or controlling them should consider contributing financially to a research project to study these diseases that the AGCSA is proposing to launch this year in collaboration with the University of Sydney.

The turf industry contribution can be matched dollar for dollar by the Federal Government through an Australian Research Council Linkage Grant. This will lay the groundwork for much needed concerted local research into these new and problematic ERI diseases and develop strategies for their sustainable management. Interested golf clubs should contact AGCSA CEO Mark Unwin on (03) 9548 8600 or email mark@agcsa.com.au.

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Beating the **heat**

he issue of urban heat islands in metropolitan areas is not new, but a new study identifying hot spots in Adelaide last year and new heat mapping undertaken by Turf Australia, has highlighted again how powerful a tool natural turf is to combat them.

'Urban heat island' (UHI), or urban heat island effect, refers to an urban or metropolitan area that is significantly warmer than its surrounding rural areas due to human activities. The main cause of UHI is from modification of land surfaces. As a population centre grows, it tends to expand its area and increase its average temperature.

Many local and state governments are struggling to manage and balance the impact of growth and development in their area without having a detrimental effect on the environment and health and wellbeing of their communities and economic performance.

ADELAIDE CASE STUDIES

The positive impact green areas have on urban heat island effect was particularly noticeable for researchers when they undertook the Western Adelaide Urban Heat Mapping Project in August 2017. The mapping project, which has led to the development of the AdaptWest Climate Change Adaptation Plan being adopted by three western Adelaide councils, was undertaken by Seed Consulting Services.

"Local government wants to learn how to reduce UHI and this project is giving them a real insight into the impact of heat islands New research is showing just how effective natural turf is at cooling our major urban centres.

and how they can utilise the information to make informed decisions for the future benefit of their communities," says Seed Consulting Services director Mark Siebentritt.

The project noted the significant benefits irrigated greenspace had on the community. It used land use analysis to show how surface temperatures vary between areas

KEY POINTS – URBAN HEAT ISLAND EFFECT

- More evidence into natural turf's ability to absorb summer heat has been published;
- A new industry project will deliver the messages about turf's cooling effect in 2019;
- New thermal imaging work has provided a visual message as to how great natural turf is at staying cool. Images show the extreme differences between a synthetic field and natural turf surface temperatures. The synthetic surface recorded temperatures well over 50°C compared to the natural turf readings of between 28°C and 33°C, depending on turf coverage.

where people are active outdoors and how management of urban areas and material selection for built assets can influence surface temperatures. Siebentritt says the results provided insights into how different approaches to managing turf can provide different outcomes, with irrigated turf being much cooler.

Two particular case studies clearly showed the benefits of irrigated natural turf;

- Case study one showed the thermal differences between irrigated and non-irrigated green space. Both surfaces produced cooler than average temperatures across the whole of the study area, with non-irrigated areas having a cooling effect of 2.2°C and irrigated areas 4.0°C.
- Case study two reviewed the impact of artificial turf versus natural turf. The Port Adelaide Hockey Club, based in Ethelton, provided a clear example of this pattern with the artificial turf surface measuring 8.1°C warmer than average surface temperatures across the region. Conversely, the surrounding irrigated natural turf surfaces measured 14°C cooler than the artificial turf at the time of data collection. The research also showed the significant difference between land surfaces during the day and night.

Again, the positive effective that green space and irrigated green space had when compared to hard surfaces and darker coloured buildings was particularly evident. Left: Turf Australia recently undertook its own thermal imaging investigation into the difference of temperatures in natural turf and synthetic surfaces to demonstrate natural turf's benefits of helping to cool urban environments

The final report included a number of recommendations that directly related to green space being included in the development of council community areas, including;

- Despite the pressure from infill, the amount of green space and tree cover should at least be maintained, and preferably increased, to provide cooling benefits;
- Green infrastructure such as trees, grass and raingardens should be used alongside or to shade bitumen covered surfaces such as major and minor roads, bikeways and footpaths. Where feasible, this green infrastructure should be irrigated in order to maximise its cooling effect;
- Councils maximise the cooling benefit from existing green cover by ensuring sufficient irrigation is provided to urban forests and other green infrastructure networks where available, such as from recycled stormwater;
- Material selection is carefully considered in the design of recreation areas for the young and elderly, with substrates such as artificial turf and rubber soft-fall covering used only after consideration is given to how heat absorption can be offset (e.g.: through the use of shade sails);
- Guidelines be developed for the amount of green space and landscaping required and building materials to be used in medium and high-density developments, noting their potential to develop into significant heat islands.

Siebentritt says that development of such an action plan in Adelaide is just one of many similar case studies being undertaken by local governments around Australia, with similar outcomes expected in those areas when results are made public in the near future.

HIGHLIGHTING TURF'S BENEFITS

Hort Innovation Australia announced in December 2018 a new Turf Fund strategic project into promoting turf's cooling effect had been tendered and would be carried out in 2019 by Seed Consulting Services. Seed will manage the delivery of the project '*Conveying* the benefits of living turf – mitigation of the urban heat island effect' (TU1800).

"We are very excited to be awarded this project and look forward to providing the turf industry with some value information," says Siebentritt.

The project will cover a number of aspects comparing natural turf and synthetic grass, including:

 How local climate might impact thermal performance;



The Western Adelaide Urban Heat Mapping Project conducted in 2017 noted the significant benefits irrigated greenspace had on the surrounding community

- The relationship of surface temperature and air temperature;
- Outdoor activity scenarios and thermal stress; and
- The heating and cooling impact load on buildings, such as schools.

When discussing the types of information that will be generated as part of the project that would be of value to the wider community when understanding how beneficial natural turf is, Siebentritt raised the interesting question of whether councils and sporting organisations should consider reviewing their heat policies, specifically for players using synthetic surfaces.

HEAT MAPPING

Turf Australia has recently undertaken its own investigation into the difference of temperatures in natural turf and synthetic surfaces. Thermal imaging consultants SkyMonkey utilised specialised thermal monitoring software and a drone to provide accurate comparison of temperatures over a range of surfaces on a relatively mild spring day in Sydney, where the temperature reached 28°C.

A sporting complex was chosen to allow for the imaging to include a wide combination of surface areas including natural turf sports fields, synthetic ovals, soft-fall play areas, car parking areas and surrounding homes. While the ambient temperature on the day was 28°C, the imagery clearly shows the synthetic grass to be significantly hotter than the natural turf, creating a damaging impact on urban heat island, reaching over a dangerous 54°C. Images (main photo opposite and below) show the extreme differences between the synthetic field and natural turf surface temperatures. The synthetic surface recorded temperatures well over 50°C compared to the natural turf readings of between 28°C and 33°C, depending on the turf coverage.

The difference in good turf coverage compared to bare or dry areas was also very apparent in the imagery, with the temperature of the natural turf sports field around 30°C compared to a barren embankment area which measured over 55°C. Surprisingly, the imaging also highlights that even building rooves and the bitumen carpark and paths around the sporting complex are cooler than the synthetic playing field.

In addition to these images, SkyMonkey has produced a video showing live comparison temperature monitoring of both natural turf and synthetic surfaces and the surrounding sporting complex area. The video is available for viewing on the Turf Australia website – www.turfaustralia.com.au – and turf growers are being encouraged to share the video and continue to promote why natural turf is the only option.

ACKNOWLEDGEMENTS

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Thermal images show the extreme differences between the synthetic field and natural turf surface temperatures. The synthetic surface recorded temperatures well over 50°C compared to the natural turf readings of between 28°C and 33°C

PROJECTS

Port Lincoln Golf Club's new 14ML storage dam which is part of a major stormwater harvesting project recently completed

Following on from last edition's Regional Profile, Port Lincoln Golf Club superintendent Andy Blacker looks at the major stormwater harvesting and irrigation infrastructure project that is helping to transform the SA course.

hen I arrived at Port Lincoln Golf Club as superintendent seven years ago, a number of agronomic and management challenges were present that restricted the club from moving forward. Without doubt the biggest of these was the lack of a quality sustainable water supply and ageing irrigation infrastructure. Previously the club relied on potable water for the irrigation of greens and tees which cost around \$100,000 per year. Coupled with that, the fairways were (and still are) irrigated using very high saline bore water (between 8000-11,000ppm).

About two years into my tenure, together with the management committee, we started to explore options for an alternate water source. The whole process, from the initial



due diligence through to recent works, has taken around five years, but the club has taken a major step in ensuring it has a far more sustainable future.

The primary aim of our investigations was to find an alternate water source that would replace mains water and to use the annual savings to pay back borrowed funds put in place to meet the infrastructure costs of the scheme. The scheme also served to address the other key issue of updating our deteriorating and labour intensive old irrigation system.

We identified several options but it was clear the most affordable one that had an immediate payback was to harvest stormwater off of an adjacent bitumen road and store it in a dam. We were fortunate that the local council was about to start major



upgrades to the road and we negotiated to have drainage swales created along the road reserve and to have that water directed into the club at two key points.

The Lower Eyre council was fantastic and invested \$30K into providing us with the interception points and culverts that delivered the water to our boundary. This got the water into our property at no cost but we needed a place to store it and a mechanism to get it from the roadside into the storage point.

Concurrently to this we commissioned a hydrogeological study to determine if two old bores that were cased but not equipped could provide us with water that could be pumped into the new dam and be shandied with the stormwater. This wasn't a cheap process and that study alone cost \$20K. What we did determine thankfully was that one of those bores had a consistent low volume supply of water suitable for use on greens that would yield 7ML per annum.

By undertaking detailed analysis of soil types and rainfall events utilising an engineering firm (MLEI), we determined that we would harvest 8ML from our stormwater scheme and a further 2ML from a lined dam of approximately 5000 square metres. In total, the overall scheme would yield 17ML which would reduce our mains water consumption by nearly 70 per cent. This represented an annual saving of just under \$60K per annum. MLEI were engaged at this point to produce a design for a new dam adjacent to our 18th hole.

Construction of the new dam and connecting drains occurred between April

The 500m transfer drains connect the road reserve to the new dam. The final 3m-wide x 600m deep lined swale drain has been designed to maximise capture and minimise any losses through overflow or soakage



and July 2018. This was a massive project and was done by using a local earthmoving contractor (Eyre Land Development) and utilising club equipment and workers. Approximately 19,000 tonnes of material was moved during construction and about 4000 was moved or shaped by hand.

The new dam is 14ML in volume and is lined with a 1.5mm high density poly liner which was installed by Fabtech with great precision. The two transfer drains are 500m long and connect the road reserve to the dam. In designing the dam, I wanted to make sure that we maximised our capture and minimised any losses through overflow or soakage. Our final design was a 3m-wide swale drain 600mm deep in the centre. This was lined with the same dam liner that we used to line the dam.

Three separate 100mm slotted drainage pipes were laid in the base of the drain and a 200mm layer of 20mm gravel was put over the pipes. Above this we installed a 50mm layer of 7mm gravel and then a 50mm layer of 5mm gravel. Filter sand 100mm thick was then put on top of the gravel and finally 150mm of sandy loam was applied and shaped to the existing ground level. Santa Ana couchgrass was laid on top to prevent erosion and integrate with the course.

The design concept was that low flow events would simply enter the system and immediately soak to the bottom of the drain and flow through the gravel and slotted pipes and high intensity events would be able to flow on the surface of the drains. Interestingly, we haven't had a rainfall event that the subsurface layers haven't been able to cope with and the scheme is working perfectly. I should also point out that the dam was positioned so that we could use gravity to our advantage in getting the water from the road to the dam. With the dam and stormwater harvesting infrastructure completed, the next phase of the scheme was the installation of a new Rain Bird IC System. We have just commissioned a new Davey Monsoon IQ pump station and Rain Bird 700s sprinklers are being installed around the greens as well as on approaches and fairways. Rain Bird 5000 sprinklers have been selected for use on tees. The installation is due for completion in mid-2020.

Due to financial constraints the club is installing the irrigation system in-house. This is a huge undertaking for a club that only has two full-time course employees. We are heavily reliant on our volunteer workforce, 'work for the dole' programme and disability scheme. The key to the success of this in-house installation has and will continue to be my unwavering adherence to quality control and the training we provide to key volunteers. I have a tremendous amount of respect to the small group of regular volunteers that are slogging away day after day ensuring the success of this project.

Waterpro in Adelaide were awarded the supply of the Rain Bird components and have been fantastic in their service delivery. Rain Bird have also been very accommodating throughout the trial, supply and installation phases and Mac Ross has always been available for site visits and professional assistance.

Due to the highly saline water used on our fairways the club has two separate mainlines. The fairways will be supplied with a new high density poly mainline (in installation phase) and the greens are supplied with an existing 80mm PVC mainline. We have two separate pump sets in our new pump shed to cater for the two water types and separate mainlines. All water types are pumped to and stored in large concrete tanks (total of 1ML storage) prior to pumping out onto the course.

While we have implemented a scheme that reduces our reliance on mains water, we still have very poor quality highly saline water for use on fairways. We are now working with the local councils and State Government to try to get funding for a better quality water supply for use on our fairways. The local re-use scheme is a long distance from the club and we are working with key stakeholders to get this water delivered to the course at a sustainable price.

We have, however, after a long and bureaucratic wait recently been issued with a licence to pump 7ML from our new bore. The bore has been fitted with a solar kit to lift the water into our new dam and has already provided us with 1ML of alternate water.

It has been a very long process to get to this point, but everyone at Port Lincoln Golf Club is rapt to see it come to fruition. The payback period on the loan is 10 years at which point we will get the full savings of the scheme. $\frac{1}{2}$



Fabtech laying the high density poly dam liner over the top of the geofabric underlay



River pebbles were used in drain intakes to allow water to freely enter the drainage profiles



Santa Ana was laid over the drains to protect the sand and gravel layers from erosion



The new Davey Monsoon IQ pump station has two separate pump sets to cater for the two water types and separate mainlines



With the dam and stormwater harvesting infrastructure completed, the next phase has been the installation of a new Rain Bird IC irrigation system





Brand ambassadors

ATM columnist Terry Muir says it's time to make the course superintendent brand a firebrand.

he brand of a golf course superintendent, if properly understood and managed, is a valuable professional and business asset. After all, whether we like it

or not, we're all 'brands'. When your name is mentioned in business, those in the room get that instant feeling about you – their perception of you as a professional brand.

Not everyone shares my perception of the brand but if I ever again hear 'the guy who mows and grows' or 'the shed guys' it will be far too soon. In short, superintendents have a brand, awareness problem and it has to change. Why? The golf business is constantly changing and superintendents cannot afford to be left behind, out of sync struggling to stay relevant. It's time for a reset, a rebrand to build a sustainable environment for the superintendent profession well into the future.

WHY THE BRAND HAS TO CHANGE

Superintendents possess information about sports turf management that only they know and they're willing to share it in the pursuit of delivering great golf courses that are sustainable and safe and community assets. They are successful people – they love what they do, they've been able to build good teams, they work in green open spaces. It is so marketable as the job that everyone wants, but this isn't always the case. The brand no longer reflects who or what a superintendent is. Ageing club members, board members and general managers have historically distorted views of the role of a superintendent. Rebranding can change that. Remember, years ago secretaries became 'personal assistants' to confirm how invaluable they are to an organisation. Even lawyers are rebranding in preparation for technology's impact on their profession.

The rebranding proposition is simple... Superintendents need to be seen as trusted professionals, advocates and experts who understand the market they are serving and care about the valuable things they are entrusted to manage – the course, the people, the business and the environment.

It is a different brand to that of the previous generation of superintendents. The old brand does not allow the new brand of superintendent the opportunity to leverage their full potential.

STAYING RELEVANT

So how can superintendents be a recognised authority figure and expert in their workplace?

At the end of the day, superintendents present their golf course – a physical structure that clearly demonstrates their abilities. It is physical, verifiable evidence of their talent and experience. This alone should make the brand stand out, but it doesn't.

When many superintendents started out, they probably established a set of values and rules to provide a foundation to guide them through the first few years. But as the business grew, management changed, and legislation and technology changed, their original identity at their workplace might now actually have become a liability that keeps the club from reaching its full potential. For example, when Sydney-based brand specialist company Bubblefish investigated a rebrand opportunity for one of their clients, they discovered an absence of any brand differentiation, no strong product focus, and virtually no attempt to appeal emotionally to the market. When they set out on the rebrand journey, they gave a new look and feel to an already existing brand in order to influence customer's perception.

Most businesses and professionals undertake a brand review every 7-10 years so that they can evolve and stay relevant. They explore a new look and way of conducting business. Whether a superintendent has moved away from their original vision or merely expanded on it, the current brand is not making them visible, appreciated and acknowledged.

There are so many compelling reasons for the superintendent brand to change. Look at the legal reasons alone – environment and safety laws, HR and WHS laws have to be managed and implemented. Superintendents Superintendents possess information about sports turf management that only they know and they're willing to share it in the pursuit of delivering great golf courses that are sustainable and safe and community assets

can become invaluable to their club, not just through turf maintenance responsibilities but by contributing strategic value which is key to their club's success.

They should share their expertise with colleagues and put themselves in a position to take on new responsibilities. Doing so proves that the superintendent will continue to be relevant as the organisation evolves. Ideally, the superintendent would transform to become a hub of information and ideas.

Brand improvement opportunities abound and it's important to consistently invest time and resources into a long-term strategy to promote a clear and powerful brand message. Digital transformation, going paperless and the fact that green open space and habitat areas are now so highly prized are just a few opportunities that can enhance the brand.

Increasing brand awareness will help superintendents survive and thrive during good times and bad times. A solid brand will create loyal supporters and that can even help you defend yourself should you receive negative attention.

TOO BUSY TO REBRAND?

Many will argue that they're too busy to change their brand. Yes, we all know superintendents are busy. The problem isn't time management, or the constant attention needed for managing the playing surface, it's cultural.

The road to becoming a superintendent is paved with long days, little sleep and many anxious moments working with Mother Nature. The 'whatever-it-takes' and the long hours are worn like a badge of honour. US research Professor Brene Brown once said, "Exhaustion is not a status symbol."

Busy is not a brand. Superintendents cannot fall into the trap of being too busy to improve and here are five more reasons to consider why it just might be a good idea to find the time to rebrand, if:

- You want to shake off an old image;
- You want to help the club tap into a new demographic;
- You want your expert services to be given maximum exposure;
- The golfing market is evolving quickly; and
- All you've got is a name. (If you asked a young adult to sketch a golf course superintendent at work, what would they draw. Would they sketch someone cutting grass?)

Superintendents are successful people – they love what they do, they've been able to build good teams and they manage a major asset

WHAT ARE EMPLOYERS LOOKING FOR?

Employers want the superintendent to make their job easy and to help them succeed. Superintendents that embrace technology, have systems in place to protect people and the environment, exhibit leadership and mentorship will always go to the front of the line.

Many in the industry may have heard of Armen Suny. He reinvented himself from a greenkeeper to becoming the lead in superintendent recruiting at US firm Kopplin Kuebler & Wallace, the golf club industry's leading search firm. Armen says that his agency looks for the ideal personal and cultural fit: "There are lots of talented agronomists out there. Finding that fit between the candidate and the culture is where we really know we've done the job."

Suny goes on to say that it is important for superintendents to explain why they're the right person for the job. One candidate listed his three top personal values. Not his objectives or successes, but his values. Most people put their career objectives at the top of a resume. No one cares what your objectives are. The bottom line is that employers want to know what kind of person you are.

Suny recently interviewed three superintendents with MBAs and said that grabs everyone's attention – a superintendent who thinks like a business person. Importantly, he commented that clubs want to know if the superintendent is developing themselves and their team.

A POWERFUL BRAND

The superintendent world of business is in constant motion. The needs and expectations of members evolve, regulators rewrite the rules and technology is changing everything. Many professions are reassessing their place in the universe and adjusting to a new reality. A rebrand will align superintendents with the changing marketplace and reveal new paths to grow the profession.

Rebranding presents an exciting journey to explore new professional offerings, discover hidden strengths and exploit the professional and ethical opportunities this industry offers. My hope is that superintendents will be appreciated as much as our doctors and other professionals. To realise this, we need to know what the superintendent brand stands for. This might help as a starting point:

- An outcomes powerhouse: Someone who delivers outcomes on all of the business's compelling causes, who gets things done, is highly productive on the right things and delivers what they say they will.
- A professional: Well known for being particularly good at turf management, but a strong all-rounder and a seeker of knowledge but also a teacher. Disciplined with the highest standards and engaged in the constant pursuit of perfection. Always evaluating and re-evaluating and finding ways to do everything better.
- Future-focussed: Have long-range goals that fuel today's decisions and actions. Not stuck in the detail of delivering today, but with a view on future-proofing the course and the business and about what's next and what's around the corner. Always thinking ahead to what future needs and expectations might be.
- Others-oriented: Appreciates others and takes the time to connect with employees, members and golfers, making them feel important, heard, understood and valued. Is curious and genuinely interested in the business, its people and the wider business environment.

That's a powerful brand. It captures visibility and reputation. If superintendents want to realise their true potential, they need to ignite the talent in this industry. It's time to make the superintendent brand a firebrand!









Driftwood washed up along the shoreline is used for course furniture, while select cart paths are made from locally sourced sleepers. Even the fairway ropes are made from natural hemp fibre

n January I was fortunate enough to visit Queenstown, New Zealand and play some of the fantastic golf courses which have made this region one of the best golfing destinations in the world. The likes of Queenstown Golf Club, Jack's Point, Millbrook Resort and Arrowtown Golf Club are all very unique in their own way and are a must-see not only for golfers but turf managers as well.

The one course that I was very interested to visit from an environmental management perspective was Jack's Point. Recently honoured internationally for its efforts in sustainability and commitment to protecting the environment, I was eager to find out how they had taken out the International Association of Golf Tour Operators (IAGTO) Sustainability Award for 'Nature Protection'.

The IAGTO Sustainability Awards represent the pinnacle of a strategic partnership between global golf tourism trade association IAGTO and non-profit golf sustainability body, the GEO Foundation, with the awards recognising excellence in environmental and social responsibility.

In announcing Jack's Point as a winner, IAGTO and GEO representatives commented:



Environmental expert Kate Torgersen recently visited Queenstown, NZ and caught up with Jack's Point superintendent Simon Forshaw to discuss the course's recent international environmental accolade.

Proving a Point

"Jack's Point wins the 2019 Nature Award category due to its extraordinary preservation of the breathtaking natural landscape. Completed in 2008, the course construction was so sensitive that only five per cent of the entire 3000-acre site will ever be touched. A range of natural materials were utilised, with recycled on-site materials incorporated as much as possible, including local wood and stone. Manmade structures were sited appropriately below sight lines and away from natural bluffs and elevated areas.

"The legislation was in place to ensure the open grassland habitat and rocky terrain (appropriately named 'The Remarkables' mountain range) will always be protected and the club is absolutely committed to the preservation of the environment. Wetland habitats were created and existing ones regenerated with improved water quality, previously degraded by pollution from livestock farming. The course has its own irrigation supply and wastewater treatment system."

Course superintendent at Jack's Point is Simon Forshaw who took me on a tour of the course to look at current and future works, explain how they maintain the course daily while being environmentally aware and the sustainability initiatives that played a part in them winning the IAGTO award.

The land upon which Jack's Point resides, on the shores of the stunning Lake Wakatipu, was previously a sheep station and to honour that history some sheep still graze on select areas of the property. Walking into the pro shop and looking at a photo of the parcel of land that was paddock after paddock and to see it now in its current state, is a testament to all involved in its design and construction.

I could not believe the transformation that had occurred, especially with the course being completed in 2008. Since the land has been converted to a golf course, many fauna species, especially birds, have returned and now use the native scrublands, wetland areas and native pasture areas as habitat.

Apart from a small minority, all course furnishings have been made from recycled materials either from the existing farm or from nearby sources. The tee and fairway markers are crafted from the dead stems of the endemic Matagouri tree which can be found throughout the course. These trees have a special significance to Jack's Point. They are extremely slow growing with some specimens on the course being over 100 years old.

Driftwood that is washed up along the lake shores is collected and used for course furniture, signs, rubbish bins and stakes (as seen in photos far left). Even the rope that is used to keep golfers out of significant areas is made from hemp! Select cart paths around the course are made from sleepers recycled from a local source. By using the sleepers it keeps wear to a minimum, especially with the amount of cart traffic that the course receives. The more permanent tracks are made from recycled gravel from the site, while the famed stone walls (above right) are made up of materials that were mined from the site. The old farm gates were not discarded either but instead utilised in the design and are now featured throughout the course.

While playing Jack's Point you really feel like you are right among nature. Apart from the select houses that are built on the course, the maintenance shed and half way house have been built out of sight to ensure that whatever direction you look you take in the wonderful vistas of the surrounding Remarkables mountain range and lake.

Turning up to play, I knew that there were good sustainable practices in place. Each golf cart had a glass bottle you could fill with filtered water in the pro shop, reducing the amount of plastic bottles. But I was even more impressed when we stopped at the half way hut! Needing to improve my golf, I tried some of New Zealand's finest gin which was served in a plastic cup that had been made from plants and vegetables! Swapping to more sustainable products like these can be small adjustments by a club but can make a huge difference to the environment.



Jack's Point employs a horticulturalist who manages the native areas. Revegetating with locally indigenous plants is common practice with the majority of plants being grown on site from cuttings and seeds collected on course. Grass clippings are collected from the course and taken to an area where they are regularly turned, creating a compost mix which is then reused throughout.

From a turf management perspective, Simon and the club are focused on sustainability. A programme is currently underway to convert all tees from bentgrass to fine fescue due to the latter's lower input requirements, but at the same time ensuring no reduction in the quality of the playing surfaces. Simon also ensures boom spraying is kept to a minimum, with the majority of weed control being applied using dabbers or knapsacks. There is also a two-metre buffer zone around any sensitive native areas and waterways.

Given its location Jack's Point is also utilised by many hikers, with several tracks throughout the course allowing not just the golfer but also the wider community to enjoy this special piece of land. This was a major factor that course architect John Darby was intent on featuring when designing Jack's Point and as a result there are 35km of hiking, mountain biking and horse riding trails. Darby wanted the best part of the land to be kept for the golf course and wider community to utilise for hiking and other leisure activities and not given over to developers.

While designing the course, it was important to retain the natural character and this was achieved by threading the holes through the shrub land and native pastures. And it wasn't just the golf course that Darby wanted to keep natural. The clubhouse design philosophy was to keep it real and honest by using natural materials which would allow the clubhouse to grow old gracefully.

In a day and age where the environment and sustainability is in the limelight, Jack's Point is a great example of how you can manage a golf club in a sustainable way, working with nature and not against it and continually putting new practices in place for the greater good of the game and environment without taking away any enjoyment for the golfer.



Checking your **pulse**

ATM HR expert Vicki Crowe looks at the importance of employee engagement and how to measure it.

ften the chatter after speaking at industry workshops or conferences turns to how to attract and retain employees. The annual average turnover in Australian companies is 15 per cent, whereas in the landscape industry the average turnover

is up to 50 per cent. However, with landscape companies that focus on retaining their employees, this average drops to 20 per cent.

You don't have to have elaborate reward systems to retain good employees and it's not always about salary. It can be as simple as asking your employees a couple of key questions, listening to them and then implementing some small changes.

A survey conducted with 239 landscape companies found that while salary and benefits are important factors in retention, the intangibles are what keep employees satisfied and loyal. The intangibles are often unknown, so you'll need to find out what they are. Offering education and training and career development opportunities are also key factors in retaining their staff.

Employee engagement strategies like 'pulse surveys' are being used by a growing number of businesses as a way to help retain their staff. 'Pulse survey' is the term used to measure employee engagement and done on a frequent basis. They typically involve using one question a week or every couple of weeks to find out the level of engagement and those intangibles. In small businesses there is often not a lot of opportunity to provide people with a career pathway, so you need to look at the responses to work out what is most important to your employees.

WHAT IS ENGAGEMENT?

Engagement is an 'emotion' and therefore hard to quantify and there is no clear definition of what it is. Some organisations define it as happiness, some as satisfaction and others as commitment to goals. Data shows that approximately 70 per cent of employees are disengaged at work. I'm sure many of you could relate to the damage that is done with just one employee who has a poor attitude.

Before you begin the process, you need to be clear about what 'engaged' means to your facility. It doesn't matter if you have five or 100 staff, it is still critical to the profitability of the business to find out whether your employees are engaged or disengaged.

Research has found that there are 10 main metrics that define employee engagement – feedback, recognition, happiness, relationship with peers, relationship with managers, personal growth, alignment with company goals and values, satisfaction, wellness and being a brand ambassador.

If you don't want to undertake pulse surveys, you may use one-on-one meetings or

a 'stay interview'. If you are using the survey method, this could be done using an online survey tool or a simple cardboard box that people put their answers in.

Create one or more questions that cover each of the 10 metrics and make the survey anonymous. Use either a scored survey method from 1-5, with 5 being the most satisfied. Some questions to include are;

- How happy are you at work?
- Why do you like it here?
- Do you have a clear understanding of your role within the organisation?
- Hypothetically, if you were to resign tomorrow, what would your reason be?
- Do you feel valued at work?
- How frequently do you receive recognition from your manager?
- Do you feel you receive enough feedback from your manager?
- Do you believe the leadership team takes your feedback seriously?
- Do you feel you'll be able to reach your full potential here?
- Do you know the company's core values?
- How comfortable do you feel giving upward feedback to your manager?
- Do you have fun at work?
- Are co-workers respectful of each other?
- Are you proud to work at the organisation?

Source: OfficeVibe, Sabrina Son. 址





R

- Exceptional melting out and improved overall disease resistance
- Bred with Mediterranean genetics for excellent vigour and fast establishment
- Excellent year round colour

Contains endophyte for superior persistence



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Yallourn Golf Club, VICTORIA

Last August, the PGA of Australia announced that Yallourn Golf Club will play host to the inaugural Gippsland Super 6 tournament in late 2019. It has prompted a flurry of work at the small Victorian regional course which is

Superintendent: Mark Burton (41). Nickname: Burto.

Family: Partner Narelle and kids Jack and Dan.

Years as a superintendent: Six. Association involvement: AGCSA (six years), VGCSA.

Turf management career: Heyfield Golf Club (apprenticeship 1994-1996 – half way through third year became boss due to staff dismissal); Patterson River Country Club (1997-1999); Traralgon Golf Club (2000-2002); Wellington Shire Council (2009-2012 – in charge of sporting ovals) and Yallourn Golf Club (superintendent 2012 to present). Qualifications: Certificate IV.

Major hobbies/pastimes outside of turf: Footy card collector, assistant coach at Boisdale FC. home to course superintendent Mark Burton.

Where in Australia is Yallourn Golf Club? Yallourn Golf Club is located in the township of Newborough in the Gippsland region of Victoria, about 60 minutes' drive from Melbourne's south-eastern suburbs. Gippsland is well-known for the coal-fired power stations within it that produce much of the state's electricity.

Tell us a bit about your background and how you came to be a superintendent. I was always interested in all sports and would have a go at any sport when I was young. I loved watching sport on television and I always wondered how golf courses were manicured to look so good. An opportunity came up for an apprenticeship at Heyfield Golf Club in central Gippsland and I was successful in applying for the role. Who were some of your early mentors? My earliest mentor (and still is) is John Scott from Maffra Golf Club. He is only too happy to take a phone call or have me drop in and see him to ask questions, get new ideas or run ideas past. There is not too much in this industry he doesn't know, although he will tell you otherwise. To add to this, he is one of the best blokes I've ever met. His earliest advice was to 'back yourself in what you're doing, because it's your neck on the line'.

Talk us through your career path and how you came to be at Yallourn? I started my apprenticeship at Heyfield Golf Club in 1994 and remained there until 1996. Halfway through the third year of my apprenticeship my boss was retrenched, making me the only curator there. When I completed my apprenticeship I moved to Patterson River Country Club and was there for two years before returning to Gippsland in 2000 to work at the Traralgon Golf Club. In 2002, I left the industry for seven years, before returning in 2009 to work at the Wellington Shire Council, based in Sale, maintaining the council's many sporting reserves. In 2012, the job at Yallourn Golf Club was advertised in the local newspapers and I applied and was successful.

What do you like most about being the superintendent at Yallourn GC? I like the fact that there is something different each and every day. You need to be hands on with every job, whether it is mowing, watering, machinery or irrigation repairs. The club has been very accepting of myself and the kids and is a very friendly golf club that has taken me in with open arms. We have become part of the Yallourn family.

Give us an overview of Yallourn GC and some of its unique characteristics. Yallourn is a very undulating course lined with beautiful gum tress and overlooks nearby Lake Narracan. It will be great to host the Gippsland Super 6 tournament later this year as you can see the final three holes all from the clubhouse.

Is it an easy/hard facility to manage? It is a challenging facility to manage due to the time constraints with being the only full-time employee on the golf course. Trying to get everything done in the week is very difficult and sometimes there just isn't enough time to get everything done. The time constraint is definitely the most challenging aspect of my job.

What changes have you implemented in terms of managing the course during your tenure as superintendent? Making significant change has been difficult due to the tight financial situation at the club. Some of the smaller changes we have made include mowing greens more regularly, including on the morning of our competition days (Wednesday and Saturday). Before I arrived at Yallourn the greens hadn't been renovated for 4-5 years and this was evident by looking at them. I now ensure we renovate twice yearly, in autumn and spring.

What other maintenance changes do you want to introduce/plan on introducing? I would like to see regular fertilising of fairways and tees as they do struggle throughout the



Mark Burton has been Yallourn Golf Club superintendent since 2012

year without fertilisation. I would also like to see our fairways and surrounds mowed more regularly, not just when they look like they need mowing.

Any special environmental considerations you have to incorporate into the management of the course? There is a waterway that runs through our course that we have to consider when using chemicals, so as not to harm the wildlife within the waterway.

What are some of the major challenges facing Yallourn GC both from a turf and club management perspective? Our major challenge is money. We operate on an extremely tight budget and when we can save a dollar we do. We rely heavily on members to volunteer their time to work on the course, in the clubhouse and during major events. We do 99 per cent of our own repairs on machinery, only calling in a mechanic when things are too difficult for myself and the volunteers. This challenge is not unique to us and there are a large number of golf clubs nearby all competing for members.

Outline any major course improvement works recently completed or coming up. In 2018, the club was successful in gaining funding (nearly \$250,000) from the Latrobe Valley Authority (LVA) to undertake several major upgrades to the course and clubhouse. Three-quarters of this amount was from the LVA, with the other quarter coming from our own members due to the 1:4 funding requirement. Work undertaken so far includes;

- The installation of an automatic irrigation system for all 20 greens, saving much time and money;
- Major drainage work in bunkers (nearly complete).
- Over 250 metres of concrete paths have been laid, catering for four holes on the course.



Yallourn is a very undulating course lined with beautiful gum trees and overlooks Lake Narracan

REGIONAL PROFILE



In the coming years Yallourn will lose three-and-a-half holes to a nearby residential development, with three new OCCM-designed holes to replace them

- Machinery shed upgrade and construction of a new toilet block between the 4th and 14th holes.
- Purchase of a new 1000 litre spray tank which allows us to spray the fairways in one fifth of the time normally taken. This year will see work start to prepare

for three new holes at Yallourn due to the new Monash Views housing development taking place adjacent to the course. This will result in a land swap between the club and the developers, which will see us lose three-and-a-half holes while receiving three brand new holes. We will say goodbye to the current 2nd, 3rd and 4th holes, as well as half of the 5th which will become a par three. These works will happen over the next couple of years, with Ogilvy Clayton Cocking Mead doing the design work. This is an exciting development for the club that has been many years in the making.

Speaking of exciting, the PGA of Australia announced last August that Yallourn will be hosting a new Tour event – the Gippsland Super 6 tournament – this coming November. How did this come about? The Yallourn committee presented a proposal to the LVA to conduct a major professional golf event to benefit the local community. Following this proposal, the LVA approached the PGA who then prepared a formal application in conjunction with the club for Victorian Government funding.

In 2018, Yallourn Golf Club was successful in gaining nearly \$250,000 in funding from the Latrobe Valley Authority (LVA) to undertake several major upgrades to the course and clubhouse



As a result the Gippsland Super 6 professional tournament will be held during Melbourne Cup week in November 2019 with a professional prize pool of \$125,000. A range of community-based events will also be conducted by the PGA in the Gippsland region during the week to increase the involvement of all sectors of the community in golf in the area. In addition to the tournament funding, the club also received a grant of \$195,000 from the LVA to upgrade club infrastructure.

Must be an exciting feeling knowing you will be hosting a major PGA Tour of Australasia event. What has been the reaction by members? The club is very excited to be hosting a significant event on the Australian golfing calendar and everyone is looking forward to November. In addition to the four day major competition (which comprises three days of stroke play and match play qualifying ahead of a top 24 sixhole shootout), there will also be a range of activities throughout the week including a junior Pro-Am, masterclass sessions and qualifying competitions for local amateurs to take part in the tournament proper.

What works will be/are being undertaken to the course to accommodate the

tournament? We have just constructed and sodded a new tee on the 17th which will be used for the playoff holes during the match play events of the tournament. We are waiting to hear from the PGA to let us know what other major works we will need to complete in order to make the event a success.

What do you think will be the most challenging aspect getting the course up for the tournament? The additional time requirements and resources required to host this event will be challenging. We are looking at borrowing extra machinery in the leadup, such as greens mower and a roller, but I am looking forward to the challenge. Extra mowing and rolling will be the main additional work we will undertake before the tournament.

Have you had any major tournament

experience before? Not at this level, but every other tournament we have we treat as a major tournament, so our expectations for the course will remain the same – maybe a touch higher! We will be seeking assistance for the event. We have had a couple of offers from current and past superintendents from other courses saying that they are willing to help out in the week leading up to the event. Ultimately, what do you hope to produce for the event? The Yallourn Golf Club at its ultimate best it can ever look. I want the professionals to walk away from the tournament thinking 'Wow, what a great course for a club that only has one superintendent and a team of volunteers'.

Water is obviously a critical issue for any golf course. How is Yallourn GC faring in the water management stakes? We are lucky at Yallourn to have such a large storage dam in the centre of our course. The drainage from the residential area above us directs stormwater into our dam for use on the golf course. Any rain comes straight into the dam to top it up. We have Santa Ana fairways which require very little water once established, which helps us out in the water department.

The one product I couldn't manage my course without is... Ultrawett wetting agent because we really suffer from dry-patch in the summer. Primo Maxx is pretty good too.

What are some pros and cons of being a regional-based superintendent? Some of the drawbacks include not being able to attend information days and seminars as we are so far away from the city. Also, being the only full time employee makes things challenging too. Waiting anywhere from 5-14 days for products to arrive once ordered can be problematic.

Many of the problems discussed in turf magazines is related to inner-city clubs with money and not always relatable to regional and country-based clubs. On the flip side, the



Yallourn will play host to the inaugural Gippsland Super 6 tournament in November

majority of members and visitors are always friendly on the course and the club has a real family vibe which makes it a great place to work at. Going down the street you always bump into someone from the club to stop and have a chat with.

Are expectations of course presentation and conditioning any less than that placed on your metropolitan counterparts? I don't think the expectations are less, they are probably the same. I think country golfers are more accepting if things don't get done due to financial constraints. In saying this, we still strive to present the course as best we can.

The club has just constructed a new tee on the 17th for the Gippsland Super 6 event



Do you have to be more resourceful as a regional-based superintendent? Absolutely! We hang onto old machinery that we think we might need. If we throw things out, we will take all of the nuts and bolts off them and store them, just in case they come in handy at a later date. We never throw anything out unless it is absolutely wrecked, because we 'might need that one day!'

Do you use volunteers to assist with the management of the course? We have a group of 3-4 volunteers that work four days a week for about four hours each day. On a Friday we get anywhere between 5-7 volunteers in to assist with preparations for our weekend competition. Our fourday-a-week volunteers assist with mowing, spraying bunkers, raking bunkers – just about everything except spraying of greens and fairways.

On Friday, our volunteers help to present the course for the competition on Saturday with their jobs varying from changing holes, raking bunkers, mowing fairways, tees and surrounds and just about any other job they are asked to undertake. Every so often we have working bees on a Sunday where members will assist to tidy up the course before major events.

If you could change one thing about your job as a regional superintendent what would it be and why? I love my job at Yallourn, but if I could change something about the role I would like to have an apprentice to mentor at the club and who can also assist with the day-to-day maintenance of the course.

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Burton is the sole paid course employee and relies on a loyal group of member volunteers

How important are the relationships you have with other course supers/trade reps? Extremely important. We recently attended a chemical seminar at another local golf club and it was surprising how many of us didn't actually know each other. I've made some good contacts with other local supers who are in similar situations. What you can pick up from others and what they get from you is priceless. We have a very small number of trade reps that call in to see us, but it's great to be able to ask them for any information and take them out onto the course to show them any problems we might have.

What are some of the more unusual requests/things you have had to do as a superintendent of a regional course? On some of our big tournament days it's all hands on deck and on a number of occasions I've found myself driving the drinks cart to provide refreshments for the golfers.

What have you got in your shed? Jacobsen Greens King 4, Kubota roughcutter, Toro 5510 fairway mower (which is used for tees and surrounds also), Toro Sand Pro bunker rake and Kubota front end loader. My favourite piece of machinery is the Jacobsen greens mower as mowing the greens is my favourite job on the course. Our next major purchase is a brand new Jacobsen Greens King 4 Plus which is currently on the way.

Do you think regional/country superintendents have a better work-life balance than their metro counterparts? No, because we might have to be on the course at any time, which might include in the middle of the night or on the weekend, to fix something or repair a leak because we haven't got a 2IC to assist with such tasks.

Favourite spot on your course? Standing on the 15th tee looking up the hole towards the green. It is our best looking hole.

Best advice you have received. 'If the members are complaining about the fairways, you're greens are good. If they're complaining about the tees – you're fairways and greens are good; and if they're complaining about the rough – the course is great'. John Scott from Maffra gave me this pearler!

What do you think is the most challenging aspect of a superintendent's role today? The most challenging aspect of my role as a superintendent is the time constraint. There is always something extra that the committee would like you to do but we only have so many hours in the week to do it.

What gives you the most job satisfaction?

On a Friday when you've come home after giving everything you possibly can to present the course the best it can be that week. Also, the occasional compliment from our members.

Most pleasing/rewarding moment during your time as Yallourn GC superintendent? Hearing that we are going to host the PGA Super Sixes tournament in 2019 is pretty rewarding. It is a good feeling knowing that my work as a super has been recognised and that the PGA feels that our course is ready to host an event of this magnitude.

AT A GLANCE - YALLOURN GOLF CLUB, VIC

Course specs: Par 72, 6002 metres. Property 60 hectares in total with 40ha of maintained turf. Santa Ana couchgrass tees and fairways, bentgrass greens. Members/rounds: 260/11,440. Major events: Pro-am, numerous sponsor and charity days, club championships, pennant, plate, 2019 Gippsland Super 6. Annual course budget: \$50,000. Staff structure: Superintendent Mark Burton plus three volunteers (four days per week) and 3-4 more on a Friday to set up for weekend competition. Soil types: Natural sandy loam. Being

so close to the brown coal-fired Yallourn Power Station and open cut mine, there is a substantial amount of coal dust in the soil also. **Water sources:** Storage dam in the centre of golf course, which fills from various points around the course, but mainly from the residential properties on the top side of the course.

Irrigation system: Newly installed Toro Lynx system completed in November 2018, with 90 per cent of sprinklers T7s. This has been a huge addition for our club as beforehand all watering was done by hand, taking anywhere from 4-5 hours each time. We only water greens and tees; fairways are never watered.

Cutting heights/regimes: Greens 3.5mm; fairways, tees and surrounds 15mm. **Renovations:** Greens are renovated twice annually. In autumn we Vertidrain and add sand. In spring we core with 12mm tines and add plenty of sand. Coming into the PGA event this November, we are considering dry-jecting our greens instead of coring to reduce recovery time.

Major disease pressures: Every 4-5 weeks a preventative spray is performed to reduce the occurrence of common diseases such as rhizoctonia and dollar spot. In summer we get a lot of dry patch, so need to use wetting agents through this period.

Nutrition management: Greens are fed every fortnight with half rates of liquid fertiliser. During renovation times we soil test and act accordingly. Tees are fertilised twice a year because of budget constraints. On fairways, we have just completed a liquid fertiliser application for just the second time in six years.
Anthracnose (Colletotrichum graminicola),

Brown Patch (Rhizoctonia solani),

Dollar Spot (Sclerotinia homoeocarpe),

Helminthosporium Disease (*Bipolaris spp*) *Drechslera* spp, *Exserohilum spp*),

Pythium Leaf Blight, Pythium Root Rot, Seedling Damping Off (Pythium spp),

Fusarium (Fusarium nivale, Microdochium nivale),

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

DISEASE SUCCESS



Ectotrophic Root Infecting Fungi (ERI) [Autumn strategy]

> Spring Dead Spot (Ophiosphaerella narmari),

Take-all Patch (Gaeumannomyces graminis var. avenae)

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

Couchgrass Decline (Gaeumannomyces graminis var. graminis),

Take-all Patch (Gaeumannomyces graminis var. avenae)

Ready to amp up disease control?

This year, turn up the dial on disease control and turf quality with Impala Fungicide.

Backed by preventative protection and curative results. Plus a new active ingredient for the Australian turf market.

Broad spectrum control of over 10 major turf diseases.

Active Constituents:

96 g/L Azoxystrobin 194 g/L Triticonazole

APVMA Product No.: 80146



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SYNGENTA LAUNCHES NEW TECHNOLOGY FOR CONTROL OF STEM WEEVIL

GCSA Gold Partner Syngenta has recently launched a new product in the Australian turf market for the control of Argentine stem weevil (ASW). Provaunt is a powerful new insecticide for the turf industry that directly targets and destrovs both the larvae and adult stages of ASW and stops the life cycle. ASW can be notoriously difficult to control as there are often a number of life cycles present at any one time throughout the summer. Provaunt, a Group 22 insecticide (a.i. 200g/ kg indoxacarb), controls adults and larvae, including the very damaging and hard-tocontrol 3rd and 4th instar.

The chemistry in Provaunt is referred to as 'meta active technology', which when ingested by the insect leads to paralysis and death. Provaunt is translaminar and lodges in the cells of the turfgrass plant where it can be ingested by the insect. Importantly, it also controls on contact with various stages of ASW.



Provaunt is Syngenta's new control option for Argentine stem weevil

BERNHARD AND CO SHARPENS PORTFOLIO

The recent BIGGA Turf Management Exhibition in the UK saw Bernhard and Company unveil its new Anglemaster 4500 automated bedknife grinder. The Anglemaster 4500 delivers even sharper accuracy with Provaunt allows turf managers to reduce their use of organophosphate technologies and synthetic pyrethroids, which anecdotally are not providing the control they once did on ASW.

Provaunt is mixed as a spray application at the low rate of 1.25kg/ha making application not only more effective but easier as well. Provaunt is available in 500g containers in an easy-to-use water dispersible granule formulation that easily dissolves when mixed with water. Local research and development has demonstrated that the best results are achieved when Provaunt is not washed in.

The addition of Provaunt to the Syngenta catalogue means turf managers can now have a programme that successfully controls ASW adults and late stage larvae in one application. When used with Spinner insecticide to systemically control 1st instar larvae, turf managers can control all damaging stages of the ASW life cycle, delivering consistent control of this damaging pest.

For more information regarding Provaunt, please contact your local Syngenta agent or Syngenta territory manager. Further reading with tips on scouting for ASW, labels and SDS can be found at www.greencast.com.au or via the Greencast smart phone app.

VELISTA'S NEW REGISTRATION

In addition to the launch of Provaunt, Syngenta has also announced that its broad spectrum turf fungicide Velista is now registered for the control of fairy ring (*basidiomycetes fungi*).

Velista, a Group 7 chemical (a.i. penthiopyrad 500g/kg), controls a range of diseases such as anthracnose, brown patch, curvularia, dollar spot and helminthosporium, as well as being a powerful rotational partner given the novel SDHI mode of action. It is now also an option for preventative and early curative control of fairy ring.

Velista has excellent residual capabilities and strong targeted binding making it

the use of RFID technology (radio-frequency identification) allowing different users and setups to be easily recalled.

One of the most flexible systems within the Bernhard range, the Anglemaster 4500 boasts smart motors that provide variable speed, enabling users to match the most



Velista is now registered for fairy ring control

an important part of any comprehensive fungicide programme and especially useful to help prevent hard-to-control fairy ring.

Syngenta says that the key to effective fairy ring control begins with understanding your situation and ensuring targeted timing throughout the season, based on history and weather conditions. Syngenta recommends;

- Initiating applications early in the season, when soil temperatures reach greater than 13°C.
- Delivering the active ingredient to the infected zone of the soil profile.
- Applying surfactants regularly to maintain soil conditions and turf health.

To ensure Velista reaches the infected fairy ring zone, as little as 3mm of irrigation is needed if the disease is limited to the thatch layer. It the disease is deeper in the soil, 6-10mm of irrigation is generally recommended. Syngenta recommends the addition of a non-ionic surfactant in the tank and repeat applications at a 21-day interval to maintain consistent control in the soil.

While preventative applications are preferable, early curative applications are possible at first observation of symptoms. Importantly, treatments at the early curative stage can be achieved with Velista. **To join the conversation on Twitter, tag #Time4Velista #FriskyFairyRingFriday and** @GreencastTurfAu. For more info on fairy ring, view the Syngenta webinar hosted by the GCSAA at: bit.ly/FairyRingWebinar

efficient speed to the stone required for the material of the blade. Working alongside the Express Dual 4250, its new drive adaptors and fully automated feed system through touchscreen operator interface mean that sharpening mowers has become much smarter than it has ever been before.



Bernhard's new Anglemaster 4500 automated bedknife grinder

"We have had a fantastic year at Bernhard and we are confident that the new additions to the range will provide equipment managers and mechanics with a greater choice of machines that adapt to different ways of working," says Steven Nixon, director for Bernhard and Company. For more information visit www.bernhard.co.uk.

BAYER RELEASES SPECTICLE TRIAL DATA

AGCSA Silver Partner Bayer has released the findings of its recent trial work with Specticle herbicide for the control of *Poa annua*. Specticle (a.i. 200 g/L indaziflam) was introduced into the turf market a couple of years ago with a new mode of action from other pre-emergent herbicides.

As part of a commitment to further research on *Poa annua* management, Bayer established two golf course trials in Melbourne in conjunction with the VGCSA during 2018;

- Trial 1: A golf course with an existing *Poa* population present in January (average population was 8 per cent).
- Trial 2: A golf course with no existing *Poa* plants in January.



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p. (03) 9437 1472 | e. sales@melchain.com.au www.melchain.com.au/golf Both trial sites received the same treatments (ml/ha) as follows;

- Specticle 250ml in January;
- Specticle 125ml in January followed by 125ml in February;
- Specticle 250ml in February;
- Specticle 125ml in February followed by 125ml in March;
- Specticle 250ml in March; and
- Specticle 125ml in March followed by 125ml in April.

A competitor product was applied for comparison, with treatments including a label low and high rate application and application timings of January, February and March. All the herbicide treatments were compared to untreated control treatments. *Poa annua* populations and turf quality measurements were taken at 0, 2, 4, 6, 8 and 10 months after the start of the trial.

By the eight month assessment in September, the *Poa annua* incidence in untreated plots had increased to 38 per cent in Trial 1 and 15 per cent in Trial 2. Both trials confirmed that Specticle will provide effective long-term control of *Poa*.

In Trial 1, with an existing *Poa* population, at eight months after application there was an average 2 per cent reduction in the *Poa* infestation in Specticle treatments compared to 10 per cent increase in *Poa* population in the competitor treatments. At the eight month mark in Trial 2, the average *Poa* population across the Specticle treatments was 3 per cent and 8 per cent for the competitor product treatments.

For the full trial results and further discussion, visit the Bayer Amplify Turf website at bayeramplifyturf.com.au/en/ Turf/Turf-Talk or contact Jyri Kaapro on jyri. kaapro@bayer.com.



INDUSTRY APPOINTMENTS

ANDERSON JOINS TORO



AGCSA Platinum Partner Toro announced in December that former Sun City Country Club course superintendent **Brad**

Anderson (pictured) had been appointed as an area sales manager for Western Australia. Anderson has had a long association with the WA golf industry over the last 25 years and during his time at Sun City was part of a major course redevelopment/design project as well as complete upgrade of the irrigation system. Based at Toro's Wangara office, Anderson can be contacted by email brad. anderson@toro.com.

HOWARD BOLSTERS LIVING TURF'S QUEENSLAND TEAM



Living Turf announced in mid-January that it had appointed **Barry Howard** (pictured) to the company. Howard joins forces

with Living Turf's Queensland team of Ashley Neuendorf, Max Whatman, Peter Woods and Brett Evans.

"We are extremely excited about this appointment," says Living Turf's national sales manager Neuendorf. "Barry is a true professional and a good bloke – he will be a good cultural fit for Living Turf and I am certain he will thrive in our supportive and progressive team environment."

The appointment comes on the back of the company's announcement that former course superintendent **Matthew Kennedy** was joining the team in December as a technical sales rep. Howard can be contacted on 0499 332 900.



STATE REPORTS

MELBOURNE POLYTECHNIC HOSTS TURF EDUCATION VALIDATION MEETING

ports turf management educators from across the country converged on Melbourne in early December for the 15th National Sports Turf Validation Meeting. Steve Tuckett, head teacher of Sports Turf Management at Melbourne Polytechnic, hosted a very productive two day event at its Fairfield Campus which also included a meeting of the National Turf Education Working Group (NTEWG) on the Tuesday.

This year's validation meeting was a two tiered approach, where firstly TAFE colleges engaged local industry representatives to analyse the assessment strategies in all qualifications and determine any concerns from a learner and industry perspective associated with delivery. This process was to obtain quality feedback from all industry sectors which was then tabled and discussed at the national meeting

The second tier involved representatives from industry. These included co-chair Hugh Gardner, Tony Guy (All Saints College, WA), Garry McClymont (Twin Waters Golf Club, Qld), Paul Janssens (Parliament House Canberra, ACT), John Forrest (Hartfield Country Club, WA), Simone Staples (AGCSA), long-time partner and sponsor, research scientist Jyri Kaapro (Bayer Australia) and TAFE centres delivering sports turf qualifications.

The main aim of the validation meeting was therefore to table the locally validated resources, review industry feedback and fix any issues found to ensure they continue to meet industry needs and training and assessment is consistent across the country. As a result all resources were endorsed by all meeting attendees.

With the endorsement of the existing training package completed, Tuesday started with Jyri Kaapro giving a presentation titled 'New technologies and advances in

ON THE MOVE

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NATHAN BALL: From superintendent Springwood Country Club, NSW to superintendent Penrith Golf Club, NSW.

TOM BICKERDIKE: From assistant superintendent Commonwealth Golf Club. Vic to superintendent Cheltenham Golf Club, Vic.

SHAUN BOWDEN: From 3IC The Glades Golf Club, Qld to assistant superintendent Pennant Hills Golf Club. NSW.

MARK BROOKS: From foreman to assistant superintendent Riversdale Golf Club, Vic.



The 15th National Sports Turf Validation Meeting was held at Melbourne Polytech last December incorporating the biannual meeting of the National Turf Education Working Group

chemical technologies'. This was followed by some real life statistics and data on the use of glyphosate following the recent media attention on the subject, before former chair of the NTEWG Frank Dempsey gave a passionate talk on lessons learnt while working for a private RTO.

The focus of the meeting then shifted to the current review of the Sports Turf Management Training Package expected to be endorsed in August 2019. Project manager of the review Tom Vasallo (Skills Impact) and curriculum writer Ron Barrow (Nestor Consulting) provided delegates with an update on the project and a timeline of the process from inception to anticipated endorsement. They outlined the project's aim, how and why changes are necessary and thanked the amount of passion, time, effort and commitment all sectors of our industry have shown in this project throughout the country.



JUSTIN BRADBURY: From JT Turf to superintendent Camden Golf Club. NSW.

GREG BURGESS: Appointed superintendent Northern Golf Club. Vic.

DAVID CASSIDY: Appointed superintendent at The Cut. WA.

TIM CHAPE: From assistant superintendent to superintendent Sun City Country Club, WA following Brad Anderson's move to Toro as a sales manager.

MARK CRITTENDEN: Departed as superintendent Cumberland Country Club, NSW.

The NTEWG meeting which followed centred on the review as well as discussing ways to build student numbers and reducing skills gaps. A topic that has been discussed in the past is how to improve the apprentice selection process. A pre-selection skill check template was tabled and is now available through the AGCSA and STA to assist employers vet their apprentice applications.

The next meeting of the NTEWG is planned for Brisbane as part of the Asia Pacific Turfgrass Conference and Trade Exhibition in June 2019 with the annual validation meeting planned to return to Canberra Institute of Technology from 1-3 December, 2019.

For more information regarding turf education and training, contact your local TAFE college or NTEWG co-chairs Albert Sherry albert.sherry@tafensw.edu.au (02) 4936 0215 or Hugh Gardner hugh.gardner@ iinet.net.au 0418 245 557.

MIKE HEALY: From McIntosh & Sons, WA to superintendent Meadow Springs Golf Club, WA.

RYAN SWANBURY: Resigned as superintendent Berri Golf Club, SA to move to Scotland.

IAN THOMPSON: Resigned as superintendent Penrith Golf Club, NSW. Has taken up a role with Yates as a senior product development horticulturist. MATT WILKES: From assistant superintendent Springwood Country Club, NSW to assistant superintendent Penrith Golf Club, NSW.

TURF QLD

ooking back over the past 12 months as we enter 2019, it has been an extremely busy time for Turf Queensland.

We are pleased to advise that discussions are being held with the GCSAQ and STA Queensland to maximise impact value at seminars, field days and workshops by bringing the different sectors of the industry together. This is a huge step and one that I'm sure all of the turfgrass green industries will appreciate. Please watch out for various events as they are announced.

We had an impressive turnout at the Lawn Fanatics Field Day on 20 October 2018 at Go Turf's property at Beerwah on the Sunshine Coast. It gave a great indication of how many of the general public are extremely interested in the maintenance and quality of their lawn, as well as seeking out information on various issues. Many experts were on hand to answer questions and it was considered highly successful. There are many new varieties of turfgrass raising their profile and Turf Queensland is sure that some varieties will be of value to the golf, sports and recreation sectors along with homeowners where it has been proven that a good lawn and garden can add 15 per cent to the value of a house. Contact your local Turf Queensland producer for further promotion

It is also important to understand the other benefits of turfgrass. Natural turf can;

- Reduce run-off and act as an effective form of erosion control.
- Turfgrass is considerably cooler than most other common surfaces – 15 degrees cooler than concrete and 30 degrees cooler than synthetic turf!
- Act as a carbon sink. Turfgrass plays an important role in carbon sequestration, or the removal of carbon from the atmosphere, with open space sports areas and parklands assisting greatly. During the process carbon dioxide is converted into plant biomass allowing

it to be stored for long periods of time below the ground in the root system. This is where grassland systems differ greatly from other ecosystems in that the below-ground biomass is relatively large compared to the above-ground growth.

 Reduce noise. Various studies have shown that turfgrass planted on slopes and barriers facing the noise source can reduce noise as much as 8-10 decibels. Any noise that does penetrate is rendered softer and less irritating.

We have had many reports surrounding workplace health and safety recently that reminds us to be proactive with regards to the protection of our loved ones and workmates. Health and wellness continues to have a high profile and something that we all should take notice of.

JIM VAUGHAN EO, TURF QUEENSLAND

NSWGCSA 🍽

t has been a pretty brutal lead-in to 2019 for members of the NSWGCSA, with summer really kicking into gear. Minimal rain events around the state have meant very dry conditions outside of the Sydney metropolitan area. Chuck in some freak hailstorm events just before Christmas – they were golf ball size at The Australian and up at Terrigal – and it has made for a challenging period for all who manage fine turf.

Speaking with former NSWGCSA Board member and long-serving Northbridge Golf Club superintendent **Mal Harris**, he says it has been the most brutal January period he has experienced in his 36 years there.

Personally, at Eastlake Golf Club, I have only received 44mm of rain for the month of January with 23mm of that falling on the 6th. The Sydney CBD experienced a high of 39 degrees on 5 January then a low of 18 degrees the following day. West of the CBD, Penrith recorded a high of 42 degrees and it only gets worse as you head further away from the coast. Humidity has also been high placing a lot of disease pressure on turf managers.

As I write this, the Australia Day long weekend forecast is for another heat wave across the state so fingers crossed everyone can get through unscathed. Hopefully another four weeks and we will all see a



Golf ball-sized hail struck a number of Sydney and Central Coast courses before Christmas

turn in the weather and can start planning renovations.

The NSWGCSA would like to welcome **Rod Hinwood** (Ellerston Golf) and **Ian Elphick** (Gunnedah GC) to the board of directors. The board is currently planning its 2019 events schedule with the first the Annual Ambrose Event to be held at Royal Canberra Golf Club on 6 May. Two 'walk 'n' talks' are also being scheduled at newly reconstructed Brighton Lakes Golf Club (formally New Brighton Golf Club) and Bayview Golf Club. Final dates are yet to be set but the Brighton Lakes day will be either May or June and Bayview in August. Both days will be sponsored by Globe Australia.

Finally, the NSWGCSA Board wishes to congratulate **Mark Crittenden** who recently stepped down after a long tenure as superintendent of Cumberland Golf Club. Mark won the 2014 NSWGCSA Outstanding Achievement Award and will be sorely missed. We wish him all the best for the future.

NATHAN BRADBURY PRESIDENT, NSWGCSA



STATE REPORTS



A s I pen this article summer is well and truly upon us. It has been a wonderfully fine season so far, with great spells of clear weather before Christmas and the same replicated throughout January for most places. It reminds of the summers of when you were a kid and could enjoy those seemingly endless days of summer. Or perhaps we just had less to worry about as a kid and every day was a holiday.

With summer comes a return of our sporting passion with cricket. After a successful series against Sri Lanka we have been well and truly humbled in the first two ODI games against the Indians who were fresh off their record-setting series win against the Australians. Thankfully we are playing only the shorter version of the game against India or else there may well have been some big one-sided results! With the World Cup later in the piece India look very strong to take it out and hopefully before then the Black Caps can sort out their current blues.

FTMI

March will see a return of the Future Turf Managers Initiative (FTMI) to Melbourne with a combination of both up and coming New Zealand and Australian greenkeepers extending their knowledge base. This threeday FTMI has proven to be very successful over recent years and provides an invaluable opportunity for both learning and networking.



The crew at Remuera Golf Club is in mourning following the death of greenkeeper Jarryd Davidson on 12 January in a car accident

The following were successful in their applications and will be representing the NZGCSA in Melbourne;

- Ben Simons (Cape Kidnappers)
- Callum Cameron (Remuera Golf Club)
- Harry Middleton (Tauranga Golf Club)Phil Marra (Shandon Golf Club)

Congratulations to the four of you and we know you will all make the most of this fantastic opportunity which is once again sponsored by generous partner Jacobsen. We are extremely grateful for this continued support.

GCSAQ Golf Course Superintendents

he GCSAQ committee held its 2019 planning session in Brisbane in early January. The committee enjoyed a bite to eat while discussing activities and initiatives for 2019.

The first major event on the calendar is the GCSAQ Golf Industry Awards which will be held on Thursday 21 March at RACV Royal Pines Resort on the Gold Coast. This is a fantastic opportunity to reward our industry leaders as well as our assistants and apprentices.

These awards recognise an individual's achievements in our industry that deserve acknowledgement within the wider golf community and are a valuable experience for career development. We invite everyone to submit a nomination via the GCSAQ website www.gcsaq.com.au/gcsaq-golfindustry-awards/ Nominations close Friday 22 February and it is important to follow the criteria as per the nomination forms carefully. In previous years the independent judging panels have found nominations difficult to judge due to some submissions not aligning with the criteria. The GCSAQ is very grateful for the continued support of award sponsors Living Turf, Greenway Turf Solutions, Ogilvy Clayton Cocking Mead, Toro and epar.

Another date to put in the diary is the GCSAQ Turf Industry Day which will be hosted at Lakelands Golf Club (superintendent **Phil Soegaard**) on Friday 12 April. This event is always popular and we will be releasing further information and registration in the coming weeks.

PAUL MCLEAN PRESIDENT, GCSAQ

NZGCSA GRADUATE OF THE YEAR

After a hard fought finals day in December, **Stefano Godinich** from Whitford Park Golf Club was awarded this year's NZGCSA Graduate of the Year Award. Congratulations to Stefano who received a trip to the Golf Industry Show in San Diego compliments of Power Turf NZ. Our thanks go to John and his team for this opportunity and support.

FINE TURF SEMINAR

It's time to ensure that you have made arrangements to attend this year's Fine Turf Seminar (FTS) hosted by the Central North Island Turf Managers Association (CNITMA). The seminar will be held in Taupo on 16-18 June 2019 and as with previous seminars is a must-attend event for both the programme and the fellowship that is always on offer.

INDUSTRY FATALITY

In a sickening start to the year, two of our own were involved in a tragic motor vehicle accident in Auckland. Following a crash between a bus and a car on 12 January, in which the two greenkeepers were travelling, the life of 24-year-old **Jarryd Davidson** was lost and his passenger **Josh Presland** critically injured. At the time of writing Josh is out of hospital and we wish him a speedy and successful recovery.

Both men were integral members of the team at Remuera Golf Club whose superintendent **Spencer Cooper** is the latest addition to the NZGCSA Board. Our thoughts and those of the entire industry go out to the families of Jarryd and Josh, and also to the tight-knit team at Remuera Golf Club who have felt this loss very closely.

LOOKING AHEAD

By now we should have all reset our goals for the year so that we get a balance between our work and home lives. And I'm not talking about the usual New Year goals of losing mountains of weight, getting fitter and drinking less. I'm talking serious goals so we don't over extend ourselves at work and burn out through the year. Goals that give you balance so that you can enjoy both your time at work and your time outside of work with family and friends. It is most important but often overlooked, so I encourage you all to make a little time to ensure that it happens.

> STEVE HODSON PRESIDENT, NZGCSA



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Some 550 paddlers took part in the 404km Massive Murray Paddle from Yarrawonga to Swan Hill last November

David Worrad (right) and Tom Irvine raised \$6000 for charity





Essential supplies – water bottle, map and pee bottle (the black one!)

Living Turf's David Worrad likes to push himself. He's trekked Kokoda, climbed to Everest base camp and last November jumped in a kayak and paddled over 400km down the Murray River all in the name of charity.

t's 6.55am on Thursday 22 November, day four of the five-day, 404-kilometre 2018 Massive Murray Paddle. We are on the water waiting for the starter's gun. The sky overhead is grey but conditions are still.

Four days earlier and some 300km back upstream at the pre-race briefing in Yarrawonga, participants were warned about the forecast for Thursday and given options on how to manage the expected conditions. By 7.30am the rain starts which soon turns torrential followed by claps of thunder and lightning. The wind picks up to over 20 knots – it's not every day you see one-foot white caps on the Murray River! By the day's end one paddler is in hospital with pneumonia while a fair few more have hypothermia! And this was supposed to be the shortest, easier day!

One of the world's longest paddling races, the Massive Murray Paddle has been connecting people, river and country since 1969. Celebrating its 50th anniversary last November, the race begins in Yarrawonga and finishes in Swan Hill and is the longest event of its kind in the Southern Hemisphere. The first two days – Yarrawonga to Tocumwal and Tocumwal to Picnic Point – are the longest at 93km and 94km respectively, while the day four stretch from Echuca to Torrumbarry is the shortest at 62km. The final stretch to Swan Hill is 77km.

The 2018 event comprised of 550 paddlers and more than 800 support crew, with the youngest paddler just eight years old and the oldest 83. A total of 170 craft took to the water, ranging from kayaks, canoes and even stand-up paddle boards. To enter the race you must support a charity and in total the 2018 event raised an impressive \$260,000 (one individual alone raised an amazing \$24,000).

I did the event in a Mirage 730 double kayak (7.3m long) with my wife's cousin Tom Irvine. He had wanted to do the event for 30 years so we teamed up and called ourselves 'Dumb and Dumber' – he was 'Dumb'. (On that Thursday, a lady paddled past us and called herself 'Dumbest'!)

I started training for the event in February as I'd never kayaked more than casually before. Starting with a one-hour session, I got up to a six-hour, 45km session the week before the event. Fitting in training around work and weekend commitments wasn't easy and wears you down. I couldn't get my head around the prospect of having to paddle



90km in a day but thanks to friends and family I kept at it. I also should mention that just prior to the event I, along with Martyn Black and Graeme Grant, went on a golfing trip to Ireland and they made sure I trained every day while I was there!

The Massive Murray paddle is a bloody fantastic event! We supported Beyond Blue because of various family/friend reasons and all up we raised around \$6000 which Tom and I were very chuffed with. I was surprised how much this affected both my preparation and how I handled the tougher moments of the event. People's support for an important cause is a significant encouragement to get to the finish line.

The event has a very strong indigenous focus with what seemed like hundreds of young kids taking their turn to be part of the race. There is huge respect for the traditional land owners and their culture. Each day's paddle had three checkpoints. So there was the opportunity for a kid to paddle between checkpoints in a double canoe with an experienced paddler. Early on each leg their conversation would be, 'Hello, what's your name, where do you go to school'. Some 20km later it was. 'Come on, keep going, you have to get to the finish!' The vibe throughout all five days was one of positivity and fun. People cheered and supported each other throughout. The camaraderie was a highlight because all day, every day, you either pass paddlers or, in our case, were passed by paddlers. There were words of encouragement, advice and plenty of jokes. There were elite competitors – who completed the 404km in just a little over 30 hours – through to one guy who decided to enter on the morning of the event (he worked for the tracking company).

Most days we found ourselves near a couple from northern England who brought out their stand-up paddle board – I couldn't imagine standing up for 8-10 hours per day for five days straight! They were unbelievable and the nicest, most friendly people. There was also an 80-year-old lady who needed help to get into her kayak, but once in her arms swirled like a fan and off she went.

Despite my initial concerns about having to paddle upwards of 90km each day, what you learn about yourself from doing endurance events like this is just how much more your body has to give when your brain says you've had enough. Each day was a chore at times, but the mental and physical challenge of keeping going was quite fulfilling.



I would strongly encourage all of you interested in a week away from work and looking for a challenge for whatever reason to consider entering Massive Murray Paddle 2019 (18-22 November). While we did the 404km together, you can enter a team of two or more and complete it as a relay event for a far more civilised experience. Check out www.massivemurraypaddle.org.au. Maybe the AGCSA can get a team together... Ju



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